BSES RAJDHANI POWER LTD (BRPL)

Notice Inviting Tender (NIT)

For

Electrical EHV work of multiple locations as mentioned below:

a) ETC work of 33KV switching substation of G319 Godrej Okhla along with 33 KV In-feed. (Scheme no. ES23GS1004)
b) Addition of 1 Nos. 20 MVA 66/11kV Power Transformer with allied equipment at 66kV Sarita Vihar Grid.(Scheme No: ES22AT4028)
c) 66 KV Control and Relay Panels Replacement work at South (3 locations) (Scheme no. ES22MS4038) and West (5 Locations) Grids. (Scheme no. EW22MS4014 & EW21MS4002)

NIT No.: CMC/BR/24-25/RB/CR/AG/1176 Dated: 25.01.2024

Due Date for Submission of Tender: 14.02.2024, 15:30 HRS

Date and Time of opening: 14.02.2024, 16:00 HRS

BSES RAJDHANI POWER LIMITED,
BSES Bhawan, Nehru Place, New Delhi – 110019.
Corporate Identification Number: U74899DL2001PLC111527
Website : www.bsesdelhi.com

CONTENTS

BSES RAJDHANI POWER LIMITED

SECTION – I

REQUEST FOR QUOTATION

1. GENERAL

BSES RAJDHANI Power Limited invites sealed tenders on a "Single Stage: Two Envelope" bidding basis (Envelope –I, Techno-Commercial Bid & Envelope-II, Price Bid) from eligible Bidders for

Electrical EHV work of multiple locations as mentioned below:

a) ETC work of 33KV switching substation of G319 Godrej Okhla along with 33 KV In-feed. (Scheme no. ES23GS1004)
b) Addition of 1 Nos. 20 MVA 66/11kV Power Transformer with allied equipment at 66kV Sarita Vihar Grid.(Scheme No: ES22AT4028)
c) 66 KV Control and Relay Panels Replacement work at South (3 locations) (Scheme no. ES22MS4038) and West (5 Locations)Grids. (Scheme no. EW22MS4014 & EW21MS4002)

I. The bidder must qualify the requirements as specified in heading "Qualifying Requirements" of this RFQ.

II. The sealed envelopes shall be duly super-scribed as:

"NIT No.: CMC/BR/24-25/RB/CR/AG/1176 Dated: 25.01.2024"
for
Electrical EHV work of multiple locations as mentioned below:

a) ETC work of 33KV switching substation of G319 Godrej Okhla along with 33 KV In-feed. (Scheme no. ES23GS1004)
b) Addition of 1 Nos. 20 MVA 66/11kV Power Transformer with allied equipment at 66kV Sarita Vihar Grid.(Scheme No: ES22AT4028)
c) 66 KV Control and Relay Panels Replacement work at South (3 locations) (Scheme no. ES22MS4038) and West (5 Locations) Grids. (Scheme no. EW22MS4014 & EW21MS4002)

III. Schedule of the tendering process is given below. Detailed Specification, Scope of Work, Terms & Conditions, etc are mentioned in the Tender documents, which is available on our website.

Cost of Tender Documents (Non- Refundable)	Rs. 1180/- (including GST)
Estimated cost of work	Rs. 95.19 Lakhs
Earnest money Deposit	Rs. 1.90 Lakhs
Duration of the Work	6 months
Tender documents on sale	25.01.2024 to 14.02.2024 (Working days)
Date & time of Submission of Bid	14.02.2024 till 15:30 HRS
Date & time of opening of Techno-Commercial Bid	14.02.2024 at 16:00 HRS

IV. The tender document can be obtained from address given below against submission of non-refundable demand draft of **Rs. 1180/-** drawn in favour of BSES Rajdhani Power Ltd, payable at Delhi:

Head of Department
Contracts & Material Dept.

BSES Rajdhani Power Limited
Ist Floor, "C" Block, BSES Bhawan
Nehru Place, New Delhi -110019.

V. Only DD shall be accepted for tender fees.

VI. The tender documents will be issued on all working days up to the date mentioned in clause 1.3. The tender documents & detail terms and conditions can also be downloaded from the website www.bsesdelhi.com. In case tender documents are downloaded from the above website, then the bidder has to enclose a separate demand draft covering the cost of bid documents.

2. POINTS TO BE NOTED

I. Works envisaged under this contract are required to be executed in all respects up to the period of completion/ duration of work mentioned above.

II. Only those agencies, who fulfil the qualifying criteria as mentioned in clause 3 should submit the tender documents.

III. BSES RAJDHANI Power Ltd reserves the right to accept/reject any or all bids without assigning any reason thereof and alter/amend/modify/add/reduce the amount and quantity mentioned in the tender documents at the time of placing Order

IV. The bid will be summarily rejected if:

(a) **Earnest Money Deposit (EMD)** and **Tender Fee** of requisite amount is not deposited as per tender conditions

(b) Bid received after due date and time.

3. EMD

I. The bidder shall furnish, as part of its bid, an EMD of the requisite amount. The EMD is required to protect the Company against the risk of Bidder's conduct which would warrant forfeiture. The EMD shall be denominated in any of the following forms:

(a) BG from nationalized / Scheduled Bank, as per the format annexed in the tender document, in favour of BSES Rajdhani Power Limited valid for 6 (six) months from original due date of bid submission.

(b) Fixed Deposit (lien marked in favor of BSES RAJDHANI POWER LTD) valid for 6 (six) months from original due date of bid submission.

II. Please note that bank details as given below have been provided only for the purpose of making BG for EMD.

Beneficiary Name	: BSES Rajdhani Power Limited
Bank Name	: State Bank of India
A/c No.	: 40214783615
IFSC Code	: SBIN0009601

The EMD of the bidders who are not technically qualified shall be returned after the price bid opening.

III. Earnest money given by all the bidders who are techno commercially qualified except the lower bidder shall be returned within 8 (Eight) weeks after award of the work.

IV. The EMD of the successful bidder shall be returned on submission of CPBG as per tender terms.

V. The EMD may be forfeited in case of:

(a) The Bidder withdraws its bid during the period of bid validity specified by the Bidder in the Bid Form or

(b) The successful Bidder does not

(i) Accept the Purchase Order/Work Order, or

(ii) Furnish the required CPBG as per tender terms

(c)The bidder is found to have submitted false or forged, any of the documents/certificates/information.

4. QUALIFYING REQUIREMENTS (QR)

The prospective bidder must meet all of the following qualifying requirements to be eligible to participate in the bidding.

(A.1) TECHNICAL QR:

a. The bidder must have successfully installed, tested and commissioned Grid AIS/GIS substations or major equipments of Grids i.e. Power Transformer, Grid Switchgear(Panels) and EHV Bay Equipment of 33 KV or higher rating in the five(5) financial years from date of Bid opening. The list of such experiences shall be furnished as per format attached in Schedule-I (List of Installations) of Technical Specification.

b. Bidder should have at least one performance Certificate for the similar works executed in the last five(5) financial years from reputed Electricity Board(s)/ reputed company(ies) in India /Abroad , transmission and distribution utilities of successful installation, testing & commissioning of similar above works. In case of bidder has a previous association with BRPL /BYPL for similar product and service, the performance feedback of BRPL/BYPL shall be given preferences.

c. Bidders shall submit the list of tools & tackles, with Sl No, Make & Calibration certificates suitable for carrying out the specified job tendered for.

d. The bidder must possess valid ISO 9001:2015 certification.

e. For Existing vendors of BRPL, Technical evaluation will also include the performance in the existing contracts. BRPL reserves the right to qualify or disqualify their bid based on the performance in spite of them meeting the above qualifying criteria.

(A.2)Commercial Qualifying Criteria:

f. The average annual turnover of the Bidder, in the preceding three (3) financial years (i.e., FY22, FY21 & FY20) should not be less than Rs 3 (Three) Crore. The bidder shall submit the Annual Turnover Report of the last 3 FYs duly certified by a Chartered Accountant. The Turnover certificate must have UDIN Number. In case the audited balance sheet is not available with the bidder for FY 22-23, the bidder shall submit the audited balance sheet for FY 19-20 or turnover certified by the auditor.

g. The bidder must provide proof of having solvency of an amount equal to Rs 0.50 Crore from any nationalized/ scheduled commercial bank. It should not be older than 01.01.2023.

h. Bidder should have Registration of GST & PAN.

i. Bidder should fulfill all statutory compliances like PF, ESI registration.

j. The bidder should possess valid Electrical Contractor License issued by competent statutory agency to undertake work in NCT Delhi. In case the bidder is not having this license, they have to give the undertaking that it will be obtained by them before the start of the work at site or suitable

sub-contractor having the valid license shall be engaged for works at site with the approval of BRPL where copy of valid license shall be submitted to BRPL before the start of the work.

k. Entities that have been currently debarred/blacklisted by any Private/central/state government institution including electricity boards in India, any of the DISCOM in India, lacks qualifying pre-requisites to participate in this tender will not be considered. Accordingly, an undertaking by the Authorized Person along with other documents to be provided by the bidder on its letterhead in this regard, confirming in clear terms, that the contractor has not been debarred/blacklisted as on the date of submission of the bid. Bidders who is currently debarred/ blacklisted/ suspended by BRPL will not be considered in this tender.

l. The bidder should give an undertaking on their letterhead that all the documents/certificates/information submitted by them against the tender are genuine/true/correct and the copies of documents have been made from the original document/s. Further, in case any of the documents/certificates/information submitted by the bidder is found to be false or, BRPL at its sole discretion shall be free to take all actions as permitted under law, including forfeiture of EMD and disqualification from participation in the future tenders of BRPL & Its group companies for an indefinite period or period as may be decided by BRPL.

m. The bidder should submit an undertaking for "No Litigation" / no legal case is pending with BRPL or its Group Companies. Bidders having any litigation/ legal case pending with BRPL shall not be considered qualified for this tender.

OTHER REQUIREMENTS:

n. Company reserves the right to carry out technical capability/ infrastructure assessment of the Bidders by factory/office/site inspection or by any other means and company's decision shall be final in this regard.

o. No Joint ventures / consortiums are allowed.

p. The bidder shall submit all necessary documentary evidence to establish that the Bidder meets the above qualifying requirements including but not limited to the following:

q. Last three Financial Years (FY 20, FY 21& FY 22) audited financial statement. Incase audited balance sheet of FY 22-23 is not available then bidder can submit provisional balance sheet for FY 22-23 along with UDIN based CA certificate. The bidder shall submit the audited balance sheet for FY 19-20 or turnover certified by the auditor.

i. Bidder to submit UDIN based CA Certificate showing NIL dues towards Statutory Liabilities, including GST, Taxation, PF, ESI, or any other dues Statutory in nature for the period upto 31.03.2022, herein collectively called as "Statutory dues" and there is no liability over the bidder relating to deposition of such statutory dues.

ii. Detail of Banks and Fund & Non fund based Credit limit

iii. Details of formation/registration of the firm (Proprietary/ Partnership) or Company along with all relevant details)

iv. Memorandum & Articles of Association of the Company/ Partnership Deed of the Firm /other registration documents, as applicable

v. Organization Chart of the Bidders Company/organization

vi. Organization chart for execution of the contract

vii. Experience details with credentials

viii. Number of Employees & necessary details

ix. Details of office/s in Delhi, Details of Registered and Corporate offices and details of other offices/establishments in India.

x. Work order / Agreement copies along with performance certificates in support of relevant experience.
xi. Turnover certificate issued by CA (along with UDIN no.) for the last three Financial Years.
xii. Net worth certificate as elaborated in financial QR
xiii. List of pending litigation with government/other institution on account of executing any order.
xiv. Copy of ESI/PF Registration certificate
xv. Copy of PAN/GST no.
xvi. Copy of GST Return of last Financial Year.
xvii. Copy of valid Electrical License
xviii. Non-Disclosure Agreement (NDA) as per format attached
xix. Bidder's details as per format attached
xx. Solvency Certificate
xxi. An undertaking to provide all Tools & Plants , PPEs as per tender scope

(a) The bidder should enclose performance certificates in support of relevant experience.
(b) For Existing vendors of BRPL, the evaluation will also include the performance in the existing contracts via-a-vis performance in terms of HR issues, all statutory Compliance parameters and wages disbursement by Vendors. BRPL reserves the right to qualify or disqualify their bid based on the contract performance despite them meeting the above-mentioned qualification requirements. In case of bidder has a previous association with BRPL/BYPL for similar product and service, the performance feedback for that bidder by BRPL/BYPL shall only be considered irrespective of performance certificate issued by any third organization.
(c) BRPL may ask for such other documents as it deems fit for substantiating/ justifying the submissions made by the bidder.

5. PRE-BID MEETING:

A pre-Bid meeting shall be organized physically or digitally (through web conferencing platform) at the time and date as specified in the tender documents in the presence of those bidders or their authorized representatives who may choose to be present.
The details of the proposed Webex Meeting (if applicable) are given below: -

NIT - 1176 Various Schemes for EHV Works in BRPL
Hosted by Head C&M

https://bsesbrpl.webex.com/bsesbrpl/j.php?MTID=md16a8d3cc758b86f4d22067e0c9fe3a8
Tuesday, February 6, 2024 6:00 PM | 6 hours | (UTC+05:30) Chennai, Kolkata, Mumbai, New Delhi
Meeting number: 2515 681 8641
Password: 1176 (1176 from video systems)

Join by video system
Dial 25156818641@bsesbrpl.webex.com
You can also dial 210.4.202.4 and enter your meeting number.

Join by phone
+65-6703-6949 Singapore Toll

Access code: 251 568 18641

All queries related to this tender must reach to C&M Department of BRPL at least three days before the date of the pre- bid meeting. All the bidder's queries shall be replied to in the pre-bid meeting. In case any change is required in the tender document the same shall be effected in the form of corrigendum to this tender. The bidder or their representatives who intend to bid and who have either purchased tender documents or will pay tender fees for downloaded documents are invited to attend the pre-bid meeting. Corrigendum, if any, to the tender document shall be hosted on the website subsequent to the pre-bid meeting. Bidders are requested to submit their offer strictly in line with this tender document& corrigendum if any.

6. BID SUBMISSION

1. The bidders are required to submit the bid in 2(two) parts and in original& duplicate (total 2 copies) at the following address:

   Head of Department,
   Contracts & Material Department,
   BSES Rajdhani Power Limited,
   Ist Floor, "C" Block, BSES Bhawan,
   Nehru Place,
   New Delhi-110019.

2. Technical bid documents along with commercial terms and conditions shall also be submitted in Pen Drive. No price bid shall be submitted in Pen Drive. The PEN Drive should be owned by Bidder. The bidder shall ensure that the Pen Drive is free from all viruses/malware. The pen drive once submitted shall not be returned.

3. This is a two part bid process. Bidders are to submit the bids in 2(two) parts. Both these parts should be furnished in separate sealed covers super scribing **NIT no. DUE DATE OF SUBMISSION, with particulars as PART-A Techno-Commercial Bid and Part-B PRICE BID** and these sealed envelopes should again be placed in another sealed envelope which should be super scribed with **—"Tender Notice No.& Due date of opening".** The same shall be submitted before the due date & time specified.

6.3.1 PART A: TECHNO-COMMERCIAL BID, UNPRICED (Envelop-1):

The first sealed envelope shall contain an Unpriced Techno-commercial bid in paper form (hard copies) and envelope super-scribing **PART-A Techno-Commercial Bid**. The details to be submitted in techno-commercial bids are given below:

a) General information about bidder

b) Documentary evidence in support of all the qualifying criteria as per clause 4.0,

c) EMD of requisite amount

d) Non-refundable separate demand draft for Rs. 1180/- In case the forms are downloaded from the website

e) Technical Literature if any.

f) Details of experience of works of the same or similar nature. Copy of work orders and performance certificates.

g) Power of attorney

h) Acceptance to Commercial Terms and Conditions viz Delivery schedule/period, Payment terms, BG etc

i) Any other relevant document to support bidder meeting QR

Techno-Commercial Bid should not contain any cost information whatsoever and shall be submitted within the due date. After techno-commercial evaluation, the list of techno-commercially qualified bidders will be posted immediately on the BSES website.

The bidder should submit complete tender document along with all corrigendum (if any) published against this NIT at our website, signed and stamped with bidder's seal as an acceptance of all the terms & conditions of the Tender.

6.3.2 PART **B: PRICE BID (Envelop-2):**

The second sealed envelope shall contain Price bids in paper form (hard copies and envelope super-scribing **PART-B Price Bid** on it. The details to be submitted in the Price bid are given below:

(a) **PRICE BID** shall Comprise of Prices **strictly** in the Format enclosed in SECTION VII. Any change in price bid format, content may lead to rejection of the bid.

(b) Price Bid will be opened after techno-commercial evaluation of all the bids and only of the qualified bidders.

6.3.3 FINANCIAL BID EVALUATION THROUGH REVERSE AUCTION

Reverse Auction (RA) shall be conducted for finalization of contract and the details of the price bid shall not be shared with bidders. The qualified bidders will participate in reverse auction through SAP-SRM tool. The RA process shall be governed by the terms and conditions enclosed as Annexure-III in this tender document. Training/details shall be provided to bidders before participation in auction. In case RA is not conducted /concluded for any reasons, a "final no regret" financial bid in a sealed envelope will be called for from all qualified bidders. Notwithstanding anything stated above, the Company reserves the right to assess bidders' capability to perform the contract, should the circumstances warrant such assessment in the overall interest of the Company. In this regard, the decision of the Company shall be final and binding on the bidders.

6. TIME SCHEDULE

The activities and their timelines are given hereunder which needs to be adhered by the bidders.

S. No.	Activity	Description	Due date
1	Submission of Technical& Commercial Queries, if any	All Queries related to NIT	05.01.2024
2	Pre-Bid Meeting	Discussion on pre-bid queries	06.02.2024
3	Submission of Techno-Commercial & Price Bid	Unpriced Techno-Commercial & Price Bid in separate sealed envelopes	14.02.2024
4	Opening of Techno-Commercial Bid	Opening of PART-A	14.02.2024
5	Opening of Price Bid	Opening of PART-B of only the techno-commercially qualified bidders (List of	To be informed separately

		bidders will be published at our website)	
6	Reverse Auction	As per RA terms	Schedule will be intimated to eligible bidders through email from email id: BRPL.Eauction@relianceada.com

7. AWARD DECISION:

1. Company intends to award the business on a lowest bid basis, so bidders are encouraged to submit the bid competitively. The decision to place order/LOI solely depends on Company on the cost competitiveness across multiple lots, quality, delivery and bidder 's capacity, in addition to other factors that Company may deem relevant.
2. The Company reserves all the rights to award the contract to one or more bidders who meet the execution requirement or nullify the award decision without assigning any reason thereof.
3. In case the performance of any contractor is found unsatisfactory during the execution process, the award will be cancelled and BRPL reserves the right to award the work to another contractor(s) who will be found eligible/fit.
4. The abnormally higher or abnormally lower bids shall not be considered with respect to estimated cost. The criteria decided by BRPL on this shall be final and binding on the bidders.
5. The bidding firms are advised to quote their Margin / Administrative Service Charges accordingly. BRPL reserves the right to reject the bids quoted with abnormally higher or abnormally lower individual activity rates. The criteria decided by BRPL on this shall be final and binding on the bidders and will not be open for discussion under any circumstances.

8. MARKET INTEGRITY

We have a fair and competitive marketplace. The rules for the bidders are outlined in the Terms & Conditions of the tender documents. Bidders must agree to these rules prior to participating in the tender. In addition to other remedies available, we reserve the right to exclude a bidder from participating in future markets due to the bidder's violation of any of the rules or obligations contained in the Terms & Conditions. Bidder(s) who violate the marketplace rules or engage in behaviour that disrupts the fair execution of the marketplace restricts a bidder from participation in future tenders of BRPL to a length of time as decided by BRPL, depending upon the seriousness of the violation. Examples of violations include, but are not limited to:

- Failure to honour prices submitted to the market place.
- Breach of the terms published in Request for Quotation/NIT
- Misrepresentation of facts, submitting false and fabricating documents

9. CONFIDENTIALITY

- All information contained in this tender document is confidential and may not be disclosed, published or advertised in any manner without written authorization from BRPL. This includes all bidding information submitted.

- All tender documents remain the property of BRPL and all bidders are required to return these documents to BRPL upon request.
- Bidder(s) who do not honour these confidentiality provisions will be excluded from participating in future bidding events.
- The bidder shall sign a Non-Disclosure Agreement (NDA) in the format attached in tender document and submit along with its bid.

10. CONTACT INFORMATION

Technical & Commercial clarification, if any, regarding this tender shall be sought in writing and sent by e-mail to the following e-mail IDs:

Address	Name/ Designation	E-mail Address / Phone Number
Technical		
Electrical EHV work of multiple locations as mentioned below: **a) ETC work of 33KV switching substation of G319 Godrej Okhla along with 33 KV In-feed. (Scheme no. ES23GS1004)** **b) Addition of 1 Nos. 20 MVA 66/11kV Power Transformer with allied equipment at 66kV Sarita Vihar Grid.(Scheme No: ES22AT4028)** **c) 66 KV Control and Relay Panels Replacement work at South (3 locations) (Scheme no. ES22MS4038) and West (5 Locations) Grids. (Scheme no. EW22MS4014 & EW21MS4002)**	Mr.Gora Dutta, AsVP- (EHV Grid)	Gora.dutta@relianceada.com 8010937153
	Mr. Nirjendu Pandey Head – EHV(P&C)	Nirjendu.Pandey@relianceada.com 011-49209323
	Mr. Abhinav Srivastava	abhinav.r.srivastava@relianceada.com
	AsVP – (CES Team)	9350134826
	All technical queries shall also be marked copy to Commercial team as per the details below.	
Commercial		
C&M Dept, 1st Floor, C Block, BSES Rajdhani Power Ltd BSES Bhawan, Nehru Place, New Delhi – 110019.	Ms. Anima Gaur DGM(Contracts) Mr. Amitava Nandi, AsVP – (Head Contracts)	anima.gaur@relianceada.com 011-49209429 Amitava.Nandi@relianceada.com 011-4920 9619

SECTION-II

INSTRUCTIONS TO BIDDERS (ITB)

1. GENERAL

BSES RAJDHANI Power Ltd (BRPL), hereinafter referred to as the "Company" is desirous for awarding work of

Electrical EHV work of multiple locations as mentioned below:

a) ETC work of 33KV switching substation of G319 Godrej Okhla along with 33 KV In-feed. (Scheme no. ES23GS1004)

b) Addition of 1 Nos. 20 MVA 66/11kV Power Transformer with allied equipment at 66kV Sarita Vihar Grid.(Scheme No: ES22AT4028)

c) 66 KV Control and Relay Panels Replacement work at South (3 locations) (Scheme no. ES22MS4038) and West (5 Locations) Grids. (Scheme no. EW22MS4014 & EW21MS4002)

1.1 All the Bids shall be prepared and submitted in accordance with these instructions.

1.2 Bidder shall bear all costs associated with the preparation and delivery of its Bid, and the Company will in no case shall be responsible or liable for these costs.

1.3 The Bid should be submitted by the Bidder in whose name the bid document has been issued and under no circumstances it shall be transferred /sold to the other party.

1.4 The Company reserves the right to request for any additional information/documents and also reserves the right to reject the proposal of any Bidder, if in the opinion of the Company, the data in support of RFQ requirement is incomplete.

1.5 The Bidder is expected to examine all instructions, forms, terms & conditions and specifications in the Bid Documents. Failure to furnish all information required in the Bid Documents or submission of a Bid not substantially responsive to the Bid Documents in every respect may result in rejection of the Bid. However, the Company's decision in regard to the responsiveness and rejection of bids shall be final and binding without any obligation, financial or otherwise, on the Company.

1.6 The company reserves the right to split the order among various successful bidders in any manner it chooses without assigning any reason whatsoever.

2. SCOPE OF WORK

Detailed specification/scope of work is provided in Section-V of this tender document.

3. DISCLAIMER

3.1. This NIT is not an agreement and further it is neither an offer nor an invitation by BRPL to bidders or any other person for award of contract. The purpose of this NIT is to provide bidders information that may be useful to them in the preparation and submission of their bids.

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

3.3. Neither Company nor its employees will have any liability whatsoever to any Bidder or any other person under the law or contract, the principles of restitution or unjust enrichment or otherwise for any loss, expense or damage whatsoever which may arise from or be incurred or suffered in connection with

anything contained in this Document, any matter deemed to form part of this Document, provision of Services and any other information supplied by or on behalf of Company or its employees, or otherwise arising in any way from the selection process for the Work.

3.4. Though adequate care has been taken while issuing the Tender document, the Bidder should satisfy itself that Documents are complete in all respects. Intimation of any discrepancy shall be given to this office immediately.

3.5. This Document and the information contained herein are Strictly Confidential and are for the use of only the person(s) to whom it is issued. It may not be copied or distributed by the recipient to third parties (other than in confidence to the recipient 's professional advisors).

3.6. It shall be deemed that by submitting a bid, a bidder agrees to release BRPL and its employees, agents and advisors irrevocably unconditionally fully and finally from any and all liability for any claims losses damages costs expenses or liabilities in anyway related to or arising from exercise of any rights and all performance of any obligations under this NIT and or in connection with the bid process to the fullest extent permitted by applicable law and waives any and all rights and all claims it may have in this respect whether actual or contingent whether present or in the future

3.7. BRPL and its employees and advisors also accept no liability of any nature whether resulting from negligence or otherwise arising from reliance of any bidder upon the contents of this NIT. BRPL may in its absolute discretion but without being under any obligation to do so, update amend or supplement the information assessment statement or assumptions contained in this NIT.

3.8. The issue of this tender document does not imply that BRPL is bound to qualify any bidder or to award the contract to any bidder. BRPL reserves the right to reject all or any of the bids without assigning any reasons whatsoever.

4. COST OF BIDDING

The Bidder shall bear all cost associated with the preparation, submission and processing of its Bid and the company will in no case be responsible or liable for the costs.

5. TENDER DOCUMENTS

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

"Check List, Sections, Annexure & Formats as elaborated in CONTENT of this NIT."

5.2. The bidder is expected to examine the tender documents, including all Instructions, Forms, Terms and Specifications. Failure to furnish all information required by the tender documents or submission of a bid not substantially responsive to the tender documents in every respect may result in the rejection of the Bid.

6. AMENDMENT OF TENDER DOCUMENTS

6.1. At any time prior to the deadline for submission of Bids, the Company may for any reason(s), whether at its own initiative or in response to a clarification requested by a prospective Bidder, alter/amend/modify the tender documents by corrigendum /amendment.

6.2. The corrigendum / amendment shall be part of tender document, pursuant to Clause 5.1, and it will be notified
(a) by way of uploading the corrigendum/amendment on BSES website (in case of public tender),
(b) in writing by e-mail to all the Bidders who have received the Bidding Documents by email. (in case of limited tender)

All such corrigendum & amendments will be binding on the bidders.

6.3. In order to provide prospective Bidders a reasonable time in which to take the Amendment into account in preparing their Bids, the Company may, at its discretion, extend the deadline for the submission of Bids.

7. PREPARATION OF BIDS & LANGUAGE

The Bid prepared by the Bidder, and all correspondence, documents etc. relating to the Bid exchanged by the Bidder and the Company shall be written in English Language. Any printed literature furnished by the Bidder may be written in another Language, provided that this literature is accompanied by English translation, in which case, for purposes of interpretation of the Bid. In case of ambiguity in the English translation, interpretation of the Company as regards to translation will be final.

8. DOCUMENTS COMPRISING THE BID

The Bid prepared and submitted by the Bidder shall comprise the following components:

(a) Techno-Commercial Bid & Price Bid as elaborated in RFQ. (STRICTLY AS PER FORMAT)
(b) All the Bids must be accompanied with the required EMD &Tender Fees against each tender.

9. BID FORM

The Bidder shall complete “Original” Bid Form and submit it along with details mentioned in Techno-Commercial bid (without filling price).

10. BID PRICES

Bidders shall quote for the entire Scope of work with prices for individual items. The bidder is required, at his expense, to obtain all the information he may require to enable him to submit his tender including necessary visits to the site to ascertain the local conditions, procurement of necessary materials, labour, etc., requirements of the local/government/public authorities in such matters.

11. BID CURRENCIES

Prices shall be quoted in Indian Rupees Only.

12. PERIOD OF VALIDITY OF BIDS

12.1. Bids shall remain valid & open for acceptance for a period of 180 days from the date of opening of the Bid.

12.2. Notwithstanding above, the Company may solicit the Bidder ‘s consent to an extension of the Period of Bid Validity and the bidder shall be liable to extend the same at the sole cost and consequences of the bidder and no claim from the company in this regard shall be maintainable.

13. ALTERNATIVE BIDS

Bidders shall submit Bids, which comply with the Tender Documents. Alternative Bids will not be considered. The attention of Bidders is drawn to the provisions regarding the rejection of Bids in the terms and conditions, which are not substantially responsive to the requirements of the Tender Documents.

14. FORMAT AND SIGNING OF BID

14.1. The original Bid Form and accompanying documents (as specified in Clause 9.0), clearly marked "Original Bid", must be received by the Company at the date, time and place specified in Section-I, RFQ.

14.2. The original copy of the Bid shall be typed or written in indelible ink and shall be signed by the Bidder or a person or persons duly authorized to sign on behalf of the Bidder. Such authorization shall be indicated by written Power-of-Attorney accompanying the Bid. All pages of the bid shall be signed by the signatory accompanied with seal of the Agency.

14.3. The Bid shall contain no interlineations, erasures or overwriting except as necessary to correct errors made by the Bidder, in which case such corrections shall be signed by the person or persons signing the Bid.

15. SEALING AND MARKING OF BIDS

15.1. Bid submission: One original (hard copies) and one duplicate (total two copies) of all the Bid Documents shall be sealed and submitted to the Company before the closing time for submission of the bid.

15.2. The Bidder has the option of sending the Bids in person. Bids submitted by Email/Telex/Telegram /Fax will be rejected. No request from any Bidder to the Company to collect the proposals from Courier/Airlines/Cargo Agents etc shall be entertained by the Company.

16. DEADLINE FOR SUBMISSION OF BIDS

16.1. The Original bid must be timely received by the company at the address specified in Section –I, RFQ.

16.2. The Company may, at its discretion extend the deadline for the submission of bids by amending the Tender Documents in accordance with Clause 6.0, in which case all rights and obligations of the Company and Bidders previously subject to the deadline will thereafter be subject to the deadline as extended.

17. ONE BID PER BIDDER

Each Bidder shall submit only one Bid by itself. A Bidder who submits or participates in more than one Bid will cause all those Bids to be rejected.

18. LATE BIDS

Any Bid received by the Company after the deadline for submission of Bids prescribed by the Company, pursuant to Clause 16.0, will be declared "Late" and rejected and returned unopened to the Bidder.

19. MODIFICATIONS AND WITHDRAWAL OF BIDS

The Bidder is not allowed to modify or withdraw its Bid after the due date of bid submission.

20. EVALUATION OF BID

20.1. The bids will be evaluated techno-commercially on compliance to tender terms and Conditions.

20.2. BRPL reserves the right to ask the bidders to provide any additional information including breakup of the prices as quoted by them against line items.

21. CLARIFICATION OF BIDS

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

22. PRELIMINARY EXAMINATION OF BIDS / RESPONSIVENESS

22.1. Company will examine the Bids to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed, and whether the Bids are generally in order.

22.2. Arithmetical errors will be rectified on the following basis. If there is a discrepancy between the unit price and the total price per item that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price per item will be corrected. If there is a discrepancy between the Total Amount and the sum of the total price per item, the sum of the total price per item shall prevail and the Total Amount will be corrected.

22.3. Company will determine the substantial responsiveness of each Bid to the Tender Documents including execution capability and acceptable quality of the services offered. A substantially responsive Bid is one, which conforms to all the terms and conditions of the Tender Documents without deviation.

22.4. Bid determined as not substantially responsive will be rejected by the Company and may not subsequently be made responsive by the Bidder by correction of the non-conformity.

23. EVALUATION AND COMPARISON OF BIDS

23.1. The evaluation of Bids shall be done based on the delivered cost competitiveness basis.

23.2. The evaluation of the Bids shall be a stage-wise procedure. The following stages are identified for evaluation purposes: In the first stage, the Bids would be subjected to a responsiveness check later on the Techno-Commercial Proposals and the Conditionality of the Bidders would be evaluated.

Subsequently, the Financial Proposals along with Supplementary Financial Proposals, if any, of Bidders with Techno-commercially Acceptable Bids shall be considered for final evaluation.

23.3. The Company's evaluation of a Bid will take into account, in addition to the Bid price, the following factors, in the manner and to the extent indicated in this Clause:

(a) Contract completion schedule
(b) Conformance to Qualifying Criteria
(c) Deviations from Tender Documents
(d) Conformity and compliance to the conditions/details provided in pre-bid meeting
(e) Change in the quantity from mentioned in the tender

23.4. The cost of all quantifiable deviations and omissions from the specification, terms and conditions specified in Tender Documents shall be evaluated.

23.5. The Company will make its own assessment of the cost of any deviation for the purpose of ensuring fair comparison of Bids.

23.6. Adjustments in price, if any, based on the above procedures, shall be made for the purposes of comparative evaluation only to arrive at an "Evaluated Bid Price". Bid Prices quoted by Bidders shall remain unaltered.

24. CONTACTING THE COMPANY

24.1. From the time of Bid opening to the time of contract award, if any Bidder wishes to contact the Company on any matter related to the Bid, it should do so in writing.

24.2. Any effort by a Bidder to influence the Company and/or in the Company's decisions in respect of Bid evaluation, bid comparison or Contract Award, will result in the rejection of the Bidder 's Bid.

25. COMPANY'S RIGHT TO ACCEPT ANY BID AND TO REJECT ANY OR ALL BIDS

The Company reserves the right to accept or reject any Bid and to annul the Bidding process and reject all Bids at any time prior to award of Contract, without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for the Company's action.

26. AWARD OF CONTRACT

The Company will award the Contract to the successful Bidder whose Bid has been determined to be the lowest-evaluated responsive Bid, provided the Bidder has been determined to be qualified to satisfactorily perform the Contract. Company reserves the right to award order to other bidders in the tender, provided it is required for need of the work. The full or part of the contract may be awarded to other bidder(s) on differential rates.

27. THE COMPANY'S RIGHT TO VARY QUANTITIES

The Company reserves the right to vary the quantity i.e. increase or decrease the Numbers/ quantities without any change in terms and conditions before the award of Contract. Further BRPL may increase or reduce the area/ scale of operations / increase or decrease the Numbers/ quantities after the start of work execution under the contract and the size of contract / contract value shall be adjusted accordingly. In case of decrease in base resources decided mutually then contract value will be adjusted accordingly.

28. LETTER OF INTENT/ NOTIFICATION OF AWARD

The letter of intent/ Notification of Award shall be issued to the successful Bidder whose bids have been considered successful for award of work/order.

The successful Bidder shall be required to furnish acceptance of LOI / notification of award within 7 days of issue of the letter of intent /Notification of Award by Company.

29. CORRUPT OR FRAUDULENT PRACTICES

29.1. The Company requires that the Bidders observe the highest standard of ethics during the entire period of work execution under the Contract. In pursuance of this policy, the Company:

(a) Defines, for the purposes of this provision, the terms set forth below as follows:

"Corrupt practice" means behaviour on the part of officials in the public or private sectors by which they improperly and unlawfully enrich themselves and/or those close to them, or induce others to do so, by misusing the position in which they are placed, and it includes the offering, giving, receiving, or soliciting of anything of value to influence the action of any such official in the procurement process or in contract execution; and "Fraudulent practice" means a misrepresentation of facts in order to influence a award process or the execution of a contract to the detriment of the Company, and includes collusive practice among Bidders (prior to or after Bid submission) designed to establish Bid prices at artificial non-competitive levels and to deprive the Company of the benefits of free and open competition.

(b) Will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question;

(c) Will declare a firm ineligible either indefinitely or for a stated period of time, to be awarded a contract if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing, a contract.

29.2. Furthermore, It shall be the responsibility of the Bidders to read and understand &aware of the provision stated in the Terms and Conditions of tender before participating in the tender.

30. PROCESS TO BE CONFIDENTIAL

Information relating to the examination, clarification, evaluation and comparison of Bids and recommendations for the award of a contract shall not be disclosed to Bidders or any other persons not officially concerned with such process. Any effort by a Bidder to influence the Company's processing of Bids or award decisions may result in the rejection of the Bidder's Bid.

Section III

SPECIAL TERMS AND CONDITIONS OF CONTRACT

1.1. Bidders are requested to visit the site to understand the scope of work, site conditions and requirements prior to Bidding. Hence, no price/time escalation shall be admissible on these accounts.

1.2. The scope of this tender includes supply , survey , design , engineering , manufacturer , shop testing ,inspection , packing , dispatch , loading , unloading and storage at site, storage and construction insurance , assembly , erection ,structural , complete pre-commissioning checks , testing and commissioning at site , obtaining statutory clearance & certification from state electrical inspector and handing over of Grid to owner on single point responsibility basis.

1.3. The scope includes supply of all barricading, free issued materials (including installation, transportation, loading & unloading), dewatering, watch and ward and transportation of scrap (generated at Site), balance free-issued material, dismantled material from site to BRPL store including loading & unloading and no additional charges shall be paid against these activities. Used barricading material will be taken back by bidder soon after job is handed over or as directed by BRPL Engineer-In-Charge (E-I-C). No additional cost for these items will be paid to the Bidder. Any leakage, pilferage and damage of the material shall be in vendor's scope.

1.4. Joints & Terminations installation shall only be done by OEM. No additional cost for this item will be paid to the Bidder. Contractor to provide all support to the Jointers for doing Joints & Terminations of Joint Kits.

1.5. Prices for all the activities shall be FIRM till the actual completion of the job. Statutory variation will be allowed for direct supplies only wherever breakup of Taxes & Duties are available in Price Bid. In case bidder has not submitted any price breakup, no variation on account of statuary variation shall be paid extra by BRPL.

1.6. There will be no price escalation given to bidder even if there is delay in the project due to ROW permission.

1.7. Permission from road owning agencies & statutory clearance for road cutting shall be taken by Bidder. The Bidder shall follow-up with local authorities and other connected persons that may require carrying out the job under this work order.

1.8. Electrical Inspector Clearance fees shall be in Bidder's scope. The related fees, payments and pursuance work shall be in scope of Bidder only.

1.9. Bidder has to submit the technical parameters with details of Spares for each rating with catalogue, reference codes etc.

1.10. Wherever BRPL specifications are not available relevant IS/IEC to be followed. All Drawings mentioned in the Tender Specification and other required for the completeness of the tender shall be submitted. Drawing submission process shall not be deemed complete if all the requirements are not complied during the submission of the same.

1.11. The bidder should have own testing equipment's/they have to provide like IR Tester, Hi Pot Test Kit, Earth Tester, etc with Calibration Certificates for testing.

1.12. The Bidder should have own Safety equipment like Neon Tester, Portable Earth, Earthing discharge rod etc. along with Calibration Certificates of all the equipment.

1.13. The Bidder should have all major tools and tackles required for installation, testing & commissioning works.

1.14. Bidder has to submit the item wise price bifurcation in bid. Un-priced copy must be attached with the Part A. Reverse Auction will be carried out on Lump sum Basis/Total Landed Cost i.e. Supply + ETC.

1.15. Any other material not specifically mentioned above but required for successful commissioning and operation is in the scope of bidder. Prior approval shall be taken from central engineering department before execution. Commercial approval shall be taken from C&M Department before execution.

1.16. Successful bidder has to adhere to the statutory compliance.

1.17. Successful Bidder has to depute the safety officer and quality officer separately at site for whole duration and they have to submit the safety report and quality report to BRPL E-I-C on weekly basis.

1.18. Successful bidder has to send the weekly progress report to BRPL EIC.

1.19. In case of any major deviation, deletion or addition which bidder may feel is relevant to this project & for its safe operation and completion of works; Bidder may clearly highlight and communicate the same to the purchaser with his bid.

1.20. Necessary Statutory Clearances from CEI of Delhi & any other authority for energizing shall be in the scope of this tender.

1.21. After commissioning of the complete system and final approval of Electrical Inspector & Compliance to punch points observed to the satisfaction of Projects as per statutory requirements, system shall be handed over to BRPL.

1.22. **Guarantee period/Defect Liability period:**

The Guarantee Period will be equipment/service/work specific and shall be as specified in the Technical Specifications for the equipment/material/service/work and where Technical specifications are not part of contract documents or guarantee period is not specified in the Technical specifications, the guarantee period shall be as per the Special Terms and Conditions of the Contract. In case of no mention of the guarantee period in Technical specifications, Defect liability period will be 24 Months from the Date of Commissioning or 30 months from the date of delivery of final lot of supplies made, whichever is later.

If during the defects liability period any materials / items are found to be defective, these shall be replaced or rectified by the bidder at his own cost within 30 days from the date of receipt of intimation

1.23. **Failure during Guarantee Period:**

If the equipment and material supplied/service or work rendered under the contract fails to perform its due, rated & intended quality performance, during the Guarantee period, the bidder is liable to undertake repair/rectify/replace the equipment and material supplied/service or work rendered under the contract

within time frame as specified below at bidder's cost to make the equipment and material supplied/service or work rendered under the contract of performing its due, rated and intended quality performance. If bidder fails to repair/rectify/replace the equipment or material supplied/service or work rendered under the contract, failed in Guarantee Period, purchaser will be at liberty to get the same done at bidder's risks and costs and recover all such expenses plus the purchaser own charges (@ 15% of expenses incurred), from the bidder or from the "Performance Bank Guarantee" as the case may be.

If during the Warranty/ Guarantee period some parts of the supplies are replaced owing to the defects/ damages under the Warranty, the Warranty period for such replaced parts shall be until the expiry of twelve months from the date of such replacement or renewal or until the end of original Guarantee period, whichever is later.

a) Service Engineer Availability to Attend, Identify & Restore Defects (Minor) of materials/Equipment's under Guarantee Period within 48 Working Hours (Exclusion of Material Support Cases)

b) Spare Material Delivery for rectification of defect (Major) Under Guarantee Period within Two Weeks. Bidder must keep Requisite Inventory of Critical Spares & Other Equipments Covered in Guarantee Period to Restore Equipment within Two Weeks.

c) In Case Of Complete Replacement of material, within a Period of 4 Weeks.

Note: BRPL is in the business of Power distribution and is committed to providing reliable and continuous power supply to its customers. In case of any fault in the system, BRPL's top most priority is to rectify the fault and restore the system as soon as possible and maintain the supply.

If during the defect liability period any fault occurs in the system due to faulty materials, design or workmanship, BRPL shall intimate the vendor of such occurrence for taking immediate corrective action.

However, if the situation, in BRPL's sole discretion warrants an emergency restoration, it reserves the right to take immediate action for identifying the fault and restoring the system with available resources & materials or with help from any other third party agency under intimation to the Vendor. All costs of replacement, substitution, shipping, labour and other related expenses including taxes and levies incurred in connection with the restoration of fault plus 15% of expenses incurred as administrative overheads shall be for the account of Vendor. BRPL will charge the vendor for the costs incurred for fault restoration or may set off such costs against any amounts payable by BRPL to the Vendor or deduct from the PBG submitted by the Vendor. Vendor shall pay BRPL the amount within 30 days.

Root cause analysis of the fault shall be done jointly by BRPL's CES & O&M teams and Vendor. In case the fault is due to any reason other than faulty materials, design or workmanship, Vendor shall be exempted from any further action or Cost.

1.24. All the bay equipment (i.e- LA, CT, PT, Disc Insulator, String, Suspension Insulator, Bushing etc.) shall be Polymeric type in the place of porcelain with creepage 31mm/kV. Rest of the parameter to be followed as per tech spec.

1.25. **PROJECT INFORMATION & COMPLETION**

The contractor shall be fully responsible to complete the project in time. It is desired that the project should be completed as per the schedule from the date of LOI or purchase order whichever is earlier.

The detailed completion schedule shall be prepared by vendor and shall be submitted at the time of detailed engineering for approval. Vendor has to submit the progress report fortnightly with this tender/as asked by the Purchaser.

1.26. PROJECT IMPLEMETATION & EXECUTION CONTROL

The bidders are requested to submit the following along with the bid, about the project implementation & execution methodology.

a) Write up/overview of project Plan
b) Implementation Methodology
c) Project Organization Chart for Representatives, Project Office & site office teams along with the functions.
d) Bar Chart & Network Diagram (with critical path) for various activities to achieve scheduled completion.

SECTION IV
GENERAL TERMS AND CONDITIONS – SUPPLY OF SCHEME NO. ES23GS1004

1.01 All the Bids shall be prepared and submitted in accordance with these instructions.

1.02 Bidder shall bear all costs associated with the preparation and delivery of its Bid, and the Purchaser will in no case shall be responsible or liable for these costs.

1.03 The Bid should be submitted by the Bidder in whose name the bid document has been issued and under no circumstances it shall be transferred /sold to the other party.

1.04 The Purchaser reserves the right to request for any additional information and also reserves the right to reject the proposal of any Bidder, if in the opinion of the Purchaser, the data in support of RFQ requirement is incomplete.

1.05 The Bidder is expected to examine all instructions, forms, terms & conditions and specifications in the Bid Documents. Failure to furnish all information required in the Bid Documents or submission of a Bid not substantially responsive to the Bid Documents in every respect may result in rejection of the Bid. However, the Purchaser's decision in regard to the responsiveness and rejection of bids shall be final and binding without any obligation, financial or otherwise, on the Purchaser.

1.06 Bidder shall procure all equipments from the approved vendor list of BRPL as per technical specifications.

2.0 Definition of Terms

2.01 "Purchaser" shall mean BSES Rajdhani Power Limited, on whose behalf this bid enquiry is issued by its authorized representative / officers.

2.02 "Bidder" shall mean the firm who quotes against this bid enquiry issued by the Purchaser. "Supplier" or "Supplier" shall mean the successful Bidder and/or Bidders whose bid has been accepted by the Purchaser and on whom the "Letter of Acceptance" is placed by the Purchaser and shall include his heirs, legal representatives, successors and permitted assigns wherever the context so admits.

2.03 "Supply" shall mean the Scope of Contract as described.

2.04 "Specification" shall mean collectively all the terms and stipulations contained in those portions of this bid document known as RFQ, Commercial Terms & Condition, Instructions to Bidders, Technical Specifications and the Amendments, Revisions, Deletions or Additions, as may be made by the Purchaser from time to time.

2.05 "Letter of Acceptance" shall mean the official notice issued by the Purchaser notifying the Supplier that his proposal has been accepted and it shall include amendments thereto, if any, issued by the Purchaser. The "Letter of Acceptance" issued by the Purchaser shall be binding on the "Supplier" The date of Letter of Acceptance shall be taken as the effective date of the commencement of contract.

2.06 "Month" shall mean the calendar month and "Day" shall mean the calendar day.

2.07 "Codes and Standards" shall mean all the applicable codes and standards as indicated in the Specification.

2.08 "Offer Sheet" shall mean Bidder's firm offer submitted to BRPL in accordance with the specification.

2.09 "Contract" shall mean the "Letter of Acceptance/Purchase Order" issued by the Purchaser.

2.10 "Contract Price" shall mean the price referred to in the "Letter of Acceptance/Purchase Order".

2.11 "Contract Period" shall mean the period during which the "Contract" shall be executed as agreed between the Supplier and the Purchaser in the Contract inclusive of extended contract period for reason beyond the control of the Supplier and/or Purchaser due to force majeure.

2.12 "Acceptance" shall mean and deemed to include one or more of the following as will be stipulated in the specification:

a) The written acceptance of material by the inspector at suppliers works to ship the materials.
b) Acceptance of material at Purchaser site stores after its receipt and due inspection/ testing and release of material acceptance voucher.
c) Where the scope of the contract includes supplying, acceptance shall mean issue of necessary equipment / material takeover receipt after installation & commissioning and final acceptance.

3.0 Contract Documents & Priority

Contract Documents: The terms and conditions of the contract shall consist solely of these RFQ conditions and the offer sheet. The several documents forming the Contract are to be taken as mutually explanatory of one another, but in case of ambiguities or discrepancies, the same shall be explained and adjusted by the Purchaser, who shall thereupon issue to the Contractor, instructions thereon. In such event, unless otherwise provided in the Contract, the priority of the documents forming the Contract shall be as follows:

1. Any amendments to Contract
2. Commercial Terms & Conditions of the Contract
3. Clarifications/addendum/corrigendum to Tender
4. Terms & Conditions of the Tender

4.0 Scope of Supply -General

4.01 The "Scope of Supply" shall be on the basis of Bidder's responsibility, completely covering the obligations, responsibility and supplies provided in this Bid enquiry whether implicit or explicit.

4.02 Bidder shall have to quote for the Bill of quantities as listed herewith.

4.03 All relevant drawings, data and instruction manuals of supply of miscellaneous material shall be scope of bidder.

4.04 Qty Variation: The Bidder/purchaser reserves the rights to vary the quantity by (+/-) 30% of the supply of miscellaneous item quantity as listed below.

Supply of miscellaneous items –Breakup of Scope of Work

1. Breakup of Fire alarm System

33 KV AIS Substation Godrej Grid			
	Fire alarm System		
Sr No	**Description**	**Unit**	**Qty**
1	Fire alarm control panel, make- honeywell, Appolo , compatible to communication with RTU on Modbus, 230VAC supply	Nos	1
2	Manual call point , Break Glass type, with push button 24VDC	Nos	2
3	Optical smoke detector ,true ceiling	Nos	19
4	Heat detector , Heat sensitive resistance, 17-28 VDC operated	M	1
5	Hooter inside building, 24VDC , audio evacuation, alarm shall be actuated by control panel	Nos	2
6	Outdoor Hooter , IP65 , audio evacuation, alarm shall be actuated by control panel	Nos	1
7	Response indicator	Nos	2
8	FRLS control cable, 2Cx1.5 sqmm control cable, polycab/KEI (as per requirement)	LOT	1
9	PVC Conduit 25 MM and accessories , AKG/BEC Heavy duty(as per requirement)	LOT	1
10	Any other item required for successful commissioning of Fire alarm system has to be supplied and erected by vendor without any cost implication to BRPL	LOT(as per actual)	1
11	Training to BRPL Personal	LS	1

2. Breakup of CCTV(VMS) System

33 KV AIS Substation Godrej Grid			
	CCTV(VMS) System		
Sr No	Description	Unit	qty
1	4MP bullet/dome camera with mounting for CRP, VCB room, Maintenace room , Staircase , Building outside area	Nos	11
2	360 degree PTZ camera with support required for mounting	Nos	1
3	NVR (as per camera quantity)for 30 days recording	Nos	1
4	Furniture(1 table + 1 chair) for control room screen	Nos	1
5	22" Full HD screen with HDMI	Nos	1
6	UPS for 30 minute backup	Nos	1
7	L2 POE network switch with rack	LOT (as per actual)	1
8	HDPE pipe 40 mm / PVC Conduit 25 MM , AKG/BEC Heavy duty	LOT (as per actual)	1
9	Cable (Video control/data, optical fibre and power supply),cable glands plugs connector and other accessories	LOT (as per actual)	1
10	Any other item required for successful commissioning of CCTV system has to be supplied by vendor without any cost implication to BRPL	LOT	1
11	Training to BRPL Personal	LS	1

3. Breakup of Air Conditioners

33 KV AIS Substation Godrej Grid			
	Air Conditioners		
Sr No	Description	Unit	qty
1	1.6 Ton , 5 star Inverter AC of reputed make (Voltas, Bluestar, Daikin, Godrej, Hitachi ,LG etc) including all accessories required for commissioning.	Nos.	9

4. Breakup of Cable Sealing Solution

33 KV AIS Substation Godrej Grid			
Cable Sealing Solution			
Sr No	**Description**	**Unit**	**Qty**
1	Supply of cable sealing module comprising of (a) 33 Kv cable 3X400 mm2 ,diameter 110mm Cable provision for 6nos existing cable + 6nos future, Total 12 nos cable,(b) provision for optical fibre cable module -- 6 nos + 2 Nos spare (c) Provision for 4X150/95/50 mm2 cable - 2nos + 1 no spare (d) provision for 4X300 mm2 cable,diameter 67 mm -- 2nos + 1 spare, (e) provision for 4X10/25 mm2 cable, Diameter 25-35 mm--- 5 nos spares	LOT	1
2	Training of BRPL Personal	LS	1

4.05 Other petty and miscellaneous material required to execute the work at site shall be in the scope of bidder.

5.0 Quality Assurance and Inspection

5.01 Immediately on award of contract, the bidder shall prepare detailed quality assurance plan/test procedure identifying the various stages of manufacture, quality checks performed at each stage, raw material inspection and the Customer hold points. The document shall also furnish details of method of checking, inspection and acceptance standards / values and get the approval of Purchaser before proceeding with manufacturing. However, Purchaser shall have right to review the inspection reports, quality checks and results of suppliers in house inspection department which are not Customer hold points and the supplier shall comply with the remarks made by purchaser or his representative on such reviews with regards to further testing, rectification or rejection, etc. In case of standard items, BRPL shall forward the standard QAP which is to be followed by vendor during manufacturing.

5.02 Witness and Hold points are critical steps in manufacturing, inspection and testing where the supplier is obliged to notify the Purchaser in advance so that it may be witnessed by the Purchaser. Final inspection is a mandatory hold point. The supplier can proceed with the work past a hold point only after clearance by purchaser or a witness waiver letter from BRPL.

5.03 The performance of waiver of QA activity by Purchaser at any stage of manufacturing does not relieve the supplier of any obligation to perform in accordance with and meet all the requirements of the procurement documents and also all the codes & reference documents mentioned in the procurement document nor shall it preclude subsequent rejection by the purchaser.

5.04 On completion of manufacturing the items can only be dispatched after receipt of dispatch instructions issued by the Purchaser.

5.05 All in-house testing and inspection shall be done without any extra cost. The in-house inspection shall be carried out in presence of BRPL/BRPL authorized third party inspection agency. Cost of Futile/abortive visit(s) shall be debited from the invoices

5.06 Purchaser reserves the right to send any material being supplied to any recognized laboratory for testing, wherever necessary and the cost of testing shall be borne by the Bidder. In case the material is found not in order with the technical requirement / specification, the charges along with any other penalty which may be levied is to be borne by the bidder. To avoid any complaint the supplier is advised to send his representative to the stores to see that the material sent for testing is being sealed in the presence of bidder's representative.

6.0 Packing, Packing List & Marking

6.01 **Packing:** Supplier shall pack or shall cause to be packed all Commodities in crates/boxes/drums/containers/cartons and otherwise in such a manner as shall be reasonably suitable for shipment by road or rail to BRPL, Delhi/New Delhi stores/site without undue risk of damage in transit.

6.02 **Packing List:** The contents of each package shall be itemized on a detailed list showing the exact weight, extreme outside dimensions (length, width & weight) of each container/box/drum/carton, Item SAP Code, PO No & date. One copy of the packing list shall be enclosed in each package delivered.

7.01 Price basis for supply of materials

Bidder has to quote their prices on Landed Cost Basis and quote separate price for each item.

FIRM prices for supply to BRPL Delhi/New Delhi stores inclusive of packing, forwarding, loading at manufacturer's premises, payment of all taxes, GST, Freight, any other local charges etc.

The above supply prices shall also include unloading at BRPL Delhi/New Delhi stores/site.

Transit insurance will be arranged by bidder.

8.0 Terms of payment and billing – SUPPLY

a) 85 % against R/A bills for supply of equipment and materials within 30 days against receipt of material at site and submission of following documents duly certified by BRPL Project-in-charge:
i. Consignee copy of LR
ii. Detailed invoice showing commodity description, qty, unit & total price,
iii. Original certificate issued by BRPL confirming receipt of material at site & acceptance
iv. Dispatch clearance & inspection report issued by the inspection authority
v. Packing List, Test Reports
vi. Guarantee Certificate.

b) 10% pro-rata after installation/erection of equipment duly certified by BRPL Project-in-charge.

c) 5% pro-rata after completion of successful acceptance testing, commissioning and handing over of the entire Installation and duly certified by BRPL Project-in-charge.

9.0 Price Validity

9.01 All bids submitted shall remain valid, firm and subject to unconditional acceptance by BRPL Delhi for 120 days from the due date of submission & subsequent corrigendum/amendment/extension of due date of submission. For awarded suppliers/contractors, the prices shall remain valid and firm till contract completion.

10.0 CONTRACT PERFORMANCE BANK GUARANTEE:

10.1 CONTRACTOR shall furnish the Contract Performance Bank Guarantee in the prescribed format (Appendix I) within 15 days from the date of issue of Order for due performance of the provisions of purchase Order.

10.2 The contract Performance Bank Guarantee shall be Rs. 1,84,817/- and shall be valid till the completion of defect liability period, plus three (3) months or latest RBI guidelines (if any) whichever is higher towards claim period, if not otherwise specified in agreement. This amount shall remain fixed during the currency of the agreement.

10.3 The CPBG shall be issued from any nationalized / scheduled bank as per company format.

10.4 The Company shall reserve the right to invoke the CPBG unconditionally and without recourse to the Contractor, if there is failure to perform any part of the Agreement for whatsoever reason. This clause is pertaining to performance of contractual obligations and the decision of Company shall be final in this regard.

10.5 In the event of any claim or any other outstanding Contractual obligations remaining unfulfilled, the Contractor shall be required to extend the CPBG till the settlement of all claims and completion of all Contractual obligations at the cost and consequences of contractor.

10.6 In the event, in Company's sole judgment, the Contractor has fulfilled all its obligations under this Agreement, The CPBG shall be released without any interest after the expiry of CPBG and its claim period as mentioned above.

10.7 If the CPBG is or becomes invalid for any reason (other than its expiry), the Contractor shall immediately notify the Company/BRPL and provide within five (5) days a replacement CPBG in the form set out in the Contract/Agreement.

10.8 Not later than sixty (60) Business Days before the expiry of the CPBG, the Contractor shall, upon request of the Company/BRPL obtain extension of the validity of such CPBG for the period stated in such request by the Company/BRPL and provide a copy of such renewed CPBG.

10.9 It is Contractor's responsibility to incur charges / cost to maintain and for extension of CPBG without claiming reimbursement from the company/BRPL.

11.0 Forfeiture

11.01 Each Performance Bond established under Clause 10.0 shall contain a statement that it shall be automatically and unconditionally forfeited without recourse and payable against the presentation by BRPL of this Performance Bond, to the relevant bank referred to above, together with a simple statement that supplier has failed to comply with any term or condition set forth in the Contract.

11.02 Each Performance BG established under will be automatically and unconditionally forfeited without recourse if BRPL at its sole discretion determines that supplier has failed to comply with any term or condition set forth in the contract.

12.0 Release

All Performance Bonds will be released without interest within seven (7) days from the last date up to which the Performance Bond has to be kept valid (as defined in Clause 10.0) except for the case set forth in Clause 21.0.

13.0 Guarantee of Performance

The bidder shall stand guarantee that the equipment and material supplied/service or work rendered under the contract is free from design, manufacturing, material, construction, erection & installation and workmanship & quality defects and is capable of its due, rated and intended quality performance, as an integrated product delivered under the contract for a specific period termed as Guarantee Period. The bidder should also guarantee that the equipment/material is new and unused except for the usage required for the tests and checks required as part of quality assurance.

14.0 Guarantee Period/Defects Liability Period

The Guarantee Period will be equipment/service/work specific and shall be as specified in the Technical Specifications for the equipment/material/service/work and where Technical specifications are not part of contract documents or guarantee period is not specified in the Technical specifications, the guarantee period shall be as per the Special Terms and Conditions of the Contract. In case of no mention of the guarantee period in Technical specifications, Defect liability period will be 24 Months from the Date of Commissioning or 30 months from the date of delivery of final lot of supplies made, whichever is later.

If during the defects liability period any materials / items are found to be defective, these shall be replaced or rectified by the bidder at his own cost within 30 days from the date of receipt of intimation.

Cost of repairs on failure in Guarantee Period:

The cost of repairs/rectification /replacement, apart from the actual cost of repairs/rectification/replacement is also inclusive of all bidder costs of required transportation, site inspection /mobilization/dismantling and re-installation costs as applicable, to be borne by the bidder. The bidder has to ensure that the interruption in the usage of intended purpose of the equipment is minimized to the maximum extent In lieu of the time taken for repairs/rectification/replacement.

15.0 Latent Defect:

Hidden defects in manufacturing or design of the product supplied and which could not be identified by the tests conducted but later manifested during operation of the equipment are termed as latent defects. Bidder shall further be responsible for 'free replacement' for another period of FIVE years from the end of the guarantee period for any 'Latent Defects' if noticed and reported by the Purchaser.

16.0 Support beyond the Guarantee Period

The Bidder shall ensure availability of spares and necessary support for a period of at least 10 years post completion of guarantee period of equipment /technology supplied against this contract. BRPL shall be duly intimated by the Vendor of End of Life Support for the product /technology supplied at least 12 months in advance.

17.0 Return, Replacement or Substitution

BRPL shall give Supplier notice of any defective Commodity promptly after becoming aware thereof. BRPL may at its discretion elect to return defective Commodities to Supplier for replacement, free of charge to BRPL, or may reject such Commodities and purchase the same or similar Commodities from any third party. In the latter case BRPL shall furnish proof to Supplier of the cost of such substitute purchase. In either case, all costs of any replacement, substitution, shipping, labour and other related expenses incurred in connection with the return and replacement or for the substitute purchase of a Commodity hereunder should be for the account of Supplier. BRPL may set off such costs against any amounts payable by BRPL to Supplier. Supplier shall reimburse BRPL for the amount, if any, by which the price of a substitute Commodity exceeds the price for such Commodity as quoted in the Bid.

18.0 Effective Date of Commencement of Contract:

The date of the issuance of the Letter of Acceptance/Purchase Order shall be treated as the effective date of the commencement of Contract.

19.0 Time – The Essence of Contract

Time is the essence of the contract and the contractor shall be responsible for performance of his works in accordance with the specified schedule. If at any time, the contractor is falling behind the schedule for reasons attributable to him, he shall take necessary action to make good for such delays by increasing his work force or by working overtime or otherwise to accelerate the progress of the work and to comply with schedule timelines and shall communicate such actions in writing to the company, to the satisfaction of the Company that his action will compensate for the delays. The contractor shall not be allowed any extra compensation for such actions.

Time shall be the essence of the Contractor. Contractor shall complete his work in accordance with the specified time-lines/ Schedules as per the terms of the contract or as may be instructed by the Company from time to time..

20.0 The Laws and Jurisdiction of Contract:

The laws applicable to this Contract shall be the Laws in force in India. To the best of their ability, the parties hereto shall endeavor to resolve amicably between themselves all disputes arising in connection with this work order. If the same remain unresolved within thirty (30) days of the matter being raised by either party, either party may refer the dispute for adjudication by arbitration. The arbitration shall be undertaken by the sole arbitrator jointly appointed by the parties. In case the parties fail to arrive at consensus to appoint the sole arbitrator, either party may approach the Court for appointing an arbitrator under Section 11 of the Arbitration and Conciliation Act, 1996 and the award of the said sole arbitrator, shall be final and binding upon the parties. The arbitration proceeding shall be conducted in accordance with this provisions of the Indian Arbitration & Conciliation Act, 1996 (as amended up to date) and the venue of such arbitration shall be the city of New Delhi only. The Arbitration shall be conducted in English language only. The courts at Delhi shall have the exclusive jurisdiction over the subject matter of

Arbitration/dispute. The cost of the Arbitration shall be equally shared by the parties as per directions of the Sole Arbitrator.

21.0 Events of Default

21.01 Company may, without prejudice to any of its other rights or remedies under the Contract or in law, terminate the whole or any part of this Contract by giving written notice to the Contractor, if in the opinion of Company, contractor has neglected to proceed with the Contracts with due diligence or commits a breach of any of the provisions of this Contract including but not limited to any of the following cases:

A) Failing to complete execution of Contract as per the terms and conditions specified in the Contract.

B) Failing to complete Contracts in accordance with the approved schedule of Contract.

C) Failing to comply with any reasonable instructions or orders issued by Company in connection with the Contract.

D) Failing to comply with any of the terms or conditions of this Contract.

E) In the event Company terminates this Contract, in whole or in part, on the occurrence of any event of default, Company reserves the right to engage any other vendor or agency to complete the Contract or any part thereof, and in addition to any other right Company may have under the Contract or in law including without limitation, including the right to penalize for delay under clause "Liquidated Damage" of this Contract , the contractor shall be liable to Company for any additional costs that may be suffered/borne by Company for the execution of the Contract.

F) Failure on the part of the Contractor to maintain its confidentiality obligations and or compromising its integrity, which are required to be of highest standards, in so far as the present scope of work is concerned.

22.0 Consequences of Default

(a) If an Event of Default shall occur and be continuing, BRPL may forthwith terminate the Contract by written notice.

(b) In the event of an Event of Default, BRPL may, without prejudice to any other right granted to it by law, or the Contract, take any or all of the following actions;

(i) present to Bank for forfeiture to the relevant bank the Performance Bond;

(ii) Purchase the same or similar Commodities from any third party; and/or

(iii) Recover any losses and/or additional expenses BRPL may incur as a result of Supplier's default.

23.0 Liquidated Damages

23.01 In the event of any delay in completion of the work beyond the stipulated time given by in order due to reasons solely attributable to the Contractor, the Contractor shall pay to the Company liquidated damages.

If the Contractor failed perform the services within the time period specified in the order, the Company shall, without prejudice to its other remedies under the contract, deduct liquidated damages a sum equivalent to 2.0% of the billed amount of final work executed for each week or part there of delay until

the actual date of completion up to a maximum deduction of 20% of billed amount of final work executed. Once the maximum is reached to Company may consider termination of contract without any liabilities to Company.

In case the contractor has not mobilized / taking up the job as per the direction of Engineer In-charge, the company have all rights to cancel / re-allocate the work allotted to the contractor.

Engineer In charge should specifically mention the amount of LD levied on the bill of contractor for this job..

24.0 Statutory variation in Taxes and Duties

The total order value shall remain **FIRM** within stipulated delivery period and shall not be adjusted on account of any price increase/variations in commodities & raw materials. However Statutory Taxes, duties and Levies imposed by Competent Authorities by way of fresh notification(s) within the stipulated delivery period shall be borne by BRPL on submission of necessary documents claiming such variation. The variation will be applicable only on such value wherever price breakup of same is submitted by vendor/available in PO/WO.

25.0 Force Majeure

25.01 General

An "Event of Force Majeure" shall mean any event or circumstance not within the reasonable control directly or indirectly, of the Party affected, but only if and to the extent that:

(i) Such event or circumstance materially and adversely affects the ability of the affected Party to perform its obligations under this Contract, and the affected Party has taken all reasonable precautions, due care and reasonable alternative measures in order to prevent or avoid the effect of such event on the affected party's ability to perform its obligations under this Contract and to mitigate the consequences thereof.

(ii) For the avoidance of doubt, if such event or circumstance would not have materially and adversely affected the performance of the affected party had such affected party followed good industry practice, such event or circumstance shall not constitute force majeure.

(iii) Such event is not the direct or indirect result of the failure of such Party to perform any of its obligations under this Contract.

(iv) Such Party has given the other Party prompt notice describing such events, the effect thereof and the actions being taken in order to comply with above clause.

25.02 Specific Events of Force Majeure subject to the provisions of above clause, Events of Force Majeure shall include only the following to the extent that they or their consequences satisfy the above requirements:

(i) The following events and circumstances:

a) Effect of any natural element or other acts of God, including but not limited to storm, flood, earthquake, lightning, cyclone, landslides or other natural disasters.

b) Explosions or fires.

(ii) War declared by the Government of India, provided that the ports at Mumbai are declared as a war zone.

(iii) Dangers of navigation, perils of the sea.

25.03 Notice of Events of Force Majeure If a force majeure event prevents a party from performing any obligations under the Contract in part or in full that party shall:

i) Immediately notify the other party in writing of the force majeure events within 7(seven) working days of the occurrence of the force majeure event
ii) Be entitled to suspend performance of the obligation under the Contract which is affected by force majeure event for the duration of the force majeure event.
iii) Use all reasonable efforts to resume full performance of the obligation as soon as practicable
iv) Keep the other party informed of all such efforts to resume full performance of the obligation on a regular basis.
v) Provide prompt notice of the resumption of full performance or obligation to the other party.

25.04 Mitigation of Events of Force Majeure Each Party shall:

(i) Make all reasonable efforts to prevent and reduce to a minimum and mitigate the effect of any delay occasioned by an Event of Force Majeure including recourse to alternate methods of satisfying its obligations under the Contract;
(ii) Use its best efforts to ensure resumption of normal performance after the termination of any Event of Force Majeure and shall perform its obligations to the maximum extent practicable as agreed between the Parties; and
(iii) Keep the other Party informed at regular intervals of the circumstances concerning the event of Force Majeure, with best estimates as to its likely continuation and what measures or contingency planning it is taking to mitigate and or terminate the Event of Force Majeure.

25.05 Burden of Proof In the event that the Parties are unable in good faith to agree that a Force Majeure event has occurred to an affected party, the parties shall resolve their dispute in accordance with the provisions of this Agreement. The burden of proof as to whether or not a force Majeure event has occurred shall be upon the party claiming that the force majeure event has occurred and that it is the affected party.

25.06 Termination for Certain Events of Force Majeure. If any obligation of any Party under the Agreement is or is reasonably expected to be delayed or prevented by a Force Majeure event for a continuous period of more than 1 (one) month during the Term of the Agreement, the Agreement shall be terminated at the discretion of the Company and neither Party shall be liable to the other for any consequences arising on account of such termination.

The Company reserves the right to demand the Contractor's services on holidays as well as beyond the normal working hours.

The Contractor will ensure that none of their person is engaged in any unlawful activities subversive of the Company's interest failing which suitable action may be taken against the Contractor as per the terms and condition of this order.

The Contractor shall be liable for payment of all taxes and duties as applicable, to the State/ Central Govt. or any local authority.

The Contractor's employees shall not be treated as Company's employees / persons for any purpose whatsoever & facilities/ benefits applicable to the Company's employees shall not be applicable to Contractor's employees. If due to any reasons whatsoever the Company is made liable to meet any

obligation under any of the laws & enactment etc, for any reason whatsoever the same shall be recovered from the Contractor either from the present and future amount payable to him or as per law.

26.0 Transfer and Sub-Letting

The Contractor shall not, without company's prior consent in writing assign or sublet or transfer any portion of services awarded to the Contractor as envisaged herein and falling under this contract. Moreover, any such consent shall not relieve the Contractor from any obligation, responsibility, or duty under this Contract.

27.0 Recoveries

When ever under this contract any money is recoverable from and payable by the bidder, the purchaser shall be entitled to recover such sum by appropriating in part or in whole by detecting any sum due to which any time thereafter may become due from the supplier in this or any other contract. Should the sum be not sufficient to cover the full amount recoverable the bidder shall pay to the purchaser on demand the remaining balance.

28.0 Waiver

No delay or forbearance by company in exercising any right or power under this Agreement shall be construed as a waiver of such right or power, nor shall any single or partial exercise of such right or power preclude any further exercise of such right of power.

29.0 Indemnification

Notwithstanding contrary to anything contained in this RFQ, Supplier shall at his costs and risks make good any loss or damage to the property of the Purchaser and/or the other Supplier engaged by the Purchaser and/or the employees of the Purchaser and/or employees of the other Supplier engaged by the Purchaser whatsoever arising out of the negligence of the Supplier while performing the obligations under this contract.

30.0 Documentation

The Bidder’s shall procure all equipment from BRPL approved sources as per attached specifications. The Bidder’s shall submit 5 copies of Material/Type Test Certificates, O&M Manuals, and Approved & As-built drawings. The Bidder’s shall ensure for the strict compliance to the specifications and Field Quality Procedures issued by BRPL Engineer in-charge.

31.0 Commissioning Spares

Commissioning Spares shall be deemed to be included in the quoted prices

32.0 Limitation on Liability

32.1 The Contractor's liability (except Third Party Liability; covered under the agreement and addendums thereto) for all damages, losses, acts or omissions, howsoever occasioned, shall not, at any time exceed an amount equivalent to Contract Value.

32.2 Notwithstanding anything stated in the agreement, the limitation of Liability shall not be available/applicable in case of wilful default/breach/negligent act/misconduct on the part of the Contractor and/or its employees.

33.0 Consequential Damages

Notwithstanding anything to the contrary in the Purchase Order, except for breach of obligations under Non-disclosure and except as expressly provided in a Purchase Order, in no event, as a result of breach of contract or breach of warranty or otherwise, shall either Party hereto or either Party's Affiliates or sub Contractors, be liable under the Purchase Order to the other Party for any consequential, special, indirect, exemplary or incidental damages, and/or for any lost profits, goodwill or revenues of such Party, howsoever arising, before or after Acceptance of the Goods and whether or not such damages are foreseeable.

SECTION VI

GENERAL TERMS & CONDITIONS - ERECTION, TESTING & COMMISSIONING

1. DEFINITIONS and INTERPRETATION

The following terms shall have the following meanings:

1.1 "Company": means BSES Rajdhani Power Ltd, a company incorporated under the Companies Act 1956 and having its office at BSES Bhawan, Nehru Place, New Delhi 110 019, which expression shall include its authorized representatives, agents, successors and assigns.
1.2 "Contractor": shall mean the successful Bidder / vendor to whom the contract has been awarded.
1.3 "Rate": The unit rates for the work to be carried out at site shall be as per finalized unit rates through tender. The finalized rates shall be firm for the entire duration of work to be carried out by the Contractor under the work order and are not subject to escalation for any reason whatsoever.
1.4. Contract Specification: The terms "Contract Specification" shall mean the Technical specification of the work as agreed by you and description of work as detailed in Annexure-I enclosed herewith and all such particulars mentioned directly/referred to or implied as such in the contract.
1.5 SITE: The terms "Site" shall mean the working location in BRPL area. Under this tender, working location shall be as mentioned elsewhere.
1.6 ENGINEER IN CHARGE: "Engineer In-charge" means the Company's authorized representative for the purpose of carrying out the work.

2. EXAMINATION OF SITE AND LOCAL CONDITIONS:

The contractor is deemed to have visited the site of the work and ascertained therefore all site conditions and information pertaining to his work. The company shall not accept any claim whatsoever arising out of the difficult site/terrain/local conditions, if any.

3. LANGUAGE AND MEASUREMENT:

The Contract issued to the contractor by the company and all correspondence and documents relating to the Contract placed on the Bidder shall be written in English language.

Metric System shall be followed for all dimension, units etc.

4. SCOPE OF WORK:

a) ETC work of 33KV switching substation of G319 Godrej Okhla along with 33 KV In-feed. (Scheme no. ES23GS1004):

The scope includes survey, design, engineering, manufacture, shop testing, inspection, packing, dispatch, loading, unloading and storage at site, storage and construction insurance, assembly, erection, structural, complete pre-commissioning checks , testing and commissioning at site , obtaining statutory clearance & certification from state electrical inspector, Municipal Corporation department (if required), Fire Officer (if required), Horticulture department (if required), and handing over to owner after successful testing & Commissioning of 1 Nos. 33 kV AIS Substation at BRPL, New Delhi on single point responsibility basis. Schedule of work shall be as per BOQ attached herewith.

After completion of E/T/C work of the scheme, Bidder has to obtain the Electrical Inspectorate's Clearance from the Electrical Inspector of Delhi Govt. Electrical Inspector Clearance fees shall be in Bidder's scope. The related fees, payments and pursuance work shall be in scope of Bidder only.

Bidder shall arrange any permission like road cutting clearance, if required, etc from the Delhi Civic authorities. The Bidder shall follow-up with local authorities and other connected persons that may be required to carry out the job under this work order.

All the labour, cranes, tool and tackles, and technical supervision etc. are including in your scope of work. Adequate number of engineers, supervisors and laborers shall be posted at site and the list of the same along with certificate of Qualification of technical staff should be submitted by the Bidder to the Engineer In Charge for checking the adequacy immediately (within seven days) after award of contract.

The Bidder shall also make his own arrangement for the accommodation/conveyance requirements for its staff at site. Company will be provided at site the adequate open space for Bidder's site store for storing the materials, tools, tackles etc. The entire Bidder's storage will be within the site premises. All the incoming and outgoing materials, equipment, tools, tackles and any other items related to said work shall be entered into the register kept for this purpose and shall be in the custody of Bidder, however company does not hold any responsibility for any loss or damage of Bidder's material etc.

All loading/unloading, of materials at work-site shall be Bidder's responsibility. Involvement of Crane/Hydra/Tractor/Trailer for this type of work shall be in your scope. Adequate weather protection shall be provided by the Bidder to keep the materials safe from sun & rain by providing covered storage space as well as using tarpaulins.

The Bidder at his own shall arrange Water and Electricity Power at his cost.

Major materials like Switchgear panels along with C&R Panels, ACDB, DCDB, Battery charger & battery bank etc. will be issued by BRPL as free issue item. However transportation of all free issue materials from BRPL stores to BRPL S/S, handling, safe storage till handing over of the installations shall be in the scope of the contractor.

Any additional work beyond the scope enumerated in the work order above shall be carried out as per the instructions of Engineer-In Charge. The company shall not entertain any claim or increase in the Work Order value due to execution of such additional work if the same is not approved by Engineer In Charge.

FREE ISSUES OF MATERIAL AND /OR EQUIPMENT:

The Purchaser issued Free Issue Material/Equipment to Vendor in order that Vendor may fulfill its obligations under the Agreement, shall remain the property of Purchaser and shall be clearly labelled as such by Vendor until handing over of the completed installations in accordance with the terms of the Agreement. Risk of loss in respect of all such Free Issue Items shall pass to Vendor upon receipt of such terms by Vendor and remain with Vendor until handing over of the completed installations to Purchaser in accordance with the terms of the Agreement. Vendor shall maintain all such Free Issue Items in good condition and shall use them solely in connection with the requirements of the Agreement.

Special Instruction:-

a. CES shall consider completion certificate of different projects (which shall be submitted by bidders in support to PQR) as a performance certificate during tender evaluation.
b. All Erection tools and tackles and testing equipment shall be available with Bidder in event of order.

c. Penalty clause shall be incorporated in case any of workmen of Bidder is found violating safety protocol as per GCC-ETC LD Clause no 15.
d. GTP & drawing approval before procurement & inspection of the ready material before dispatch shall be done by CES-BRPL.
e. 1.1 Continuous Metal Barricades:-

1) Vendor shall demonstrate to BRPL Engineer in Charge, ready availability of Metal Barricades (With Specifications as per BSES Standards for continuous barricading) within 15 Days of Order Award. Barricades not conforming to BRPL specification shall be summarily rejected.
2) BRPL will permit Excavation only after Minimum Length of Barricades is made available at Site.
Minimum Length of Barricades: Must be equal to the Route Length of Cable Laying OR 600 MTR (2 Runs X 300 MTR), whichever is Lower. Thus:-
a) If Route Length of Cable Laying is < 600 MTR, then Min-m Length of Barricades to be made available at Site = Actual Route Length,
b) If Route Length of Cable Laying is > 600 MTR, then Min-m Length of Barricades to be made available at Site = 600 MTR
3) Non-compliance of above will lead to immediate termination of Contract and may also result in - a) Forfeiture of Security Money b) Disqualification from future Tender participation for a Min-m 1 Year Period ".

f. All Erection tools and tackles and testing equipment shall be available with Bidder in event of order.
g. Penalty clause shall be incorporated in case any of workmen of Bidder is found violating safety protocol as per GCC-ETC LD Clause no 15.
h. From each lot of HDPE Pipe, a sample will be sealed by Site in-charge/Execution Engineer in presence of Vendor representative and sent to any laboratory as per BRPL Engineer-In-Charge's instruction. Cost of testing will be paid by the Concerned Vendor. Also, strict action will be taken against the vendor does not conform to BRPL specification.
i. HDPE tech spec is also attached for your further process.
j. HDPE type-- PN6 PE80
k. Length -- As per site requirement
l. Diameter -- As per attached Technical Specification
m. Make -- Flow well, Tirupati, Naredra Poly Plast, Eon Plast
n. Type test & Printing -- As per attached Technical Specification
o. GTP & drawing approval before procurement & inspection of the ready material before dispatch shall be done by CES-BRPL.

B. Scope of Work of B& C

B. Addition of 1 Nos. 20 MVA 66/11kV Power Transformer with allied equipment at 66kV Sarita Vihar Grid**.(Scheme No: ES22AT4028)**

I. Transportation of Power Transformer, CT, PT, Circuit Breaker, 11 kV Panels, C&R Panels and other equipment from BRPL Stores to Site and vice versa.
II. Installation of Power Transformer, NIFPS, 11 kV Panels and other equipment.
III. Preparing earthing pits.
IV. Power Cables & Control Cable laying and terminations.
V. Testing and commissioning of all equipment.
VI. Relay Coordination and commissioning.

C. 66 KV Control and Relay Panels Replacement work at South (3 locations) (**Scheme no. ES22MS4038**) and West (5 Locations) Grids. **(Scheme no. EW22MS4014 & EW21MS4002)**

I. Dismantling of existing Control & Relay Panels.
II. Removal of panels and control cables from site and transportation to scrap store.
III. Installation of new Control & Relay Panels.
IV. Control Cable laying and termination.
V. Testing and commissioning of all equipment.

(d) NOTE: Electrical inspection fees of Rs. 10,000/- + GST extra will be borne by BRPL to finalized vendor through the tender for Sarita vihar Grid.

5. RATES:

The rates finalized for this order shall be firm for the entire duration of work carried out by the Bidder under the order and are not subject to any variation and escalation for any reason whatsoever.

The cost of insurance during loading/unloading of materials/ equipments during its storage and handling/erection at site for installation is included in the Bidder's scope and value shall be included in the unit rates finalized.

The unit rates finalized is also inclusive of barricading and watch & ward during execution and no separate charges shall be paid for the same.

6. TAXES AND DUTIES:

Prices are inclusive of all taxes and duties including GST as applicable. However, IT as per applicable rate will be deducted from your bills as Tax Deduction at Source (TDS).

The total order value shall remain **FIRM** within stipulated delivery period and shall not be adjusted on account of any price increase/variations in labour. However Statutory Taxes, duties and Levies imposed by Competent Authorities by way of fresh notification(s) within the stipulated delivery period shall be borne by BRPL on submission of necessary documents claiming such variation. The variation will be applicable only on such value wherever price breakup of same is submitted by vendor/available in PO/WO.

1. As Per Notification No. 39/2021 – Central Tax dated 21st December, 2021 w.e.f 01/01/2022 registered person (ie, Recipent/Purchaser) can avail tax credit on those invoices only which have been reflected in GSTR 2A or GSTR2B (it means 100% matching of invoice is required). Also, GST has to be deposited by Supplier/Contractor by filing of GSTR- 1 and GSTR-3B.
2. In view of above, if the same is not complied with by the supplier/contractor and the Recipient/Purchaser is not in position to avail / utilize Input Tax Credit due to non-compliance or non-filing of GSTR-1 and GSTR-3B for the month/quarter (as applicable) in which the supply was made, then Recipient/Purchaser has right to hold 100% GST amount from next payment due of the subsequent month till the time default is not cured.
3. For releasing of the payment kept on hold on account of GST supplier shall submit payment proof i.e GST Portal screenshot reflecting name of Recipient/Purchaser alongwith GSTR-1 and GSTR-3B for month/quarter (as applicable) in which the same has been discharged. Payment shall not be released, till the time proof of payment of GST as mentioned above is not submitted.
4. Further, the recipient/purchaser shall also be entitled to recover any financial loss incurred (including tax, interest and penalty) due to non-compliance or non-filing of GSTR-1 and GSTR-3B by the supplier.
5. In case where delivery of goods is being made on FOR site basis, the Supplier is responsible to comply with rules applicable for E-way bill. Any violation in provision of E-way Bill will attract penalty and seizure of Transit Material. Any Penalty and Pre-Deposit due to violation of rules/provision shall be paid and borne by Supplier. Also, Supplier is responsible for releasing of goods from Authority whether CGST/SGST. Delay in supply due to seizure of goods shall attract liquidated damages as per Order / Contract provisions. "

7. TERMS OF PAYMENT (Erection, Testing & Commissioning)

Payment shall be made as under:

i) 85% pro-rata of total installation value shall be payable against R/A bills payable within 45 days after installation / erection of material at site duly certified by Engineer in charge.

ii) 10% pro-rata of total installation value shall be payable against R/A bills payable within 30 days after testing & commissioning of material at site.

iii) 5% of contract value payable after completion of successful acceptance testing, commissioning and handing over of complete systems duly certified by Engineer in charge, submission of Electrical Inspector Clearance Certificate.

The contractor shall submit the invoice along with the checklist duly filled in Invoice shall be processed and payment shall be made to contractor on certification of Engineer-In Charge for compliance to check point's given in check list.

7. CONTRACT PERFORMANCE BANK GUARANTEE:

8.1 Contractor shall furnish the CPBG in the prescribed format within 15 days from the date of issue of LOI / Work Order for due performance of the provisions of Work Order/Agreement.

8.2 The contract Performance Bank Guarantee shall be as per given below table -1 and shall be valid till the completion of defect liability period plus three (3) months or latest RBI guidelines (if any) whichever is higher towards claim period, if not otherwise specified in agreement. This amount shall remain fixed during the currency of the agreement.

Table -1 (CPBG required for given below Scheme for Services)		
Sr. No.	Scheme Details	CPBG Amount in Rs.
1	Scheme No: ES23GS1004	1,59,813 /-
2	Scheme No: ES22AT4028	1,79,000 /-
3	Scheme No. EW22MS4014 (4 Locations)(West Grid)	2,22,713 /-
4	Scheme No. EW21MS4002 (1 Location) (West Grid)	57,189 /-
5	Scheme No.ES22MS4038 (3 Locations)(South Grid)	1,48,425 /-

8.3 The CPBG shall be issued from any nationalized / scheduled bank as per company format.

8.4 The Company shall reserve the right to invoke the CPBG unconditionally and without recourse to the Contractor, if there is failure to perform any part of the Agreement for whatsoever reason. This clause is pertaining to performance of contractual obligations and the decision of Company shall be final in this regard.

8.5 In the event of any claim or any other outstanding Contractual obligations remaining unfulfilled, the Contractor shall be required to extend the CPBG till the settlement of all claims and completion of all Contractual obligations at the cost and consequences of contractor.

8.6 In the event, in Company's sole judgement, the Contractor has fulfilled all its obligations under this Agreement, The CPBG shall be released without any interest after the expiry of CPBG and its claim period as mentioned above.

8.7 If the CPBG is or becomes invalid for any reason (other than its expiry), the Contractor shall immediately notify the Company/BRPL and provide within five (5) days a replacement CPBG in the form set out in the Contract/Agreement.

8.8 Not later than sixty (60) Business Days before the expiry of the CPBG, the Contractor shall, upon request of the Company/BRPL obtain extension of the validity of such CPBG for the period stated in such request by the Company/BRPL and provide a copy of such renewed CPBG.

8.9 It is Contractor's responsibility to incur charges / cost to maintain and for extension of CPBG without claiming reimbursement from the company/BRPL.

9. Guarantee of Performance

The bidder shall stand guarantee that the equipment and material supplied/service or work rendered under the contract is free from design, manufacturing, material, construction, erection & installation and workmanship & quality defects and is capable of its due, rated and intended quality performance, as an integrated product delivered under the contract for a specific period termed as Guarantee Period. The bidder should also guarantee that the equipment/material is new and unused except for the usage required for the tests and checks required as part of quality assurance.

10. Guarantee period/Defect Liability period for ETC of Godrej Grid:

The Guarantee Period will be equipment/service/work specific and shall be as specified in the Technical Specifications for the equipment/material/service/work and where Technical specifications are not part of contract documents or guarantee period is not specified in the Technical specifications, the guarantee period shall be as per the Special Terms and Conditions of the Contract. In case of no mention of the guarantee period in Technical specifications, Defect liability period will be 24 Months from the Date of Commissioning or 30 months from the date of delivery of final lot of supplies made, whichever is later.

If during the defects liability period any materials / items are found to be defective, these shall be replaced or rectified by the bidder at his own cost within 30 days from the date of receipt of intimation.

10a. WARRANTY / DEFECT LIABILITY PERIOD for Sarita vihar & CRP replacement:

The Contractor shall be liable to rectify all defects in the materials or works done by the Contractor under this Contract, or from any act or omission of the contractors for a period of Twelve (12) months from date of final work completion certification by the Engineer in-charge.
If any defect noticed and system cannot be used by reason of any defect, the defect liability period shall be extended by the period equal to the period during which the system is not in operation.

In respect of any warranty work performed by the Contractor, the period during which a claim may be made for such warranty work shall be extended by an additional period of twelve (12) months from the completion of such portion of warranty work.

11. COMPLETION PERIOD:

You are required to mobilize your manpower and Tools & Tackles and furnish a list of equipments to be used for erection and commence the execution activity as per instructions of Engineer In-charge. The entire Erection, Testing & Commissioning work should be completed period of 6 months. The detailed

schedule and milestone completion dates would be as per the contract schedules given from time to time by Engineer In-charge at site. You shall submit a weekly progress report to Engineer In charge.

12. CLEANLINESS & PRECAUTIONS TO BE TAKEN WHILE DOING WORK AT SITE TO PREVENT DUST POLLUTION

All debris shall be removed and disposed of at assigned areas on daily basis. Surplus excavated earth shall be disposed of in an approved manner. In short, the contractor shall be fully responsible for keeping the work site clean at all times. In case of non- compliance, company shall get the same done at Contractor's risk and costs.

While carrying out any civil work including road/ pit digging, plinth/ fence making, road restoration etc contractor shall adhere to below mentioned guidelines.

1. No construction material/ debris shall be stored on metalled road.

2. Wind breakers of appropriate height on all sides of ear marked area using CGI sheets shall be raised to ensure that no construction material dust fly outside ear marked area.

3. The construction material i.e. coarse sand, stone aggregates, excavated earth, cement and any other material to and from the site shall be transported under wet and covered condition to ensure their non-slippage en-route to avoid air contamination.

4. The contractor shall provide mask and helmet to every worker working on the construction site and involved in loading/unloading and carriage of construction material and construction debris to prevent inhalation of dust particles.

5. Over loading of vehicles shall be strictly prohibited

6. The construction material at site shall be stored under wet and covered condition.

7. The dumping sites for temporarily storing the excavated earth shall be properly levelled, watered and rehabilitated by plantation to avoid flying of dust.

8. The worker at the site shall be sensitized to adopt / observe the dust controlled measures in true spirit.

9. If any C&D waste is generated at site the same will be transported to the C&D waste site only and the record for the same will be maintained by the agency.

10. Wet jet in grinding and stone cutting is being permitted at site.

11. The necessary record for dust control is being maintained by the department on day to day basis and being monitored regularly.

GUIDELINES REGARDING INSPECTION & MAINTENANCE OF PITS/ DUG AREA WHILE DOING WORK AT SITE IN BRPL AREA
The contractor shall ensure strict compliance of the following directions:
a) The sites of all manholes, pits, holes, tanks or any other opening in the ground of any kinds shall be regularly inspected and maintained.

b) Schedule and protocols of inspections and maintenance shall be drawn up and notified to BRPL.

c) These sites shall be cordoned off to render them inaccessible to the public.

d) The existence of these sites shall be clearly & visibly marked by the display of signboards/signages.

e) If they are required to be covered, it shall be ensured that the covers are in place.

The Execution vendors shall be responsible for all the preventive and protective environmental steps as per guidelines. Any violation from the above guidelines has been viewed very seriously by the authorities. Concerned agency is liable for the penalties / other action by the authorities, The Agency shall indemnify BRPL from all liabilities on this account.

All debris shall be removed and disposed of at assigned areas on daily basis. Surplus excavated earth shall be disposed of in an approved manner. In short, you shall be fully responsible for keeping the work site clean at all times. In case of non- compliance, company shall get the same done at Bidder's risk and costs.

13. COMMISSIONING & ACCEPTANCE TEST:

After completion of the work, the Bidder shall conduct trial run/ operation in the presence of Engineer In charge. During such trial run the system shall be operated under the supervision of the Bidder. If any rectification/modification required during this period the Bidder shall do all necessary measures.
On satisfactory completion of above, the system shall be deemed to have energized and placed in commercial operation. The Engineer-in-Charge will issue an acceptance certificate.

14. WORK COMPLETION CERTIFICATION, HANDING OVER:

The work carried out by the Bidder under this order has to be certified by Engineer In-charge for satisfactory completion of work allotted to the Bidder with respect to specifications / Field Quality Procedures as per applicable standards. In case of modification/correction to be carried out, Bidder shall carry out the said modifications/correction without additional cost. The Bidder shall remain in close contact with Engineer In-Charge at site to report the general findings of the fieldwork during the initial as well as later stage of the work at site.

The Bidder shall be solely responsible for any shortage or damage of materials issued to them handling of and / or in storage and erection at site and cost of the same will be recovered from the Bidder as certified by Engineer In-Charge. Bidder must submit a periodical material reconciliation statement in the approval format with every Running Bill raise by him or end of every month whichever is earlier. The Bidder shall maintain an accurate and exhaustive record detailing out the list of all items received by him for the purpose of erection and keep such record open for the inspection of the company.

15. PENALTY AND LIQUIDATED DAMAGES:

15.1 Penalty: A penalty of 2.5% of bill amount shall be levied in each case of non-compliance of safety practices and site cleanliness.

15.2 Liquidated Damages: In the event of any delay in completion of the work beyond the stipulated time given by in order due to reasons solely attributable to the Bidder, the Bidder shall pay to the Company liquidated damages.

If the Bidder failed perform the services within the time period specified in the order, the Company shall, without prejudice to its other remedies under the contract, deduct liquidated damages a sum equivalent to 0.5 % of the total order value for each week or part there of delay until the actual date of completion up to a maximum deduction of 10% of total order value. The levy payment or deduction of such damages shall not relieve the Bidder from his obligation to complete the Works on time or from any other part of his obligation and liabilities under the Contract. Once the maximum is reached, the Company reserves the right for termination of contract without any liabilities to the Company.

In the event of an extension of time being granted by the EIC, in writing for the Completion of the works, this clause shall be applicable after the expiry of such an extended period.

Engineer In charge should specifically mention the amount of LD levied on the bill of Bidder.

16. SAFETY REGULATIONS & SAFETY CODE:

The Bidder shall indemnify the Company from any consequence arising due to Bidder's failure in respect to safety compliance.

First Aid facilities at easily accessible place shall be provided by the Bidder at his own cost as per provisions of Labor act or as advised by the Company wherever works are carried out.

All critical injuries shall be reported promptly to the Company. The report shall cover type, nature, cause, physician's report and actions for prevention of those types again.

To ensure effective enforcement of the rules and regulations relating to safety precautions, arrangements made by the Bidder shall be open to inspection by the Company.

The cost so incurred by the Bidder in providing for safety standards and requirements as above shall be deemed to be included in the rates quoted for various items under the scope of Contract and no extra amounts shall be payable to the Bidder on this account.

The Bidder shall furnish to the Company within seven days from issue of Work Order whichever is earlier, for approval of Company, the proposed safety program on how it intends to implement the safety procedures and precautions to ensure that the site is accident free.

The Bidder shall ensure adequate safety precautions at site as required under the law of the land and shall be entirely responsible for the complete safety of their workman as well as other workers at site and premises. The Bidder shall not deploy any worker below the age of 18 years.

The Bidder shall observe the safety requirements as laid down in the contract and in case of sub-contract (only after written approval of company), it shall be the responsibility of main Bidder that all safety requirements are followed by the employees and staff of the sub-vendor.

The Bidder employing two hundred employees or more, including contract workers, shall have a safety coordinator in order to ensure the implementation of safety requirements of the contract and a Bidder

with lesser number of employees, including contract workers, shall nominate one of his employees to act as safety coordinator who shall liaise with the safety officer on matters relating to safety and his name shall be displayed on the notice board at a prominent place at the work site.

The Bidder shall be responsible for non-compliance of the safety measures, implications, injuries, fatalities and compensation arising out of such situations or incidents.

In case of any accident, the Bidder shall immediately submit a statement of the same to the owner and the safety officer, containing the details of the accident, any injury or causalities, extent of properly damage and remedial action taken to prevent recurrence and in addition, the Bidder shall submit a monthly statement of the accidents to the owner at the end of each month.

17. STATUTORY OBLIGATIONS:

The Contractor shall ensure the due compliance of all the applicable statutory acts, including but not limited to the following acts, where special attention of the Contractor is required to be drawn towards the compliance of provision (along with the latest amendments/additions) including any statutory approval required from the Central/State Governments, Ministry of Labour.

- The Child Labour (Prohibition and Regulation) Act, 1986.
- The Agreement Labour (Regulation and Abolition) Act, 1970.
- The Employee's Pension Scheme, 1995.
- The Employee's Provident Funds and miscellaneous provisions Act, 1952.
- The Employees State Insurance Act, 1948.
- The Industrial Disputes Act, 1947.
- The Maternity Benefit Act 1961.
- The Minimum Wages Act, 1948.
- The Payment of Bonus Act, 1965.
- The Payment of Gratuity Act, 1972.
- The payment of Wages Act, 1936.
- The Delhi Shops & Establishment Act, 1954.
- The Workmen's Compensation Act. 1923.
- The Company's Liability Act, 1938.
- The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013
- The Delhi Preservation of Trees Act 1994

Further the Contractor shall be liable to comply with all the amendment in existing acts / upcoming new comprehensive labour acts/codes related to applicable labour laws.

The Contractor shall, prior to commencement of the jobs under this agreement, furnish to the Company the Registration No and Codes of permanent Provident Fund and ESI of its employees.

Contractor shall bear the entire responsibility, liability and risk relating to coverage of its workforce under different statutory regulations including Workmen's Compensation Act, ESI Act, Factories Act 1948, the Agreement Labour (Regulation and Abolition) Act 1970, as amended from time to time, and any other relevant laws/regulations as the case may be. Contractor shall also be solely responsible for the payment of all benefits such as Provident Fund, Bonus, Retrenchment Compensation, leave etc. applicable as per the various statutory laws/regulations and shall keep the Company indemnified in this regard against any claim. The Company shall be

entitled to deduct from any money due to or become due to Contractor, any money paid or payable by way of compensation as aforesaid or cost or expenses in connection with any claims thereto and Contractor shall abide by the decision of the Company as regards the sum payable by Contractor under the provisions of this clause

The Contractor shall obtain all registration/permissions licenses etc., which are/may be required under any labour or other legislations for providing the services under this Agreement.

In case it is desired by any Labour authorities to produce the records with respect to salary/ PF/ESI/EDIL/Bonus etc., the said record/register will be made available by the Contractor.

The contractor shall follow all law of the land and prevailing orders issued by various Govt. Departments like Dept. of Power / DERC/ NGT/Dept. of Forest/ Dept. of Environment / DPCB / CPCB/ Court orders etc.

18. WORKMAN COMPENSATION:

The Contactor shall take insurance policy under the Workman Compensation Act to cover such workers who are not covered under ESI and PF by the Bidder however engaged to undertake the jobs covered under this order and a copy of this insurance policy will be given to Company for reference and records. This insurance policy shall be kept valid at all times. In case there are no worker involve other than those who are covered under ESI and PF by the Bidder, the Bidder shall certify for the same.

The Bidder shall keep the company indemnified at all times, against all claims of compensation under the provision of Workmen Compensation Act 1923 and as amended from time to time or any compensation payable under any other law for the time being workman engaged by the Bidder/sub-contractor/sub-agent in carrying out the job involved under this work order and against costs and expenses, if any, incurred by the company in connection therewith and without prejudice to make any recovery.

The company shall be entitled to deduct from any money due to or to become due to the Bidder, moneys paid or payable by way of compensation as aforesaid or cost or expenses in connection with any claims thereto and the Bidder shall abide by the decision of the Company as to the sum payable by the Bidder under the provisions of this clause.

19. STAFF AND WORKMAN

It shall be responsibility of Bidder

(a) To obtain Contract Labour License from the concerned authorities and maintain proper liaison with them. Necessary Forms for obtaining Labour License would be issued by the company. However you will bear all expenses for obtaining Labour license and registration in PF Department for your scope of work. You will deposit PF of your staff/laborer each month and all related documents should be furnished to us.

b) To obtain workman insurance cover against deployment of workers etc.

(II) To maintain, proper records relating to workmen employed, in the form of various Registers, namely,

a) Register of workmen.
b) Register of muster roll.
c) Register of overtime.
d) Register of wages.
e) Any other reAISter as per latest amendment Labour Act.

The records shall be in the prescribed formats only.

(III) To disburse monthly wages to your workers/ supervisors in time and in the presence of Company representatives or as directed by the Labour authorities.

(IV) To maintain proper liaison with the Project authorities, local police and all other government and local bodies.

(V) To pay your workmen at least not less than the minimum prescribed wages as per state/Central Labour laws as may be, applicable. The Bidder shall, be responsible for compliance of all the provisions of minimum Wages Act, PF, ESIC Act workmen Compensation Act and Contract Labour Regulation & Abolition Act the rules made there under. In case of non-compliance of the statutory requirements, the company would take necessary action at the risk and cost of the Bidder.

(VI) To employ required number of skilled/semi-skilled and unskilled workmen as per site requirement to complete the entire project as per schedule. To provide safety shoes, safety helmets, safety belts, gloves etc. to your worker/staff as per requirement during erection work.

(VII) To employ necessary engineering and supervisory staff for completion of the Project in time. While day-to-day management of the site and supervision of the works shall be the responsibility of your Engineer - In charge, he will report to the Engineer in charge to assist him to discharge the overall responsibility of the execution of the project.

20. INSURANCE

The contractor shall take suitable insurance policy for its men and materials (Term Insurance for life , GPA, Mediclaim policy, Workmen Compensation Policy etc.)as listed below for the resources deployed by him

a) Term Insurance for life:

Before commencing the execution of the work the Contractor shall take Term Insurance Policy for life for the staff engaged/deployed by them for the work under agreement, to insure against any loss of life which may occur during the agreement for the work of the Company. The policy shall have coverage of Rs. 10 Lakh.

b) Group Personal Accident Insurance:

Before commencing the execution of the work the Contractor shall take Accidental insurance policy for the staff engaged/deployed by him for the work under agreement, to insure against any loss of life which may occur during the agreement for the work of the Company. The policy shall have coverage of Rs. 5 Lakh (Table C Death + Permanent Total Disability + Partial permanent Disability due to external accidents). Permanent total disability coverage shall be 125% of the basic sum assured of Rs 5 Lakh.

The Contractor shall be responsible for on the spot same day claim settlement with the victim's legal heirs without waiting for settlement by insurance claim and without any liability on BRPL. The premium amount for both the above policies shall be borne by the Contractor. The Contractor shall furnish copy of policy within 15 days of start of work under the contract.

c) Medical Insurance Policy:

Contractor shall take a mediclaim policy including family floater of minimum sum assured value Rs. 2.00 lakhs for the resources who are not covered under ESI.

d) Comprehensive Marine Storage cum Erection insurance policy:
Company shall take at his own cost Comprehensive Marine Storage cum Erection insurance policy for the total work. However, Contractor shall take at his own cost third party insurance and other suitable insurance policy for his own men and materials. Please note that these insurance policies shall be taken in consultation with the company and a copy of the such insurance policies shall have to be furnished to company within 15 days of the date of LOI/Order.

e) For all the insurance policies (whether taken by the Company or Contractor), the Contractor shall be responsible for settlement of claims with the underwriters without any liability on the company and will arrange replacements / rectification expeditiously without a waiting settlement of insurance claim, at contractor's own cost and this shall not entitle the Contractor for any extension of time.

21. SECURITY:

Adequate number of trained Security Guards shall be deployed both at the storage yard and stores as well as places of work to prevent theft and pilferage of material and accessories and various other materials. All security rules and safety rules enforced at site by company shall be strictly observed.

22. ENVIRONMENTAL, HEALTH & SAFETY PLAN:

Contractor will make ensure that the Environment, Health & Safety (EHS) requirements are clearly understood and faithfully implemented at all levels at site as per instruction of Company.

Contractors must comply with these requirements:

a) Comply with all of the elements of the EHS Plan and any regulations applicable to the work

b) Comply with the procedures provided in the interests of Environment, Health and Safety

c) Ensure that all of their employees designated to work are properly trained and competent

d) Ensure that all plant and equipment they bring on to site has been inspected and serviced in accordance with legal requirement and manufacturer's or suppliers' instructions

e) Make arrangements to ensure that all employees designated to work on or visit the site present themselves for site induction prior to commencement of work

f) Provide details of any hazardous substances to be brought onsite

g) Ensure that a responsible person accompanies any of their visitors to site

All contractor's staff are accountable for the following:

1. Use the correct tools and equipment for the job and use safety equipment and protective clothing supplied, e.g. helmets, goggles, ear protection, etc. as instructed
2. Keep tools in good condition
3. Report to the Supervisor any unsafe or unhealthy condition or any defects in plant or equipment
4. Develop a concern for safety for themselves and for others
5. Prohibit horseplay
6. Not to operate any item of plant unless they have been specifically trained and are authorized to do so.

18.1 Measures related to the Tree Pruning, excavation near tree and construction & demolition:

Notwithstanding anything stated in the tender document, work contract or any other communication issued related to the performance of the work order awarded, it is clarified that the vendor and its associate/employees/worker, during the performance of work under this work order(s), shall ensure full compliance of the provisions of all environment laws/rules/directions by any authority including judicial authority/ regulation related to excavation near tree and construction & demolition activity, and shall mandatorily comply the following instructions:

A. Tree Pruning, Planning, Installation and Maintenance of Utility Apparatus in proximity to trees shall be done mandatorily by ensuring the following prescribed measures:

1) No excavation work shall be done within two (2) meters of the Tree Trunk.
2) Any exposed roots beyond 2 meters of the tree trunk, should be protected with dry sacking and backfilling must be done with a suitable manure mixture and/or the compost material mix as soon as possible on the completion of the works.
3) For any excavation to be carried out beyond the prescribed distance of 2 meters but within 3 meter from the tree trunk, manual methods (by use of hand) or by using trenchless techniques shall be preferred over use of a mechanical excavation.
4) No roots shall be cut during the excavation work.
5) Not to lean any materials against or chain mechanical plants to the trunk of the trees.
6) Avoid any soil contamination from oil, gasoline, paint and paint thinner or other chemicals.
7) No concrete or construction or repairing work shall be done at least within two (2) meter radius of the trunk of trees.
8) All the electric wires and high tension cables and other apparatus relating to supply of electricity shall permanently be removed from the trees branches.

Records to be maintained by the supervisor to demonstrate adherence to the guidelines for excavation in Proximity to the Trees:

1) Ensure pre and post photography and videography of the site demarcated for the excavation work and the same shall not be deleted/removed until securing the prior permission of the Circle head O&M.
2) While digging and upon exposure to the roots- take immediate photographs of the same and report the matter to senior officers for further guidance.

If any unauthorized layering of other cables is being carried out at the digging site by some other agency/person, then immediately capture photographs of the same and inform the seniors, who shall take suitable legal actions, if required, which includes intimating to tree officer about such unauthorized laying of wires by such agency.

B. DUST MITIGATION MEASURES FOR CONSTRUCTION & DEMOLITION ACTIVITIES

Any construction/demolition/excavation related activity performed in furtherance of the performance of work under award, be undertaken only after ensuring the Dust Mitigation Measures prescribed as follows:

1) Dust/wind breaking walls of appropriate height around the periphery of the construction site.

2) Installation of Anti Smog Gun(s) (for >20,000 m2 built up area).
3) Tarpaulin or green net on scaffolding around the area under-construction and the building.
4) All vehicles including carrying construction material and construction debris of any kind should be cleaned and wheels washed.
5) All vehicles carrying construction material and construction debris should be fully covered and protected.
6) All construction debris and construction material of any kind should be stored on the site and not dumped on public roads or pavements.
7) No loose soil or sand or Construction & Demolition Waste or any other construction material which may cause dust, shall not be left uncovered.
8) No grinding and cutting of building materials in open area. Wet jet should be used in grinding and stone cutting.
9) Unpaved surfaces and areas with loose soil should be adequately sprinkled with water to suppress dust.
10) Roads leading to or at construction sites must be paved and blacktopped i.e., metallic roads (for >20,000 m2 built up area).
11) Construction and demolition waste should be recycled on-site or transported to authorized recycling facility and due record of the same should be maintained.
12) Every worker working on construction site and is involved in loading, unloading and carriage of construction material and construction debris should be provided with dust-mask to prevent inhalation of dust particle.
13) Arrangement should be provided for medical help, investigation and treatment to workers involved in the construction of building and carry of construction material and debris relatable to dust emission.
14) Dust mitigation measures shall be displayed prominently at the construction site for easy public viewing.
15) Ensure the compliance of all dust control measure.

It is clarified that BRPL has zero tolerance with respect to the non-compliance/breach of environment laws/rules/directions by any authority including judicial authority/ regulation. Accordingly, in case of breach by the vendor/its associate/employee/worker to the laws/rules as detailed above, shall be termed as serious breach to the terms of work order and BRPL shall be free to take all actions against vendor for such breach of contract including the termination of the said contract. Additionally, the vendor shall also be liable to indemnify BRPL/its Directors/Officers/Employees/Associates in full including the payment of all loss/penalties/compensation including environment compensation as imposed by any judicial/quasi-judicial citing/alleging such breach.

The vendor shall also be under a mandate to provide an Undertaking to BRPL, which includes that the excavation, tree pruning, construction and demolition work, if performed by such vendor, the same shall be in strict adherence of all environment laws/rules/directions by any authority including judicial authority/ regulation and all the measures provided in work order/tender under the head/title "Measures related to the Tree Pruning, excavation near tree and construction & demolition".

Format 1

Undertaking from the _____(Vendor- undertaking the excavation work)

I _____, Proprietor of M/s_____, having R/o. at _____

Has been awarded a work order no._____,dated_____, from BSES Rajdhani Power Limited (BRPL), to carry out digging/excavation work on the stretch of road detailed in the work order.

Details of the Road cutting permission are RCP no. _____ dated _____ valid from _____ to _____ on the stretch of road detailed in the work order.

I have read the Guidelines on Excavation (as enclosed) and understood the same in sense and sprit. I assure that I shall abide with the said guidelines along with the all other provision associated with laws relating to laying of cables under the said work order.

I do herby undertake that I shall be fully responsible for any violation of any kind and shall be liable for any cost consequences, penalty, liability, damages if imposed by any authority court citing/disputing the performance of the task.

I further undertake to indemnify BRPL its officers, directors, employees and associates from any cost consequences, penalty, liability, damages if imposed by any authority court citing/disputing the performance of the task.

I do herby agree and confirm that forming a part of work order/agreement and breach of this undertaking shall be termed as breach of the terms of the said work order/agreement.

I have read and understood the terms of this undertaking and submitting this undertaking out of my own accord and without any coercion.

Deponent

23. TEST CERTIFICATE & QUALITY ASSURANCE:

The Bidder shall procure all equipment from genuine sources as approved by the Company and as per Company specifications. The Bidder shall submit all the test certificates and joint inspection reports related to major equipment wherever applicable. The Bidder shall ensure for the strict compliance to the specifications and Field Quality Procedures issued by company / Engineer in-charge.

24. SUB-CONTRACTING / SUBLETTING:

BIDDER shall not assign or transfer the whole or any part of this Work Order or any other benefits accruing there from nor shall it subcontract / sublet the whole or any part of the Works without the prior written consent of COMPANY.

In the event the Bidder assigns this work order, Bidder's assignees shall be bound by the terms and conditions of this work order and shall , if deemed necessary by COMPANY at the time of such assignment, undertake in writing to be so bound by this Work Order.

Notwithstanding the subletting / subcontracting of any portion of the works, Bidder shall remain wholly responsible for the carrying out, completion and satisfactory execution of Works in all respects in accordance with this Work Order, specification, approved drawings and data sheets.

25. INDEMNITY:

Bidder shall indemnify and save harmless COMPANY against and from any and all liabilities, claims, damages, losses or expenses arising due to or resulting from:

A. Any breach non-observance or non-performance by Bidder or its employees or agents of any of the provisions of this Work Order.
B. Any act or omission of Bidder or its employees or agents.
C. Any negligence or breach of duty on the part of Bidder, its employees or agents including any wrongful use by it or them of any property or goods belonging to or by COMPANY or any other third party at site including adjoining neighbors.

Bidder shall at all times indemnify COMPANY against all liabilities to other persons, including the employees or agents of COMPANY or Bidder for bodily injury, damage to property or other loss which may arise out of or in consequence of the execution or completion of Works and against all costs charges and expenses that may be occasioned to COMPANY by the claims of such person.

26. EVENTS OF DEFAULTS:

COMPANY may, without prejudice to any of its other rights or remedies under the Work Order or in law, terminate the whole or any part of this Work Order by giving written notice to the Bidder, if in the opinion of COMPANY, Bidder has neglected to proceed with the works with due diligence or commits a breach of any of the provisions of this work order including but not limited to any of the following cases:

a) Failing to complete execution of work within the terms specified in this work order.
b) Failing to complete works in accordance with the approved schedule of works.
c) Failing to meet requirements of specifications, drawings, and designs as approved by COMPANY.
d) Failing to comply with any reasonable instructions or orders issued by COMPANY in connection with the works.
e) Failing to comply with any of the terms or conditions of this work order.

In the event COMPANY terminates this work order, in whole or in part, on the occurrence of any event of default, COMPANY reserves the right to engage any other sub-vendor agency to complete the work or any part thereof, and in addition to any other right COMPANY may have under this work order or in law including without limitation the right to penalize for delay under clause 15.0 of this tender, the contractor shall be liable to COMPANY for any additional costs that may be incurred by COMPANY for the execution of the Work.

Failure on the part of the Contractor to maintain its confidentiality obligations and or compromising its integrity, which are required to be of highest standards, in so far as the present scope of work is concerned.

27. RISK & COST:

If the Contractor fails to execute the work as per specification/Agreement/as per the direction of Engineer-in-change within the scheduled period and/or even after the extended period, the company shall be having the right to cancel/terminate the agreement and the company reserves the right to get the work executed from any other

source at the Risk & Cost of the Contractor. The Extra Expenditure so incurred shall be debited to/recovered from the Contractor.

28. ARBITRATION:

To the best of their ability, the parties hereto shall endeavor to resolve amicably between themselves all disputes arising in connection with the proposed Agreement. If the same remain unresolved, within fifteen (15) days of the matter being raised by either party, either party may refer the dispute for settlement by arbitration. The arbitration to be undertaken by a sole arbitrator to be appointed by the company. The decision of the arbitrator is final and binding upon both the parties. The arbitration proceeding shall be conducted in accordance with the provisions of the Indian Arbitration & Conciliation Act, 1996 and the venue of such arbitration shall be New Delhi only.

29. FORCE MAJEURE:

29.1 General:

An "Event of Force Majeure" shall mean any event or circumstance not within the reasonable control, of the Party affected, but only if and to the extent that:

(i) Such event or circumstance, despite the exercise of reasonable diligence, could not have been prevented, avoided or reasonably foreseen by such Party;

(ii) Such event or circumstance materially and adversely affects the ability of the affected Party to perform its obligations under this Contract, and the affected Party has taken all reasonable precautions, due care and reasonable alternative measures in order to prevent or avoid the effect of such event on the affected parties ability to perform its obligations under this Contract and to mitigate the consequences thereof. For the avoidance of doubt, if such event or circumstance would not have materially and adversely affected the performance of the affected party had such affected party followed good industry practice, such event or circumstance shall not constitute force majeure.

(iii) Such event is not the direct or indirect result of the failure of such Party to perform any of its obligations under this Contract; and

(iv) Such Party has given the other Party prompt notice describing such events, the effect thereof and the actions being taken in order to comply with above clause

29.2 Specific Events of Force Majeure:

Subject to the provisions of above clause, Events of Force Majeure shall include only the following to the extent that they or their consequences satisfy the above requirements:
The following events and circumstances:

a) Effect of any natural element or other acts of God, including but not limited to storm, flood, earthquake, lightning, cyclone, landslides or other natural disasters, and

b) Explosions or fires

c) Declaration of the Site as war zone.

d) Any order, regulation, directive, requirement from any Governmental, leAISlative, executive or judicial authority.

29.3 Notice of Events of Force Majeure

If a force majeure event prevents a party from performing any obligations under the Contract in part or in full, that party shall:

(i) Immediately notify the other party in writing of the force majeure events within 2 working days of the occurrence of the force majeure event

(ii) Be entitled to suspend performance of the obligation under the Contract which is affected by force majeure event for the duration of the force majeure event

(iii) Use all reasonable efforts to resume full performance of the obligation as soon as practicable

(iv) Keep the other party informed of all such efforts to resume full performance of the obligation on a regular basis

(v) Provide prompt notice of the resumption of full performance or obligation to the other party.

29.4 Mitigation of events of force majeure:

The Bidder shall:

(i) Make all reasonable efforts to prevent and reduce to a minimum and mitigate the effect of any delay occasioned by an Event of Force Majeure, including applying other ways in which to perform the Contract;

(ii) Use its best efforts to ensure resumption of normal performance after the termination of any Event of Force Majeure and shall perform its obligations to the maximum extent practicable as agreed between the Parties; and Keep the Company informed at regular intervals of the circumstances concerning the event of Force Majeure, with best estimates as to its likely continuation and what measures or contingency planning it is taking to mitigate and or terminate the Event of Force Majeure.

29.5 Burden of proof:

In the event that the Parties are unable in good faith to agree that a Force Majeure event has occurred to an affected party, the parties shall resolve their dispute in accordance with the provisions of this Contract. The burden of proof as to whether or not a force majeure event has occurred shall be upon the party claiming that the force majeure event has occurred and that it is the affected party.

29.6 Terminations for certain events of force majeure:

If any obligation of any Party under the Agreement is or is reasonably expected to be delayed or prevented by a Force Majeure event for a continuous period of more than 1 (one) month during the Term of the Agreement, the Agreement shall be terminated at the discretion of the Company and neither Party shall be liable to the other for any consequences arising on account of such termination.

The Company reserves the right to demand the Contractor's services on holidays as well as beyond the normal working hours.

The Contractor will ensure that none of their person is engaged in any unlawful activities subversive of the Company's interest failing which suitable action may be taken against the Contractor as per the terms and condition of this order.

The Contractor shall be liable for payment of all taxes and duties as applicable, to the State/ Central Govt. or any local authority.

The Contractor's employees shall not be treated as Company's employees / persons for any purpose whatsoever & facilities/ benefits applicable to the Company's employees shall not be applicable to Contractor's employees. If due to any reasons whatsoever the Company is made liable to meet any obligation under any of the laws & enactment etc, for any reason whatsoever the same shall be recovered from the Contractor either from the present and future amount payable to him or as per law.

30. SECRECY CLAUSE:

The technical information, drawing and other related documents forming part of work order and the information obtained during the course of investigation under this work order shall be the Company's executive property and shall not be used for any other purpose except for the execution of the work order. The technical information drawing, records and other document shall not be copied, transferred, or divulged and/ or disclosed to third party in full/part, not misused in any form whatsoever except to the extent for the execution of this work order.

This technical information, drawing and other related documents shall be returned to the Company with all approved copies and duplicates including drawing/plans as are prepared by the Bidder during the executions of this work order, if any, immediately after they have been used for agreed purpose.

In the event of any breach of this provision, the Bidder shall indemnify the Company against any loss, cost or damage or claim by any party in respect of such breach.

The Contractor shall not use the name/logo/emblem of the Company in any manner either for credit arrangement or otherwise and it is agreed that the Company shall not in any way be responsible for the debts, liabilities or obligations of the Contractor and/or his employees.

The Contractor hereby covenant that the Contractor shall be responsible for theft, if any committed, by his staff and the Contractor shall indemnify Company from and against all claims, demands, actions, suits and proceedings, whatsoever that may be brought or made against the Company by or on behalf of any person, body, authority whatsoever and whomsoever and all duties, penalties, levies, taxes, losses, damages, costs, charges and expenses and all other liabilities of whatsoever nature which the Company may be liable to pay, incur or sustain by virtue of or as a result of the performance or non- performance or observance or non- observance by the Contractor of any of the terms and conditions of this agreement. The Company shall have full power and rights at its discretion to pay or defend or compromise any suits, claims or demands brought or made, whether pending or threatened touching upon this agreement as it may consider necessary or desirable and shall be entitled to recover from the Contractor all sums of money including all legal costs, charges and expenses incurred by virtue of any such compromises which shall not be called into question by the Contractor but shall be final and binding on the Contractor.

Contractor shall submit signed NDA as per the format 4.3 attached.

31. TERMINATION

31.1 TERMINATION BY COMPANY FOR NON PERFORMANCE

During the course of the execution, if at any time the Company observe and forms an opinion that the work under the order is not being performed satisfactory and the performance of the Contractor not found satisfactory, the Company reserves its right to cancel/ terminate this Agreement giving 30 days' notice without assigning any reason and the Company will recover all damages including losses occurred due to loss of time from the Contractor. After termination of the agreement, the Contractor shall immediately stop all activities related to the work terminated. This is without prejudice to other rights under the terms of contract. The Contractor shall hand over the Company all drawing/documents prepared for this contract up to the date of cancellation of order.

31.2 PREMATURE TERMINATION

The order can be terminated by the Company before the expiry of its term under the following conditions:

(i) The Contractor repudiates this order or otherwise evidences intention not to be bound by this order;
(ii) The Contractor assigns, mortgages, or charges or purports to assign, mortgage, or charge any of its obligations or rights in contravention to the provisions of this order; or, transfers or negates any of its obligations in contravention to the provisions of this order.
(iii) The Contractor breaches the Secrecy/Non-disclosure Clause/Confidentiality obligations.
(iv) If at any stage during the tenure of the work order, Contractor is found to be involved or indulging or even attempting illegal, unlawful action or activities or some fraudulent or even trying to take or ask bribe from any customer or to give bribe official/staff or misuse or abuse any meter or property of the Company.
(v) The Company shall be entitled to deduct from any money due or to becomes due to the Contractor, money paid or payable by way of compensation as aforesaid or cost or expenses in connection with any claims thereto. The Contractor shall abide by the decision of the Company as to the amount payable by the Contractor under the provision of this clause.

31.3 TERMINATION BY COMPANY FOR CONVENIENCE

The Company shall, in addition to any other right enabling it to terminate the Contract, have the right to terminate the Contract at any time without assigning any reason, by giving a written notice of minimum 30 days to the Contractor. The Contract shall stand terminated on the date as per the notice but such termination shall be without prejudice to the rights of the Parties accrued on and before the date of termination.

32. QUALITY

Contractor shall ensure that strict quality is maintained in the Performa and execution of works under this Work Order and Works are executed in conformity with the Specification.
All tools, tackles, instruments and other equipments used in the execution of the Works shall be duly calibrated as required and Contractor shall maintain proper records of such tools, tackles, instruments and / or equipment.
Contractor shall prepare the quality plan as per the specifications and shall strictly monitor compliance with the approved quality plan during the entire period of this Work Order.
Contractor shall submit duly approved Quality Check sheets along with final bill and the same shall be integral part of final Quality Clearance. QA Check sheets format attached with this contract as Annexure-A for the following:

QA - CHECKSHEET FOR 11KV RMU
QA - CHECKSHEET FOR 11KV TERMINATION
QA - CHECKSHEET FOR DISTRIBUTION TRANSFORMER
QA - CHECKSHEET FOR FEEDER PILLAR
QA - CHECKSHEET FOR FENCING
QA - CHECKSHEET FOR HIGH MAST
QA - CHECKSHEET FOR HT OVERHEAD LINE 11KV
QA - CHECKSHEET FOR LT ACB
QA - CHECKSHEET FOR OH LT LINE
QA - CHECKSHEET FOR PKG SUB-STN
QA - CHECKSHEET FOR ROUTINE ELECTRICAL TESTS
QA - CHECKSHEET FOR STREET LIGHT
QA - CHECKSHEET FOR UNDERGROUND HT CABLE 11KV
QA - CHECKSHEET FOR UNDERGROUND LT CABLE
QA - CHECKSHEET FOR POWER TRANSFORMER (EHV)

33. LIABILITY OF BIDDERS

Subject to the due discharge of its obligations under the Contract and except in case of gross negligence or willful misconduct on the part of the Bidder or on the part of any person acting on behalf of the Bidder, with respect to any loss or damage caused by the Bidder to the Employer's property or the Site, the Bidders shall not be liable to the Employer for the following:

a) For any indirect or consequential loss or damage; and
b) For any direct loss or damage that exceeds:

(i) The total payments made and expected to be made to the Bidder under the Contract including reimbursements, if any; or
(ii) The insurance claim proceeds which the Bidder may be entitled to receive from any insurance purchased by the Bidder to cover such a liability, whichever is higher.

This limitation of liability shall not affect the Bidder's liability, if any, for damage to any third party, caused by the Bidder or any Person or firm acting on behalf of the Bidder in executing the Works.

Notwithstanding anything contained in the Contract, the Bidder shall not be liable for any gross negligence or willful misconduct on the part of the Employer or any of its affiliates, any Bidder, or any party, other than Bidder and/or, its directors, officers, agents or representatives or its affiliates, or Sub-vendor, or the Bidder or any third party engaged by it.

Notwithstanding anything contained in the Contract, including but not limited to approval by the Employer of any drawings, documents, Bidder list, supply of information or data or the participation of the Employer in any meeting and/or discussion or otherwise, shall not absolve the Bidder from any of its liabilities or responsibilities arising in relation to or under the Contract.

Quantities

BSES RAJDHANI POWER LIMITED

Annexure –A

LOCATION WISE QUANTITIES OF CRP REPLACEMENT

SERVICES WORK ANNEXUREOD SCHEME NO. EW22MS4014								
	66 KV CONTROL AND RELAY PANELS REPLACEMENT WORK AT WEST GRIDS							
S.No.	Description	Unit	Code	QUANTITY (GRIDWISE)				
				SCHEME NO. EW22MS4014				
				NANGLOI	SAGARPUR	BINDAPUR	BODELLA-1	Total QTY
1	Dismantling of 66 KV Control Relay Panel	EA	4060304	8	8	7	8	31
2	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required. **For Control and relay panel for Transformer, line, Bus coupler, Capacitor - 66 kV, C & R panel**	EA	4060192	8	8	7	8	31
3	Testing of 66KV Line CRP a. Testing of all the Indications from Yard or CB in case of I/D panel. b. Checking of all Interlock Schemes and Inter Panel wirings. i Inter locks in O/D Yard b.a 89A to 89B b.b 89A,89B to 89E1 b.c 89L and 89E2 b.d CB to ES1 & ES2 b.e CB to 89A/89B,89L ii Inter Locks in I/D 33KV Panels b.a I/C 1 to I/C 2 to Bus Coupler iii Inter panel DC wiring iv Inter Panel AC wiring v Inter Panel PT wiring if Required vi Inter Panel LBB wiring of 96 relay if required in Scheme c. Testing of Breaker Closing and Tripping d. Testing of Trip Circuit Supervision,both Pre Close and Post Close. e. Testing of 89A,89B,89L Open/Close Operation with TNC from CRP,in case of Motor Driven Isol. f. Checking Semaphore Indications of Earth Isolatores. g. Checking PT Selection Scheme in CRP. h. Checking Locking, Connections, Termination, Lamp,Space Heater etc of CRP. i. Setting of MFM	EA	4060432	8	8	7	8	31
4	Laying, dressing, megger and contnuity test of PVC, armoured control and auxilary power cables in excavated trench/cable trays .**For 12CX2.5 sqmm, Cu**	M	4060218	5000	5000	5000	5000	20000
5	Laying, dressing, megger and contnuity test of PVC, armoured control and auxilary power cables in excavated trench/cable trays .**For 6/5CX2.5 sqmm, Cu**	M	4060221	5000	5000	5000	5000	20000

6	Installation of ladder type cable trays including fixing of supports, tees, bands, joints ,cantilever and supporting structures. **For 600 mm wide**	M	4060243	100	100	100	100	400
7	Dismentaling/ Reclaiming and de-termination of PVC insulated, armoured control and auxilary power cables from dugged trench and re-rolling the cable on the drum or in the shape of coil **for 10CX2.5 sqmm, Cu**	M	4060322	5000	5000	5000	5000	20000
8	Dismentaling/ Reclaiming and de-termination of PVC insulated, armoured control and auxilary power cables from dugged trench and re-rolling the cable on the drum or in the shape of coil **for 5/6CX2.5 sqmm, Cu**	M	4060324	5000	5000	5000	5000	20000
9	E125-Fab.of MS Structure	MT	4060249	1	1	1	1	4
10	Laying of MS flat in the excavatd trench including risers, equipment earthing, overlapping of MS flat at the joints by twice of its width and welding of over lapping and cross joints including supply of electrodes, red oxide/bitumin compound , paint etcand Laying of GI earth strip for equipment earthing, along the wall, trench, cable trays etc including fabrication of supports/cleats and fixing with wall bolts, welding works, painting of earth strip and riser with red oxide paint/bitumin compound and final. **For 50X6 sqmm**	M	4060208	300	300	300	300	1200
11	Providing and Fixing of Danger plates.	EA	4060357	16	16	16	16	64
12	Providing and Fixing of number plates .	EA	4060358	16	16	16	16	64
13	Providing and Fixing of circuit plates .	EA	4060360	16	16	16	16	64
14	Supply of Glands 10X2.5MM	EA	4060412	200	200	200	200	800
15	Supply of Glands 5X 2.5MM	EA	4060413	200	200	200	200	800
16	Supply of Rubber Mat 1000 mm wide (5 mtr. Length)	EA	4060419	6	6	6	6	24
17	Supply of Galvanized Nut & Bolts	KG	4060421	30	30	30	30	120
18	Transportation of electrical equipment I.e.CB,CT,PT,ISOLATORS,LA,CABLE DRUMS etc. from store/any site in Delhi to site of work in Delhi inclding loading and unloading at both ends by using T & P such as Tripod/cranes etc.(Considering max lead of 50KM)	TRP	4060425	10	10	10	10	40
19	Transportation of electrical equipment from store/any site in Delhi to site of work in Delhi inclding loading and unloading at both ends manually.(Considering max lead of 50KM)	TRP	4060426	6	6	6	6	24
20	Watch & Ward Charges.	DAY	4060430	90	90	90	90	360
21	Erection of ground earthing with **40 mm dia, 3 mtr long, GI Pipe** electrode,fabrication and fixing of clamps, test links, funnel including supply of sand and charcoal.	EA	4060407	4	4	4	4	16
22	Erection of double compression gland including termination **For 12CX2.5 sqmm, Cu**	EA	4060234	200	200	200	200	800
23	Erection of double compression gland including termination **For 6CX2.5 sqmm, Cu**	EA	4060237	200	200	200	200	800
24	Digging of earth pit upto depth of 10 ft. inrocky/ semi rocky as per feasibility at site of embedding 600 x600mm earth plate with M.S Flate 50 x8 mm running the same through 3/4 " dia G.I. grouting pipe. Earth Plate to be covered by charcoal 200kg. And 100 Kg. Sodium chloride in the earth pit and refilling etc. NOTE: Charcoal, commonsalt, earth plate, G.I. Pipe, MS flat, Badarpur, Cement and bricks to be supplied by the contractor	EA	4060405	4	4	4	4	16

25	Making of civil goomitties around GI earthpipe as per standard design of BSES. Supply of necessary bricks, cement, badarpur, sand, C1 cover of size 1'x1' and providing the same at the top of goomitties.	EA	4060409	4	4	4	4	16
26	SUPPLY OF 2.5MM2, CU LUG,CABLE TIE,2.5MM2 FLEXIBLE WIRE AND OTHER WIRING ACCESSORIES	LS/ EA		10	10	10	10	40
27	Erection of electrical equipment Including Supply of T&P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required. **For Terminal/ Marshalling Kiosk**	EA	4060190	8	8	7	8	31
28	Dismantling of **Bay Terminal/Marshalling kiosk**	EA	4060301	8	8	7	8	31

SERVICES WORK ANNEXURE OF SCHEME NO. EW21MS4002

66 KV CONTROL AND RELAY PANELS REPLACEMENT WORK AT WEST GRIDS

S.No.	Description	Unit	Code	QUANTITY (GRIDWISE)
				EW21MS4002
				BODELLA-2
1	Dismantling of 66 KV Control Relay Panel	EA	4060304	9
2	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required. **For Control and relay panel for Transformer, line, Bus coupler, Capacitor - 66 kV, C & R panel**	EA	4060192	9
3	Testing of 66KV Line CRP a. Testing of all the Indications from Yard or CB in case of I/D panel. b. Checking of all Interlock Schemes and Inter Panel wirings. i Inter locks in O/D Yard b.a 89A to 89B b.b 89A,89B to 89E1 b.c 89L and 89E2 b.d CB to ES1 & ES2 b.e CB to 89A/89B,89L ii Inter Locks in I/D 33KV Panels b.a I/C 1 to I/C 2 to Bus Coupler iii Inter panel DC wiring iv Inter Panel AC wiring v Inter Panel PT wiring if Required vi Inter Panel LBB wiring of 96 relay if required in Scheme c. Testing of Breaker Closing and Tripping d. Testing of Trip Circuit Supervision,both Pre Close and Post Close. e. Testing of 89A,89B,89L Open/Close Operation with TNC from CRP,in case of Motor Driven Isol. f. Checking Semaphore Indications of Earth Isolatores. g. Checking PT Selection Scheme in CRP. h. Checking Locking,Connections,Termination,Lamp,Space Heater etc of CRP. i. Setting of MFM	EA	4060432	9
4	Laying, dressing, megger and contnuity test of PVC, armoured control and auxilary power cables in excavated trench/cable trays .**For 6/5CX2.5 sqmm, Cu**	M	4060221	5000
5	Installation of ladder type cable trays including fixing of supports, tees, bands, joints ,cantilever and supporting structures. **For 600 mm wide**	M	4060243	100
6	Dismentaling/ Reclaiming and de-termination of PVC insulated, armoured control and auxilary power cables from dugged trench and re-rolling the cable on the drum or in the shape of coil **for 10CX2.5 sqmm, Cu**	M	4060322	5000
7	Dismentaling/ Reclaiming and de-termination of PVC insulated, armoured control and auxilary power cables from dugged trench and re-rolling the cable on the drum or in the shape of coil **for 5/6CX2.5 sqmm, Cu**	M	4060324	3000
8	E125-Fab.of MS Structure	MT	4060249	1

9	Laying of MS flat in the excavatd trench including risers, equipment earthing, overlapping of MS flat at the joints by twice of its width and welding of over lapping and cross joints including supply of electrodes, red oxide/bitumin compound , paint etcand Laying of GI earth strip for equipment earthing, along the wall, trench, cable trays etc including fabrication of supports/cleats and fixing with wall bolts, welding works, painting of earth strip and riser with red oxide paint/bitumin compound and final. **For 50X6 sqmm**	M	4060208	300
10	Providing and Fixing of Danger plates.	EA	4060357	16
11	Providing and Fixing of number plates.	EA	4060358	16
12	Providing and Fixing of circuit plates.	EA	4060360	16
13	Supply of Glands 10X2.5MM	EA	4060412	200
14	Supply of Glands 5X 2.5MM	EA	4060413	200
15	Supply of Rubber Mat 1000 mm wide (5 mtr. Length)	EA	4060419	6
16	Supply of Galvanized Nut & Bolts	KG	4060421	30
17	Transportation of electrical equipment I.e.CB,CT,PT,ISOLATORS,LA,CABLE DRUMS etc. from store/any site in Delhi to site of work in Delhi inclding loading and unloading at both ends by using T & P such as Tripod/cranes etc.(Considering max lead of 50KM)	TRP	4060425	10
18	Transportation of electrical equipment from store/any site in Delhi to site of work in Delhi including loading and unloading at both ends manually.(Considering max lead of 50KM)	TRP	4060426	6
19	Watch & Ward Charges.	DAY	4060430	90
20	Erection of ground earthing with **40 mm dia, 3 mtr long, GI Pipe** electrode, fabrication and fixing of clamps, test links, funnel including supply of sand and charcoal.	EA	4060407	4
21	Erection of double compression gland including termination **For 6CX2.5 sqmm, Cu**	EA	4060237	200
22	Digging of earth pit upto depth of 10 ft. inrocky/ semi rocky as per feasibility at site of embedding 600 x600mm earth plate with M.S Flate 50 x8 mm running the same through 3/4 " dia G.I. grouting pipe. Earth Plate to be covered by charcoal 200kg. And 100 Kg. Sodium chloride in the earth pit and refilling etc. NOTE: Charcoal, commonsalt, earth plate, G.I. Pipe, MS flat, Badarpur, Cement and bricks to be supplied by the contractor	EA	4060405	4
23	Making of civil goomitties around GI earthpipe as per standard design of BSES. Supply of necessary bricks, cement, badarpur, sand, C1 cover of size 1'x1' and providing the same at the top of goomitties.	EA	4060409	4
24	SUPPLY OF 2.5MM2, CU LUG,CABLE TIE,2.5MM2 FLEXIBLE WIRE AND OTHER WIRING ACCESSORIES	LS/EA		10
25	Erection of electrical equipment Including Supply of T&P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required. **For Terminal/ Marshalling Kiosk**	EA	4060190	9
26	Dismantling of **Bay Terminal/Marshalling kiosk**	EA	4060301	9
27	Laying, dressing, megger and contnuity test of PVC, armoured control and auxilary power cables in excavated trench/cable trays .For 10CX2.5 sqmm, Cu	EA	4060219	5000
28	Erection of double compression gland including termination For 10CX2.5 sqmm, Cu	EA	4060235	200

SERVICES WORK ANNEXURE OF SCHEME NO. ES22MS4038

66 KV CONTROL AND RELAY PANELS REPLACEMENT WORK AT SOUTH GRIDS

S.No.	Description	Unit	Code	QUANTITY (GRIDWISE) ES22MS4038			TOTAL Qty.
				VKJ D Blk	Okhla Ph 2	VKJ B Blk	
1	Dismantling of 66 KV Control Relay Panel	EA	4060304	8	0	8	**16**
2	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required. **For Control and relay panel for Transformer, line, Bus coupler, Capacitor - 66 kV, C & R panel**	EA	4060192	7	8	6	**21**
3	Testing of 66KV Line CRP a. Testing of all the Indications from Yard or CB in case of I/D panel. b. Checking of all Interlock Schemes and Inter Panel wirings. i Inter locks in O/D Yard b.a 89A to 89B b.b 89A,89B to 89E1 b.c 89L and 89E2 b.d CB to ES1 & ES2 b.e CB to 89A/89B,89L ii Inter Locks in I/D 33KV Panels b.a I/C 1 to I/C 2 to Bus Coupler iii Inter panel DC wiring iv Inter Panel AC wiring v Inter Panel PT wiring if Required vi Inter Panel LBB wiring of 96 relay if required in Scheme c. Testing of Breaker Closing and Tripping d. Testing of Trip Circuit Supervision, both Pre Close and Post Close. e. Testing of 89A,89B,89L Open/Close Operation with TNC from CRP,in case of Motor Driven Isol. f. Checking Semaphore Indications of Earth Isolators. g. Checking PT Selection Scheme in CRP. h. Checking Locking, Connections, Termination, Lamp, Space Heater etc of CRP. i. Setting of MFM	EA	4060432	7	0	6	**13**
5	Laying, dressing, megger and contnuity test of PVC, armoured control and auxilary power cables in excavated trench/cable trays .**For 6/5CX2.5 sqmm, Cu**	M	4060221	4000	4000	4000	**12000**
6	Installation of ladder type cable trays including fixing of supports, tees, bands, joints ,cantilever and supporting structures. **For 600 mm wide**	M	4060243	100	200	100	**400**
7	Dismentaling/ Reclaiming and de-termination of PVC insulated, armoured control and auxilary power cables from dugged trench and re-rolling the cable on the drum or in the shape of coil **for 10CX2.5 sqmm, Cu**	M	4060322	5000	4000	5000	**14000**
8	Dismentaling/ Reclaiming and de-termination of PVC insulated, armoured control and auxilary power cables from dugged trench and re-rolling the cable on the drum or in the shape of coil **for 5/6CX2.5 sqmm, Cu**	M	4060324	3000	4000	3000	**10000**

9	E125-Fab.of MS Structure	MT	4060249	1	1	1	**3**
10	Laying of MS flat in the excavatd trench including risers, equipment earthing, overlapping of MS flat at the joints by twice of its width and welding of over lapping and cross joints including supply of electrodes, red oxide/bitumin compound , paint etcand Laying of GI earth strip for equipment earthing, along the wall, trench, cable trays etc including fabrication of supports/cleats and fixing with wall bolts, welding works, painting of earth strip and riser with red oxide paint/bitumin compound and final. **For 50X6 sqmm**	M	4060208	300	300	300	**900**
11	Providing and Fixing of Danger plates.	EA	4060357	14	16	14	**44**
12	Providing and Fixing of number plates .	EA	4060358	14	16	14	**44**
13	Providing and Fixing of circuit plates .	EA	4060360	14	16	14	**44**
14	Supply of Glands 10X2.5MM	EA	4060412	170	170	170	**510**
15	Supply of Glands 5X 2.5MM	EA	4060413	170	170	170	**510**
16	Supply of Rubber Mat 1000 mm wide (5 mtr. Length)	EA	4060419	4	6	4	**14**
17	Supply of Galvanized Nut & Bolts	KG	4060421	30	30	30	**90**
18	Transportation of electrical equipment I.e.CB,CT,PT,ISOLATORS,LA,CABLE DRUMS etc. from store/any site in Delhi to site of work in Delhi inclding loading and unloading at both ends by using T & P such as Tripod/cranes etc.(Considering max lead of 50KM)	TRP	4060425	4	8	4	**16**
19	Transportation of electrical equipment from store/any site in Delhi to site of work in Delhi inclding loading and unloading at both ends manually.(Considering max lead of 50KM)	TRP	4060426	4	8	4	**16**
20	Watch & Ward Charges.	DAY	4060430	90	30	90	**210**
21	Erection of ground earthing with **40 mm dia, 3 mtr long, GI Pipe** electrode,fabrication and fixing of clamps, test links, funnel including supply of sand and charcoal.	EA	4060407	4	10	4	**18**
23	Erection of double compression gland including termination **For 6CX2.5 sqmm, Cu**	EA	4060237	170	170	170	**510**
24	Digging of earth pit upto depth of 10 ft. inrocky/ semi rocky as per feasibility at site of embedding 600 x600mm earth plate with M.S Flate 50 x8 mm running the same through 3/4 " dia G.I. grouting pipe. Earth Plate to be covered by charcoal 200kg. And 100 Kg. Sodium chloride in the earth pit and refilling etc. NOTE: Charcoal, commonsalt, earth plate, G.I. Pipe, MS flat, Badarpur, Cement and bricks to be supplied by the contractor	EA	4060405	4	10	4	**18**
25	Making of civil goomitties around GI earthpipe as per standard design of BSES. Supply of necessary bricks, cement, badarpur, sand, C1 cover of size 1'x1' and providing the same at the top of goomitties.	EA	4060409	4	10	4	**18**
26	SUPPLY OF 2.5MM2, CU LUG,CABLE TIE,2.5MM2 FLEXIBLE WIRE AND OTHER WIRING ACCESSORIES	LS/EA		7	8	6	**21**
27	Erection of electrical equipment Including Supply of T&P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required. **For Terminal/ Marshalling Kiosk**	EA	4060190	7	8	6	**21**
28	Dismantling of **Bay Terminal/Marshalling kiosk**	EA	4060301	7	0	6	**13**
29	Laying, dressing, megger and contnuity test of PVC, armoured control and auxilary power cables in excavated trench/cable trays .For 10CX2.5 sqmm, Cu	EA	4060219	4000	4000	4000	**12000**

30	Erection of double compression gland including termination For 10CX2.5 sqmm, Cu	EA	4060235	170	170	170	**510**
31	Dismantling of 33 KV Control Relay Panel	EA	4060305	0	8	0	**8**
32	Testing of33KV Line CRP a. Testing of all the Indications from Yard or CB in case of I/D panel. b. Checking of all Interlock Schemes and Inter Panel wirings. i Inter locks in O/D Yard b.a 89A to 89B b.b 89A,89B to 89E1 b.c 89L and 89E2 b.d CB to ES1 & ES2 b.e CB to 89A/89B,89L ii Inter Locks in I/D 33KV Panels b.a I/C 1 to I/C 2 to Bus Coupler iii Inter panel DC wiring iv Inter Panel AC wiring v Inter Panel PT wiring if Required vi Inter Panel LBB wiring of 96 relay if required in Scheme c. Testing of Breaker Closing and Tripping d. Testing of Trip Circuit Supervision,both Pre Close and Post Close. e. Testing of 89A,89B,89L Open/Close Operation with TNC from CRP,in case of Motor Driven Isol. f. Checking Semaphore Indications of Earth Isolatores. g. Checking PT Selection Scheme in CRP. h. Checking Locking,Connections,Termination,Lamp,Space Heater etc of CRP. i. Setting of MFM	EA	4060469	0	4	0	**4**
33	33 KV B/C. CRP (33 KV Bus Coupler) a. Testing of all the Indications from Yard or CB in case of I/D panel. b. Checking of all Interlock Schemes and Inter Panel wirings. i Inter locks in O/D Yard ii Inter Locks in I/D 33KV Panels iii Inter panel DC wiring iv Inter Panel AC wiring v Inter Panel PT wiring if Required vi Inter Panel LBB wiring of 96 relay if required in Scheme c. Testing of Breaker Closing and Tripping d. Testing of Trip Circuit Supervision,both Pre Close and Post Close. e. Checking Semaphore Indications of Earth Isolatores. f. Checking PT Selection Scheme in CRP. g Checking Locking,Connections,Termination,Lamp,Space Heater etc of CRP. h Setting of MFM	EA	4060478	0	1	0	**1**

34	PTR HV Side CRP (33/11 KV PTR) & I/C from 66/33 KV PTR. (33 KV PTR BAY) a. Testing of all the Indications from Yard or CB in case of I/D panel. b. Checking of all Interlock Schemes and Inter Panel wirings. i Inter Locks in I/D 33KV Panels ii I/C 1 to Bus Coupler iii Inter panel DC wiring iv Inter Panel AC wiring v Inter Panel PT wiring if Required vi Inter Panel LBB wiring of 96 relay if required in Scheme vii Wiring of RTCC Relay c. Testing of Breaker Closing and Tripping d. Testing of Trip Circuit Supervision,both Pre Close and Post Close. e. Checking Semaphore Indications of Earth Isolatores. f. Checking PT Selection Scheme in CRP. g. Checking Locking,Connections,Termination,Lamp,Space Heater etc of CRP. h. Setting of MFM	EA	4060486	0	3	0	**3**
35	Excavation of trench below the ultimate good earth level in following type of soil including refilling after laying of eath mat riser, fixing of earth electrodes welding etc. For Soft soil	CUM	4060205	0	250	0	**250**

SECTION – VII: PRICE BID

1a. BOQ of Scheme No: ES23GS1004 - BOQ FOR Godrej Grid – Supply Part(A)					
SUPPLY PART					
Sr No	**Description**	**UOM**	**Qty.**	**Rate**	**Amount**
1	Supply of MS Rod 40 mm. Dia For Earthing	MT	7.00		
2	Supply of Video Surveillance /Monitoring System for entire substation as per attached specification	LS	1.00		
3	Supply of 1.6 Ton, Air Conditioner split wall mounted Inverter AC System for grid S/stn as per attached details	LS	1.00		
4	Supply of Perforated cable Tray 600mm including couplier and all hardware with tray cover	mtr	35.00		
5	Supply of Perforated cable Tray, Tray 300 mm including couplier and all hardware with tray cover	mtr	15.00		
6	Supply of Perforated cable Tray, Tray 100 mm including couplier and all hardware with tray cover	mtr	10.00		
7	Supply of Fire Alarm System for Entire Grid S/stn. As per attached details	LS	1.00		
8	Supply of Cable sealing solution As per attached details	LS	1.00		
	Total without GST				
	GST @18 %				
	Total Including GST				

1b.BOQ

Scheme No: ES23GS1004- Service Part(B) for Godrej Grid

ETC OF 33KV SWITCHING SUBSTATION AT G319 GODREJ OKHLA ALONG WITH ITS 33 KV IN-FEED

SR.No	SERVICE CODE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
1	4060424	Transportation of various material like 40 mm dia Rod 12-15 mtrs long by 25 T trailor from store/any site in Delhi to site of work in Delhi including loading and unloading at both ends manually.(Considering max lead of 50KM)	TRP	1		
2	4060425	Transportation of electrical equipment I.e.CB,CT,PT,ISOLATORS,LA,CABLE DRUMS etc. from store/any site in Delhi to site of work in Delhi including loading and unloading at both ends by using T & P such as Tripod/cranes etc.(Considering max lead of 50KM)	TRP	10		
3	4060426	Transportation of electrical equipment from store/any site in Delhi to site of work in Delhi including loading and unloading at both ends manually.(Considering max lead of 50KM)	TRP	15		
4	4060427	Transportation of Empty cable drum from site to site or from site to store anywhere in Union teritory of Delhi.	TRP	2		
5	4060176	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required. For 33 kV Indoor switchgear, Line panel with single bus bar arrangement	EA	4		
6	4060178	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required. For 33 kV Indoor switchgear, Bus coupler panel with single bus bar arrangement	EA	1		
7	4060179	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required. For 33 kV Indoor switchgear, Bus PT panel with single bus bar arrangement	EA	2		
8	4060189	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required. For 50/220 V Float cum boost battery charger	EA	1		
9		Erection of ACDB	EA	1		
10		Erection of 48 V ,Li-Ion Battery	EA	1		
11	4060219	Laying, dressing, megger and contnuity test of PVC, armoured control and auxilary power cables in excavated trench/cable trays .For 10CX2.5 sqmm, Cu	M	50		
12	4060221	Laying, dressing, megger and contnuity test of PVC, armoured control and auxilary power cables in excavated trench/cable trays .For 6/5CX2.5 sqmm, Cu	M	50		
13	3003170	Laying of HT/LT cable > 70 to 150 in trench	M	200		
14	3003171	Laying of HT/LT cable< 70 in trench	M	200		

15	4060210	Laying of MS flat in the excavated trench including risers, equipment earthing, overlapping of MS flat at the joints by twice of its width and welding of over lapping and cross joints including supply of electrodes, red oxide/bitumin compound , paint etcand Laying of GI earth strip for equipment earthing, along the wall, trench, cable trays etc including fabrication of supports/cleats and fixing with wall bolts, welding works, painting of earth strip and riser with red oxide paint/bitumin compound and final. For 40 mm dia MS Rod	M	550		
16	4060208	Laying of MS flat in the excavatd trench including risers, equipment earthing, overlapping of MS flat at the joints by twice of its width and welding of over lapping and cross joints including supply of electrodes, red oxide/bitumin compound , paint etcand Laying of GI earth strip for equipment earthing, along the wall, trench, cable trays etc including fabrication of supports/cleats and fixing with wall bolts, welding works, painting of earth strip and riser with red oxide paint/bitumin compound and final. For 50X6 sqmm	M	400		
17	4060205	Excavation of trench below the ultimate good earth level in following type of soil including refilling after laying of eath mat riser, fixing of earth electrodes welding etc. For Soft soil	CUM	300		
18	4060206	Excavation of trench below the ultimate good earth level in following type of soil including refilling after laying of eath mat riser, fixing of earth electrodes welding etc. For Semi rocky/rocky soil with providing of good earth	CUM	50		
19	4060341	Demolishing cement concrete including disposal of material outside the premises: PCC	CUM	10		
20	4060405	Digging of earth pit upto depth of 10 ft. inrocky/ semi rocky as per feasibility at site of embedding 600 x600mm earth plate with M.S Flate 50 x8 mm running the same through 3/4 " dia G.I. grouting pipe. Earth Plate to be covered by charcoal 200kg. And 100 Kg. Sodium chloride in the earth pit and refilling etc. NOTE: Charcoal, commonsalt, earth plate, G.I. Pipe, MS flat, Badarpur, Cement and bricks to be supplied by the contractor	EA	8		
21	4060409	Making of civil goomitties around GI earthpipe as per standard design of BSES. Supply of necessary bricks, cement, badarpur, sand, C1 cover of size 1'x1' and providing the same at the top of goomitties.	EA	8		
22		Erection of double compression gland including termination For any type of LT power cables(Supply of Lugs/Ferrules etc shall be in vendor scope)	EA	15		
23		Erection of double compression gland including termination For any type of control cables(Supply of Lugs/Ferrules etc shall be in vendor scope)	EA	5		
24	4060243	Installation of ladder type cable trays including fixing of supports, tees, bands, joints ,cantilever and supporting structures. For 600 mm wide	M	35		
25	4060244	Installation of ladder type cable trays including fixing of supports, tees, bands, joints ,cantilever and supporting structures. For 300 mm wide	M	15		

26	4060245	Installation of ladder type cable trays including fixing of supports, tees, bands, joints ,cantilever and supporting structures.For 100 mm wide	M	10		
27		Erection of Non treated electrode upto 3 M depth	EA	54		
28		Erection of Spike rod for building DSLP	EA	4		
29		Erection and commissioning of Remote end LDR including supply of TB,MCB,wire,lugs etc. and Relocation of existing relays/ modification of panel to accomodate the new relay etc. As per site requirement	Nos	4		
30		Testing and Commissioning of all installed equipment of the Grid S/stn ,Spare items supplied with Panels (like CT,PT & Relays etc.) and remote end LDRs, (All test like CT Analyzer test , Primary injection test,relay Secondary injection test , Line Stability Test , Circuit Breaker all test, IR test @ 5KV , Busbar Hipot test, earth resistance measurement test etc. as per satisfaction of BRPL)All testing equipments to be arranged by vendor. Providing Four sets of test reports in proper file/spiral binding shall be in vendor's scope.	LOT	1		
31		Nomenclature work in Building and all equipments front & back side ,Nomenclature of main gate, Nomenclature on fire cylinders, Functional Location marking on metal plate fixing at 2 location (Size 800mm X200mm) etc as per BRPL's requirement	LOT	1		
32		Installation, Testing and commissioning work (Including SCADA integration)for complete Fire alarm system in s/stn building	LOT	1		
33		Installation, Testing and commissioning work of Video Monitoring system	LOT	1		
34		ETC of Air Conditioner with Supply of copper piping and other accessories, Any other work for successful commissioning shall be in vendor's scope.	LOT	1		
35		Installation of Cable sealing System including necessary Civil work	LOT	1		
36		Erection of 22.5 KG Fire Extinguishers with Trolley	Nos	2		
37		Erection of 4.5 KG Fire Extinguishers with mounting on Bracket	Nos	10		
38		Erection of Fire Bucket with Stand	NOS	1		
39	4060250	Fabrication work using MS steel (for any type & as per drawing, specification provided by BSES) including all consumables i.e. welding rods, supplying and providing 2 coats of red oxide primer and one coat of aluminum paint, nuts, bolts and washers. All type frames, structure, clamps etc. Steel shall be provided by Contactor.	KG	500		
40		Supply and erection of of 5 pin (3 Phase+1 Neutral + 1 Earth) 32A welding socket as per approved make	EA	2		
41		Supply and erection of Shock treatment chart	Nos	2		
42		Supply and erection of First Aid Medical kit , (Thadani Make; Medic Series 2500)	Nos	1		
43		Supply and erection of Waste bin, Large size (Green & Blue), atleast 60 Litre capacity of each	Nos	2		
44		Supply and erection of SLD lamination and Framing on A1 Size	Nos	1		

45		Supply and fixing of Key stand with lockable door	Nos	1		
46		Supply and erection of VCB handle mounting frame in VCB room	NOS	1		
47		Supply and Fixing of Danger Boards suitable for 33 kV System	Nos	4		
48		Supply of 96 F(72 Single mode + 24 Multimode) LIU , wall mounted for Line Differential relay communication	EA	8		
49		Erection of LIU including all hardware	EA	8		
50		Splicing , Termination and commissioning of 48 F LIU , wall mounted	EA	16		
51		Supply of patch cords, Duplex , Pigtel (Single mode 36+12 multimode), Both end Connectors as per LIU and Relay , Length 10M	EA	16		
52		Supply and Fixing of Entry /Exit Sign Boards at each entrance and Providing of plates 2 SET of each type (PTW issued, Cable back end alive , cable earthed , Breaker opne , etc) as per IMS	LOT	1		
53		Laying of Safety Rubber Mat	LOT	1		
54		Supply of (platform height must be atleast 4 feet) aluminum A type foldable ladder	Nos	1		
55		Supply of Galvanized 25mm Dia; NB; Class-2; GI Spike rod length 1.5M minimum for Building DSLP	EA	4		
56	4060411	Supply of Glands 4X25MM	EA	20		
57	4060412	Supply of Glands 10X2.5MM	EA	20		
		Total				
		GST 18%				
		Net Total				

2.BOQ

Scheme No: ES22AT4028

Addition of 1 Nos. 20 MVA 66/11kV Power Transformer with allied equipment at 66kV Sarita Vihar Grid.

SR.No	SERVICE CODE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
1	4060426	Transportation of electrical equipment from store/any site in Delhi to site of work in Delhi including loading and unloading at both ends manually.(Considering max lead of 50KM)	TRP	10		
2	4060425	Transportation of electrical equipment I.e.CB,CT,PT,ISOLATORS,LA,CABLE DRUMS etc. from store/any site in Delhi to site of work in Delhi including loading and unloading at both ends by using T & P such as Tripod/cranes etc.(Considering max lead of 50KM)	TRP	20		
3	4060427	Transportation of Empty cable drum from site to site or from site to store anywhere in Union territory of Delhi.	TRP	2		
4	4060131	Loading and Transportation of Power transformer tank from the place of its storage in store/any site, in Delhi, to erection site in Delhi (Max lead considered 50 KM) For 25 MVA, 66/11 KV (Crane,wooden sleepers,labour & all T&P etc.to be provided by the contractor.)	EA	1		
5	4060138	Transportation including Loading, unloading of Power transformer accessories from the place of its storage in store/any site, in Delhi, to truck/trailor, (Max lead considered 50 KM) .For 25 MVA, 66/11 KV (Crane,wooden sleepers,labour & all T&P etc.to be provided by the contractor.)	EA	1		
6	4060144	Unloading Shifting/dragging of power transformer tank along with all accessories from the place of its storage in store/any site, in Delhi, upto 30 mtrs near to truck/trailor and putting transformer on foundation For -25 MVA, 66/11 KV	EA	1		
7	4060151	Dragging of Power Transformer above 30 mtrs	M	50		
8	4060153	Assembly/Erection and testing commissioning of power transformer and accessories including fabrication of channel frame for grouting of marshalling box, cable support structure, filling of oil and dehydration of oil by a high vacuum filter machine.Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required For 25 MVA, 66/11 kV Power Trf. Note 1 : Power transformer accessories include all standard fittings - radiator, conservator tank, OLTC and OLTC conservator tank, breather, Bushings, ladder, pipings, Marshalling box, fans, RTCC panel, control cables between transformer, marshalling box Note 2: Dehydration of transformer shall be in contractor's scope of work and a high vacuum filter plant shall be used by the contractor.Note: This include only the existing cables to be used, same glading and termination to be used, same supporting structure to be used. No additional cables laying glanding and tremination is in this scope. No new structure fabrication is in this scope	EA	1		

9	4060159	Charges for Testing,Dehydration of Trfr.Oil/OLTC-Oil as reqd.at site i/c.using of own (contractor's) filter machine,tool & plant,labour and submission of Test-Results as per standard practice.	L	16000		
10	4060160	Cleaning & Painting of Power-Trfr.with one coat of red-oxide primer and two coats of light grey paint i/c.supply of superior quality paint (ISI-marked),all labour,brushes etc.by contractor.	EA	1		
11	4060161	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required.For 66 kV SF6 Circuit Breaker including support structure	EA	1		
12	4060163	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required.For 66 kV isolator without earth switch	EA	2		
13	4060164	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required.For 66 kV isolator with one earth switch	EA	1		
14	4060166	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required.For 66 kV /33KV CT, any ratio	EA	3		
15	4060169	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required.For 66 kV LA's with or witout surge counter	EA	3		
16	4060180	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required.For 33 kV/11kv Indoor switchgear, Bus trunking panel with single bus bar arrangement	EA	1		
17	4060181	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required.For 11 kV Indoor switchgear, Incomer panel & bus coupler	EA	2		
18	4060182	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required.For 11 kV, Indoor switchgear, Outgoing panel	EA	8		
19	4060183	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required.For 11 kV, Indoor switchgear, Capacitor panel	EA	1		
20	4060190	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required.For Bay Terminal/Marshalling Kiosk	EA	1		

21	4060191	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required.For CT/PT Junction Box	EA	3		
22	4060192	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required.For Control and relay panel forTransformer, line, Bus coupler, - 66 kV, C & R panel	EA	1		
23	4060196	Erection of MOM box for 33 and 66KV Insolator including welding, cutting etc.	EA	3		
24	4060197	Sringing and sagging of main bus and cover bus bar with ACSR Zebra conductor and Jumpering of various electrical equipment by ACSR Zebra conductor in between equipment to equipment of any length required and from bus bar to equipment of any length required with the help of PG clamps, T connectors and other clamps. For 66 kV /33KV Yard	M	200		
25	4060198	Sringing and sagging of screen wire 7/9 gauge including assembly and erection of hardware fitting and connecting earthing to the gantry structure by crimping of copper socket .For 66 kV/33 KV Yard	M	100		
26	4060200	Stringing of Single Tension String Insulator with single tension clamp for single Zebra conductor	EA	6		
27	4060202	Stringing of Single Suspension String Insulator with single tension clamp for single Zebra conductor	EA	6		
28	4060203	Stringing of Bolted type 'T'/PG Connector suitable for single Zebra conductor	EA	48		
29	4060205	Excavation of trench below the ultimate good earth level in following type of soil including refilling after laying of eath mat riser, fixing of earth electrodes welding etc. For Soft soil	CUM	30		
30	4060206	Excavation of trench below the ultimate good earth level in following type of soil including refilling after laying of eath mat riser, fixing of earth electrodes welding etc. For Semi rocky/rocky soil with providing of good earth	CUM	40		
31	4060208	Laying of MS flat in the excavatd trench including risers, equipment earthing, overlapping of MS flat at the joints by twice of its width and welding of over lapping and cross joints including supply of electrodes, red oxide/bitumin compound , paint etcand Laying of GI earth strip for equipment earthing, along the wall, trench, cable trays etc including fabrication of supports/cleats and fixing with wall bolts, welding works, painting of earth strip and riser with red oxide paint/bitumin compound and final. For 50X6 sqmm	M	1400		
32	4060210	Laying of MS flat in the excavatd trench including risers, equipment earthing, overlapping of MS flat at the joints by twice of its width and welding of over lapping and cross joints including supply of electrodes, red oxide/bitumin compound , paint etcand Laying of GI earth strip for equipment earthing, along the wall, trench, cable trays etc including fabrication of supports/cleats and fixing with wall bolts, welding works, painting of earth strip and riser with red oxide paint/bitumin compound and final. For 40 mm dia MS Rod	M	100		

33	4060219	Laying, dressing, megger and contnuity test of PVC, armoured control and auxilary power cables in excavated trench/cable trays .For 10CX2.5 sqmm, Cu	M	1800		
34	4060221	Laying, dressing, megger and contnuity test of PVC, armoured control and auxilary power cables in excavated trench/cable trays .For 6/5CX2.5 sqmm, Cu	M	1800		
35	4060235	Erection of double compression gland including termination For 10CX2.5 sqmm, Cu	EA	110		
36	4060237	Erection of double compression gland including termination For 5CX2.5 sqmm, Cu	EA	110		
37	4060244	Installation of ladder type cable trays including fixing of supports, tees, bands, joints ,cantilever and supporting structures. For 300 mm wide	M	30		
38	4060246	Cable laying of 6.35/11KV,XLPE,stranded Aluminium 1CX1000sq. mm Armoured,FRLS outer PVC sheath	M	1000		
39	4060249	Fabrication of MS structure as well as galvanised for different equipment like isolator, C.T.'s, P.T.'s, CVT, LA's etc, cable supporting structure including supply of nuts and bolts, consumables , welding electrode, hacksaw blades etc. excluding supply of steel.	MT	6.5		
40	4060348	Erection of MS as well as galvanised structure for different equipment like isolator, C.T.'s, P.T.'s, CVT, LA's , ISO etc, cable supporting structure, 33kV/66 kV GI gantry structure , Tower Structure i/c consumables , welding electrode ,tack welding & hacksaw blades etc.	MT	9		
41	4060400	Painting of any M.S.Structure with one coat of Red oxide and two coats of AL.paint ISI marked including supply of paint by contractor.	KG	6500		
42	4060408	Erection of ground earthing with 40 mm dia, 3 mtr long, MS rod electrode, fabrication and fixing of clamps and test links, including supply of sand and charcoal.	EA	15		
43	4060251	S/I/T/C of 11 KV Bus-Trunking Chamber suitable for joining the H.T. panel i/c Fabrication of M.S Steel chamber with M.S Steel sheet and Angle Frame,its painting with one coat of primer and two coats of required colour ISI marked paint to match the colour with existing H.T panels,Fabrication of copper Bus, Bar,Supply and fixing the Aluminimum bottom plate with cable entry holesand transportation of all items from Grid to work shop and vice-versa complete as required.	EA	1		
44	4060252	Supply and fixing of H.T.Heat-Shrink Sleeve of 75mm dia for fixing to 11 KV,Bus-Bars complete as required.	M	15		
45	4060270	Dismantling of 66 kV isolator without earth switch	EA	2		
46	4060271	Dismantling of 66 kV isolator with one earth switch	EA	1		
47	4060273	Dismantling of 66 kV/33 kv CT, any ratio	EA	3		
48	4060276	Dismantling of 66 kV LA's with surge counter	EA	3		
49	4060278	Dismantling of circuit breaker with machanisum box & CT i/c.determination of control cable,removal of jumpering & draining of oil and shifting upto the transport place.33KV MOCB/OCB/SF6/VCB	EA	1		
50	4060275	Dismantling of 66 kV CVT	EA	1		
51	4060302	Dismantling of CT/PT Junction Box	EA	3		
52	4060303	Dismentalling of MOM Box for 33 and 66KV Isolator with	EA	3		

		Earth				
53	4060304	Dismantling of 66 KV Control Relay Panel	EA	1		
54	4060337	Dismentling of MS as well as galvanised structure for different equipment like isolator, C.T.'s, P.T.'s, CVT, LA's , ISO etc, cable supporting structure, 33kV/66 kV GI gantry and tower structure including consumables , welding electrode & hacksaw blades etc.	MT	2		
55	4060364	Providing and laying in position specified grade of reinforced cement concrete excluding the cost of centring, shuttering, finishing and reinforcement - All work upto plinth level :- 1:4:8 (1cement : 4 coarse sand : 8 graded stone agg. 20 mm nominal size.)	CUM	5		
56	4060399	Reseting, mounting and connection of cable structure and dismounting of 6Nos 1X1000MM cables end boxes from its structure and installtion of cleats & post insulators	EA	2		
57	4060405	Digging of earth pit upto depth of 10 ft. inrocky/ semi rocky as per feasibility at site of embedding 600 x600mm earth plate with M.S Flate 50 x8 mm running the same through 3/4 " dia G.I. grouting pipe. Earth Plate to be covered by charcoal 200kg. And 100 Kg. Sodium chloride in the earth pit and refilling etc. NOTE: Charcoal, commonsalt, earth plate, G.I. Pipe, MS flat, Badarpur, Cement and bricks to be supplied by the contractor	EA	15		
58	4060409	Making of civil goomitties around GI earthpipe as per standard design of BSES. Supply of necessary bricks, cement, badarpur, sand, C1 cover of size 1'x1' and providing the same at the top of goomitties.	EA	15		
59	4060412	Supply of Glands 10X2.5MM	EA	110		
60	4060413	Supply of Glands 5X 2.5MM	EA	110		
61	4060420	Supply of Galvanized Tower/Gantry structure	KG	2500		
62	4060421	Supply of Galvanized Nut & Bolts	KG	200		
63	4060422	Supply of Copper Bus Bar of various size	KG	80		
64	4060453	Circuit Breaker Test w/o Gas Pressure Inspection (66KVPTRBay+LV Pnl) a. Time Interval b. Contact Resistance c Check Local Remote operation d. Check Breaker Trouble Indication	EA	1		

65	4060449	PTR HV Side CRP (66KVPTRBay+LV Pnl)a. Testing of all the Indications from Yard or CB in case of I/D panel. b. Checking of all Interlock Schemes and Inter Panel wirings. i Inter locks in O/D Yard b.a 89A to 89B b.b 89A,89B to 89E1 b.c 89L and 89E2 b.d CB to ES1 & ES2 b.e CB to 89A/89B,89L ii Inter Locks in I/D 33KV Panels b.a I/C 1 to I/C 2 to Bus Coupler iii Inter panel DC wiring iv Inter Panel AC wiring v Inter Panel PT wiring if Required vi Inter Panel LBB wiring of 96 relay if required in Scheme vii Wiring of RTCC Relay c. Testing of Breaker Closing and Tripping d. Testing of Trip Circuit Supervision,both Pre Close and Post Close. e. Testing of 89A,89B,89L Open/Close Operation with TNC from CRP,in case of Motor Driven Isol. f. Checking Semaphore Indications of Earth Isolatores. g. Checking PT Selection Scheme in CRP. h. Checking Locking,Connections,Termination,Lamp,Space Heater etc of CRP. i. Setting of MFM	EA	1		
66	4060455	Isolater Test (66KVPTRBay+LV Pnl) a. Contact Resistance b. Check Local Remote operation c. Check all indications d. Check Electrical and Mech. Inter locks	EA	3		
67	4060390	Grouting of cable mounting structure with cement concrete having ratio 1:3:6 including fixing with gantry structure. Badarpur, cement and stone ballast shall be supplied by contractor.Suitable for mounting 33/66 KV cable.	EA	2		
68	4060440	Line/Cable Hipot Test including rest of the Bay Eqpts. (66KV Line Bay)	EA	1		
69	4060468	Testing of 66 KV LA 10KA	EA	3		
70	3005515	High Voltage test of 11KV 3x300/ 400 sq.mm cable - Testing Equipment to be provided by the contractor.	EA	9		
71	3003202	Fixing of fire extinguishers/ bucket by means of proper hooks clamps etc. as required including grouting and painting of hooks/clamps.	EA	7		
72		Supply of Cooling Fans for PTR	EA	6		
73		Supply of B Class GI Pipe 4" O.D.	M	18		
		Total				
		GST 18%				
		Net Total				

3.BOQ

Scheme No: EW22MS4014

66 KV CONTROL AND RELAY PANELS REPLACEMENT WORK AT WEST NANGLOI, SAGARPUR, BINDAPUR & BODELLA 1

SR.No	SERVICE CODE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
1	4060304	Dismantling of 66 KV Control Relay Panel	EA	31		
2	4060192	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required. For Control and relay panel for Transformer, line, Bus coupler, - 66 kV, C & R panel	EA	31		
3	4060432	Testing of 66KV Line CRP (for 66 KV Line Bay) a. Testing of all the Indications from Yard or CB in case of I/D panel. b. Checking of all Interlock Schemes and Inter Panel wirings. i Inter locks in O/D Yard b.a 89A to 89B b.b 89A,89B to 89E1 b.c 89L and 89E2 b.d CB to ES1 & ES2 b.e CB to 89A/89B,89L ii Inter Locks in I/D 33KV Panels b.a I/C 1 to I/C 2 to Bus Coupler iii Inter panel DC wiring iv Inter Panel AC wiring v Inter Panel PT wiring if Required vi Inter Panel LBB wiring of 96 relay if required in Scheme c. Testing of Breaker Closing and Tripping d. Testing of Trip Circuit Supervision,both Pre Close and Post Close. e. Testing of 89A,89B,89L Open/Close Operation with TNC from CRP,in case of Motor Driven Isol. f. Checking Semaphore Indications of Earth Isolatores. g. Checking PT Selection Scheme in CRP. h. Checking Locking,Connections,Termination,Lamp,Space Heater etc of CRP. i. Setting of MFM	EA	31		
4	4060218	Laying, dressing, megger and contnuity test of PVC, armoured control and auxilary power cables in excavated trench/cable trays .For 12CX2.5 sqmm, Cu	M	20000		
5	4060221	Laying, dressing, megger and contnuity test of PVC, armoured control and auxilary power cables in excavated trench/cable trays .For 6/5CX2.5 sqmm, Cu	M	20000		
6	4060243	Installation of ladder type cable trays including fixing of supports, tees, bands, joints ,cantilever and supporting structures. For 600 mm wide	M	400		
7	4060322	Dismentaling/ Reclaiming and de-termination of PVC insulated, armoured control and auxilary power cables from dugged trench and re-rolling the cable on the drum or in the shape of coil for 10CX2.5 sqmm, Cu	M	20000		

8	4060324	Dismentaling/ Reclaiming and de-termination of PVC insulated, armoured control and auxilary power cables from dugged trench and re-rolling the cable on the drum or in the shape of coil for 5CX2.5 sqmm, Cu	M	20000		
9	4060249	Fabrication of MS structure as well as galvanised for different equipment like isolator, C.T.'s, P.T.'s, CVT, LA's etc, cable supporting structure including supply of nuts and bolts, consumables , welding electrode, hacksaw blades etc. excluding supply of steel.	MT	4		
10	4060208	Laying of MS flat in the excavatd trench including risers, equipment earthing, overlapping of MS flat at the joints by twice of its width and welding of over lapping and cross joints including supply of electrodes, red oxide/bitumin compound , paint etcand Laying of GI earth strip for equipment earthing, along the wall, trench, cable trays etc including fabrication of supports/cleats and fixing with wall bolts, welding works, painting of earth strip and riser with red oxide paint/bitumin compound and final. For 50X6 sqmm	M	1200		
11	4060357	Providing and Fixing of Danger plates.	EA	64		
12	4060358	Providing and Fixing of number plates .	EA	64		
13	4060360	Providing and Fixing of circuit plates .	EA	64		
14	4060412	Supply of Glands 10X2.5MM	EA	800		
15	4060413	Supply of Glands 5X 2.5MM	EA	800		
16	4060419	Supply of Rubber Mat 1000 mm wide (5 mtr. Length)	EA	24		
17	4060421	Supply of Galvanized Nut & Bolts	KG	120		
18	4060425	Transportation of electrical equipment I.e.CB,CT,PT,ISOLATORS,LA,CABLE DRUMS etc. from store/any site in Delhi to site of work in Delhi inclding loading and unloading at both ends by using T & P such as Tripod/cranes etc.(Considering max lead of 50KM)	TRP	40		
19	4060426	Transportation of electrical equipment from store/any site in Delhi to site of work in Delhi inclding loading and unloading at both ends manually.(Considering max lead of 50KM)	TRP	24		
20	4060430	Watch & Ward Charges.	DAY	360		
21	4060407	Erection of ground earthing with 40 mm dia, 3 mtr long, GI Pipe electrode,fabrication and fixing of clamps, test links, funnel including supply of sand and charcoal.	EA	16		
22	4060234	Erection of double compression gland including termination For 12CX2.5 sqmm, Cu	EA	800		
23	4060237	Erection of double compression gland including termination For 5CX2.5 sqmm, Cu	EA	800		
24	4060405	Digging of earth pit upto depth of 10 ft. inrocky/ semi rocky as per feasibility at site of embedding 600 x600mm earth plate with M.S Flate 50 x8 mm running the same through 3/4 " dia G.I. grouting pipe. Earth Plate to be covered by charcoal 200kg. And 100 Kg. Sodium chloride in the earth pit and refilling etc. NOTE: Charcoal, commonsalt, earth plate, G.I. Pipe, MS flat, Badarpur, Cement and bricks to be supplied by the contractor	EA	16		
25	4060409	Making of civil goomitties around GI earthpipe as per standard design of BSES. Supply of necessary bricks, cement, badarpur, sand, C1 cover of size 1'x1' and providing the same at the top of goomitties.	EA	16		

26		SUPPLY OF 2.5MM2, CU LUG,CABLE TIE,2.5MM2 FLEXIBLE WIRE AND OTHER WIRING ACCESSORIES	EA	40		
27	4060190	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required.For Bay Terminal/Marshalling Kiosk	EA	31		
28	4060301	Dismantling of Bay Terminal/Marshalling Kiosk	EA	31		
		Total				
		GST 18%				
		Net Total				

4.BOQ

Scheme No: EW21MS4002

66 KV CONTROL AND RELAY PANELS REPLACEMENT WORK AT WEST BODELLA 2

SR.No	SERVICE CODE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
1	4060304	Dismantling of 66 KV Control Relay Panel	EA	9		
2	4060192	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required. For Control and relay panel for Transformer, line, Bus coupler, - 66 kV, C & R panel	EA	9		
3	4060432	Testing of 66KV Line CRP (for 66 KV Line Bay) a. Testing of all the Indications from Yard or CB in case of I/D panel. b. Checking of all Interlock Schemes and Inter Panel wirings. i Inter locks in O/D Yard b.a 89A to 89B b.b 89A,89B to 89E1 b.c 89L and 89E2 b.d CB to ES1 & ES2 b.e CB to 89A/89B,89L ii Inter Locks in I/D 33KV Panels b.a I/C 1 to I/C 2 to Bus Coupler iii Inter panel DC wiring iv Inter Panel AC wiring v Inter Panel PT wiring if Required vi Inter Panel LBB wiring of 96 relay if required in Scheme c. Testing of Breaker Closing and Tripping d. Testing of Trip Circuit Supervision,both Pre Close and Post Close. e. Testing of 89A,89B,89L Open/Close Operation with TNC from CRP,in case of Motor Driven Isol. f. Checking Semaphore Indications of Earth Isolatores. g. Checking PT Selection Scheme in CRP. h. Checking Locking, Connections, Termination, Lamp,Space Heater etc of CRP. i. Setting of MFM	EA	9		
4	4060221	Laying, dressing, megger and contnuity test of PVC, armoured control and auxilary power cables in excavated trench/cable trays .For 6/5CX2.5 sqmm, Cu	M	5000		
5	4060243	Installation of ladder type cable trays including fixing of supports, tees, bands, joints ,cantilever and supporting structures. For 600 mm wide	M	100		
6	4060322	Dismentaling/ Reclaiming and de-termination of PVC insulated, armoured control and auxilary power cables from dugged trench and re-rolling the cable on the drum or in the shape of coil for 10CX2.5 sqmm, Cu	M	5000		

7	4060324	Dismentaling/ Reclaiming and de-termination of PVC insulated, armoured control and auxilary power cables from dugged trench and re-rolling the cable on the drum or in the shape of coil for 5CX2.5 sqmm, Cu	M	3000		
8	4060249	Fabrication of MS structure as well as galvanised for different equipment like isolator, C.T.'s, P.T.'s, CVT, LA's etc, cable supporting structure including supply of nuts and bolts, consumables , welding electrode, hacksaw blades etc. excluding supply of steel.	MT	1		
9	4060208	Laying of MS flat in the excavatd trench including risers, equipment earthing, overlapping of MS flat at the joints by twice of its width and welding of over lapping and cross joints including supply of electrodes, red oxide/bitumin compound , paint etcand Laying of GI earth strip for equipment earthing, along the wall, trench, cable trays etc including fabrication of supports/cleats and fixing with wall bolts, welding works, painting of earth strip and riser with red oxide paint/bitumin compound and final. For 50X6 sqmm	M	300		
10	4060357	Providing and Fixing of Danger plates.	EA	16		
11	4060358	Providing and Fixing of number plates .	EA	16		
12	4060360	Providing and Fixing of circuit plates .	EA	16		
13	4060412	Supply of Glands 10X2.5MM	EA	200		
14	4060413	Supply of Glands 5X 2.5MM	EA	200		
15	4060419	Supply of Rubber Mat 1000 mm wide (5 mtr. Length)	EA	6		
16	4060421	Supply of Galvanized Nut & Bolts	KG	30		
17	4060425	Transportation of electrical equipment I.e.CB,CT,PT,ISOLATORS,LA,CABLE DRUMS etc. from store/any site in Delhi to site of work in Delhi inclding loading and unloading at both ends by using T & P such as Tripod/cranes etc.(Considering max lead of 50KM)	TRP	10		
18	4060426	Transportation of electrical equipment from store/any site in Delhi to site of work in Delhi inclding loading and unloading at both ends manually.(Considering max lead of 50KM)	TRP	6		
19	4060430	Watch & Ward Charges.	DAY	90		
20	4060407	Erection of ground earthing with 40 mm dia, 3 mtr long, GI Pipe electrode,fabrication and fixing of clamps, test links, funnel including supply of sand and charcoal.	EA	4		
21	4060237	Erection of double compression gland including termination For 5CX2.5 sqmm, Cu	EA	200		
22	4060405	Digging of earth pit upto depth of 10 ft. inrocky/ semi rocky as per feasibility at site of embedding 600 x600mm earth plate with M.S Flate 50 x8 mm running the same through 3/4 " dia G.I. grouting pipe. Earth Plate to be covered by charcoal 200kg. And 100 Kg. Sodium chloride in the earth pit and refilling etc. NOTE: Charcoal, commonsalt, earth plate, G.I. Pipe, MS flat, Badarpur, Cement and bricks to be supplied by the contractor	EA	4		
23	4060409	Making of civil goomitties around GI earthpipe as per standard design of BSES. Supply of necessary bricks, cement, badarpur, sand, C1 cover of size 1'x1' and providing the same at the top of goomitties.	EA	4		
24		SUPPLY OF 2.5MM2, CU LUG,CABLE TIE,2.5MM2 FLEXIBLE WIRE AND OTHER WIRING ACCESSORIES	EA	10		

25	4060190	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required.For Bay Terminal/Marshalling Kiosk	EA	9		
26	4060301	Dismantling of Bay Terminal/Marshalling Kiosk	EA	9		
27	4060219	Laying, dressing, megger and contnuity test of PVC, armoured control and auxilary power cables in excavated trench/cable trays .For 10CX2.5 sqmm, Cu	M	5000		
28	4060235	Erection of double compression gland including termination For 10CX2.5 sqmm, Cu	EA	200		
		Total				
		GST 18%				
		Net Total				

5.BOQ

Scheme No: ES22MS4038

66 KV CONTROL AND RELAY PANELS REPLACEMENT WORK AT SOUTH VASANT KUNJ B & D BLOCK AND OKHLA PHASE 2

SR.No	SERVICE CODE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
1	4060304	Dismantling of 66 KV Control Relay Panel	EA	16		
2	4060192	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required. For Control and relay panel for Transformer, line, Bus coupler, - 66 kV, C & R panel	EA	21		
3	4060432	Testing of 66KV Line CRP (for 66 KV Line Bay) a. Testing of all the Indications from Yard or CB in case of I/D panel. b. Checking of all Interlock Schemes and Inter Panel wirings. i Inter locks in O/D Yard b.a 89A to 89B b.b 89A,89B to 89E1 b.c 89L and 89E2 b.d CB to ES1 & ES2 b.e CB to 89A/89B,89L ii Inter Locks in I/D 33KV Panels b.a I/C 1 to I/C 2 to Bus Coupler iii Inter panel DC wiring iv Inter Panel AC wiring v Inter Panel PT wiring if Required vi Inter Panel LBB wiring of 96 relay if required in Scheme c. Testing of Breaker Closing and Tripping d. Testing of Trip Circuit Supervision,both Pre Close and Post Close. e. Testing of 89A,89B,89L Open/Close Operation with TNC from CRP,in case of Motor Driven Isol. f. Checking Semaphore Indications of Earth Isolatores. g. Checking PT Selection Scheme in CRP. h. Checking Locking,Connections,Termination,Lamp,Space Heater etc of CRP. i. Setting of MFM	EA	13		
4	4060221	Laying, dressing, megger and contnuity test of PVC, armoured control and auxilary power cables in excavated trench/cable trays .For 6/5CX2.5 sqmm, Cu	M	12000		
5	4060243	Installation of ladder type cable trays including fixing of supports, tees, bands, joints ,cantilever and supporting structures. For 600 mm wide	M	400		
6	4060322	Dismentaling/ Reclaiming and de-termination of PVC insulated, armoured control and auxilary power cables from dugged trench and re-rolling the cable on the drum or in the shape of coil for 10CX2.5 sqmm, Cu	M	14000		

7	4060324	Dismentaling/ Reclaiming and de-termination of PVC insulated, armoured control and auxilary power cables from dugged trench and re-rolling the cable on the drum or in the shape of coil for 5CX2.5 sqmm, Cu	M	10000		
8	4060249	Fabrication of MS structure as well as galvanised for different equipment like isolator, C.T.'s, P.T.'s, CVT, LA's etc, cable supporting structure including supply of nuts and bolts, consumables , welding electrode, hacksaw blades etc. excluding supply of steel.	MT	3		
9	4060208	Laying of MS flat in the excavatd trench including risers, equipment earthing, overlapping of MS flat at the joints by twice of its width and welding of over lapping and cross joints including supply of electrodes, red oxide/bitumin compound , paint etcand Laying of GI earth strip for equipment earthing, along the wall, trench, cable trays etc including fabrication of supports/cleats and fixing with wall bolts, welding works, painting of earth strip and riser with red oxide paint/bitumin compound and final. For 50X6 sqmm	M	900		
10	4060357	Providing and Fixing of Danger plates.	EA	44		
11	4060358	Providing and Fixing of number plates .	EA	44		
12	4060360	Providing and Fixing of circuit plates .	EA	44		
13	4060412	Supply of Glands 10X2.5MM	EA	510		
14	4060413	Supply of Glands 5X 2.5MM	EA	510		
15	4060419	Supply of Rubber Mat 1000 mm wide (5 mtr. Length)	EA	14		
16	4060421	Supply of Galvanized Nut & Bolts	KG	90		
17	4060425	Transportation of electrical equipment I.e.CB,CT,PT,ISOLATORS,LA,CABLE DRUMS etc. from store/any site in Delhi to site of work in Delhi inclding loading and unloading at both ends by using T & P such as Tripod/cranes etc.(Considering max lead of 50KM)	TRP	16		
18	4060426	Transportation of electrical equipment from store/any site in Delhi to site of work in Delhi inclding loading and unloading at both ends manually.(Considering max lead of 50KM)	TRP	16		
19	4060430	Watch & Ward Charges.	DAY	210		
20	4060407	Erection of ground earthing with 40 mm dia, 3 mtr long, GI Pipe electrode,fabrication and fixing of clamps, test links, funnel including supply of sand and charcoal.	EA	18		
21	4060237	Erection of double compression gland including termination For 5CX2.5 sqmm, Cu	EA	510		
22	4060405	Digging of earth pit upto depth of 10 ft. inrocky/ semi rocky as per feasibility at site of embedding 600 x600mm earth plate with M.S Flate 50 x8 mm running the same through 3/4 " dia G.I. grouting pipe. Earth Plate to be covered by charcoal 200kg. And 100 Kg. Sodium chloride in the earth pit and refilling etc. NOTE: Charcoal, commonsalt, earth plate, G.I. Pipe, MS flat, Badarpur, Cement and bricks to be supplied by the contractor	EA	18		
23	4060409	Making of civil goomitties around GI earthpipe as per standard design of BSES. Supply of necessary bricks, cement, badarpur, sand, C1 cover of size 1'x1' and providing the same at the top of goomitties.	EA	18		

24		SUPPLY OF 2.5MM2, CU LUG,CABLE TIE,2.5MM2 FLEXIBLE WIRE AND OTHER WIRING ACCESSORIES	EA	21		
25	4060190	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required.For Bay Terminal/Marshalling Kiosk	EA	21		
26	4060301	Dismantling of Bay Terminal/Marshalling Kiosk	EA	13		
27	4060219	Laying, dressing, megger and contnuity test of PVC, armoured control and auxilary power cables in excavated trench/cable trays .For 10CX2.5 sqmm, Cu	M	12000		
28	4060235	Erection of double compression gland including termination For 10CX2.5 sqmm, Cu	EA	510		
29	4060305	Dismantling of 33 KV Control Relay Panel	EA	8		
30	4060469	33KV Line CRP (33KV Line Bay)a. Testing of all the Indications from Yard or CB in case of I/D panel. b. Checking of all Interlock Schemes and Inter Panel wirings. i Inter locks in O/D Yard b.a 89A to 89B b.b 89A,89B to 89E1 b.c 89L and 89E2 b.d CB to ES1 & ES2 b.e CB to 89A/89B,89L ii Inter Locks in I/D 33KV Panels b.a I/C 1 to I/C 2 to Bus Coupler iii Inter panel DC wiring iv Inter Panel AC wiring v Inter Panel PT wiring if Required vi Inter Panel LBB wiring of 96 relay if required in Scheme c. Testing of Breaker Closing and Tripping d. Testing of Trip Circuit Supervision,both Pre Close and Post Close. e. Testing of 89A,89B,89L Open/Close Operation with TNC from CRP,in case of Motor Driven Isol. f. Checking Semaphore Indications of Earth Isolatores. g. Checking PT Selection Scheme in CRP. h. Checking Locking,Connections,Termination,Lamp,Space Heater etc of CRP. i. Setting of MFM	EA	4		
31	4060478	33 KV B/C. CRP (33 KV Bus Coupler) a. Testing of all the Indications from Yard or CB in case of I/D panel. b. Checking of all Interlock Schemes and Inter Panel wirings. i Inter locks in O/D Yard ii Inter Locks in I/D 33KV Panels iii Inter panel DC wiring iv Inter Panel AC wiring v Inter Panel PT wiring if Required vi Inter Panel LBB wiring of 96 relay if required in Scheme c. Testing of Breaker Closing and Tripping d. Testing of Trip Circuit Supervision,both Pre Close and Post Close. e. Checking Semaphore Indications of Earth Isolatores. f. Checking PT Selection Scheme in CRP. g Checking Locking,Connections,Termination,Lamp,Space Heater etc of CRP. h Setting of MFM	EA	1		

32	4060486	PTR HV Side CRP (33/11 KV PTR) & I/C from 66/33 KV PTR. (33 KV PTR BAY) a. Testing of all the Indications from Yard or CB in case of I/D panel. b. Checking of all Interlock Schemes and Inter Panel wirings. i Inter Locks in I/D 33KV Panels ii I/C 1 to Bus Coupler iii Inter panel DC wiring iv Inter Panel AC wiring v Inter Panel PT wiring if Required vi Inter Panel LBB wiring of 96 relay if required in Scheme vii Wiring of RTCC Relay c. Testing of Breaker Closing and Tripping d. Testing of Trip Circuit Supervision,both Pre Close and Post Close. e. Checking Semaphore Indications of Earth Isolatores. f. Checking PT Selection Scheme in CRP. g. Checking Locking,Connections,Termination,Lamp,Space Heater etc of CRP. h. Setting of MFM	EA	3		
33	4060205	Excavation of trench below the ultimate good earth level in following type of soil including refilling after laying of eath mat riser, fixing of earth electrodes welding etc. For Soft soil	CUM	250		
		Total				
		GST 18%				
		Net Total				

Appendix- I

33kV Godrej Grid Substation

COMMERCIAL TERMS AND CONDITIONS – SUPPLY

Sl No	Item Description	AS PER BRPL	BIDDER'S CONFIRMATION
1	Validity	120 days from the due date of submission or amended due date of submission	
2	Price basis	a) **Firm**, FOR Delhi store basis. Prices shall be inclusive of all taxes & duties, freight up to Delhi stores. b)Unloading at stores - in vendor's scope c) Transit insurance in Bidder scope	
3	Payment terms	a. 85 % against R/A bills within 30 days against receipt of material at site. b. 10% pro-rata after installation/erection of equipment c. 5% pro-rata after completion of successful acceptance testing, commissioning and handing over of the entire Installation and duly certified by BRPL Project-in-charge.	
4	Completion time	6 months from date of LOI/Order	
5	Defect Liability period	24 months from the date of Handing over of entire Installation.	
6	Liquidated damages	0.5% of total price for every week delay subject to maximum of 10% of total contract value	
7	Contract Performance Bank Guarantee	Refer clause no. 10 in Section IV	

Appendix-II

33kV Godrej Grid Substation

COMMERCIAL TERMS AND CONDITIONS – E/T/C

Sl No	Item Description	AS PER BRPL	BIDDER'S CONFIRMATION
1	Validity	120 days from the due date of submission or amended due date of submission	
2	Price basis	**Firm**. Prices shall be inclusive of all taxes & duties.	
3	Payment terms	a) 85% pro-rata of total installation value shall be payable against R/A bills payable within 45 days after installation/erection of material at site duly certified by Engineer in charge. b) 10% pro-rata of total installation value shall be payable against R/A bills payable within 30 days after testing & commissioning of material at site duly certified by Engineer in charge. c) 5% of contract value payable after completion of successful acceptance testing, commissioning and handing over of complete systems duly certified by Engineer in charge, submission of Electrical Inspector Clearance Certificate.	
4	Completion time	6 months from date of LOI/Order	
5	Defect Liability period	24 months from the date of Handing over of entire Installation.	
6	Liquidated damages	0.5 % of the order value for each week or part there of delay until the actual date of completion up to a maximum deduction of 10% of total order value	
7	Contract Performance Bank Guarantee	Refer clause no. 7 in Section VI	

Note: RA is mandatory. The bids will be evaluate commercially based on the total all inclusive price. BRPL reserves the right to evaluate the bid in totality or partially. RA methodology will be informed separately to all the qualified bidders prior to RA.

SECTION X

GRAND SUMMARY OF THE QUOTED PRICE

Sr. No.	Scheme no.	SCHEME DESCRIPTION	Total price for supply F.O.R site inclusive all duties taxes	Total for Erection, Testing & Commissioning inclusive all Taxes (INR)	Grand Total(INR)
1	ES23GS1004	ETC work of 33KV switching substation of G319 Godrej Okhla along with 33 KV In-feed.			
2	ES22AT4028	Addition of 1 Nos. 20 MVA 66/11kV Power Transformer with allied equipment at 66kV Sarita Vihar Grid.	N.A.		
3	EW22MS4014	66 KV CONTROL AND RELAY PANELS REPLACEMENT WORK AT WEST NANGLOI, SAGARPUR, BINDAPUR & BODELLA 1	N.A.		
4	EW21MS4002	66 KV CONTROL AND RELAY PANELS REPLACEMENT WORK AT WEST BODELLA 2	N.A.		
5	ES22MS4038	66 KV CONTROL AND RELAY PANELS REPLACEMENT WORK AT SOUTH VASANT KUNJ B & D BLOCK AND OKHLA PHASE 2	N.A.		
	TOTAL Package Cost				
In words :					

We declare that the following are our quoted prices in INR for the entire project/schemes.

Date: Bidder Name:

Place: Bidders Address:

Name & Signature ……..

Designation: ……

Common Seal:……..

ANNEXURE – I : BID FORM

To,

Head of Department,
Contracts & Material Department,
BSES RAJDHANI Power Ltd
Ist Floor, C Block
BSES Bhawan, Nehru Place
New Delhi 110019.

Dear Sir,

1 We understand that BRPL is desirous of awarding the contract for…….. (Name of the Work) work in its licensed distribution network area in Delhi.

2 Having examined the Tender Documents for the above named works, we the undersigned, offer to deliver the goods/services in full conformity with the Terms and Conditions, technical specifications & Scope of Work as may be determined in accordance with the terms and conditions of the contract. The quoted amounts for this work are in accordance with the Price Schedules attached herewith and are made part of this bid.

3 If our Bid is accepted, we undertake to deliver the entire goods/services as per delivery/ completion schedule mentioned in Section III from the date of award of order/letter of intent.

4 If our Bid is accepted, we will furnish a Contract Cum Performance Bank Guarantee (CPBG) for due performance of the Contract in accordance with the Terms and Conditions of the NIT.

5 We agree to abide by this Bid for a period of 180 days from the due date of bid submission and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

6 We declare that we are aware of the provision of all Laws associated with the supply of equipment's/materials or Services and the prices have been quoted accordingly.

7 Unless and until Letter of Intent is issued, this Bid, together with your written acceptance thereof, shall constitute a binding contract between us.

8 We understand that BRPL is not bound to accept the lowest, or any bid BRPL may receive.

9 There is provision for Resolution of Disputes under this Contract, in accordance with the Laws and Jurisdiction of Contract.

10 We do hereby agree and shall abide the terms of tender documents/agreement, in full

Dated this..... day of..... 2024

Signature..... In the capacity of ……

.....duly authorized to sign for and on behalf of

(IN BLOCK CAPITALS).....

ANNEXURE – II : BIDDER'S DETAILS

S.No.	Item	Description
1	**Company Name**	
2	BRPL Vendor Code (If Registered)	
3	Area of Specialization	
4	Company Founded Year	
5	Type of Company	
6	Constitution(Company Registration number)	
7	Name of Director / Mobile Number	
8	Name of other main person / Mobile Number	
9	Vendor Address	
10	Vendor Contact no	
11	Vendor Email ID	
12	No. of Manpower on payroll (Executive/Skilled/Semi-Skilled/Un-skilled)	
13	No. of Contractual Manpower (Executive/Skilled/Semi-Skilled/Un-skilled)	
14	Other Office / Factory Address	
15	ISO certification	
16	PAN	
17	PF/ESI	
18	Shop Establishment Certificate (If Applicable)	
19	Electrical License Detail (If Applicable)	
20	GST	
21	GST Registration Date	
22	SSI	
23	MSME Registration Number (If Applicable)	
24	Turn Over FY 2019-20 (Rs. Cr.)	

25	Turn Over FY 2020-21 (Rs. Cr.)	
S.No.	**Item**	**Description**
26	Turn Over FY 2021-22 (Rs. Cr.)	
27	Turn Over FY 2022-23 (Rs. Cr.)	
28	Profit after Tax FY 2019-20 (Rs. Cr.)	
29	Profit after Tax FY 2020-21 (Rs. Cr.)	
30	Profit after Tax FY 2021-22 (Rs. Cr.)	
31	Profit after Tax FY 2022-23 (Rs. Cr.)	
32	Networth (Rs Cr.)	
33	Bank Guarantee Limit (in Cr.)	
34	Over Draft/Cash Credit Limit (in Cr.)	
35	Present Order Booking (Rs Cr.)	
36	Order executed with Reliance ADA (Rs Cr.)	
37	Name & Detail of relative working in BRPL	
38	Main Customer	
39	Details of orders executed / Under Execution	Please submit the details in Attachment - A

ATTACHMENT – A

Reference List of Order Executed / under Execution by the Vendor (M/s ……)

A) Major Orders Executed

SN	Name of Project	Client name & address	Client contact Detail (Person name, e-mail ID, Mobile & landline number)	Vendor's Scope of Work	Date Of Award	Value of Work (Rs in Lakhs)	Completion date as par Order	Actual Completion Date	LD / Penalty imposed, if any (Rs in Lakhs)	Litigation / Arbitration (Y/N) (If Yes, furnish details)	Remarks
1.											
2.											
3.											
4.											
5.											

B) Orders Under Execution

SN	Name of Project	Client name & address	Client contact Detail (Person name, e-mail ID, Mobile & landline number)	Vendor's Scope of Work	Date Of Award	Value of Work (Rs in Lakhs)	Completion date as par Order	Actual Completion Date	LD / Penalty imposed, if any (Rs in Lakhs)	Litigation / Arbitration (Y/N) (If Yes, furnish details)	Remarks
1.											
2.											
3.											
4.											
5.											

BSES RAJDHANI POWER LIMITED

ANNEXURE – III :ACCEPTANCE FORM FOR PARTICIPATION IN REVERSE AUCTION EVENT

(To be signed and stamped by the bidder prior to participation in the auction event)

BRPL intends to use the reverse auction through SAP-SRM tool as an integral part of the entire tendering process. All the bidders who are found as techno commercially qualified based on the tender requirements shall be eligible to participate in the reverse auction event.

The following terms and conditions are deemed as accepted by the bidder on participation in the bid event:

1. BRPL shall provide the user id and password to the authorized representative of the bidder. (Authorization letter in lieu of the same be submitted along with the signed and stamped acceptance form)

2. BRPL will make every effort to make the bid process transparent. However, the award decision by BRPL would be final and binding on the supplier/Contractor.

3. The bidder agrees to non-disclosure of trade information regarding the purchase, identity of BRPL, bid process, bid technology, bid documentation and bid details.

4. The bidder is advised to understand the auto bid process to safeguard themselves against any possibility of non-participation in the auction event.

5. In case of bidding through internet medium, bidders are further advised to ensure availability of the entire infrastructure as required at their end to participate in the auction event. Inability to bid due to telephone line glitch, internet response issues, software or hardware hangs; power failure or any other reason shall not be the responsibility of BRPL.

6. In case of intranet medium, BRPL shall provide the infrastructure to bidders, further, BRPL has sole discretion to extend or restart the auction event in case of any glitches in infrastructure observed which has restricted the bidders to submit the bids to ensure fair & transparent competitive bidding. In case of an auction event is restarted, the best bid as already available in the system shall become the start price for the new auction.

7. In case the bidder fails to participate in the auction event due any reason whatsoever, it shall be presumed that the bidder has no further discounts to offer and the initial bid as submitted by the bidder as a part of the tender shall be considered as the bidder's final no regret offer. Any offline price bids received from a bidder in lieu of non-participation in the auction event shall be out rightly rejected by BRPL.

8. The bidder shall be prepared with competitive price quotes on the day of the bidding event.

9. The prices as quoted by the bidder during the auction event shall be inclusive of all the applicable taxes, duties and levies and shall be FOR at BRPL site.

10. The prices submitted by a bidder during the auction event shall be binding on the bidder. No further communication will be there.

11. No requests for time extension of the auction event shall be considered by BRPL.

12. The original price bids of the bidders shall be reduced on pro-data basis against each line item based on the final all-inclusive prices offered during conclusion of the auction event for arriving at contract amount.

For……

Signature:

Name:

Designation:

ANNEXURE – IV: ENVIRONMENTAL, OCCUPATIONAL HEALTH & SAFETY CONDITIONS OFCONTRACT

1.0 General Requirements

1.1 The contractor shall ensure that safety of all the workers, materials, Installation and equipment's belonging to him or to others and working at the site is ensured through effective and practicable safety management systems.

1.2 The contractor shall be responsible for compliance to provisions of all safety requirements under various notices, acts, rules and relevant applicable legislations.

1.3 The contractors shall comply with all health & safety requirements as deemed necessary by BRPL from time to time.

1.4 Works shall be carried out by the contractor after taking necessary "Permit to work". Also the work shall not be carried out without use of Protectiveequipment's like shoes, safety belts, helmets etc. adhering to safety compliance.

1.5 All the equipment's being used shall be timely calibrated and a copy of the same shall be submitted to Safety Department within 4 weeks of the acceptance of contact and thereafter on every renewal.

2.0 EHS Policy

The contractor as per requirement of CEA Measures Relating to Safety and Electric Supply Regulations, 2010 shall follow the Environment, Health & Safety policy of BRPL.The contractor shall implement quality, health & safety management systems in accordance to BRPL EHS policy and ensure that intentions of such policy are met.

3.0 Health & Safety Plan

3.1 Within 4 weeks of the notification of acceptance of the tender, the contractor shall submita detailed and comprehensive Contract specific health & safety plan incorporating HIRA (Hazard Identification & Risk Analysis) to BRPL. This plan shall necessarily include detailed policies, procedures, method statement for each activity to be performed and regulations which, when implemented, will ensure compliance of the contract provisions stated herewith.

3.2 The contractor shall submit health & safety plan for such activities required to be carried out under the awarded contract as deemed necessary by BRPL.

3.3 Health & safety plans, procedures, method statements, etc. developed & submitted by contractors shall be reviewed and approved by designated authorities of BRPL (Head Safety). First cut of the plan shall be submitted to Safety Department within 2 weeks of agreement of contract. After suggested rectification, the final plan shall be submitted to Head Safety not later than 4 weeks of the agreement of contract. A copy of the same shall be given to the engineer in charge also. The document shall carry the signatures of the authorized signatory (the person who has signed the agreement document of contract).

3.4 The health & safety plans, procedures, method statements, etc. shall not be changed without prior review and approval by designated authorities of BRPL.

4.0 OHS Organization & Responsibility

4.1 The contractor supervisor will play the role of safety supervisor. The safety supervisor shall hold a diploma degree from a recognized institute or university as per CEA Regulations, 2010. Also simultaneously contractor has to ensure their competency in safety or EHS with 40 hours training from reputed agency (like RLI/Allied Boston/ National Safety Council) or trainer, which should be verified earlier by BRPL safety department accordingly. The copy of training certificate shall be submitted to Safety Department within 4 weeks of agreement of contract. Time extension may be given in extraordinary situation subjected to submission of any convincing document carrying valid proof of near future plan of the training.

4.2 The training certificate should not be more than one-year-old.

4.3 Apart from above, as an owner of the company the contractor & their other key persons are also responsible for safety compliance and related issues.

5.0 First Day at Work –Induction Training and Issuance of ID-Card

5.1 The contractor shall ensure that all his workers have under gone the safety induction and have been issued with a valid ID card prior to start work at BRPL site. The proof of the same shall be submitted to Safety Department within 4 weeks of agreement of contract.

5.2 All contractor workers shall undergo above as per the BRPL site specific procedure issued from time to time.

5.3 The contractor shall ensure that no worker is in any O&M activities until the valid ID card is issued and the same is available by each worker at site including that of sub-contractor(s).

5.4 In case any worker lost the ID card issued to him, the contractor shall ensure that such incidences are promptly reported to BRPL and duplicate or new ID card is issued immediately after completing formalities as deemed necessary by BRPL.

6.0 Provision of Safe Working Conditions

6.1 Proper barricading shall be created during height work, cable laying work, working on pole, etc. Dimensions of barricading while cable laying work- Height- 2 mtr, Length- 1.5 mtr. There shall not be any gap in between two barricades. LED Bacon light shall be placed at 1st and every 4th barricade. However, while working on pole during supply maintenance work there should be a barricading cone and caution tape . In narrow lanes, where proper barricading as per rules is not possible, use barricading as per the approval of respective safety circle head in writing and copy forwarded to safety and uploading in QMS.

6.2 **PPE' Requirement**

6.2.1 The contractor shall ensure all the required PPEs given in clause 6.2 and shall allow their workers to start work at site only after proper verification of adequacy of safety gears/PPE required for the specific job at site by the Safety personnel/Site Engineer of BRPL.

Contractor has to ensure the quantity and quality of PPEs during procurement and continuous usage of following PPE's by his staff.

S.NO.	NAME OF THE PPEs	LINEMAN / FITTER/SKILLED	HELPER/UNSKILLED	SUPERVISOR
1	SAFETY HELMET	✓	✓	✓
2	FULL BODY HARNESS (POSITIONING BELT)	✓	X	X
3	ELECTRICAL HAND GLOVES	✓	✓	X
4	SAFETY SHOES	✓	✓	✓
5	SAFETY GOGGLES	✓	✓	✓
6	REFLECTIVE JACKET	✓	✓	✓

6.2.2 Contractor has to ensure for proper procurement and distribution of required PPE's among their workers with receiving in attached format (Appendix-3) which will be verified by the safety department during inspection. The entire issuance format duly signed by individual worker and to be verified/ certified by Department Head and the same need to be submitted to Safety Department along with mentioned certificates within 4 weeks of agreement of contract. The sample of the PPE's being procured by the contractor shall be submitted and approved from the Safety Department beforehand.

6.2.3 The contractor has to provide 3 arc protection face shields in each zone (2 for complaint team and 1 for maintenance team) as per specifications mentioned in clause 6.2.5.6.

6.2.4 If any of the contractor staff found without PPEs, the said PPE's will be issued to them from BRPL store with immediate effect. And the 20% extra amount with procurement cost will be recovered from their next monthly bill cycle.

Note: PPEs shall strictly be as per the brand mentioned in clause 6.2.5

6.2.5 **Technical Specification of the PPEs**

6.2.5.1. Safety Shoes – With Composite / Fiber toes (CE approved / IS 15298) – Mandatory for all personnel working at BRPL O&M. The safety shoes shall meet the following features:

1. Electric Shock Resistant Sole
2. Impact Resistant
3. Scrap/Heat Resistant
4. Slip Resistant
5. Oil and Acid Resistant

6. Rubber PU Sole
7. Anti-puncture

Lead MAKE: BATA/HONEYWELL/KARAM

6.2.5.2 **Safety Helmets**: (IS 2925 - 1984 or DGMS) with chin strap – Mandatory for all personnel working at BRPL O&M. The specification of safety helmet shall be as given below:
V-GARD HDPE Yellow With 4 Point FasTrac Ratchet Suspension

Shell Material	UV stabilizedHDPE, Non vented
Suspension	• With 4 Point FasTrac Ratchet Suspension sewn headband • Textile straps made from polyester Suspension • point fixing: good positioning, ...stability, better air circulation due to ...limited contact areas with the head • Easy clean sweatband
Size	52-62 cm
Accessory slot	Standard 30 mm with removable HDPE dead plugs suitable to leak proof fitting
Approvals	ANSI/ IEC Z89.1 Class E (electrical)
Additional	Low temperature -10°C (acc. to GB2811), High temperature +50°C
Colours	Yellow
weight	360 g

Lead MAKE: 3M / KARAM / UFS

6.2.5.3 Full Body positioning Harness: (CE approved / IS 3521 / EN 361 / EN 355) – Shall be used while work is in progress at height more than 1.8 meter or where from a person may fall and get injured. The specification of the Full body harness shall be as given below:

Anchorage	AdjustabletwochestattachmentD-rings and A dorsal attachmentD-ring
Adaptability	Adjustable shoulder and thigh straps
Convenience	Shoulder and thigh straps differentiated by a dual color scheme.
Ergonomics	Idealy. Positioned sit strap for extended comfort.
Size	Standard
weight	1200GMS
ENERGY ABSORBING FORKED LANYARDS :	
Spec.	44mm wide polyamide webbing.
Length	1.5 Meter

There should not be any metallic part in the full body harness.

Lead MAKE: KARAM /LIFEGEAR/UFS/HONEYWELL

6.2.5.4 Flex Chem Full View Safety Goggles – Shall be used to protect workers eyes from foreign materials and flying particles. Mandatory for all personnel working at BRPL O&M. Safety goggles shall meet the following feature:

1. Acetate lens for special applications requiring superior chemical resistance.
2. Industrial version of tough and popular first responder goggles.
3. Soft Flex low profile frosted frame for increased comfort.
4. Comfortable headband with length adjustment.
5. Indirect venting for comfortable, long lasting wear can be worn with safety helmets and over prescription spectacles.
6. Sight Gard + premium anti-fog coating (EN 166 "N") with good anti- scratch properties.

Technical Specification:

Weight	95g.
Lens thickness	1.0mm
Overall width	173mm
Overall length	90mm
Bridge	47.6mm
Lens base	5.5 curve
Lens size	86.1mm verticle, 174mm diagonal
Headband	Adjustable length at max.440mm(long enough to fit together with helmets)
Material & colors	
Lens	Acetate clear, coating, Sightgard + anti-fog according to EN 166 "N" & anti scratch.
Body	PVC smoke
Headband holder	Nylon
Headband	Adjustable grey elastic fixed on frame side parts
Marking / Approvals	
Standard number	EN 166
Frame marking	MSA EN 166 34-FT CE
Lens marking	2C-1.2 MSA 1 FT N CE
Filter class	2C (Ultra violet radiation with enhanced color recognition)
Scale number	1.2: luminous trasmittance-89%
Optical class	1 (best class, for permanent wear)
Mechanical resistance	F (low energy impact 45m/s) T (at extreme temperature -5 to $+55^0$ C)
Resistance to	N(distorted vision due to lens fogging)
UV filter	99.9%
Ordering information	10145578-FlexiChem Sightgard + clear , 6x

Lead MAKE: MSA / UVEX/ UFS/3M/KARAM

6.2.5.5 Electrical Insulating Hand Gloves – Shall be used to prevent electric shock based upon the hazards/risks involved in a particular activity. Safety goggles shall meet the following features:

- Breakthrough manufacturing process for exception dry grip.
- Soft and flexible for enhanced tactility, high dexterity and wearer comfort.
- Ergonomic design featuring tapered fingers to reduce hand fatigue.
- Relaxed wrist for easy on/off.

	For LT work	**For HT work**
Length	360mm	360mm
Class	2	0
Thickness	3.6mm	1mm

Proof test voltage	20000	5000
Maximum use voltage	11000	1000
Tensile strength	>16mpa[Mega Pascal]	
Puncture resistance	>18N/mm [Newton per mili meter]	
Elongation at break	>600% [Stretching length]	
Tension set	<15%	

- It should be resistant to oil, acid, ultra violet rays and very low temperature.
- Each pair of glove should be marked with class, category, month & year of manufacturing, CE logo, batch no. and certified laboratory no.
- EN certified to electrical and thermal hazards,
- EN certified to thermal & electrical hazards to confirm EN 60-903,
- EN certified to mechanical hazard to EN-388

Lead MAKE: Honeywell / ANSELL/CATU

6.2.5.6 Arc Protection Face Shield

a) ATPV value is 10 cal/cm2
b) It shall have a slotted hard hat and chin guard
c) Visible light transmission (VLT) shall be 70%
d) It should have anti fog lens
e) It should have a provision for replacement of lens and brackets.
f) It should cover the complete face and the complete neck region.
g) It must not hinder the work. Must be comfortable for the height jobs as well as in the ground.
h) Carry bag for the kit.

Lead MAKE: Oberon/Honeywell

6.2.5.7 Certificates required for all PPEs:

1. Manufacturer Certificate
2. Test Certificate
3. Authorization of Dealership/Distribution ship

The copy of all the certificates shall be submitted to safety department within 4 weeks of agreement of contract.

7.0 Integrated Management System & Audits

7.1 The Contractor shall work in the framework of Integrated Management System (IMS) and shall maintain documentation as prescribed in the IMS Manual of BRPL. IMS Manual can be obtained directly from site engineer/Division Head/Respective Head.

7.2 All contractors during their currency of contract shall strive to continuously improve and demonstrate strict compliance to ISO 9001, 14001 & 45001 standards of BRPL.

7.3 To verify compliance and to continually improve the management system, all contractors shall be subjected to both internal & external audits.

8.0 Medical Examination

8.1 The contractor shall arrange a medical examination of all his employees including his sub-contractor employees like lineman, ALM, supervisor, Fitter, welders, gas cutters, drivers and all the workers supposed to work at height (and any other trade specified deemed necessary by BRPL at the time of deployment then annually) before employing, after illness or injury, if it appears that the illness or injury might have affected his fitness and, thereafter, once in every year as per the provisions of applicable laws or as prescribed by BRPL with proper record.

8.2 Records of medical examination as described above shall be maintained at the contractor premises and a copy of the same shall be submitted to Safety Department within 4 weeks of agreement of contract.

8.3 No person about whom the Contractor knows or has reason to believe that he is a deaf or he has a defective vision or he has a tendency to giddiness shall be required or allowed to work in any O&M operation or other

construction work which is likely to involve a risk of any accident either to the worker himself or to any other person.

9.0 Working at Height

9.1 The Contractor shall ensure that all works carried out at a height of 2 Meter or more shall only be started after obtaining a permit to work at height, which shall be issued as per the procedure of BRPL by authorized personnel.

9.2 The contractor shall ensure that all control measures mentioned and agreed through above work permit or as deemed necessary by BRPL are enforced and complied all the time during activities carried out at height.

9.3 Full body harness and ladder along with the required PPEs shall be used during height work.

9.4 Barricading cone and tape shall be used along with creation of proper safety zone.

10.0 Reporting of Near Miss/ Incidents / Dangerous Occurrences

10.1 In case of any incident/ accident occurs during the O&M activities undertaken by the Contractor thereby causing a dangerous occurrence or near miss or any minor or major or fatal injury to his employees due to any reason, whatsoever, it shall be sole responsibility of the Contractor to promptly inform the same to Department Head in prescribed form and also to all authorities envisaged under the applicable laws.

11.0 Suspension of Work

11.1 BRPL shall have the right at its sole discretion to suspend the work till compliance of safety norms, if in its opinion the work is being carried out in such a way that it may cause accidents and endanger the safety of the persons and / or property, and / or equipments.

11.2 In such cases, the contractor shall be informed in writing about the nature of hazards and possible injury /accident and he shall comply to remove all shortcomings promptly. Decision of BRPL shall be conclusive and binding on the Contractor in such aspects.

11.3 The contractor shall not be entitled to damages / compensation for suspending of work due to safety reasons and the period of such stoppage of work will not be taken as an extension of time for completion of the facilities as per the work order and will not be the ground for wavier of levy of liquidated damages.

11.4 The contractor shall follow and comply with all safety Rules of BRPL, relevant provisions of applicable laws pertaining to the safety of workmen, employees plant and equipment as may be prescribed from time to time without any demur, protest or contest or reservation. In case of any nonconformity between statutory requirement and safety rules of the BRPL referred above, the latter shall be binding on the contractor unless the statutory provisions are more stringent.

12.0 OHS Appreciation Policy

12.1 If the contractor observes all the safety rules and codes, statutory laws and rules during the period of the contract awarded by the BRPL and no accident occurs then BRPL may consider the performance of the contractor and safety score card will be prepared. The best contractor will be appreciated by suitable “SAFETY AWARD” as per scheme as may be announced separately from time to time.

13.0 Safety Motivational Scheme for Contractor Employee

13.1 All contractors must reward their employee monthly for best worker in term of complying safety norms. They should honour with a gift of Rs. 500/- (five Hundred) with commendation certificate to motivate others towards safety compliance. The record with photograph should kept with them & also to be submitted to BRPL safety department. Contractor may ask to BRPL safety people for their presence during awarding time.

13.2 All contractors have to observe safety day/ week on 4th March to 10th march every year with proper planning and record to create safety awareness inside their organization. A detailed report of observing the same to be forwarded to safety department every year.

14.0 Guidelines for Penalty Policy Implementation

14.1 Total penalty shall be calculated by multiplying the number of safety violations and the penalty amount specified for such violations in **Appendix - 1. (Example – If at first offence persons are found working without safety helmet at 3 locations, the penalty would be 3X2000 = Rs.6000/-)**

14.2 The amount of penalty can be increased or decreased based upon the seriousness of safety violations. The decision of recommending authority shall be final one.

14.3 Recommending authority shall send his factual observations to Department Head and Safety Head who in turn shall either reject or approve it. If approved, he shall send it to Finance & Accounts for execution. Finance Accounts shall execute the penalty and confirm the same & shall send it back to Department Head and Safety Head.

14.4 Recommending Authority means the Department Head, HODs, Site Safety officer / Supervisor, representatives from OHS and other personnel authorized jointly by O&M.

14.5 Penalties will be imposed for delay in submission of EHS related requirements/documents mentioned in the contract. Once the contract is accepted, the requirements as mentioned in **Appendix- 2 to be submitted within 4 weeks.**

14.5 Safety Head may impose penalty for serious violations directly.

14.6 All penalties shall be imposed directly on the concerned contractors. No penalty shall be imposed on individuals.

15.0 Guidelines for Safety Appreciation Policy Implementation

15.1 Recommending Authority shall write comments of his Appreciation in case he observes that there is no any safety violations.

15.2 Recommending Authority shall send his Safety Appreciation to Safety Head who in turn shall either approve or reject it and shall send it to Site Safety Officer for keeping in records.

15.3 Management will appreciate the Safe Contractors for their best performance towards safety norms based upon number of safety appreciation notes.

15.4 Every year best Safe Contractor shall be suitably awarded. The contractor shall be selected based upon the maximum numbers of approved safety appreciation notes.

15.5 Any contractor who has received any penalty for a particular year shall not be entitled for Safe Contractor's Award irrespective of number of safety appreciation notes he has received.

15.6 Site Safety Officer will maintain the contractor wise record of penalty & safety appreciation notes and declare the results latest by 28th February of every year for the performance of previous year.

15.7 BRPL Management shall present a Trophy with commendation certificate of safety excellence every year on the occasion of 4th to 10th March (National Safety Day) to the contractor, who qualified the safety standard criteria.

Appendix – 1
Penalty Policy on Safety Violation

	Type of Offense	Penalty Detail	Execution Channel
A	Not Wearing Safety Helmets Safety shoes/ Safety Goggles / Electrical insulating hand gloves/ reflective jacket/Not using electrically safe tools and equipments. (Poor quality or damaged item means noncompliance)	# First Offence - Warning Note & Rs.2000/- # Second Offence - Warning Note & Fine of Rs.5000/- # Third Offence- Note of recommendation of the concerned workmen/ supervisors for removal from deployment with BRPL& Fine of Rs.15000/-	Recommendation by OHS-Representative/Department Head Approval by Safety Head Deduction by Finance & Account
B	Not wearing Full Body Harness/fall arresters while working at a height more than 1.8 meter or where from a person may fall. Not using Safety Net to arrest falling objects and personnel. Not using Arc Protection Face Shield Not using barricading cone and tape. (Poor quality or damaged item means noncompliance)	# First Offence -Warning Note & Fine of Rs.5000/- # Second Offence - Warning Note for dismissal and a Fine of Rs.10000/- # Third Offense - -Action for the concerned Workmen/ supervisor for removal from deployment with BRPLand a fine of Rs.25000/-	Recommendation by OHS-Representative/Department Head Approval by Safety Head Deduction by Finance & Account
C	Any other unsafe work practices or condition which is considered having potential for fatality or injury to personnel.	# First Offence - Warning Note & Fine of Rs.10000/- # Second Offence - Action for the concerned workmen/ supervisors for removal from deployment with BRPL and fine of Rs.20000/-.	Recommendation by OHS-Representative/Department Head Approval by Safety Head Deduction by Finance & Account

Notes:
Refer clause No. 14 for penalty policy implementation guidelines
If there are 03 violations by an individual employee, his removal from deployment with BRPL # If there are 10 violations in one quarter, will be recommended for termination of contract order.

Appendix – 2
Penalty Policy on non- submission of EHS related requirements

Following EHS related requirements to be submitted within 4 weeks of agreement of contract

Requirement	Penalty Detail	Execution Channel
1. Contract specific health & safety plan and HIRA (Hazard Identification & Risk Analysis) 2. Safety supervisor training records on EHS (40 hrs training) 3. Submission of sample of PPE's in EHS department for approval (if procured by the contractor) 4. Bills/challan of PPE's along with test certificates (if procured by the contractor) 5. PPE's receipt by worker (as per Appendix-3) 6. Medical examination record of workers 7. ID card of workers 8. Calibration Certificates of equipment's	Delay of 15 days- Warning Note & Consolidated Fine of Rs.5000/- on non-submission of proof of any of these mentioned 8 types of documents On every subsequent delay of 15 days- Warning Note & Consolidated Fine of Rs. 10,000/- on non-submission of proof of any of these mentioned 8 types of documents	Recommendation by OHS-Representative Approval by Safety Head Deduction by Finance & Account

FORMAT – 4.1

EMD BANK GUARANTEE

(To be issued in a Non Judicial Stamp Paper of Rs.100/-purchased in the name of the bank)

Whereas [name of the Bidder] (herein after called the "Bidder") has submitted its bid dated[date of submission of bid] for the supply/services of [name and/or description of the goods/sevices] (here after called the "Bid"). KNOW ALL PEOPLE by these presents that WE [name of bank] at [Branch Name and address],having our registered office at[address of the registered office of the bank](herein after called the "Bank"),are bound unto BSES RAJDHANI Power Ltd., with its Corporate Office at BSES Bhawan, Nehru Place, New Delhi - 110019 ,(herein after called —the "Purchaser")in the sum of …… (Rupees …… only) for which payment well and truly to be made to the said Purchaser, the Bank binds itself, its successors, and assigns by these presents. Sealed with the Common Seal of the said Bank this_____ day of_____ 2024. The Conditions of this obligation are:

1. If the Bidder withdraws its Bid during the period of bid validity specified by the Bidder on the Bid Form;

or

2. If the Bidder, having been notified of the acceptance of its Bid by the Purchaser during the period of bid validity:

(a) Fails or refuses to execute the contract form, if required: or

(b) Fails or refuses to furnish the performance security, In accordance with the instructions to Bidders/Terms and Conditions.

We undertake to pay to the Purchaser up to the above amount upon receipt of its first written demand, without the Purchaser having to substantiate its demand, provided that is its demand the purchaser will note that amount claimed by it is due to it, owing to the occurrence of one or both of the two condition(s), specifying the occurred condition or condition(s). This guarantee will remain in force up to and including 180 days after the due date of submission bid, and any demand in respect thereof should reach the Bank not later than the above date.

(Stamp & signature of the bank)

Signature of the witness(s)

FORMAT – 4.2

PROFORMA OF CONTRACT CUM PERFORMANCE BANK GUARANTEE

(TO BE ISSUED ON RS 100/- STAMP PAPER)

This Guarantee made at _____ this [___] day of [_____] 2024

1. WHEREAS **M/s BSES Rajdhani Power Limited**, a Company incorporated under the provisions of Companies Act, 1956 having its Registered Office at **BSES Bhawan, Nehru Place, New Delhi - 110019**, India hereinafter referred to as the "Company", (which expression shall unless repugnant to the context or meaning thereof include its successors, administrators, executors and assigns).

2. AND WHEREAS the Company has entered into a contract for _____ (Please specify the nature of contract here) vide Contract No. _____dated _____ (hereinafter referred to as the "Contract") with M/s._____, (hereinafter referred to as "Contractor", which expression shall unless repugnant to the context or meaning thereof be deemed to mean and include each of their respective successors and assigns) for providing services on the terms and conditions as more particularly detailed therein.

3. AND WHEREAS as per clause ____of General Conditions of Contract, the Contractor is obliged to provide to the Company an unconditional bank guarantee for an amount equivalent to ten percent (10%) of the total Contract Value for the timely completion and faithful and successful execution of the Contract from [_____] pl. specify the name of Bank) having its head/registered office at [_____] through its branch in _____(pl. specify the name of Branch through which B.G is issued) hereinafter referred to as "the Bank", (which expression shall unless it be repugnant to the context or meaning thereof be deemed to include its successors and permitted assigns).

4. NOW THEREFORE, in consideration inter alia of the Company granting the Contractor the Contract, the Bank hereby unconditionally and irrevocably guarantees and undertakes, on a written demand, to immediately pay to the Company any amount so demanded (by way of one or more claims) not exceeding in the aggregate [Rs.]……(in words) without any demur, reservation, contest or protest and/or without reference to the Contractor and without the Company needing to provide or show to the Bank ,grounds or reasons or give any justification for such demand for the sum/s demanded.

5. The decision of the Company to invoke this Guarantee and as to whether the Contractor has not performed its obligations under the Contract shall be binding on the Bank. The Bank acknowledges that any such demand by the Company of the amounts payable by the Bank to the Company shall be final, binding and conclusive evidence in respect of the amounts payable by the Supplier to the Owner. Any such demand made by the Owner on the Bank shall be conclusive and binding, notwithstanding any difference between the Owner and the Contractor or any dispute raised, invoked, threatened or pending before any court, tribunal, arbitrator or any other authority.

6. The Bank also agrees that the Company at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor without proceeding against the Contractor notwithstanding any other security or other guarantee that the Companymay have in relation to the Contractor's liabilities.

7. The Bank hereby waives the necessity for the Company first demanding the aforesaid amounts or any part thereof from the Contractor before making payment to the Company and further also waives any right the Bank may have of first requiring the Company to use its legal remedies against the Contractor, before presenting any written demand to the Bank for payment under this Guarantee.

8. The Bank's obligations under this Guarantee shall not be reduced by reason of any partial performance of the Contract. The Bank's obligations shall not be reduced by any failure by the Company to timely pay or perform any of its obligations under the Contract.

9. The Bank further unconditionally and unequivocally agrees with the Company that the Company shall be at liberty, without the Bank's consent and without affecting in any manner its rights and the Bank's obligation under this Guarantee, from time to time, to:

   (i) Vary and/or modify any of the terms and conditions of the Contract;

   (ii) Forebear or enforce any of the rights exercisable by the Company against the Contractor under the terms and conditions of the Contract; or

   (iii) Extend and/or postpone the time for performance of the obligations of the Contractor under the Contract;

   and the Bank shall not be relieved from its liability by reason of any such act or omission on the part of the Company or any indulgence shown by the Company to the Contractor or any other reason whatsoever which under the law relating to sureties would, but for this provision, have the effect of relieving the Bank of its obligations under this Guarantee.

10. This Guarantee shall be a continuing bank guarantee and shall not be discharged by any change in the constitution or composition of the Contractor, and this Guarantee shall not be affected or discharged by the liquidation, winding-up, bankruptcy, reorganization, dissolution or insolvency of the Contractor or any of them or any other circumstances whatsoever.

11. This Guarantee shall be in addition to and not in substitution or in derogation of any other security held by the Company to secure the performance of the obligations of the Contractor under the Contract.

12. NOTWITHSTANDING anything herein above contained, the liability of the BANK under this Guarantee shall be restricted to _____ (insert an amount equal to ten percent (10%) of the Contract Value) and this Guarantee shall be valid and enforceable and expire on _____ (pl. specify date) or unless a suit or action to enforce a claim under this Guarantee is filed against the Bank on or before the date of expiry.

13. On termination of this Guarantee, all rights under the said Guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities hereunder.

14. The Bank undertakes not to revoke this Guarantee during its validity except with the prior written consent of the Company and agrees that any change in the constitution of the Bank or the Contractor shall not discharge our liability hereunder.

15. Company may assign this Guarantee to any Person or body whether natural, incorporated or otherwise under intimation to the Bank. The Bank shall be discharged of its obligations hereunder by performance in accordance with the terms hereof to such assignee without verifying the validity / legality / enforceability of the assignment.

16. This Guarantee shall be governed by the laws of India. Any suit, action, or other proceeding arising out of, connected with, or related to this Guarantee or the subject matter hereof shall be subject to the exclusive jurisdiction of the courts of Delhi, India.
    Dated this ……. day of …….. …2024 at …….

(Signature)
.....

(Name)
.....

(Designation with Bank Stamp)

Attorney as per

BSES RAJDHANI POWER LIMITED
Power of Attorney No.....

Date.....

Beneficiary's bank detail with IFSC Code:

Beneficiary Name	: BSES Rajdhani Power Limited
Bank Name	: State Bank of India
A/c No.	: 40214783615
IFSC Code	: SBIN0009601

Vendor has to fill this form & submit along with the PERFORMANCE BANK GUARANTEE

1. Bank Email ID----------Bank Phone No----------

2. Where to Dispatched the BG -Local Address of bank ----------

3. Where to Dispatched the BG Head Office Address ----------

FORMAT – 4.3

NON-DISCLOSURE AGREEMENT

THIS NON-DISCLOSURE AGREEMENT ("Agreement") is made and entered into at Delhi on the _____ day of _____, 2024

By And Between

M/s BSES Rajdhani Power Limited, a company registered under the Companies Act, 1956 and having its registered office at **BSES Bhawan, Nehru Place, New Delhi - 110019** (hereinafter referred to as the "Disclosing Party" which expression shall unless repugnant to the meaning and context mean and include its successors and permitted assigns) of the FIRST PART

And

_____, a company incorporated under the Companies Act, 1956 and having its registered office at _____, (hereinafter referred to as the "Receiving Party" which expression shall unless repugnant to the meaning and context mean and include its successors and permitted assigns) of the OTHER PART

Disclosing Party and Receiving Party are hereinafter individually referred to as the "Party" and collectively as the "Parties".

WHEREAS the Disclosing Party is in discussions with the Receiving Party for Security Management Services ("Project") and the Disclosing Party may in conjunction with the aforesaid disclose to the Receiving Party information relating to their businesses which is confidential and sensitive in nature and the Receiving Party is willing to undertake to restrict the use and further disclosure of the information in accordance with the terms and conditions set out herein:

1. The "Receiving Party" acknowledges and confirms the confidential and sensitive nature of all information, documents and material relating to Persons and entities which may be accused of or related to the theft of electricity which is a penal offense under the provisions of the electricity act 2003As well as the various data and tools which may be available by way of documents as well as other modes of proof("Project") (i) that may be disclosed or made available to the Receiving Party by the Disclosing Party or its employees/ representatives/ advisors/ consultants; (ii)Receiving Party may gain or gather from any source; (iii) Receiving Party may process or arrive at during the course of the Project; (iv) Receiving Party may have come across during its discussions with any person in the course of the Project; and (v) all negotiations and discussions between the Parties relating to the Project (all the information referred to above is hereinafter referred to as the "Confidential Information").

2. Confidential Information is understood to include but is not limited to information made available in written, machine recognizable, graphic or sample form including, without limitation, drawings, photographs, models, design or performance specifications, its analysis, compilations, studies, notes and all other information and data disclosed orally or visually which has been developed / is exclusive to the Disclosing Party and includes information provided in various meetings.

   Provided, however, that Confidential Information shall not include information which (a) is, or becomes, publicly known, otherwise than through a wrongful act of the Receiving Party or its representatives; (b) is in the possession of the Receiving Party prior to receipt from the Disclosing Party or its representatives without an obligation of confidentiality; (c) is independently developed by the Receiving Party, provided that it was not derived from the Confidential Information; (d) is furnished to others by the Disclosing Party without restrictions, similar to those herein on the rights of such others to use or disclose; or (e) is approved in writing by the Disclosing Party for disclosure.

3. The Receiving Party shall not disclose the Confidential Information to any other person save and except with the express consent in writing given by the Disclosing Party. The Receiving Party, however, may disclose such part of the Confidential Information where (i) such disclosure is in response to a valid order of a court or any other

governmental body having jurisdiction over this Agreement or (ii) such disclosure is otherwise required by law, provided that Receiving Party has given prior written notice to the Disclosing Party forthwith it came to learn about such disclosure requirement or the demand for such for disclosure and made all reasonable efforts to protect the Confidential Information in connection with such disclosure.

4. The Receiving Party shall with reference to the Confidential Information take all actions as may be necessary to (i) maintain the confidentiality thereof; (ii) limit its use of such Confidential Information solely for the purpose of the Project; (iii) avoid disclosure even to any of its employees that are not associated with the Project; (iv)avoid any dissemination or publication by any of its employees/ representatives associated with the Project; (v) avoid writing about sensitive information which is disclosed verbally and is sensitive to the operations; and (vi) safeguard the Confidential Information from being accessed by any unauthorized person. Such actions shall include but not be limited to obtaining appropriate non-disclosure undertakings from its employees directly or indirectly engaged in the Project.

5. The Receiving Party hereby agrees to indemnify and hold harmless the Disclosing Party and its directors and employees from and against any damage, loss, cost or liability (including all expenses and costs of enforcing rights under the Agreement) arising out of or resulting from (i) any use or disclosure by the Receiving Party of Confidential Information in violation of the Agreement; (ii) any leakage of the Confidential Information at the end of the Receiving Party or its employees/ representatives; and (iii) breach or violation of any of the other covenants herein.

6. The Receiving Party will, promptly upon the request of the Disclosing Party, deliver to the Disclosing Party, the documents comprising the Confidential Information or any part thereof and will destroy any copies, notes, or extracts thereof, without retaining any copy thereof, except that any portion of the Confidential Information that consists of analysis and any written Confidential Information not so requested and returned, shall be retained and kept subject to the terms of this Agreement, or upon the Disclosing Party's request destroyed (such destruction to be confirmed in writing).

7. The term of this Agreement is 3 years from the date of execution of this Agreement. However, the obligation to maintain confidentiality of the Disclosing Party's information shall survive the termination of this Agreement. Any violation of this agreement may lead to termination of all the relations with the Receiving party and black listing/ debarring of the Agency for future engagements.

8. This Agreement shall be governed by the laws of India. Any dispute, difference or claim related to or arising under, out of or in connection with this Agreement shall be resolved subject to the jurisdiction of Delhi Courts.

For the Disclosing Party

_____
Authorized Signatory
Name:
Designation:

For the Receiving party

_____
Authorized Signatory
Name:
Designation:

FORMAT – 4.4

NO DEVIATION DECLATATION

NO DEVIATION –A (Technical)

NIT NO & DATE:

DUE DATE OF TENDER:

We hereby accept all terms and conditions of the technical scope of work as mandated in the tender documents subject to the following deviations as mentioned against the applicable technical qualifying requirement:

S.NO.	SL.NO OF TECHNICAL SPECIFICATION/SCOPE OF WORK	DEVIATIONS, IF ANY

SIGNATURE & SEAL OF BIDDER

NAME OF BIDDER

Note-The above template is indicative only, May vary depending on the nature of procurement/value.

NO DEVIATION –B(Commercial)

NIT NO & DATE:

DUE DATE OF TENDER:

We hereby accept all terms and conditions of the commercial requirement as mandated in tender document subject to the following deviations as mentioned against the applicable commercial qualifying requirement:

S.NO.	S. NO OF COMMERCIAL REQUIREMENTS	DEVIATIONS, IF ANY

SIGNATURE & SEAL OF BIDDER

NAME OF BIDDER

Note:-It is important to explicitly include all such terms and conditions which are considered absolutely necessary to be accepted by bidder without any deviation. Tender document shall have a stipulation that deviation to such criteria shall make the bid liable for rejection.

FORMAT – 4.5

BIDDER'S COMMUNICATION DETAILS

Bidder should furnish the below details for future communication: -

GENERAL INFORMATION	
NAME OF Company	
POSTAL ADDRESS	

FOR TECHNICAL QUERY:		
CONTACT PERSON & DESIGNATION	NAME	DESIGNATION
E-MAIL	MOBILE NO	TELEPHONE NO

FOR COMMERCIAL QUERY:		
CONTACT PERSON & DESIGNATION	NAME	DESIGNATION
E-MAIL	MOBILE NO	TELEPHONE NO

Note: No communication shall be entertained from any other email id, except as mentioned above. Bidder needs to inform the company if any changes in the email id on their letter head duly signed by the authorized signatory.

ANNEXURE-IV

TECHNICAL SPECIFICATIONS

BSES

Technical Specification

For

Grounding and Lightening Protection System

Specification no – BSES-TS-76-GES-R0

Rev:		0
Date:		06 May 2022
Prepared by	Bhanu Gehlot	
	Uttam Shukla	
Reviewed by	Abhinav Srivastava	
Approved by	Gopal Nariya	

INDEX TABLE

1. SCOPE

This specification covers the guidelines of earthing & lightening protection at 66/11, 33/11, 66/33/11 kV Grid substation and the technical requirements of material required for earthing system.

2. STANDARDS & CODES

2.1.	CEA guidelines	Technical standards for construction of electrical plants and electrical lines
2.2.		IE Rules of 1956
2.3.	IEEE Std 80	IEEE guide for safety in AC substation grounding
2.4.	CBIP :2006 – publication no. 229	Manual on substation layout
2.5.	IS 3043: 1987	Code of practice for earthing
2.6.	IS 2629 (1985)	Recommended practice for hot dip galvanizing of Iron & Steel
2.7.	IS 2633 (1986)	Method for testing uniformity of coating on zinc coated article
2.8.	IS 5358 (1969)	Specification for hot dip galvanized coating on fasteners
2.9.	IS 4759 (1996)	Specification of Hot dip zinc coatings on structural steel and other allied products
2.10.	IS 1239 (2004)	Steel tubes, tubular and other wrought steel fittings- specification
2.11.	IEC 62561-2	Requirements for conductors and earth electrodes
2.12.	IEC 62561-7	Requirements for earthing enhancing compounds
2.13.	UL 467	Standard for safety - Grounding and bonding equipment
2.14.		Handbook on Electrical Earthing (Ministry of Railways)

3. REQUIREMENT OF EARTHING

3.1.	Primary guidelines	Following are primary guidelines for a good earthing system in a Grid substation: a. The impedance to ground should be as low as possible. In general it should not exceed **0.5ohm**. b. The step and touch potentials shall be within safe limits. c. The contractor shall do the calculation for number of earthing rods being used in a substation for achieving the desired earth resistance.

3.2.	Design Parameters	Earthing Calculation parameters shall be taken as: 1) Duration of shock current ts=1sec. 2) Top Gravel resistivity shall be 3000 Ohm Meter. 3) Split/ Diversion Factor shall be considered as 1 4) Earth conductor/ electrodes size calculation based upon corrosion considered for next 40 years. 5) The final diameter of earth conductors/rod shall be maximum of calculated dia or 25 mm (prescribed in clause 5)
3.3.	Earthing lead size	a. The actual size of earthing lead will depend on the maximum fault current which the earthing lead will be required to carry safely. b. Please refer **AnnexureA1** for HT fault level.
3.4.	Earthing type	a. Rod earthing shall be provided for the Grid substation. b. The size of the rod depends upon the current to be carried and the type of the soil. Soil resistivity testing will be carried out by vendor. c. The Earth Electrode should be embedded vertically. Wherever hard rock is encountered, the rod can be inclined at an angle of about 30deg to the horizontal as per clause 9.2.2 of IS 3043. d. The vertically driven rods shall be interconnected with each other using horizontal grid conductors.
3.5.	Earth Pit	a. As per clause 20.5.2 of IS 3043, the minimum distance between the vertical earth electrodesshall not be less thanthe length of rod. b. Minimum of 1m distance of earth pit from electrical equipment and structures shall be maintained. c. The earth pits shall be backfilled with earth enhancing material as per Drawing . d. Treated Earth pits shall be used where earth resistance value is getting over the prescribed value in specification i.e. 0.5 ohms. e. Treated Pipe earthing required for 2 nos. each for PTR & Station TRF neutral and RTU/ SCADA. f. 50% quantity of the total earth electrodes to be provided with earth enhancing material (Terec++/ marconite).
3.6.	Horizontal Conductor	a. The entire earth rod driven in ground vertically shall be interconnected with earth grid conductors horizontally under the ground. b. The Horizontal conductors shall be laid 600mm below FGL. c. Minimum earth coverage of 300 mm shall be provided between the Horizontal conductor and the bottom of trench/foundation/underground pipe at the crossing. d. Horizontal conductors around a building /switchyard fence shall be buried outside the boundary at a minimum distance of 2000 mm. e. Risers shall be provided 300mm above the ground level for equipment earthing. Two number treated earth pits shall be provided with riser for connection of transformer neutral. f. All the joints between rods flats shall be **exothermic** type for creating better electrical contact between two. Welding between rods to flat, flat to flat should be arc welding type. g. Wherever bolted connection is done, it shall be done through two bolts at each joint to ensure tightness and avoid loosening with passage of time. h. Where a 66 kV overhead line terminates at the substation, a

		metallic continuity between the end tower and the substation earth grid should be established with two independent connections. i. To ensure good welding, it should be carried out only after scratching off the galvanization, dirt, grease etc by thorough cleaning of contact surface. After welding it will be made with anticorrosive zinc rich paint.
3.7.	Equipment earthing	a. GI strips shall be used for the equipment earthing. b. Two separate and distinct earth connections shall be provided for earthing of electrical frameworks. c. The connection of GI strip with riser of earth mat shall be electric arc welding arrangement;connection ofequipment with earthing end shall be double bolted arrangement. d. The transformer neutral shall be earthed with two independent grounding conductors connected to two separate earth pits. e. Fence within the earth grid shall be bonded to the plant earth system at regular interval not exceeding 10 meters. Fence gate shall be separately earthed with flexible Copper braid to permit movement. f. Bolted connection shall be made only for earthing of equipment/devices and for some removable structures. The contact surfaces shall be thoroughly cleaned before connection to ensure good electrical contact. g. Cable armor shall be earthed at both ends for multi core cables. For single core cables, the earthing shall be at switchgear end only. h. For prefabricated cable trays, a separate ground conductor shall run along the entire length of cable tray and shall be suitably clamped on each cable tray at periodic intervals. Each continuous laid out lengths of cable tray shall be earthed at minimum two places by GS flats to Owner's earthing system, the distance between earthing points shall not exceed 30 metre. Wherever earthmat is not available Contractor shall do the necessary connections by driving an earth electrode in the ground. i. Earthing conductor's crossings the road shall be installed at 1000 mm depth and where adequate earth coverage is not provided it shall be installed in Hume pipes. Earthing conductors embedded in the concrete floor of the building shall have approximately 50mm concrete cover. j. Metallic stairs and hand rails shall be earthed as for columns. Additionally a 25x6 GI flat shall run the entire length of the stairs. The GI flat shall be welded to the stairs and hand rails at intervals of 1500 mm. k. The main earth conductor shall be securely fixed to the columns /walls/trays by welding /clamping at the intervals not exceeding 1500 mm. The earth conductors shall be interconnected between them and to the main earth grid through risers. l. **In case of GIS substation, earthing rods to be considered in RCC floor as per GIS OEM recommendation.**
3.8.	Lightening protection	a. Direct stroke lightning protection (DSLP) shall be provided in the EHV switchyard by shield wires/ High mast spike gaurd. The final arrangement shall be decided after approval of the DSLP calculations. The Contractor is required to carry out the DSLP

		calculations and submit the same to the Owner for approval of the same at detailed engineering stage after award of contract. b. DSLP protection shall be provided for control room building as per design calculation following Indian standards. The down conductor should be high conductivity bare copper tape with minimum size of 75 sqmm. c. Connection between each down conductor & Test link shall be located approximately 2000mm above ground Level. d. Separate earth electrodes shall be provided for building DSLP connecting the down conductors to the risers & finally to the Earthmesh. Minimum electrodes to be provided – 4 Nos.

4. SPECIFICATION OF EARTHING MATERIALS

4.1.	GI earthing strip	a. Fully galvanized iron strips shall be used conforming to IS 2629. b. The zinc deposition shall not be less than 610gm/sqm of the galvanized surface area of the MS Earthing strips. c. The zinc coating used for the galvanization shall be of 9.99 % purity grade as per IS 209. d. All the galvanized material shall be checked for uniformity and weight as per IS. e. The standard length of galvanized iron earthing strip shall be minimum 7Mtrs.
4.2.	Vertical and Horizontal Earth Electrode	a. Copper clad steel rod driven in the earth vertically shall be a high tensile-low carbon steel rod of adequate diameter(as per the clause 6.0 of the specs) and 3m length complying UL467, IEC62561-2 and IS 3043, molecularly bonded by 99.99% pure high conductivity copper on the outer surface with copper coating thickness 254 microns or more with sufficient amount of earth enhancement compound as per IEC 62561-7. b. Copper bonding must be UL/CPRI/ERDA certified. c. Rod shall be tested and certified from CPRI/ERDA for a short circuit current withstanding of desired value. d. There shall be following marking on the rod-Dimension Detail, product model no, Reference number of certification. e. It shall have high corrosion resistance and shall eliminate electrolytic action. f. The rod shall have thread profile at both the ends to ensure no copper is removed from the steel.

5. SIZES OF THE EARTHING MATERIALSFOR EQUIPMENT EARTHING

S.No.	Title	Material	Sizes of the earthing	Type	UOM	No of Lead
	Main Earthing Grid					
5.1	Vertical Rods	MS Bonded Rods	40	Rod	mm (dia)	
5.2	Above Ground risers	GI	50x10	Flat	Sqmm	2
5.3	Horizontal Rods	MS Bonded Rods	40	Rod	mm (dia)	
5.4	Treated Earth Pit	MS Bonded Rods	40	Rod	mm (dia)	
	Power Transformers					
5.5	Frame	GI	75X10	Flat	Sqmm	2
5.6	Marshalling Box	GI	50X6	Flat	Sqmm	2
5.7	Radiator	GI	50X6	Flat	Sqmm	2
5.8	Neutral	GI	75X10	Flat	Sqmm	2
5.9	Fan	GI		As per sizes mentioned for fans		
	11 KV System					
5.10	11 KV Swithcgear	GI	50X6	Flat	Sqmm	2
5.11	11 KV Bus Duct	GI	50X6	Flat	Sqmm	2
5.12	11 KV Cable Box	GI	50X6	Flat	Sqmm	2
	415 V System					
5.13	ACDB	GI	50X6	Flat	Sqmm	2
5.14	Station Trafo Frame	GI	50X6	Flat	Sqmm	2
	DC System					
5.15	Battery Charger	GI	50X6	Flat	Sqmm	2
5.16	DCDB	GI	50X6	Flat	Sqmm	2

	Other Electrical Items					
5.17	Three phase receptacles, welding outlet	GI	25x3	Flat	Sqmm	1
5.18	C&R Panel	GI	50X6	Flat	Sqmm	2
5.19	Push Button	GI	8	Wire	Swg	1
5.20	Cable Trays(one run along the tray section)	GI	50X6	Flat	Sqmm	1
	Other Non Electrical Items					
5.21	Railway Tracks	GI	25x6	Flat	Sqmm	At suitable Points
5.22	Metallic noncurrent carrying structures like stair case	GI	25x6	Flat	Sqmm	1
5.23	Columns, Structures	GI	50X6	Flat	Sqmm	2
5.24	Steel pipe racks	GI	25x6	Flat	Sqmm	1
5.25	Fence/Gate	GI	50X6	Flat	Sqmm	As per clause 3.7 (e)
5.26	Hand Rail	GI	8	Wire	Swg	1

6. TESTING AND INSPECTION

6.1.	Earthing materials	a. The purchaser reserves the right to inspect the material at the time of tests. All tests shall be performed in the presence of BYPL/BRPL representative. The bidder shall give intimation in advance to witness the test. b. Acceptance test for GI earthing strips – Tests for Visual examination, dimensional verification and galvanization shall be witnessed at the time of inspection. c. Acceptance test of Earth enhancement compound – Tests for leaching, sulphur determination, corrosion and resistivity shall be done as per IEC 62561-7 d. Type test reports of the earthing materials from CPRI/ERDA/Equivalent lab shall be submitted. The bidder shall submit UL-467/CPRI/ERDA test reports for copper clad steel rod.

6.2.	Measurement of Earth resistance	a. After the completion of work ground resistance of each installation shall be measured by BYPL/BRPL/Contractor. b. The measurement of resistance shall be witnessed and signed by representative of BYPL/BRPL as well as the contractor. The test certificates shall be generated for each installation clearly indicating the details of the transformer, name of the substation, location, district, serial no. of testing equipment and name of testing engineer. c. The desire ground resistance shall be measured after interconnection of earth pits is completed. The value of earth resistance shall not be more than **0.5 ohm**. d. In case where this value exceeds 0.5 ohms, the earthing design shall be redesigned. The pit location, earth electrode, soil treatment, earth conductor, GI strip used shall be checked whether properly used at site. If not, these shall be changed as per the redesigned plan.

7. DEVIATIONS

7.1.	Deviation	Deviations from this Specification shall be stated in writing with the tender by reference to the Specification clause/GTP/Drawing and a description of the alternative offer. In absence of such a statement, it will be assumed that the bidder complies fully with this specification. No deviation will be acceptable post order.

8. DOCUMENTS SUBMISSION

The bidder has to submit the following documents along with bid:-

8.1.	Complete earthing calculation
8.2.	Complete product catalogue, Manual and calibration certificate of the equipment
8.3.	Type test reports
8.4.	Deviation Sheet (if any)

9. GUARANTEED TECHNICAL PARTICULARS

S. No	Parameter	BYPL/BRPL Requirement	Vendor Data
9.1	Rod to rod welding	Exothermic	
9.2	Zinc deposition of GI earthing Strip	610gm/sqm	
9.3	Length of GI Strip	7m (Minimum)	

9.4	Diameter of Cu clad Rod	25 mm or calculated Dia whichever is higher	
9.5	UL/CPRI/ERDA Certification of Cu Bonding	Test certificate to be provided	
9.6	Cu bonding	250 Micron	
9.7	Length of Copper bonded rod	3 m	
9.8	Purity of Copper	99.99%	
9.9	Short circuit withstand test of Rod	31.5kA	
9.10	Marking on the rod-Dimension Detail, product model no, Reference number of certification	Sample Required	
9.11	ROHS Certificate from NABL accredited lab for not having toxic chemical in earth enhance material	Test certificate to be provided	
9.12	Resistivity of earth enhancing material	0.12 ohm-m(Max)	
9.13	Exothermic welding material	IEEE 837 Complied	
9.14	Make of Steel	SAIL/ESSAR/TATA	

ANNEXURE A1 : REFERENCE FAULT LEVEL

Voltage Level(kV)	Design Fault Level
66/11	31.5 KA
33/11	25 KA

BSES

Technical Specification

of

Illumination and Lighting System

Specification no – BSES-TS-98-ILS-R0

Rev		0
Page		1 of 12
Date		17 May 2022
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Reviewed by	Abhinav Srivastava	
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INDEX

1. SCOPE

The specification covers the design, engineering, manufacture, assembly and testing at manufacturer's work, supply and installation of Illumination system for substation including normal distribution pillars, normal lighting board, emergency distribution pillar, emergency lighting board, Junction boxes, Illumination lamps with required lux level.

2. STANDARDS AND CODES

Standard Code	Standard Description
IS 16101 : 2012	General Lighting -LEDs and LED modules – Terms and Definitions
IS16102(Part 1) 2012	Self-Ballasted LED Lamps for General Lighting Services, Part 1 Safety Requirements
IS16102(Part 2) 2012	Self-Ballasted LED Lamps for General Lighting Services, Part 2 Performance Requirements
IS16103(Part 1) 2012	Led Modules for General Lighting, Part 1Safety Requirements
IS16103(Part 2) 2012	Led Modules for General Lighting, Part 2 Performance Requirements
IS15885(Part2/Sec13)	Safety of Lamp Control Gear , Part 2 Particular Requirements , Section 13 dc. or ac. Supplied Electronic Control gear for Led Modules
IS16104 : 2012	d.c. or a.c. Supplied Electronic Control Gear for LED Modules - Performance Requirements
IS16105 : 2012	Method of Measurement of Lumen Maintenance of Solid State Light (LED) Sources
IS16106 : 2012	Method of Electrical and Photometric Measurements of Solid-State Lighting (LED) Products
IS 16107(Part 1)2012	Luminaires Performance ,Part 1 General Requirements
IS 16107(Part 2)2012	Luminaires Performance, Part 2 Particular Requirements ,Section 1 LED Luminaire
IS 16108 : 2012	Photo biological Safety of Lamps and Lamp Systems
IS 10322 : 2012	Luminaires: Part 5 Particular requirements, Section 3 Luminaires for road and street lighting
IS 5	Colours for Ready Mixed Paints and Enamels
IS 613	Copper Rods and Bars for electrical purposes
IS 694	PVC Insulated cables for working voltages up to and including 1100 V
IS 2551	Danger notice plates
IS 5082	Wrought Aluminium and Aluminium alloy bars, rods, tubes and sections for electrical purpose
IS 6665	Code of practice for industrial lighting
IS 13703	LV Fuses for voltage not exceeding 1000V ac or 1500V dc
IS 10118	Code of Practice for Selection, Installation and Maintenance of

	Switchgear and Controlgear
International Standard	
IEC 62612	Self-ballasted LED lamps for general lighting services for voltage above 50 V — Performance requirements
IEC : 60598-2-3	Particular requirements - Luminaries for road and street lighting
IEC 62471	Photo biological safety of lamps and lamp systems
IEC 62778	Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaries
IEC 61000-4-5	Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test
IEC 60439	Low Voltage Switchgear and Controlgear assemblies - Type tested and partially type tested assemblies
IEC 60529	Degrees of protection provided by enclosures (IP Code)
IEC 60947-1	Low Voltage Switchgear and Controlgear - General Rules
IEC 60947-2	Low Voltage Switchgear and Controlgear - Circuit breakers
IEC 61643	Low-voltage surge protective devices

3. ILLUMINATION SYSTEM

3.1.	Lux level requirement	3.1.1. The design of the illumination system shall ensure availability of the average illumination levels as specified below with the maximum possible uniformity in the entire substation. The illumination system shall consist of the normal lighting system and emergency lighting system. The minimum illumination levels shall be as specified below(Reference IS3646(Part II)). 3.1.1.1. Roads within substation : 20 lux 3.1.1.2. Boundary wall of the substation : 10 lux 3.1.1.3. Control room : 300 lux 3.1.1.4. Switchgear Room : 200 lux 3.1.1.5. Battery room : 100 lux 3.1.1.6. Stair case : 100 lux 3.1.1.7. Power Transformers : 100 lux 3.1.1.8. Cable cellar/ Indoor trench : 70 lux 3.1.1.9. Outdoor switchyard : 70 lux 3.1.1.10. APFC/ station trafo : 70 lux 3.1.2. Contractor shall design the lighting system with the help of desired software. Owner shall verify the same post commissioning with lux meter to check the levels. In case desired lux levels are not met contractor has to install addition fitting in outdoor and indoor location as per requirement. 3.1.3. Complete design calculation sheets for arriving at the number of luminaires required for the normal and emergency requirements shall be furnished by the bidder. Design calculation sheets for the selection of cables, MCB, HRC fuses, bus bars, etc. are also required to be furnished for Owner's approval.

3.2.	Illumination circuit	3.2.1.	The illumination system load and welding load in the substation area shall be supplied from 415/230 volt ACDBs to be provided in the substation control room. Requisite numbers of 3-phase, 4-wire, cable circuits for illumination system and welding socket outlets shall be extended from the above board. The laying of cables from the Board to the illumination system/welding socket outlets and their installation are included in the Bidder's scope.
		3.2.2.	Each outgoing cable circuit for illumination loads from the 415 volt switchboard shall terminate in the respective outdoor pillar boxes located in the substation. Outgoing feeders from the illumination shall be taken to the various illumination points in the substation. Necessary fuses shall be provided near light fixtures in the substation.
		3.2.3.	The emergency illumination load shall be supplied from the main emergency illumination board located in the control room. Necessary cable circuits with appropriate fuses shall be provided by the Contractor for the supply system for emergency illumination load of the substation.
		3.2.4.	Emergency DC lighting system shall be provided in the substation wherever required. The emergency lighting shall be adequate for safe movement by the operating personnel in the substation in the event of failure of normal lighting system. Number of lights shall be decided at the time of detailed engineering. A total of minimum 12 no's individually controllable 18 watt LEDs shall be provided in the substation.
		3.2.5.	6 Nos. welding sockets to be provided, 4 Nos. in Outdoor Yard & 2 Nos. in Control room building.
		3.2.6.	Illumination to be provided inside the Indoor trenches as per required lux level.
3.3.	Wiring	3.3.1.	All lighting fixtures and 5A convenience outlets shall be wired with 1.1 KV grade PVC insulated extra flexible, multistranded, copper conductor cables of size not less than 2.5 sq.mm.
		3.3.2.	For 15A heavy-duty outlets copper conductor cables of size not less than 6 sq. mm shall be used.
		3.3.3.	The wiring shall consist of phase, neutral and ground. For grounding the lighting fixtures/convenience outlets etc. Green CU wire of size 2.5 sqmm shall be used. The phase and neutral conductor shall be suitably colour coded. For DC black & white wires to be used.
		3.3.4.	Supply shall be looped between the lighting fixtures of the same circuit by using junction boxes. For this purpose one (1) 100 mm x 100 mm square junction box shall be provided for each lighting fixture. For recessed lighting fixtures, supply shall be extended from the junction boxes to the fixtures by means of flexible conduits. The conduits shall be of HMS (High mechanical stress) type and of minimum dia 25 MM. While for stem-mounted/wall-mounted lighting fixtures the junction box shall be

		mounted below one of the mounting stems. 3.3.5. For lighting branch circuits the nos. of lighting switches shall be decided keeping in mind the ease of control, as well as to limit the current to 2.5A per circuit. 3.3.6. For convenience outlets, the bidder shall design the wiring scheme so as to limit 6 nos. of 5A outlets per branch circuit and two nos. of 15A outlets per branch circuit. 3.3.7. All wiring materials such as terminals, crimping lugs, ferrules etc. shall also be provided by the Contractor. 3.3.8. No section of the conduit shall be filled with more than 70% of its area. Any consumable material that is required for pulling the wires through conduit shall also be provided by the Contractor. 3.3.9. Lighting fixtures coming in one area shall be evenly distributed between three phases so that tripping of one phase or two phases does not cause total loss of illumination in that area.
3.4.	Required documents to be submitted	Complete manufacturer's literature/catalogues, performance curves, illumination distribution curves, G.A. drawings, specification sheets, etc. as relevant in respect of all materials/equipment to be supplied shall be submitted by the Contractor.
3.5.	Illumination system check after installation	After completion of installation of the illumination system in the substation, the actual illumination level at different locations shall be measured by the Contractor in the presence of Owner's authorised representative. If the average value of the measured illumination levels is found to fall short of the specified levels, the Contractor shall have to provide additional lighting fixtures so as to achieve the specified levels of illumination at no additional cost to the Owner. While measuring the illumination levels due allowance shall be made on account of maintenance factor. The specified lux levels shall be suitably increased to cover maintenance factor of 0.6 for outdoor areas.

4. DISTRIBUTION PILLARS FOR NORMAL ILLUMINATION SYSTEM

4.1.	Construction	4.1.1. Distribution pillars of adequate dimensions shall be constructed from sheet steel having a thickness not less than 2 mm. 4.1.2. The pillars shall be totally enclosed weather-proof, dustproof, vermin-proof, having hinged doors with locking arrangement and shall be capable of being mounted in the substation. 4.1.3. The pillars suitable for cable entry at the bottom shall be designed for easy access of connections to terminals and inspection of equipment mounted therein. 4.1.4. The degree of protection of the board shall be IP55. 4.1.5. The enclosure shall be painted externally with Shade No., 692 of IS:5 and internally with brilliant white of semi-glossy finish of IS:5. 4.1.6. Location of LDB, ELDB & PDB to be finalized during

		detailed engineering.
4.2.	Configuration	4.2.1. Each pillar shall accommodate the following: 4.2.2. One incoming, 4-pole (3 phase and neutral) isolating switch with MCB of appropriate current rating. 4.2.3. 3-phase and neutral bus bars of appropriate current rating. 4.2.4. Single-poleearth leakage circuit breakers of suitable current ratings on all outgoing circuits. 4.2.5. Neutral links for all outgoing circuits. 4.2.6. Cable lugs, compression type cable glands, name plates, circuit numbers, earthing lugs, etc. to make the pillar complete in all respects. 4.2.7. 20% spare outlets shall be provided for outgoing feeders. 4.2.8. Three (3) indicating lamps with fuses to indicate that supply is 'ON'.

5. LIGHTING DISTRIBUTION BOARDS

5.1.	Construction	5.1.1. Metal-clad enclosure with minimum 2 mm CRCA sheets for load-bearing members and 1.6 mm for non load-bearing members suitably reinforced with structural. 5.1.2. 3-phase, 4-wire bus bar system with high conductivity aluminium busbars mounting on FRP insulators having anti-tractive property with minimum 25 mm phase-to-phase and minimum 19 mm phase-to-earth clearances. The busbars shall be uniform throughout the length of the LDB and busbar joints shall be silver plated and covered with shrouds. 5.1.3. All cables shall enter from the bottom. 5.1.4. The degree of protection for the LDB shall be IP-54. 5.1.5. The enclosure shall be painted externally with Shade No., 692 of IS:5 and internally with brilliant white of semi-glossy finish of IS:5.
5.2.	Configuration	Each LDB shall accommodate the following: 5.2.1. One incoming, 4-pole (3 phase and neutral) isolating switch with MCB of appropriate current rating. 5.2.2. 3-phase and neutral bus bars of appropriate current rating. 5.2.3. 4 Pole outgoing MCBs of appropriate rating 5.2.4. Cable lugs, compression type cable glands, name plates, circuit numbers, earthing lugs, etc. to make the pillar complete in all respects. 5.2.5. 20% spare outlets shall be provided for outgoing feeders. 5.2.6. Three (3) Nos. indication lamps (Red, Yellow, Blue) shall be provided to indicate that the incoming supply is available. Similarly, 3 Nos. indication lamps shall be provided to indicate that the busbar is energised.
5.3.	Busbar	5.3.1. The busbars shall be suitable for short-time current rating of 40KA for 1 Sec.

		5.3.2.	The busbar temperature rise shall not exceed 35 Deg C over an ambient of 50 Deg C.
		5.3.3.	The LDBs shall be provided with a continuous busbar of 25 x 6 sq.mm (electrolytic copper) with suitable hardware for connection to the main grounding grid

6. MAIN EMERGENCY LIGHTING BOARD

6.1.	Construction	6.1.1.	Metal-clad enclosure with minimum 2 mm CRCA sheets for load-bearing members and 1.6 mm for non load-bearing members suitably reinforced with structural.
		6.1.2.	All cables shall enter from the bottom.
		6.1.3.	The degree of protection for the LDB shall be IP-54.
		6.1.4.	The enclosure shall be painted externally with Shade No., 692 to IS:5 and internally with brilliant white of semi-glossy finish to IS:5.
6.2.	Configuration	6.2.1.	Each Board shall accommodate the followings:
		6.2.2.	Automatic changeover contactor.
		6.2.3.	Voltage sensing relays.
		6.2.4.	Time delay relay.
		6.2.5.	Bus Bars.
		6.2.6.	Two pole MCBs of adequate ratings for incoming and outgoing feeders.
		6.2.7.	Test switch, push button type.
		6.2.8.	Indicating lamps, ac - Green, dc - Red.
		6.2.9.	Terminals for remote indication
		6.2.10.	Cable lugs, compression type cable glands, name-plates, circuit numbers, earthing lugs and remote indication wiring upto substation 415V a.c. control board, to make the board complete in all respects.
6.3.	Changeover facility	The main emergency lighting board shall have an automatic changeover switch to energise the dc lighting system in the event of AC power failure. It shall have voltage-sensing relays to perform the changeover automatically when AC voltage of any one phase falls below 60 percent of 240 volts and continues at that low level for more than 10 seconds. These shall changeover from DC to AC again when 70 percent of 240 volt is restored and this continues for 10 seconds.	
6.4.	Emergency Lighting Pillar	Local Emergency Lighting Pillar shall be identical in details to Lighting Distribution Pillar specified in clause 4 except that it shall have two pole isolating switch fuse unit on the incoming side and only two busbars and shall be without neutral links.	

7. LUMINAIRES

7.1.	Luminaires type	Luminaires for use in normal and emergency illumination systems in the substation shall be suitable for LED lamps. All the luminaires shall be supplied complete with all accessories and lamps. The LED lamps ratings shall be adequate to achieve the required Lux level and calculation for number of luminaires shall be in the bidder's scope. Minimum rating shall be a follows - 7.1.1. Outdoor –90W minimum 7.1.2. Indoor –36W minimum
7.2.	Flood lights	The flood light luminaires in the substation shall be fixed at suitable height on the substation structures/ building, so as to provide the specified average illumination in the substation area without causing any glare to the operational/ maintenance staff working in the substation. While fixing the luminaires it shall be ensured that the stipulated electrical clearances are not violated. The Contractor shall supply and install suitable type of non-mettalic street light poles or octagonal galvanished poles required for installing the fittings for illuminating the roads, fence boundary wall etc.
7.3.	Reliability	Substation lighting circuits shall be divided into two or three sections and provided with time switches of suitable ratings.
7.4.	Design features for Outdoor Luminaires	
7.5.	Fixture	7.5.1. The luminaries housing shall be either extruded or pressure die casted aluminium of minimum 1.6 mm thickness. Body must be Corrosion Resistant Powder Coated and UV resistant. 7.5.2. The entire housing shall be dust and waterproof having Ingress protection of housing as IP65 or above as per IEC 60529. 7.5.3. Luminaire should be covered with suitable Glass or diffuser with high Transitivity. All luminaires shall be supplied with either clear toughened glass or clear polycarbonate cover for better IP retention and higher life.
7.6.	LED	7.6.1. Theluminousefficacy of LEDluminaireshall be atleast 85 lumen/watt. 7.6.2. LED module efficacy shall not be less than 90 percent of the rated LED module Efficacy. 7.6.3. Color Rendering Index (CRI) shall be at least 70 7.6.4. Color Temperature shall be 5500-6500K 7.6.5. Uniformity Emin/Eavg> 0.4, Emin/Emax>0.33
7.7.	LED Driver	LED driver shall have following features: 7.7.1. LED driver shall be applicable for Power supply 240V AC±10%, at 50Hz+3% / -5%. 7.7.2. Output voltage of the driver shall bedesigned to meet the

		Power Requirementsof the system. 7.7.3. Power factorofcompletefitting shall bemorethan 0.90atfull load. 7.7.4. Total Harmonic Distortion (THD) shall be< 10 %
7.8.	General Requirements	7.8.1. The connecting wires used inside the Luminaire, shall be low smoke halogen free, fire retardant e-beam cable and fuse protection shall be provided in input side. 7.8.2. Thelumenmaintenanceof all theLEDfixturesshallnotbelessthan70%after50,000 hours. 7.8.3. Built in protection features for Short circuit, Surges (at least upto 5kV), and overvoltage shall be provided. 7.8.4. High /Low voltage cut-off shall be provided. 7.8.5. The whole luminaire shall be eco-friendly green technology based i.e. mercury free. 7.8.6. No UV and IR radiations shall be produced. 7.8.7. Access of driver for maintenance shall be provided at the top/side of the luminaire fixture. 7.8.8. All fasteners must be of stainless steel.

8. JUNCTION BOXES/WALL BOXES

8.1.	Size	100 mm x 100 mm junction boxes and wall boxes of standard size shall be provided.
8.2.	Construction	Wall boxes and junction boxes shall be made of FRP with a thickness of 2.0mm. Necessary conduit termination fittings such as bushings, locknuts etc. also be provided.

9. AUTOMATIC LIGHTING CONTROLLER

9.1.	Size	Contractor shall provide microprocessor based automatic lighting controller for controlling switching arrangement of indoor and outdoor lighting. The controller shall have provision of setting 52 week ON / OFF time as per astronomical clock or as per user requirement. All abnormal events shall be recorded in the controller. Secure / Genus or equivalent are approved makes.

10. SOCKETS & SWITCHES

10.1.	Indoor	All sockets and switches shall be modular and universal type suitable for 5/15A
10.2.	Outdoor	Two nos transformer oil filtration sockets shall be provided, one at each transformer bay. These sockets shall be three phase industrial type and rated for 100A.

11. NAMEPLATE & MARKING

11.1.	Name plate details of LED housing	Followings shall be clearly engraved/embossed on the die cast housing of LED: Rated voltage or voltage range (marked 'V' or 'Volt'); 11.1.1. Rated current (marked A' or 'Ampere'); 11.1.2. Rated wattage (marked 'W' or 'Watts'); 11.1.3. Rated frequency (marked in 'Hz') 11.1.4. Rated lumen 11.1.5. Indian/International Standards to which it is manufactured 11.1.6. Month and year manufacture 11.1.7. Customer Name - BSES Yamuna / Rajdhani Power Ltd 11.1.8. Fitting serial number 11.1.9. PO no and date 11.1.10. Guarantee period
11.2.	Panel nameplate and marking details	
11.2.1.	Panel nameplate	Panel shall have a nameplate clearly indicating the following: 11.2.1.1. Panel Serial No.- 11.2.1.2. Customer Name - BSES Yamuna/Rajdhani Power Ltd 11.2.1.3. PO No. & date - 11.2.1.4. Panel Name - 11.2.1.5. Current rating - 11.2.1.6. Guarantee period -
11.2.2.	Feeder nameplate	Large and bold name plate carrying the feeder identification shall be provided on the top of each module.
11.2.3.	Danger plate	Panel shall have a danger plate of anodized Aluminium clearly indicating the danger logo and voltage details.
11.2.4.	Material	Anodized Aluminium 16SWG. Nameplates shall be satin silver in colour with black letters engraved on them. Stickers are not allowed.
11.2.5.	Fixing	All nameplates shall be riveted to the panels at all four corners. Bolting/screwing is not acceptable.

12. APPROVED MAKE OF COMPONENTS

12.1.	Relays	ABB/Jyoti/Omran
12.2.	HRC Fuse Links	GE/ Siemens/ L&T
12.3.	AC Contractors/ DC contactor	L&T/Siemens/Telemechanique/GE/ABB

12.4.	Terminals	Connectwell/Elmex/Wago/Phoenix
12.5.	Push buttons / Actuator	L&T/Siemens/Vaishno/Schneider
12.6.	MCB	Legrand/Hager/Schneider/ABB
12.7.	LED	NICHIA/ OSRAM/ CREE/ PHILIPS//EDISON
12.8.	Luminaire fittings	GE/Philips/Crompton/Bajaj
12.9.	Indicating lamps	Vaishno/Binay/Teknic/Siemens/Mimic/C&S

13. INSPECTION & TESTING

13.1.	Type test	All Equipment should be of type tested quality only, type test certificate to be submitted along with offer. If the manufacturer's lab is accredited by govt. / authorized body then it shall be acceptable for type testing.
13.2.	Acceptance & Routine tests	As per relevant Indian standard

14. DEVIATION

14.1.	Deviation	Deviations from this Specification shall be stated in writing with the tender by reference to the Specification clause/GTP/Drawing and a description of the alternative offer. In absence of such a statement, it will be assumed that the bidder complies fully with this specification. No deviation will be acceptable post order.

BSES Rajdhani Power Limited
BSES Bhawan, Nehru Place, New Delhi- 19

TECHNICAL SPECIFICATION

FOR

CABLE INSTALLATION & ACCESSORIES

Prepared by	Javed Ahmed		Rev: 1
Reviewed by	Abhinav Srivastava		Date: 12th June 2018
Approved by	Gopal Nariya		

Technical Specification for Cable Installation and Accessories

1.0 INSTALLATION OF CABLES:

1.1 The cable shall be laid as per IS 1255. The Contractor shall prepare cable schedules for all the cable circuits associated with the equipment in the substation showing length, size and routing of each cable which shall be given suitable code numbers and submit the same for Owner's/Engineer's information/approval. Cable and Conduit laying shall be done strictly in accordance with the cable schedules.

1.2 The control and power cables shall be laid in conduits, concrete pipes, ducts, trays or cable trenches unless indicated otherwise. The power and control cables shall be laid in different trays. Cables shall be cleated to the cable tray after properly dressing.

1.3 Ducts shall be provided wherever cable trenches cross roads with provision of one spare duct for future use.

1.4 All civil works, viz, excavations, sand cover, providing brick cover on directly laid cables, construction of foundations, trenches with cable tray supports, cable ducts under roads, back filling, finishing associated with cabling work shall be duly completed.

1.5 The Contractor shall supply and install all the surface mounted/ embedded rigid and flexible conduits, their connections, and associated clamps, bushings, lock-nuts, caps etc required in the cabling work.

1.6 All conduits and their accessories shall be made of galvanized heavy gauge steel as per BIS Specification. The internal bore of all pipes shall be smooth and suitable for pulling PVC sheathed cables without damage.

1.7 The Contractor shall supply all fittings including ordinary tees and elbows, check nuts, male and female fittings pull boxes, junction boxes, conduit outlets, outlet boxes, splice boxes, terminal boxes, gaskets and box covers, saddles and all supporting steel work and all such arrangements which are required to complete the conduit installations.

1.8 Pre-fabricated junction boxes, conduit boxes and conduits shall be shop fabricated out of malleable iron or steel plates and shall be galvanized and provided with galvanized malleable iron or steel plate covers and rubber gaskets

1.9 All the apparatus, connections and cable work shall be designed and arranged to eliminate the risk of fire and minimize damage which might be caused in the event of fire. Wherever cables pass through floor or wall openings or other partitions, suitable bushes of approved type shall be supplied and put in position by the Contractor.

1.10 Standard cable grips, reels and rollers shall be utilized for cable pulling.

1.11 Each cable, whether power or control, shall be provided with a metallic or plastic tag of an approved type, bearing cable reference number indicated in the cable schedule prepared by the Contractor, at every 10 meter run and at both ends of the cable, adjacent to the

terminations as well as where cables enter or leave ducts. Cable routing shall be so done that cables are accessible for identification and maintenance easily, and are arranged neatly.

1.12 In no case the cables shall be bent sharply or kinked with the radius of bending falling below 15D where D is the overall diameter of the cable.

1.13 When power cables are laid in the proximity of communication cables, the minimum horizontal and vertical separation between power and communication cables shall be 600 mm. Wherever possible the power and communication cables shall be located as far from each other as possible. The power and communication cables shall cross each other at right angles.

1.14 Wherever cables cross roads, water, oil, sewage or steam-lines, special care shall be taken while designing the trenches/ducts for protection of the cables.

1.15 In each cable run, some extra length shall be provided at a suitable location to enable making of one or two straight-through joints for carrying out repairs if the cable develops fault at a later date.

1.16 Cable splices shall not be permitted except where called for as per the construction drawings, or where permitted by the Engineer. Straight-through joints in the run of cables wherever unavoidable shall be through joint-boxes.

1.17 The termination of cables at various equipments shall be carefully made in accordance with the manufacturer's instructions and detailed connection diagrams.

Termination materials for all cables shall match with the type of cable insulation and have thermal and electrical ratings and chemical properties similar to those of the associated cable.
All terminating materials except for those already supplied with the electrical equipment shall be provided by the Contractor.

1.18 Control cable terminations shall be made in accordance with the color code marked wiring diagrams of control circuits. Multi-conductor control cable jackets shall be removed as required to train and terminate the conductors. The cable jacket shall be left on the cable, to the extent possible. The insulated conductors from which the jacket is removed shall be neatly trained in bundles and terminated. The bundles shall be firmly, but not tightly, tied utilizing plastic or nylon ties or specially treated fungus-proof cord.

1.19 The connectors for control cables shall preferably terminate in Ross Courteny terminals and washers and be covered with transparent insulating sleeves so as to prevent accidental contact with ground or adjacent terminals. The insulating sleeves shall be fire resistant and shall be long enough to overlap the conductor insulation.

1.20 When control cables are to be fanned out and tied together with cord, the Contractor shall make connections to terminal blocks and test the equipment for proper operation before tying the cables together with cord.

1.21 Jointing of cables shall be made in accordance with the applicable Bureau of Indian Standards Code of practice, Owners approval and manufacturer's special instructions. The materials and tools required for cable jointing work shall be in the Contractor's scope.

1.22 The supply of joint boxes shall include all hardware fittings, compounds, tapes and other materials required for making the joints.

Special tools, clips and saddles, glands, seals, PVC sealing compound, locknut, etc, required for connection and termination of cables shall be in the Contractor's scope.

1.23 All cables shall be megger-tested before jointing. After jointing is completed all L.V cables shall be megger-tested.

Cable cores shall be tested for:

i. Continuity.
ii. Absence of cross phasing
iii. Insulation resistance to earth.
iv. Insulation resistance between conductors.

2.0 CABLE TRAYS, ACCESSORIES & TRAY SUPPORTS, CONDUITS, PIPES AND DUCTS

2.1 Cable trays shall be run either in concrete cable trench or overhead supported from building steel. The cable trays shall be ladder type for power cable and perforated type for Control cable. The trays shall be supplied with matching fittings and accessories.

2.2 Cable tray shall be fabricated out of rolled mild steel sheets free from flaws such as laminations, rolling marks, pitting etc. Minimum thickness of cable trays shall be 2.0mm.

2.3 Cables shall be clamped to the cable trays in the horizontal runs with 18 gauge GI wires. For vertical runs the cables shall be clamped with suitable site-fabricated clamps.

2.4 All cable trays including perforated sheet trays, weld mesh trays, vertical raceways shall be hot-dip galvanized and epoxy coated. The trays shall be of standard width of 150mm, 300mm, 450mm & 600mm and standard length of 2.5M. Trays upto 300mm shall be perforated type and above 300 mm shall be ladder type.

2.5 The conductors carrying AC and DC supplies shall not be bunched together in a conduit. Where single-core cables are individually drawn into separate pipes, HDPE pipes shall be used.

Technical Specification for Cable Installation and Accessories

2.6 Flexible metallic conduits shall be used for termination of connections to equipment to be disconnected at periodic intervals and also for termination of connections to level switches, limit switches, pressure switches etc.

2.7 In order to minimize condensation or sweating inside the conduit, all outlets of the conduit system shall be properly drained and ventilated so to prevent entry of insects and water as far as possible.

2.8 The conduits or pipes shall be run along walls, floor and ceilings, on steel supports, embedded in soil, floor, wall or foundation, in accordance with the relevant layout drawings, approved by the Owner.

2.9 All fittings in the conduit systems having threaded connections shall be tightened with full thread engagement and with a minimum of wrench work in order to avoid wrench outs.

2.10 Embedded conduits running parallel to a masonry surface shall, wherever possible, have a cover of at least 38 mm.

2.11 The conduits shall be lead into terminal boxes through the entry points provided by the equipment manufacturers unless otherwise shown in the drawings or unless otherwise directed by the Engineer.

2.12 While installing asbestos pipe or other fiber conduit, cracked pieces shall not be used. The sections cracked or broken during or after placement shall be replaced.

2.13 For underground conduit runs the Contractor shall excavate and backfill as necessary.

2.14 Exposed conduit shall be adequately supported by racks and clamps or straps or by other approved means.

2.15 Where conduits are stubbed out of masonry for future extension outside the structure, they shall be specially protected against corrosion and shall be boxed in against possible physical damage.

2.16 Each conduit run shall be marked with its designation as indicated on the drawings - 'Identification'.

2.17 Where conduit and boxes in locations of severe exposure require, painting of galvanized surfaces with Alkyd Resin Zinc Dust paint following by a finish coat of Aluminum paint, shall be performed by the Contractor in a good and approved manner.

2.18 The Contractor shall bond of metal pipes or conduits in which cables have been installed to the main earthing system.

2.19 The conduits and accessories shall be adequately protected against mechanical damage as well as corrosion.

Technical Specification for Cable Installation and Accessories

3.0 TERMINATION AND STRIGHT THROUGH JOINTS

3.1 Termination and jointing kits for 11KV and 33KV grade XLPE insulated Aluminum cables shall be proven design and make already been extensively used and type tested. Termination kit and jointing kits shall be pre moulded type, taped type or heat shrinkable. The joints and termination shall be tested as per IS 13573. The kit contents shall be of proven design and type tested. Kit contents shall be supplied from the same source as were used for type tested. The kit shall be complete with Aluminum solderless crimping cable lugs and ferrules as DIN standard

The termination kit make and specification shall be strictly as per approval of the Owner.

3.2 The straight through and termination kit shall be suitable to withstand the fault level for 11KV and 33KV system

4.0 CABLE GLANDS, LUGS & ACCESSORIES

4.1 The cable shall be terminated using double compression type cable glands. The cable glands shall confirm to BS 6121 and of robust construction capable of clamping the cables and armour firmly without injury to the insulation. The cable glands shall be made out of heavy duty brass machine finished and nickel chrome plated. The thickness of plating shall not be less than 10 micron. The rubber component shall be made out of neoprene and tested quality.

4.2 The trefoil clamps for single core cables shall be pressurized die cast Aluminum or fiber Glass or Nylon and shall include necessary fixing accessories such as GI bolts and nuts. Trefoil clamps shall have adequate mechanical strength to withstand the forces generated by short circuit current.

4.3 Cable End seal (Roxtec/MCT Brattberg) shall be provided for all Control Cable and Power Cable (including outgoing HT panels) at all the points wherever cable entries in the control room building or between room to room. 30% Spare modules shall be provided along with centre core has to be provided. System shall take up variation margin of +/-3mm in diameter of Cable. For details refer specs.

5.0 DEVIATIONS

Deviation from this specification, if any, shall be clearly brought out in the offer. Unless owner explicitly accepts such deviations, it shall be considered that the offer fully complies with the specification.

BSES Rajdhani Power Limited
BSES Bhawan, Nehru Place, New Delhi- 19

TECHNICAL SPECIFICATION

FOR

EXHAUST & VENTILATION SYSTEM INCLUDING AIRCONDITIONING

Prepared by	Javed		Rev: 0
Reviewed by	Abhinav Srivastava		Date:
Approved by	Gopal Nariya		

Technical Specification Exhaust and Ventilation System

1.0 INTENT OF SPECIFICATION

1.1 This specification is intended to cover the design, manufacture, assembly, testing at manufacturer's works, supply & delivery, properly packed for transport for site of Air Conditioning system and Ventilation system for substation control room building complete with all materials and accessories for efficient and trouble free operation

1.2 In the event of any discrepancy with the listed documents, the stipulation this specification shall govern.

2.0 SCOPE OF SUPPLY

The following equipment shall be furnished with all accessories.

a) Exhaust Fan system.
b) Air Conditioning
c) All necessary components for operation of the above equipment.
d) All wiring & accessories to complete the installation.
e) All relevant drawings, data & instruction manuals.
f) Mandatory spares.
g) Commissioning spares and recommended spare part list for three (3)

3.0 GENERAL REQUIREMENT

3.1 All equipment and material shall be designed, manufactured and tested in accordance with the latest applicable Indian Standards except where modified and/or supplemented by this specification.

3.2 Equipment and materials conforming to any other standard, which ensures equal or greater quality, may be accepted. In such case copies of the English version of the standard adopted shall be submitted along with the bid.

3.3 In particular, the following standards and specifications are applicable.

3.4 Air conditioners suitable for 230V, 50 Hz single phase AC supply shall be capable of performing the functions as cooling, dehumidifying, air circulating and filtering. The air conditioners shall be complete with automatic temperature control and cut-in and cutout etc. for temperature range 16 to 25 degree C.

3.5 Outdoor unit of the air conditioners shall be fitted discharge cooled type rotary Compressor.

3.6 Air Conditioner shall be 5 Star rated

3.7 Air Conditioning shall maintain 22 Degree Celsius in summers and Winters, Environment condition shall be referred from General Design Criteria Chapter 1

3.8 Approved make of AC is Voltas/LG/Carrier.

3.9 The minimum thickness of the base in outdoor unit shall be 1.20 mm & sheet thickness for rest of the body shall be 0.70 mm (Min.) with galvanized coating thickness of 120 g/ sq. m and shall be provided with stiffeners for robust construction and shall have rounded corners.

3.10 The casing of the indoor units shall be made of ABS/HIPS/GS and shall be impact resistant. The control box of indoor unit shall withstand flame retardant.

3.11 Remote cordless control with LCD/LED Display for Air conditioner shall be provided with one On/Off timer, selecting fan speed (three speed) and setting up of temperature. Display shall be provided on indoor unit or on handset or on both.

3.12 Maximum power consumption of the split air conditioners shall be measured at capacity rating test conditions. Overall power factor of the unit shall be at least 0.85 at capacity rating test conditions

This specification shall be read and constructed in conjunction with the bid documents and annexure to determine the scope of work.

DESIGN CRITERIA

	Air Conditioning shall be supplied in Control Room and Switchgear Room including GIS Room, maintenance room and SCADA room. Exhaust system shall be supplied in following rooms -Toilet – one Pantry- One Cable Celler- Industrial type numbers shall be as per calculation
Number and details of wall mounted/Ceiling fan	Battery room – 1 No Control room – 3 No's Switchgear Room – 6 No's GIS Room-As per Calculation, 6 Nos(Minimum). **Note: Wall mounted fan shall be industrial type, domestic fans shall not be acceptable**
Power Point & socket	Each room shall be provided with at least 2 No's 15 Ampere Switch socket and 2 no's 5 ampere switch sockets. Two no's industrial 16 ampere points shall be provided in control room for installation of air conditioning system for future.

	All equipment, accessories and wiring shall have fungus protection, involving special treatment of insulation and metal against fungus, insects and corrosion.

4.0 DEVIATIONS

Deviation from this specification, if any, shall be clearly brought out in the offer. Unless owner explicitly accepts such deviations, it shall be considered that the offer fully complies with the specification.

BSES Rajdhani Power Limited
BSES Bhawan, Nehru Place, New Delhi- 19

TECHNICAL SPECIFICATION

FOR

FIRE EXTINGUISHER

Prepared by	Javed		Rev: 1
Reviewed by	Abhinav Srivastava		Date: 24.05.21
Approved by	Gopal Nariya		

Technical Specification Fire Extinguisher

1.0 INTENT OF SPECIFICATION:

This specification is intended to cover the design, manufacture, assembly, testing at manufacturer's works, supply & delivery, properly packed for transport FOR site of Portable wall and trolley mounted Fire extinguisher and fire buckets for substation control room building complete with all materials and accessories for efficient and trouble free operation.

In the even of any discrepancy with the listed documents, the stipulation of this specification shall govern.

2.0 SCOPE OF WORK

2.1 Scope of Supply

The following equipment shall be furnished with all accessories:-

a) Wall mounted fire extinguisher-15 Nos. of 4.5kG (CO_2 Type)
b) Trolley mounted fire extinguisher- 5 Nos. of 22.5kg (CO_2 Type)
c) Sand buckets with stand- 4 Set with 4 bucket in each stand
d) All installation hardware.
e) All relevant drawings, data & instruction manuals.
f) Mandatory spares.
g) Commissioning spares and recommended spare part list for three (3) years of operation.
h) Rubber Mat for entire Indoor equipments front and backside(as per latest IS)

3.0 GENERAL REQUIREMENT

3.1 Codes and Standard

All equipment and material shall be designed, manufactured and tested in accordance with the latest applicable Indian Standards except where modified and/or supplemented by this specification.

Equipment and materials conforming to any other standard which ensures equal or greater quality may be accepted. In such case copies of the English version of the standard adopted shall be submitted along with the bid.

In particular, the following standards and specifications are applicable.

Indian Electricity Rules	Relevant safety regulation of CEA
Indian electricity act	
IS 2190	Selection, installation & maintenance of first aid, fire extinguisher.
	Tariff Advisory Committee Manual
IS 1646	Code for practice for fire safety of buildings
IS 940	Portable fire extinguisher, Water type - specification
IS 2878	Fire extinguisher CO2 type
IS 2171	Specification for fire extinguisher dry powder.
IS 10204	Specification for fire extinguisher Mechanical foam type.

This specification shall be read and constructed in conjunction with the bid documents and annexure to determine the scope of work.

4.0 DESIGN CRITERIA

General	The contractor shall supply the required type and quantities of fire extinguisher and Sand buckets. The quantity shall be as per TAC recommendations.
Location	Fire extinguisher and sand buckets shall be installed in Control room, battery room, switchgear room, ACDB & battery charger room, Cable cellar, Transformer yard, Outdoor switchyard and Capacitor bank.
Distribution	The fire extinguishers in various locations shall be as per the guidelines of TAC-India.
Tests	All equipment shall be completely assembled wired, adjusted and routine tested at the factory as per relevant standards.

5.0 DEVIATIONS

Deviation from this specification, if any, shall be clearly brought out in the offer. Unless owner explicitly accepts such deviations, it shall be considered that the offer fully complies with the specification.

BSES

TECHNICAL SPECIFICATION

FOR

VIDEO SURVEILLANCE SYSTEM

Prepared by	Javed Ahmed		Rev: 2
Reviewed by	Abhinav Srivastava		
Approved by	Gopal Nariya		Date: 2nd Feb 2021

1. SCOPE:

Design, Engineering, procurement of bought out items, manufacture, integration, inspection, factory testing and supply of complete CCTV System for the entire plant as per requisition consisting of following including necessary hardware, software and accessories as applicable.

2. STANDARDS:

In accordance with Latest Relevant IS/IEC.

3. SCOPE OF SUPPLY:

- CCTV cameras suitable for remote operation with all necessary accessories and installation hardware consisting of, but not limited to the following:

1. High speed zoom lens.
2. 360 Degree Cameras
3. Automatic Iris
4. Pan & tilt unit
5. Receiver unit
6. Weatherproof junction box
7. Weatherproof housing for unit camera.
8. Glass Dome with reflector shield on outside.
9. Night Vision.
10. One set of 360 camera shall be installed before start of work

- System cabinet consisting of following:-

1. Video encoder, network switches, etc.
2. Central control unit with all control functions like pan, tilt, focus and consisting of switching unit.
3. Video Motion Detection system
4. Video recorder to record video images

- 2 Nos -21'' FULL HD, LED Monitor with HDMI interface to CPU with Keyboard, Optical Mouse for monitoring at Main Control Room & Security Security Room.

- Monitoring unit also including Programming unit consisting of programming Monitor LED 21", keyboard and optical mouse, independent of monitoring unit with all required hardware and software for CCTV functioning.

- All furniture required in the Control room and Security Gate, to mount the CCTV equipment like TV, PC, keyboard , DVR, etc.

- All types of Cables (Video, Control/data, Optic Fiber and Power Supply etc.), cable glands, plugs, connectors and accessories, for interconnection of all the equipments supplied by vendor.

- Junction boxes, Power distribution boxes, repeaters, cable glands, etc. as necessary.

- Mounting poles for mounting the camera along with a climbing ladder.

- The Ladder to be provided with wheels & brakes for easy movement on roads.

- HDPE pipe with required pipe fittings for laying optical fiber cables between CCTV Cameras and main control room, and between main control room and security control room (gate / security house).
- Cable trays for CCTV cables within control rooms with required accessories in case required at site. Cable trays outside control room (where main cable duct is not available). Buried cable trench for cabling along the boundary walls.
- All necessary supports for installation of all items supplied by vendor.
- All mounting accessories required to mount various items supplied by vendor.
- Earthing material required for earthing of CCTV equipment installed by Vendor.
- Necessary base frame support for mounting CCTV cabinets in main control room.
- Any other item necessary but not specifically listed for successful operation of CCTV system.
- Packing, forwarding, transportation and storage at site of complete CCTV system and accessories.
- Supply of special instrument or tools needed for testing, calibration and maintenance of offered CCTV system.
- Supply of consumables and commissioning spares as per requisition for CCTV system.
- Any other item or/and activity not listed/indicated specifically but necessary for successful operation of CCTV system.
- CCTV monitoring of the site & image capture in case of an intrusion
- Future hardware expansion facility.
- The CCTV system shall be support high resolution viewing & recording.
- The images shall be transferred to a central location or on Mobile using Internet connectivity.
- The System shall be CE & FCC certified
- Complete system shall be from the same manufacturer.
- System should be design to work on low bandwidth WAN with following considerations:

1) Camera stream : H.265
2) Camera resolution : 4CIF (704x480)
3) Video quality : Medium
4) Number of cameras : 01
5) Frame rate per camera at site :25FPS
6) Frame rate per camera at Centre :15FPS
7) Recording type : Continuous 24 Hours per day
8) Desired days of storage per camera : 30 Days

All cameras should support dual stream and configured in such a way that one stream should provide feed to central control centre and other stream should be capable to support edge recording (memory card on camera or NVR). System should be intelligent to monitor WAN and whenever there is outage or central control centre not reachable camera should start recording on memory card or NVR present on camera and capable to restore the data to the central system in the missing area.

4. SCOPE OF SERVICE :

- Installation, integration of complete CCTV system and associated accessories including calibration, cabling, junction boxes, power supply, distribution boxes, etc.
- Installation of CCTV Cameras. The Cameras to be mounted on top of Pole, so as no blind spot is created due to pole.
- Installation of CCTV monitors for monitors located in main control room and monitors located in security control room (gate / security house).
- Installation of monitor located in MCR and security control room.
- Installation of mounting poles wherever applicable.
- Installation of CCTV cabinets for various units.
- Installation of programming unit PC.
- Installation of various junction boxes (signal, power, control) supplied by vendor.
- Laying of co-axial / optical fiber cable between CCTV Camera & Control Console Cabinets.
- Laying of power cable between CCTV Cameras and CCTV Cabinet in MCR.
- Laying of CCTV Cables (video, control, data, power).
- Laying of CCTV fiber optic Cables between MCR and security control room.
- Termination, ferruling and glanding at both ends and interconnection of various cables (video, optical, control, power) supplied by vendor for complete CCTV system.
- Distribution of power supply and reduction to required levels to various CCTV equipment supplied by vendor.
- Integration of CCTV Camera with BRPL Network

The entire IP surveillance system to be designed to control and monitor the locations provided based on following considerations:

- Camera to be of 4 MP (all to be integrated in the VMS present and future)
- CCTV system should be design to work on WAN with at lower bandwidth as low as (256Kbps per camera). Objects or persons should be identified under low bandwidth Scenario
- Bandwidth should be configurable

- System should be design to work and record on 15fps and 1 MP centrally
- System should be design with event based and continuous recording as and when required

Four types of cameras shall be considered to monitor the movement of the people as follows:

1) Indoor
2) Outdoor
3) PTZ
4) 360 degrees outdoor

- All cameras shall be True Day/Night function IP camera
- Analytics to be in built at camera side like – Face capture, Trip Wire, Counter, Object removal, Motion detection.
- All accessories with the outdoor cameras like JBs, power supply, media converter etc. should be in water poof and dust proof housing
- All cabling including LAN network will be in scope of vendor in case of open through ISI mark PVC / GI pipes or concealed through ISI mark PVC / HDPE pipe
- L2 POE Cisco switches should be used to power-up the camera in case of 4 or more at a location else power adapter to be used to power up the cameras
- Servers should be either HP / IBM
- Servers should be planned in redundancy

5. TESTS.

All equipment with their terminal connectors, and other hardware etc., shall conform to type tests and shall be subjected to routine and acceptance tests in accordance with Latest Relevant IS .

6. COMPLETENESS OF EQUIPMENT:

Any fittings, accessories or apparatus which may not have been specifically mentioned in this specification but which are usually necessary for the satisfactory operation of the equipment, shall be deemed to have been included in this specification.

7. PACKINGS:

All material shall be suitably packed for transport, direct to site and Manufacturer shall be responsible for all damages/losses due to improper packing. All boxes shall be marked with signs indicating the up and down sides of the boxes along with the unpacking instructions, if considered necessary by the Manufacturers.

Note: All critical areas/rooms to be covered fully leaving no grey area. Placement of cameras shall be such that there should be no shadow portion.

BSES BSES RajDhani Power Limited
BSES Bhawan, Nehru Place, New Delhi- 19

TECHNICAL SPECIFICATION

FOR

FIRE DETECTION AND ALARM SYSTEM

Prepared by	Javed		Rev: 0
Reviewed by	Abhinav Srivastava		Date:
Approved by	Gopal Nariya		

Technical Specification Fire Detection and Alarm System

1.0 INTENT OF SPECIFICATION:

This specification is intended to cover the design, manufacture, assembly, testing at manufacturer's works, supply & delivery, properly packed for transport FOR site of Fire and smoke Detection & Alarm System for substation control room building complete with all materials and accessories for efficient and trouble free operation.

In the even of any discrepancy with the listed documents, the stipulation of this specification shall govern.

2.0 SCOPE OF WORK

2.1 Scope of Supply

The following equipment shall be furnished with all accessories :-

a) Smoke and heat detectors and installation.
b) Manual call point for the substation building.
c) Fire detection alarm panels which shall be SCADA compatible along with its integration with SCADA.
d) All wiring & accessories to complete the installation.
e) All installation hardware.
f) All relevant drawings, data & instruction manuals.

3.0 GENERAL REQUIREMENT

3.1 Codes and Standard

All equipment and material shall be designed, manufactured and tested in accordance with the latest applicable Indian Standards except where modified and/or supplemented by this specification.

Equipment and materials conforming to any other standard which ensures equal or greater quality may be accepted. In such case copies of the English version of the standard adopted shall be submitted along with the bid.

In particular, the following standards and specifications are applicable.

Indian Electricity Rules	Relevant safety regulation of CEA
Indian electricity act	
CBIP manual	
IS 2189	Code of practice for selection, installation & maintenance of automatic fire alarm system.
IS 2190	Selection, installation & maintenance of first aid, fire extinguisher.
IS 1646	Tariff Advisory Committee Manual
	Code for practice for fire safety of buildings

Technical Specification Fire Detection and Alarm System

This specification shall be read and constructed in conjunction with the bid documents and annexure to determine the scope of work.

4.0 DESIGN CRITERIA

General	1. The fire detection system shall consist of various types of fire detectors, control cabling, fire alarm panels, central monitoring station, annunciation/control panels, local panels. 2. The fire detection and alarm system shall be microprocessor based, analogue addressable system. 3. A central monitoring system shall be provided in the control room covering complete substation. 4. The control system shall be compatible to be interfaced with SCADA system through separate communication port.
Location	Fire detectors shall be provided for the entire substation building including control room, switchgear room, battery charger, corridors, Cable Celler etc.Fire detectors shall be located at strategic location in various rooms of the building.
Operation	The operation of any of the fire detectors / manual call point should result in the following : a) A visual signal exhibited in the alarm panel indicating the area where the fire is detected. b) An audible alarm (Hooter) sounded in the panel. c) An external alarm sounded in the building, location of which shall be decided during detailed engineering. d) An alarm should be signaled to the control room.
Detection & Alarm system	1. Each zone shall be provided with two zone cards in the panel so that system will remain healthy even if one the cards become defective which shall be indicated at SCADA . 2. The control panel shall be suitable for 230V AC and 220V DC as power supply.
Cabling	The detector cable and the other control cable shall be armoured, screened and twisted FRLS type in external areas and shall be of unarmoured FRLS type inside building (in conduits)
Tests	All equipment shall be completely assembled wired, adjusted and routine tested at the factory as per relevant standards.
	Following tests shall be performed on the system a) Response characteristics of fire detectors. b) Performance test on fire extinguisher as required in the code. c) A comprehensive visual and functional check for the fire alarm panel. d) Verification of wiring as per approved schematic. e) Testing of fire detection panel as per BS3116 Part IV.
Site Test	All the detectors installed shall be tested for actuation by bringing a suitable smoke source near the detector creating a stream smoke over the detector. After each test smoky atmosphere should be cleared so that the detector shall reset.

	Certify proper operation of all detectors and call points.
	One of each type of extinguisher shall be tested for its performance.

5.0 DEVIATIONS

Deviation from this specification, if any, shall be clearly brought out in the offer. Unless owner explicitly accepts such deviations, it shall be considered that the offer fully complies with the specification.

TECHNICAL SPECIFICATION

FOR

CABLE SEAL SOLUTION

Specification No- SP-GMS-01-R0

Prepared by	Javed Ahmed		Rev: 1
Reviewed by	Abhinav Srivastava		
Approved by	Gopal Nariya		Date: 16th April 2022

Index

1.0. SCOPE:

This specification covers design, engineering, manufacture, assembly, stage testing, inspection & testing before supply & delivery at site and installation testing and commissioning including handover the system to BRPL after successful execution of Cable Seal Solution
This Scope includes the following

a) Supply of Cable Seal System including its transportation to BRPL Site
b) Installation testing commissioning of Cable seal solutions with all the accessories including minor civil work if any.

2.0. Basic Features:

Following requirements shall be fulfilled and supported with valid test reports/certificates:

1. Minimum IP 65 Protection level Certificate for protection from Dust and Water.
2. Heat sink test report of Cable transit system.
3. Certificate/ Test Report for Protection from Rats and Rodents.
4. ATEX, PESO Approval for Explosive atmosphere.
5. NEMA Certificate as per UL 508A for the safety of Cabinets & Enclosures mandatory.
6. Material of Frame shall be of Stainless Steel.
7. System must have Bonding & grounding (Armour Earthing) feature as per IS 3043-1987 using a suitable Tin Plated Copper Braid to be used wherever required. It should be also tested for Impulse withstands as per IEC 62305-1 for minimum 50kA for 1 sec.
8. Manufacturer should have direct presence in India with all the after Sale & Service support from last 10 years.
9. Cable sealing system should have been tested for F- Rating Fire for 3 hrs as per UL 1479/ EN, Insulation and Integrity for 120 mins as mentioned in Indian National Building Code(EI 120) Certificate from BS 476 are mandatory.
10. Cable sealing system should have been tested for GAS tightness of 2.5 bar pressure.
11. EPDM modules in System must have Halogen content less than 200ppm with low smoke index-F1 Classification as per NF16-101 & NF16-102, Heat Radiation test in compliance with M2 classification, UV Ageing Test as per ISO-4892-2:2006 & ISO-815- 1:2008, Oxygen Index Test as per ASTM D 2863-00, Shock & Vibration Test as per NES 510.
12. System must have Bonding & grounding (ArmourEarthing) feature as per IS 3043-1987 using a suitable Tin Plated Copper Braid to be used wherever required. It should be also tested for Impulse withstand as per IEC 62305-1 for minimum 50kA for 1 sec.
13. Smoke Index shall be low. Type test reports for the same shall be provided by the supplier.
14. Shelf life of module - 25 Years
15. Solubility – Insoluble in water.

3.0. SERVICE CONDITIONS:

S.No	Particulars	Data
1	Design Ambient temperature	0°C to 50 °C
2	Seismic Condition	Zone IV as per IS 1893
3	Wind Pressure	195 kg/M² upto elevation of 30 M as per IS 875
4	Maximum Relative Humidity	100%
5	Maximum Altitude above Sea level	1000M
6	Rainfall	750mm (concentrated in 4 months)
7	Pollution level	Heavy/Dry
8	Average of no thunderstorm days	40 per annum

4.0. SYSTEM DESIGN

1. Modules with concentric peel able/removable layered multi-diameter cable sealing system consisting of frames, blocks and accessories shall be installed where the cables enter or leave any type of Electrical Panel/Cabinet/Transformer cable box.Each concentric module shall have a minimum of 10 mm range between smallest and largest adaptable diameter. System should be designed with minimum **+/-** 3 mm design margin. System should have provision for usable spares of 30**%** with no loose/ hanging / add layer / plug in type or to be stored components of modules / seals, each spare module should be concentric peelable/removable multi-diameter layered with complete range installed on Frame and solid Block are not acceptable..

2. It Shall cover following openings

   For all Cable entry from outside to control room building and between room to room

5.0. MAINTENANCE

Bidder shall furnish a maintenance manual and support maintenance activity.

6.0. APPROVED MAKES

Roxtec, MCT Brattberg

7.0. APPROVED MAKES

8.1	Submissions along with the bid	
8.1.1	Duly filled GTP and copy of	2 copies + 1 soft copy

	specification	

8.0. SHIPPING

9.1	Shipping	The bidder shall ascertain at an early date and definitely before the commencement of manufacture, any transport limitations such as weights, dimensions, road culverts, Overhead lines, free access etc. from the Manufacturing plant to the project site. Bidder shall furnish the confirmation that the proposed Packages can be safely transported, as normal or oversize packages, up to the site. Any modifications required in the infrastructure and cost thereof in this connection shall be brought to the notice of the Purchaser.
		The Bidder shall be responsible for all transit damage due to improper packing.

9.0. HANDLING AND STORAGE

10.0	Handling and Storage	Manufacturer instruction shall be followed. Detail handling & storage instruction sheet / manual needs to be furnished before commencement of supply.

10.0. QUALITY

11.1	Vendor quality plan	To be submitted for purchaser approval
11.2	Inspection points	To be mutually identified & agreed in quality plan

11.0. DEVIATION

12.1	Deviation	Deviations from this Specification shall be stated in writing with the tender by reference to the Specification clause/GTP/Drawing and a description of the alternative offer. In absence of such a statement, it will be assumed that

		the bidder complies fully with this specification. No deviation will be acceptable post order.

12.0. TESTING AND INSPECTION

Shall be as per latest relevant standards

13.0. TRAINING

Training on installation, commissioning, operation and maintenance shall be included in the proposal.

- at factory/site- 1 Manday

SCHEDULE – C12

GROUNDING & LIGHTNING PROTECTION SYSTEM

S.No.	Description	Unit	Data by vendor
1	**Earth mat**		
a	Material		
b	Size of conductor		
c	Fault withstand current & duration		
2	**Equipment Earthing**		
a	Material		
b	Size of conductor		
3	**Earth Electrode**		
a	Material		
b	Size		
c	Length		
4	**Lightning Protection System**		
a	Material and size of horizontal air termination		
b	Material and size of vertical air termination		
c	Material and size of down conductor		
d	Size of test link		
e	Material of enclosure for test link		
f	Material and size of earth electrode		

Bidders Name : _____

Signature : _____

Name : _____

Designation : _____

Seal of Company Date : _____

SCHEDULE – C13

CABLE ACCESSORIES

1	Cable Accessories	
1.01	Makes	
1.02	Termination kits	
1.03	Straight through joint kits	
1.04	Cable glands	
1.05	Cable lugs	
1.06	Termination blocks	
1.07	Types	
1.08	Termination kits	
1.09	Straight through joints	
1.1	Cable glands	
1.11	Cable lugs	
1.12	Terminal blocks	

Bidders Name : _____

Signature : _____

Name : _____

Designation : _____

Seal of Company Date : _____

SCHEDULE – C14

CABLE TRAYS, ACCESSORIES AND TRAY SUPPORT, CONDUITS, PIPES AND DUCTS

1	**General**	
a	Name of the Contractor	
b	Name of sub contractors, if any	
c	Applicable standards	
2	**Cable Trays and Fittings**	
a	Cable Trays and Fittings	
i.	Make	
ii.	Type	
iii.	Material	
	1. Thickness (mm)	
	2. Thickness of galvanization (microns)	
	3. Zinc coating per sq meter (gms)	
3	**Conduits , Fitting and Accessories**	
a	Pipes with fitting	
i.	Make	
ii.	Type	
iii.	Material	
	1. Thickness (mm)	
	2. Thickness of galvanization (microns)	
b	Flexible conduits with fittings and accessories	
i.	Make	
ii.	Type	
iii.	Material	
	1. Thickness (mm)	
	2. Thickness of galvanization (microns)	

Bidders Name : _____

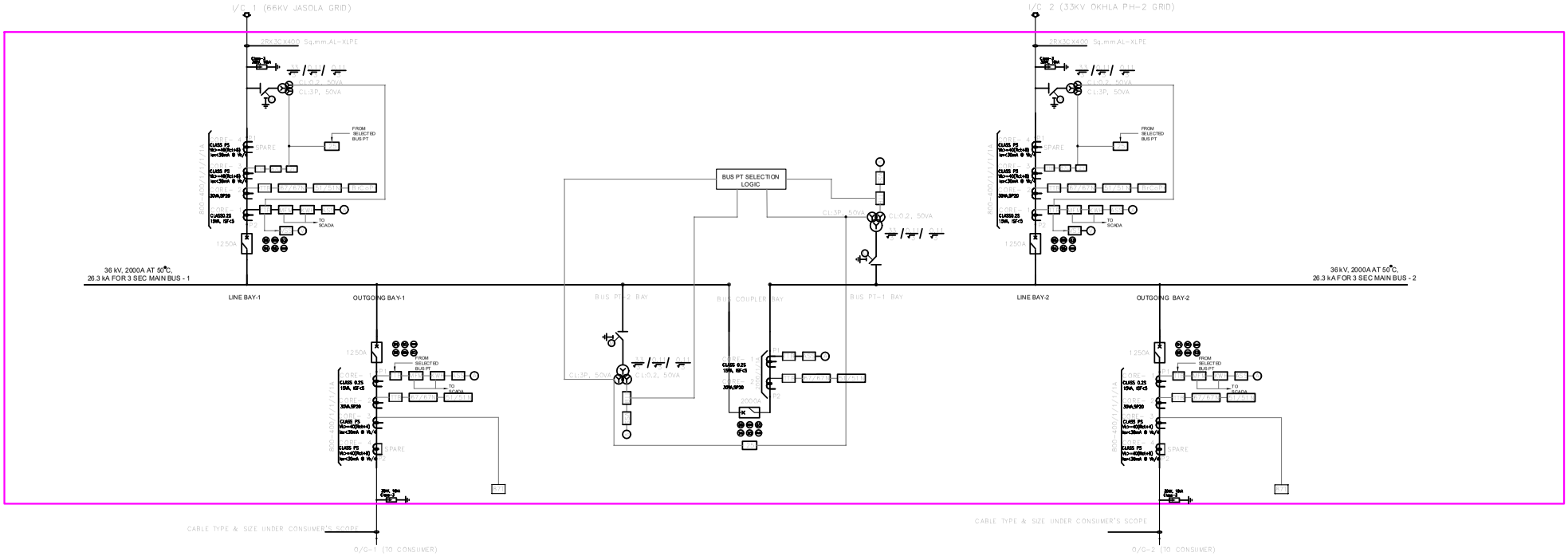
Signature : _____

Name : _____

Designation : _____

Seal of Company Date : _____


RECHARGE PIT
AS / PLUMBING
2NOS. 300 Ø RCC HUME PIPES
1100mm DEEP FOR HT CABLE
1NO. 300 Ø RCC HUME PIPE
1100mm DEEP FOR HT CABLE
600x600X1200D
MAN HOLE
1000X1000X1200D
MAN HOLE
1200X1200X1200D
MAN HOLE
GI. PIPE EARTHING
FOR POLE LIGHTING
HT METER
B/EARTH
HT ISO.
B/EARTH
80ø FIRE PIPE
RUNNING AT UNDER FILLING
300 MM WIDE SAUCER
DRAIN AS/ PLUMBING
2NOS 150ØPVC SLEEVE
FOR D.G. B/EARTH
2NOS 150ØPVC SLEEVE
FOR HSD PIPE
LIFT
B/EARTH
EXT FP-2
B/EARTH
D.G-1
N/EARTH
D.G-2
N/EARTH
D.G-3
N/EARTH
HT PANEL
B/EARTH
1NO 150ØPVC SLEEVE
FOR HT PANEL B/EARTH
2NOS 300ØPVC SLEEVE
FOR HT CABLE
2NOS 150ØPVC SLEEVE
FOR TRAFO. PANEL B/EARTH
TRAFO.
N/EARTH
TRAFO.
B/EARTH
FIRE EM. PANEL
B/EARTH
LT PANEL
B/EARTH
2NOS 150ØPVC SLEEVE
FOR LT PANEL B/EARTH
1NO 150ØPVC SLEEVE
FOR EXTERNAL
UPS
B/EARTH
EXT FP -1
B/EARTH
100ø FIRE PIPE
FROM BASEMENT 1 CEILING
2NOS 100ØPVC SLEEVE
FOR EXTERNAL
3NOS 100ØPVC SLEEVE
FOR LV SYSTEM
2NOS 100ØPVC SLEEVE
FOR LV SYSTEM
2NOS 150ØPVC SLEEVE
FOR LIFT B/EARTH
FGL.+730
FGL.+700
FGL.+680
FGL. +750
T.O.S ±00
FGL. +685
FGL. +672
FGL. +664
FGL. +684
SLOPE
1:20
DN
RAMP
UP 1:15
LA
33KV HT PANEL
ROOM
1200 W X 1200 DEEP
H.T CABLE TRENCH
D.G COOLING PIPE SHAFT
1500X500MM
ELECTRICAL CUTOUT
500X200MM
HSD YARD
HSD TANK
B/EARTH
BOUNDARY WALL AS/ARCH.
RETAINING
WALL AS / STR
100ø TWO WAY FIRE WITHDRAW
CONNECTION PIPE
150ø FOUR WAY FIRE
BRIGADE INLET CONNECTION
WATER METER CHAMBER
FROM TANKER SUPPLY
80ø INLET LINE FROM
MUNICIPAL WATER SUPPLY
SAUCER DRAIN
AS/ PLUMBING
150ø DG PUMP EXHAUST PIPE
FFH



LEGEND

- POWER CIRCUIT
- CONTROL CIRCUIT
- BUSBAR
- LIGHTNING ARRESTOR
- 3 POSITION MOTORISED ISOLATOR WITH EARTH
- POTENTIAL TRANSFORMER
- MOTORISED EARTH SWITCH
- CURRENT TRANSFORMER
- SF6 CIRCUIT BREAKER
- POWER TRANSFORMER
- FUSE
- DRAWOUT TYPE VACCUM CIRCUIT BREAKER
- 27 UNDER VOLTAGE PROTECTION
- 59 OVER VOLTAGE PROTECTION
- MFM MULTI FUNCTION METER
- PQA POWER QUALITY ANALYSER
- EM ENERGY METER
- AMMETER SELECTOR SWITCH
- AMMETER
- VOLTAGE SELECTOR SWITCH
- VOLTMETER
- TEST TERMINAL BLOCK
- 87L LINE DIFFERENTIAL PROTECTION
- 21 DISTANCE PROTECTION
- 25 SYNC-CHECK RELAY
- 87T RESTRICTED EARTH FAULT
- OLTC TAP POSITION & RAISE/LOW ON OLTC
- 63 DIFFERENT SWITCHES ON POWER TRANSFORMER - HV WTI, LV WTI, OTI, Main Tank OSR, SPR, PRV, Buchholz, MOG, OLTC OSR trip, OLTC Out of Step/Stuck Up/Motor trip
- 59N NEUTRAL DISPLACEMENT PROTECTION
- 67/50/51 DIRECTIONAL OVERCURRENT & EARTH FAULT
- 50/51 OVERCURRENT & EARTH FAULT
- 46/50/51 BROKEN CONDUCTOR PROTECTION
- 63 SF6 ABNORMAL PRESSURE PRTECTION
- 50BF LOCAL BREAKER BACKUP PROTECTION
- 86 LOCK OUT RELAY
- 74 ANTIPUMPING RELAY'N
- 52 BREAKER CONTACT MULTIPLIER
- 74 TRIP CIRCUIT SUPERVISION RELAY

Note:

1. This drawing is tentative and for tendor pupose only.
2. Refer tender specification for further details.

REV. No.	DESCRIPTION	DATE	PRPD. BY	CHKD BY	APPR. BY
C					
B					
A	FIRST DRAWING	28.12.23	SK	US	AS

BSES Rajdhani Power Limited

BSES Rajdhani Power Limited
BSES BHAWAN
Nehru Place, New Delhi - 110019

DRAWN	SK
CHECKED	US
APPD.	AS
DATE	28.12.23
SCALE	NTS

TITLE:-

SLD OF M/S GODREJ PROPERTIES

DWG No.:- BRPL-GODREJ PROPERTIES-DEE-B-0000

SHEET 1 OF 1

REV. 00

VER. 00

BSES Basemap

GRID Map

Scheme Verification

BSES Raster

Google Road

Google Hybrid

BSES

TECHNICAL SPECIFICATION

FOR

LAYING OF 66 kV / 33 kV / 11 kV / 1.1 KV GRADE PVC / XLPE CABLES

Specification no: GN101-03-SP-06-03

BSES RAJDHANI POWER LTD			
Prepared by	Pronab Bairagi		Rev : 03
Reviewed by	Amit Tomar	31.10.17	Date : 31.10.2017
Approved by	Vijay Panpalia		Pages : 44
Registered Office: BSES Bhavan, Nehru Place, Delhi - 110019			

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General Specification

1.0 Codes & standards

Materials, equipment and methods used in the Laying of 11/33/66KV Cable shall conform to the latest edition of following –

S. No.	Reference No.	Name of Standard
1		Indian Electricity Rules, 1956
2		Indian Electricity Act, 1910
3		Indian Electricity Supply Act, 1948
4		Electricity Laws Act, 1991
5		National Electrical Code (Indian standards Institution)
6	IS 1255	Code of practice for installation and maintenance of Power Cable upto and Including 33KV rating.
7	IS 1554	PVC Insulated Electrical Cables upto 11KV
8	IS 2274	Code of Practice for electrical wiring installation – system voltage exceeding 650V
9	IS 7098 Part II	Crosslinked Polyethylene Insulated PVC sheathed cables for working voltages from 3.3KV upto and including 33KV
10	IS 7098 Part III	Crosslinked Polyethylene Insulated PVC sheathed cables for working voltages from 66KV upto and including 220KV
11	IS 5820	Specification of precast concrete Cable cover.

2.0 Design guidelines and Parameter for cable laying-

S. No.	Parameter	Details
2.1	Selection of Cable Route	The cable route selection shall be done by the concerned supervising engineer by first conducting route survey and selecting a route along with contractor keeping followings in mind: -The side of road which presents the least obstacles and the fewest roadways crossings. -The future consumers and existing cables in the route may influence the cable route. -Railway, road crossings, MCD and other government agencies may also influence in selection of cable route. -Plans for future building projects should be considered. -The route shall be as far as possible away from parallel running gas, water pipes and telephone/telecommunication cables.
2.2	Site Preparation	a) Barricading: • The identified cable route shall be barricaded continually before excavation. • Barricading shall be as drawing laid • Open Trench method shall be adopted as far as possible for trench preparation. b) Excavated Earth:

		• The excavated earth shall be so stored at site, that it shall not cause trouble to running traffic • All excavated earth shall be stored within the barricaded area. • c) Full height fence, barriers, barricades etc. shall be erected around the site in order to prevent the working area from the risk of accidents due to speedy vehicular movement. Same the way barricades protect the road users from the danger due to construction equipment and temporary structures. d) The structure dimensions of the barricades , material and composition, its colour scheme, BSES logo and details shall be in accordance with specification and drawing laid down in the tender documents. e) All the barricades shall be erected as per the design requirements of employer, numbered painted and maintained in good condition and also barricade in charge maintain a barricade register at site. f) All barricades shall be conspicuously seen in the dark/night time by the road users so that no vehicle hits the barricades. Conspicuity shall be ensured by affixing retro reflective strips of required size and shape at appropriate angle at bottom and middle portion of the barricades at a minimum gap of 1000 mm. In addition minimum one red light /red blinker and red beacon light should be placed at the top of each barricade. g) PPP to be provided by vendor to all workers and engineers. **h) Also refer Annexure- 7: Barricading and Safety**
2.3	Clearance	The desired minimum clearances are as follows – - Power cable to power cable – A minimum clearance equal to diameter shall be maintained. Trench drawings shall be referred to for guidance. - Power Cable to control cables – 0.2 M - Power cable to communication cable – 0.3M - Power cable to gas/water main – 0.3 M
2.4	Depth of Cable Laying	The desired minimum depth of laying from ground surface to the top of cable shall be: 650 / 1100V grade XLPE Cables – 75 cm 6.35 / 11KV grade XLPE Cables – 90 cm Low voltage and Control cable - 75 cm 19 / 33KV grade XLPE Cables - 1.2 M 38 / 66KV grade XLPE Cables - 1.5 M Cables at Road crossing - 1.0 M (min.) Cables at railways level crossings (measured from bottom of sleepers to the top of Pipe) - 1.0 M (min.) Whenever there is any obstacle at the laying depth, the cable should be lowered/ raised to cross the obstacle. However variation in the depth is to be approved by BSES. The Contractor shall provide the same in deviation report.
2.5	Width of Cable	The width and depth of Cable Trenches shall depend upon number of

	trenches	circuits and Voltage Grade. Annexure # 3 and drawings of this specification shall be followed.
2.6	Bending Radius of Cables	While pulling of the Cable from the drum or during laying following minimum bending radius shall be maintained so that the cable, in particular the insulation does not get damaged – A) Single Core Cables (PVC & XLPE) Upto 1.1KV grade – 15 X D Above 11KV grade - 20 X D B) Multi Core Cables (PVC & XLPE) Upto 1.1KV grade - 12 X D Above 1.1KV grade – 15 X D Where 'D' is overall diameter of the cable.
2.7	Maximum permissible Tensile Strength for Cables	For cables pulled with Stocking PVC and XLPE SWA Armoured cables P = 30 X D PVC and XLPE AWA Armoured cables P = 20 X D Where P= pulling force in Kgrm, D= Diameter of Cable in mm For Cables pulled by Cable eyes Aluminium conductor – 30 N/mm2 = 3 Kg/sq. mm Copper conductors - 50N/mm2 = 5 Kg/sq. mm Permissible force is calculated by multiplying the above values by cross sectional area (CSA) of conductor of each core and then number of cores.
2.8	Methods of Laying	a) Cables shall be laid in direct in ground, in trenches excavated therein and shall be protected with covers as given in the drawing. Cables shall also be drawn into pipes of ducts or laid in the formed trenches or troughs or on racks or supported in trays or cleats as required by the site exigencies. Where the cables are laid in the formed trenches, the installation shall include removal and replacement of the trench covers and the provision of temporary protective covers on the trenches where they cross the access ways. b) HDPE (PN6,PE80) or RCC ducts shall be used where cable cross roads and railways tracks. Spare ducts for future extensions should be provided. Spare duct should be sealed off. Buried ducts or ducting blocks shall project into footpath or upto the edge of road, where there is no footpath, to permit smooth entry of cable without undue bending. The diameter of the cable conduit or pipe or duct should be at least 1.5 times the outer diameter of the cable. Angular alignment of the duct across road crossings shall be predetermined to maintain safe bending radius when direction of cable trench changes before or after the road. c) The contractor shall lay cable by Horizontal direct drilling (HDD) in main roads and highway with heavy traffic, passage to public property where excavation is not possible. Contractor shall take approval for laying of cable by means of HDD wherever required from the supervising engineer. The cable laid by HDD shall be

		minimized so that it doesn't exceed by 12% of total route length. This is to avoid De-rating of Cables. d) Unless approved by BSES, the contractor shall lay the cables, direct in ground, in single layer. The cables shall be laid with the pre-determined and approved cable route. e) Spacing shall be maintained uniformly between the cables all along the length including the bends, as approved by BSES. To maintain the spacing, suitable non-metallic formers shall be placed uniformly with spacing not exceeding 5 meters. Every bend shall have at least one spacer. f) 75 mm of the sand bed shall be placed at the bottom of cable trench. g) After the cables have been laid the trench shall be filled with the sand and shall be well rammed to a level not less than 75 mm above the top of the cables all throughout the route. h) To protect the cables against external mechanical damage, which may be caused by other agencies, the cable shall be protected by suitable cover. (for drawing of RCC cable cover refer annexure VI). i) The type of the covers shall be as under - 1.1KV Cables – Single layer of brick thickness not less than 75 mm (3 inch) - 11KV Cables – sand stone of thickness not less than 75mm (3 inch). - 33KV Cables shall be protected by reinforced concrete cover of width 300 mm as per attached drawing with thickness not less than 50mm. - 66KV Cables shall be protected by reinforced concrete cover as per attached drawing with thickness not less than 50mm. The RCC cable cover shall be embossed as "BSES EHV CABLE". j) Back fill to be filled up to 75mm and the warning tape shall be installed continuously. The tape shall be yellow in colour with Black / Red lettering of minimum 20mm height. The approved warning message shall be written in English and Hindi/ local language. The minimum thickness and width of the tape should be 300 microns and 150 mm respectively. k) The trench shall be filled-up by loose soft soil (300mm) and Excavated soil as indicated in drawings.
2.9	Cable over	On Bridges the cables are generally supported on wooden cleats and

	Bridges	clamped on steel supports at regular intervals. The cables laid on bridges shall be provided with Sun shield. Approval from appropriate authorities (PWD/railways) as applicable shall be taken by contractor.
2.10	Laying of Single Core Cables	a) The single core cables shall be laid in trefoil formation. Single core cables can be laid individually in HDPE pipe in case of HDD only. (Details of HDPE Pipe as per Annexure-9) b) For single core cables laid in trefoil formation, plastic cable ties shall be used at interval of 1.0 (one) meter throughout the cable length to maintain the trefoil arrangement. c) To balance the inductance, the phase sequence in trefoil format shall be maintained by vendor (for double circuit) d) To prevent magnetic losses (eddy current and hysteresis losses), the base plate of the panels or the terminal box of the equipments, shall have aluminium plate. In case the entry into the building is through GI pipe, a "slit" in the GI pipe shall be necessary. Alternatively GI pipes may altogether be avoided and non-metallic pipes such as PVC or HDPE pipe shall be used. Concrete pipes having steel reinforcement (RCC pipe) are not to be used.
2.11	Earthing of Single Core Cables	a) Single point bonded earthing shall be employed to prevent flow of induced circulating current in the armour and screen and consequential de-rating of cables for feeder less than 2.0 KM. b) For feeder length more than 2 KM, mid point earthing shall be provided.
2.12	Violation of barricading guideline and safety norms	On violation of barricading guideline and safety norms, a fine of Rs.5000 /day shall be imposed. BRPL inspector/engineer in-charge shall be empowered to impose the above penalty.

3.0 General guidelines for Laying Cables

S. No.	Parameter	Details
3.1	General	a) Laying of the cables and handling of the same shall be undertaken, at all times, by adequate staff suitably trained and supplied with all the necessary plant, equipment and tools. b) The contractor shall be responsible for all the route survey, establishment of the position of the joints as per the site exigencies and the drum lengths of cables to be laid. While carrying out the route survey the contractor shall take into account the obstacles on the route whether above or below ground. The cable shall be planned to be laid in an orderly formation, free from unnecessary bends and crossings c) The contractor shall submit a drawing for the complete scheme

		showing the entire route, road crossings, location of joints and also the arrangement of cables to be laid. In case due to site exigencies, cables have to cross over within the trench, the same shall be shown in the drawing. For each and every job, these drawings shall be approved by BSES, prior to commencement of work. d) BSES shall arrange for all the material and manpower required for jointing and end termination. The Contractor shall provide pit, carry out excavation for creation of working space required for jointing by the jointer. All civil works, structural work, clamping and earthing shall be carried out by the contractor, so that the cables and accessories perform satisfactorily during the entire life time. e) The entry and exit of the cables into the building shall be through RCC or GI pipe except for single core cables, which shall be properly sealed and shall be duly supported as per the method and technique approved by BSES, so that the outer sheath of the cable does not get damaged at the entry and exit points. The sealing should be of adequate length so that it minimizes the risk of spreading of fire or ingress of water.
3.2	Handling and Storage of Cable drums (All empty drums are returnable)	a) The cable drums shall be transported upright, so that the weight is distributed on both the flanges. Under no circumstances the cable drum may be laid on its side. During transportation the drums must be properly secured. The cable drums should never be dropped from Lorry or a trailer, so as to prevent damage to the cable drum and also to the cable. Ramp may be used for unloading. The drums may be rolled over short distance, provided the correct direction of rolling as provided on the drum is observed. Alternatively, a mobile crane should be used for lifting and lowering the drum. A chain-pulley arrangement may also be used to lift the drums and deposit the same on ground if required. b) In case the drums are to be stored prior to cable laying, they should be arranged in such a way to leave some space between them for air circulation. It is desirable that the drums stand on battens placed directly under the flanges. Overhead covering is not essential except in heavy rainfall areas or during monsoon. Cable should however be protected from direct rays of sun by leaving the battens on or by providing some form of sunshade. In no case the drums shall be stored in a flat position with flanges horizontal. c) For transportation of the cable drums from storage site to work site, the drum should be mounted on a trailer or an open lorry and unloaded by mobile cranes. d) After cable laying, empty cable drums shall be taken return back by vendor from site at their own risk and cost. Cost of empty drums shall be deducted from vendor account during final settlement.
3.3	Cable Laying	a) The ground over which the drum is positioned at site should be

		properly consolidated and jacks placed on both sizes of the drum to make the pay-off arrangement stable. Suitable arrangement be made to stop the drum rotation, during cable laying preferably by square wooden poles kept temporarily pivoted over cable roller under the flanges which when required can be applied on the flange as a brake by personnel manning the drum. b) The cable should always be paved off from the top of the drum. The drum must be positioned in such a way that the arrow on the drum points opposite to the direction of rotation marked on the drum. c) It must be ensured that the cable is not dragged over sharp object or on the road surface, so as to avoid damage to the outer sheath of the cable. d) The pulling method to be used shall be approved by BSES. Cable supplier's recommended maximum pulling tension shall not be exceeded. e) Rollers shall be placed at intervals and the cable shall be pulled over the rollers. The rollers shall be kept lubricated so that they rotate freely, minimize friction to the cable in motion. Rollers shall be positioned at the bends to minimize side wall friction. The contractor shall ensure that PVC/HDPE sheath of cable is free from damage due to abrasion. f) The cable should not be pulled out from the drum by lifting of the coil while the drum is lying flat on the flange. This leads to twisting of the armour and cores resulting in permanent damage to the cable. g) To avoid ingress of moisture, it must be observed that the end capping of the cables is not damaged. Cut pieces of the cables must be capped immediately, before laying of the same is taken-up.
3.4	Excavation of the Trenches	a) The excavation of the trenches shall be commenced, with proper co-ordination with BSES, so that all the necessary clearances for the route are already obtained from the competent authorities, well in time. b) Before opening of the section of the trench, the contractor shall satisfy himself that the line of the trench is clear of underground obstructions, by taking out trial pits on the line of the trench. c) The exact location of each trench shall be approved on site by BSES. The trenches shall be kept as straight as possible and each trench shall be excavated to approved formation and dimensions. If necessary, the trenches shall be adequate shored by wooden planks and bracing to avoid trench cave-ins which would cause injury to the persons and also damage the cables laid. d) The bottom of each trench shall be firm and of smooth contour. The contractor shall take reasonable precautions to prevent damage to the highway or ground surface from a slip or breaking away of the sides of the trench. e) The trench excavation and filling in shall be so executed that all

		walls, roads, sewers, drains, pipes, cables, structures, places and things shall be reasonably secured against risk of subsidence or injury and shall be carried out to the satisfaction of the authorities concerned. Should, however, a damage to an existing or other services be made, the Contractor will arrange and pay for any necessary repair, to make good the damages. f) Where trenches pass from a footway to a roadway or at other positions where a change of level is necessary, the bottom of the trench shall rise or fall gradually. The rate of rise or fall shall be approved by BSES. g) Contractor shall ensure that during excavation and until restoration has been completed, for reasonable access of persons and vehicles to property or places adjacent to the route. h) When the excavation of the trenches has been accurately executed, the contractor shall inform BSES for approval. Laying of cables or building of structure shall not be started until the contractor has been advised by BSES to proceed with the work.
3.5	Excavated material	a) The materials excavated from each trench shall be placed so as to prevent nuisance or damage to adjacent ditches, drains fences, gateways and other property or things. Excavated material shall be stacked so as to avoid undue interference with traffic. b) Where, owing to traffic or for reasons of safety or other considerations, this is not permissible, the excavated material shall be removed from the site and returned for refilling the trench on completion of laying; surplus material shall be disposed off by the contractor at his own cost.
3.6	Pipes and Ducts	a) Care shall be taken to make the bend of the pipes or duct lines as easy as practicable and in no case of radius less than 3 meters. Where approved, split pipes may be used on bends, the pipes being fitted round the cable after laying. b) All road crossings shall be ducted. This applies to present and future roads as indicated on the route plans. The pipes and the ducts shall be laid in an approved manner and shall be surrounded by 150 mm of PCC (1:2:4) c) Ducts under the road shall be provided by the contractor, by non-disruptive method, if road cutting is not permitted by the concerned authorities Cable laying shall be done by Horizontal Direct drilling method (HDD). d) The cables shall be suitably protected at entry and exit from the pipes, so that the outer sheath does not come in contact with the edges of the pipes / ducts. The pipes and ducts shall have slope so that the seepage water can drain through the small opening provided on the lower side of the pipe sealing. e) The pipes and ducts shall be secured to the base at both ends and at regular interval, throughout the length, so that at no point the ducts or pipes get suspended over the threaded cable, and damage the same, thus defeating the very purpose of providing the pipe / duct.

		f) At all road crossings at least one spare duct / pipe shall be provided for future use. The pipe shall be thoroughly cleaned of obstructions. A draw wire or rope shall be left in each pipe to facilitate the drawing in of the cables. The duct end shall be sealed temporarily to prevent the entry of foreign matter. End caps and permanent markers shall be placed flush with footpath / roadways at both the ends. The pipes and ducts shall be cleaned again immediately before the cables are drawn in. g) The internal diameter of the pipe / duct should be such that the cables occupy only 40% of the area of the pipe / duct to avoid de-rating.
3.7	Joint Bays	The contractor shall provide all help so as to enable jointers to carry out their work efficiently and expeditiously. The method of securing and supporting cable joints and cables also the bonding and earthing thereof, shall be detailed on the drawing. The details shall be approved by BSES prior to commencement or work. The joint position should be staggered.
3.8	Back filling of trenches	a) Filling in of trenches shall not be commenced until BSES has inspected and approved the cables and accessories at site. The inspection should be got done on daily basis so that the trenches do not remain open unnecessarily, to avoid inconvenience to public. b) The trench shall be backfilled after putting all protections for cables. c) Soft soil shall be backfilled for 300 mm above the cable protection cover. d) Caution Tape shall be laid all along the cable route above the soft soil filling. e) Complete backfilling shall be done above the caution tape.
3.9	temporary Reinstatement	a) Where cables routes are in public highways, footpaths, gardens etc., the method of reinstatement will be subject to approval by MCD. All costs incurred will be at the contractor's expenses. b) The contractor shall be responsible for proper permanent reinstatement of the upper levels, which shall be carried out to the satisfaction of BSES and the MCD authorities concerned. c) Before finally leaving site, permanent reinstatement shall be executed by the contractor to the approval of MCD and the property owners and all costs incurred shall be to the contractor's account.
3.10	Permanent Reinstatement of Public Road,	a) In public roads and footways the surfaces and foundations shall be temporarily reinstated by the contractor. After settlement, temporary reinstatement material shall be removed as necessary and the permanent reinstatement shall be carried out to the approval of the appropriate highway authority / MCD. Stone and pre-cast concrete paving kerbs and channels shall also be finally reinstated by the contractor. b) Temporary reinstatement shall be maintained by the contractor until commencement of final reinstatement to ensure that the surface is always safe for the passage of pedestrians and vehicular traffic.

3.11	Identification	All cables shall be identified below the gland at each end, at joint position and at approved positions by means of bands engraved or punched with cable no. feeder name, size of cable, number of cores, phase colour etc. The bands shall be secured fastened in a permanent manner, and shall be made of material able to resist corrosion, dampness and mechanical damage.
3.12	Cable Route Markers	All cables routes shall have markers at suitable location with a gap not exceeding 30 meters. The route markers shall be approved design. Additional markers shall be provided at joint locations with approved markings.
3.13	Cable supports / Clamps	a) The contractor shall supply and install all the supports, racks, trays, cleats, saddles, clips and other parts required to carry and secure the cables, without risk so that there is no undue mechanical load or stress due to weight of the cable at each end. Cleats, saddles and clips shall be of the design as approved by BSES. No cable shall be laid on the trench floor. They shall be run in a neat and orderly manner and the crossing of cables within the trench shall be avoided as far as possible. Where cable runs unavoidably cross, a suitable supporting arrangement shall be provided to maintain an adequate gap between the cables b) Every cable shall be supported at a point not more than 500 mm from its termination.
3.14	Installation of Cables in tunnels / basement / below the panels etc	a) The design of cable support for cables installed in air in cable tunnels, basements etc. shall consist of vertical steel members spaced at approved interval and secured to the walls, floors and ceilings as necessary by means of bolts either cemented in position or expanded into cored holes. Each vertical support shall have bolted to it a number of steel brackets spaced at the intervals and designed to support and retain trays constructed of galvanized sheet steel of adequate section to carry the weight of the cables, plus space for an additional quantity of future cables at least 25% by weight and dimensions in excess of the cables installed under the contract and an additional load of 100 kg at the extremity without distortion. The trays shall be designed with raised edges to retain the cables and shall incorporate an interlocking feature so as to prevent movement between supports. b) The design and construction of all cable cleating and supporting arrangements shall suit the cable system design. The spacing of cable supports shall be approved by BSES. c) Cable run on trays shall be neatly dressed and where not provided with cleats shall be secured by heavy gauge, type approved metal reinforced, clips or saddles. Not more than six cables shall be embraced by one clip. d) Mild steel of appropriate sections, duly painted in an approved manner, shall be used for fabrication of cable supports. The steel shall be free from blisters, scales, laminations or other defects. Before final painting, the steel sections shall be provided with double coat of red primer.

3.15	Cable Protection at overhead Towers or Poles	Where the cables terminate on overhead line poles or towers located outside substation compounds the contractor shall provide suitable cable supporting galvanized steel work attached to the pole or tower and comprising backboard, runners, sheet, steel cover of not less than 3.0mm thickness, stays, cable cleats, anti climbing guard and all incidental items to provide secure protection for the cables. Isolators and Lightning arrestor if required to be installed shall be provided as free issue item to the contractor, however the erection and steel structure required shall be in scope of the contractor.
3.16	Sun Shades	All cables shall be protected from direct solar radiation by ventilated sun shields as approved by BSES.
3.17	Route Plan	a) BSES intents to show all the cable routes, location of joints and other underground obstructions on a GPS map. b) During the progress of the contract works the contractor shall record on a set of route plans and cross section drawings of an approved form, these details so that the same can be transferred on the GPS maps. Such particulars will allow an accurate reference to be made in the case of any fault or projected modification. These records shall show, amongst other data, both indoors and outdoors the exact position of every joint, cable end termination and also the particulars of the depth of the trench, the arrangement of the cables, with cable numbers and the position of all obstructions revealed during the course of excavations. These completed records shall be submitted to BSES within 15 days of completion of any particular route/feeder. The final bill shall not be processed by BSES unless this activity has been completed to the entire satisfaction of BSES
3.18	Site Facilities to be maintained by the Contractor	a) The contractor shall arrange for all the tools and tackles required for cable laying as per this specification. BSES shall arrange for all the material and manpower required for jointing and end termination. b) Illumination and Power supply shall be arranged by the contractor so that the work can be carried out round the clock. c) The contractor shall maintain functional dewatering pumping facility with suitable power supply so as to protect the cables and the joints from ingress of water due to rain or otherwise d) The contractor shall make arrangement to provide suitable scaffolding arrangement to carry out the termination work e) The contractor shall carry out proper barricading of the dug cable route and the joint bays and shall take all necessary precautions to avoid any public hazard f) Also refer Annexure-7: Barricading and Safety.
3.19	Type of Roads and guidelines for road restoration	The typical section of type of Roads (based on width) under PWD and MCD are :- - 20 Feet Wide road - 30 Feet wide road - 40 to 60 Feet Road - Other (which include Kota stone, Agra stone, Cement concrete, interlocking paving tiles, brick road, chequered tiles

		and asphalted road) The drawing are shown in annexure IV The guidelines for road restoration for various type of roads and surfaces are indicated in annexure V as :- - Bituminous road Type I (category I & II) - Bituminous road Type II (category III) - Cement concrete road - Kota/Rajasthan stone Road - Brick Road - Interlocking paving tiles. - Agra stone road - Chequered tiles road - Asphalted road

4.0 Testing

S. No.	Parameter	Details
4.1	Tests to be carried out during and after completion of Cable Laying	Testing of cable before jointing – - Cable shall be tested for Insulation Resistance prior to laying by opening the end and resealing end properly. Testing on complete Cable Installation – a) Insulation resistance of each core shall be measured against all the other cores and the metal screen connected to earth. b) The resistance of the conductor shall be measured. c) DC High voltage. For old cables test voltage shall be 1.5 times rated voltage or less depending on age of cable.(refer annexure # 2 for values) d) Charging of Cable at No-Load at Nominal working voltage for 24 Hours. e) After laying and before termination of cable a sheath test shall be conducted for 66KV Single core Cable as under :- At both ends the cable shall be raised from ground. From the end graphite coat applied over the outer PVC jacket shall be removed with a piece of glass for a length of 300mm. A spiked steel rod with an eye for attaching a wire shall be driven into the ground and connected to a nearby water or hydrant pipe. Insulation resistance of PVC jacket shall be measured between the aluminium wire armour and the spike with a 500/1000V insulation tester. Measured resistance shall not be less than 2.5M OHM per KM. Thereafter 10KV DC shall be applied for one minute in the same way. After the test the armour shall be kept earthed to the steel spike for 15 minutes for discharging residual charge.
4.2	**Statutory**	a) Road cutting permission

	clearance	Road cutting permission shall be taken from competent authority by vendor. How ever official fees shall be paid by BRPL. b) Electrical inspector clearance Electrical Inspector clearance shall be in vendor scope. How ever official fees shall be paid by BRPL.

5.0 Progress Reporting:

S. No.	Parameter	Details
5.1	Detailed Progress report	Progress report to be submitted by Contractor to BSES once in a Week containing i) Excavation status ii) Cable laying status iii) Status of preparedness for Jointing iv) Reason for any delay in total programme v) Details of damage to cable during laying. vi) Progress on final completion / Constraints / Forward path

6.0 Drawing, Data & Manuals:

S. No.	Parameter	Details
6.1	To be submitted After Completion of the Job	As the works is completed the following reports in quadruplicate shall be submitted to BSES for record purpose and shall be incorporated in the 'As constructed Records'. a) Feeder details (sending end, receiving end, SAP number of project etc) - Type of cables, cross section area, rated voltage. Details of construction, cable number & drum number. - Year and month of laying. - Actual total route length, cable length, length between joint to joints or end. - Location of cables and joints in relation to certain fixed reference points, for example buildings, hydrant, boundary stones etc. - Jointing reports detailing the date, weather conditions, jointers and supervising Engineers names, details of type of cable and type of joint or termination, location and joint bay number, ambient temperature. - Results of original electrical measurements and testing on cable installation. - Full written reports will be required of any damage occurring to cable or equipment together with remedial action proposed which will be subject to the approval of BSES.
6.2	Drawing and document sizes	Standard size paper A0, A1, A2, A3, A4

7.0.0 Deviations

Deviations from this Specification shall be stated in writing by the contractor. Written approval shall be obtained from BSES by the contractor. In absence of such a statement, it will be assumed by BSES that the Contractor complies fully with this specification during execution of the job.

Deviation mentioned in any other submitted tender docs like in GTP, QAP, Old PO, old WO, BRPL Standard, vendor standards etc. shall not be considered as a deviation at any stage of contract.

The format for approval of deviation attached in annexure # 1

Annexure # 1 – DEVIATION REPORT FORMAT

S. NO.	Clause No. of Specification	Details about deviation	Reason for deviation	Approved by (Sign & Name)

Annexure # 2 – DC HIGH VOLTAGE TEST

Rated Voltage of cable in KV	Test Voltage Between		Duration in Min.
	Any conductor and metallic sheath / Screen / armour	Conductor to conductor (for unscreened Cables)	
0.65 / 1.1	**3**	**3**	**15 Min**
6.35 / 11	**18**	**30**	
19 / 33	**60**	**----**	
38 / 66	**90**	**----**	

Reference value for DC High voltage Test.

Annexure # 3 – CABLE TRENCH DETAILS

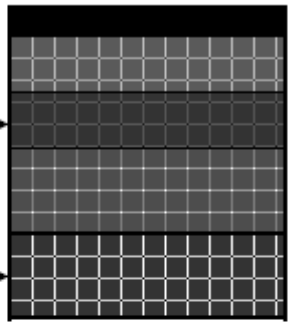
S. No.	Cable Size	Trench		Cable Trench drawing reference
		Width (mm)	**Depth (mm)**	
1	**1.1 kV LT Cables**			
a	3.5Cx150 mm^2 - Single Circuit	**400**	**875**	A – 1 (Drg. # 9)
b	3.5Cx150 mm^2 - Double Circuit	**400**	**875**	A – 1 (Drg. # 9)
c	3.5Cx150 mm^2 - Triple Circuit	**400**	**875**	A – 1 (Drg. # 9)
d	3.5Cx300 mm^2 - Single Circuit	**400**	**875**	A – 1 (Drg. # 8)
e	3.5Cx300 mm^2 - Double Circuit	**400**	**875**	A – 1 (Drg. # 8)
f	3.5Cx300 mm^2 - Triple Circuit	**400**	**875**	A – 1 (Drg. # 8)
2	**11 KV Cables**			
a	3Cx150 / 300 mm^2 - Single Circuit	400	**1055**	A – 2 (Drg. # 6)
b	3Cx150 / 300 mm^2 -Double Circuit	650	**1055**	B – 1 (Drg. # 7)
3	**33 kV Cables**			
a	3Cx400 mm^2 - Single Circuit	**400**	**1235**	A – 3 (Drg. # 3)
b	3Cx400 mm^2 - Double Circuit	**650**	**1235**	B – 2 (Drg. # 4)
c	3Cx400 mm^2 - Quadruple Circuit	**650**	**1235**	B – 2 (Drg. # 5A)
d	3Cx400 mm^2 - Quadruple Circuit	**650**	**1545**	B – 3 (Drg. # 5B)
e	3Cx400 mm^2 - Quadruple Circuit	**1200**	**1235**	C – 1 (Drg. # 5C)
4	**66 kV Cables**			
a	1Cx630/1000 mm^2 - Single Circuit	**650**	**1445**	B – 4 (Drg. # 1)
b	1Cx630/1000 mm^2 - Double circuit	**1200**	**1445**	C – 2 (Drg. # 2)
c	3Cx300 mm^2 - Double circuit	**1200**	**1445**	C – 2 (Drg. # 2A)

Annexure # 4 – Standard Road Profile

STANDARD ROAD PROFILE
20' - 00 " FEET WIDE ROAD (Road type 1)

Sketch 1 of 4

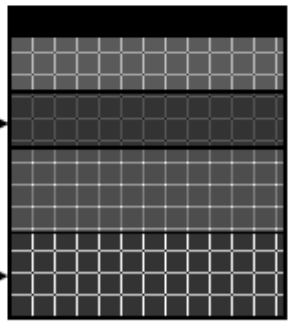
1 **20 mm thick** Pre-Mix Carpet
2 **75 mm thick** WBM 53mm to 22.5 mm stone aggregate
3 **75 mm thick** WBM 63mm to 45 mm stone aggregate
4 **100 mm thick** WBM 90mm to 65 mm stone aggregate
5 Compacted Earth



Sketch 2 of 4

30' - 00 " FEET WIDE ROAD (ROAD TYPE II)

1 **20 mm thick** Pre-Mix Carpet
2 **75 mm thick** WBM 53mm to 22.5 mm stone aggregate
3 **75 mm thick** WBM 63mm to 45 mm stone aggregate
4 **100 mm thick** WBM 90mm to 65 mm stone aggregate
5 Compacted Earth

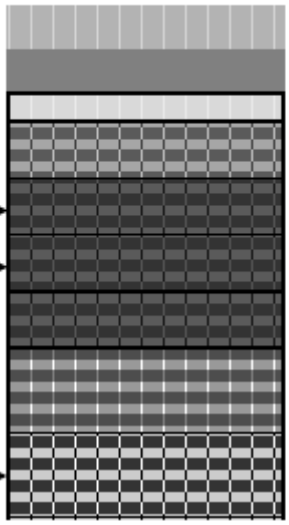


Section X-X '

Sketch 3 of 4

40'-00 " TO 60'-00" FEET WIDE ROAD

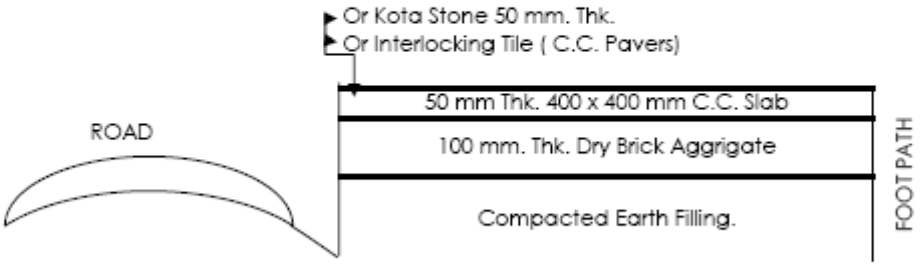
1 **50 mm thk.**(Dense Asphaltic coat) (DAC)
2 **50 mm thk.**(Dense Bituminous)
3 **20 mm thick** Pre-Mix Carpet
4 **75 mm thick** WBM 53mm to 22.5 mm stone aggregate
5 **75 mm thick** WBM 63mm to 45 mm stone aggregate
6 **75 mm thick** WBM 63mm to 45 mm stone aggregate
7 **75 mm thick** WBM 63mm to 45 mm stone aggregate
8 **100 mm thick** WBM 90mm to 65 mm stone aggregate
9 Compacted Earth



Section A-A '

Sketch 4 of 4

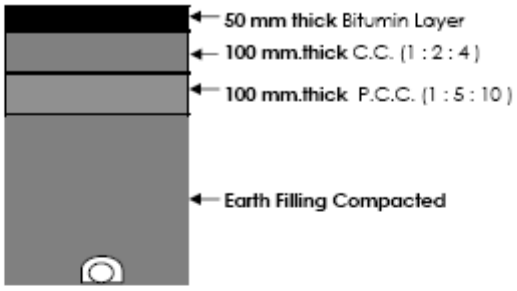
General drawing for cases other than roads.



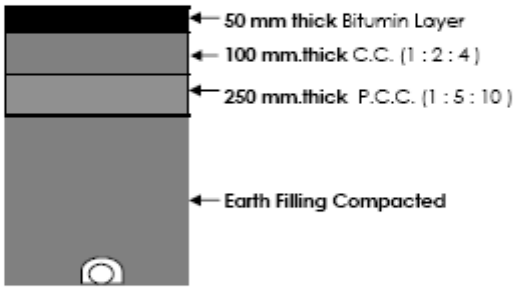
Details of Foot Path Along roads under PWD & MCD.

Annexure # 5 – Road Restoration Sectional Drawing

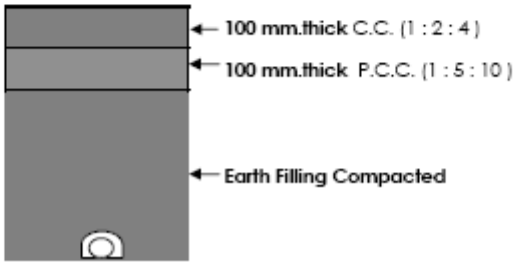
ROAD RESTORATION SECTIONAL DRAWINGS



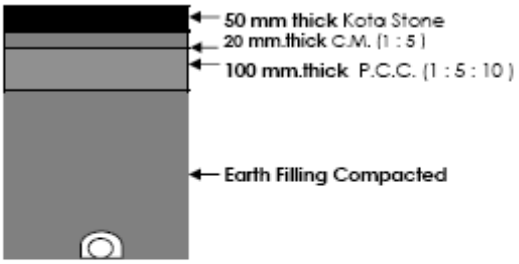
Bituminious Road Type - I (Category 1 & 2) Road width 20 to 30 feet and 30 to 40 feet.



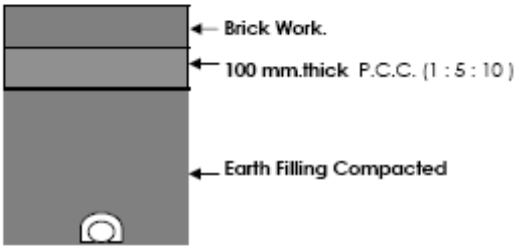
Bituminious Road Type - II (Category 3)



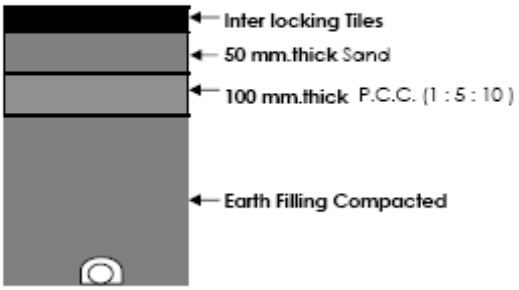
Cement Concrete Road



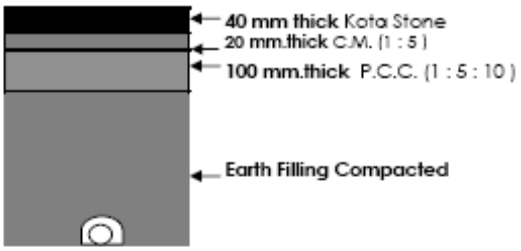
Kota / Rajasthan stone Road



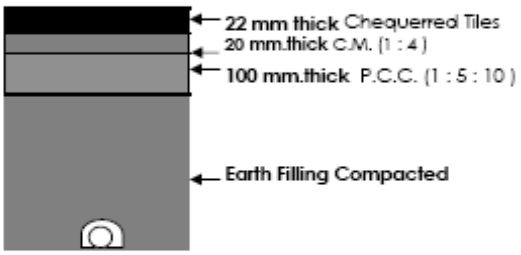
Brick Road



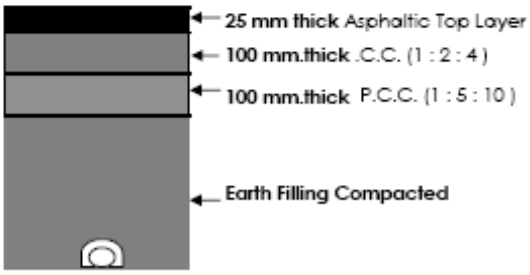
Interlocking Paving Tiles



Agra stone Road .



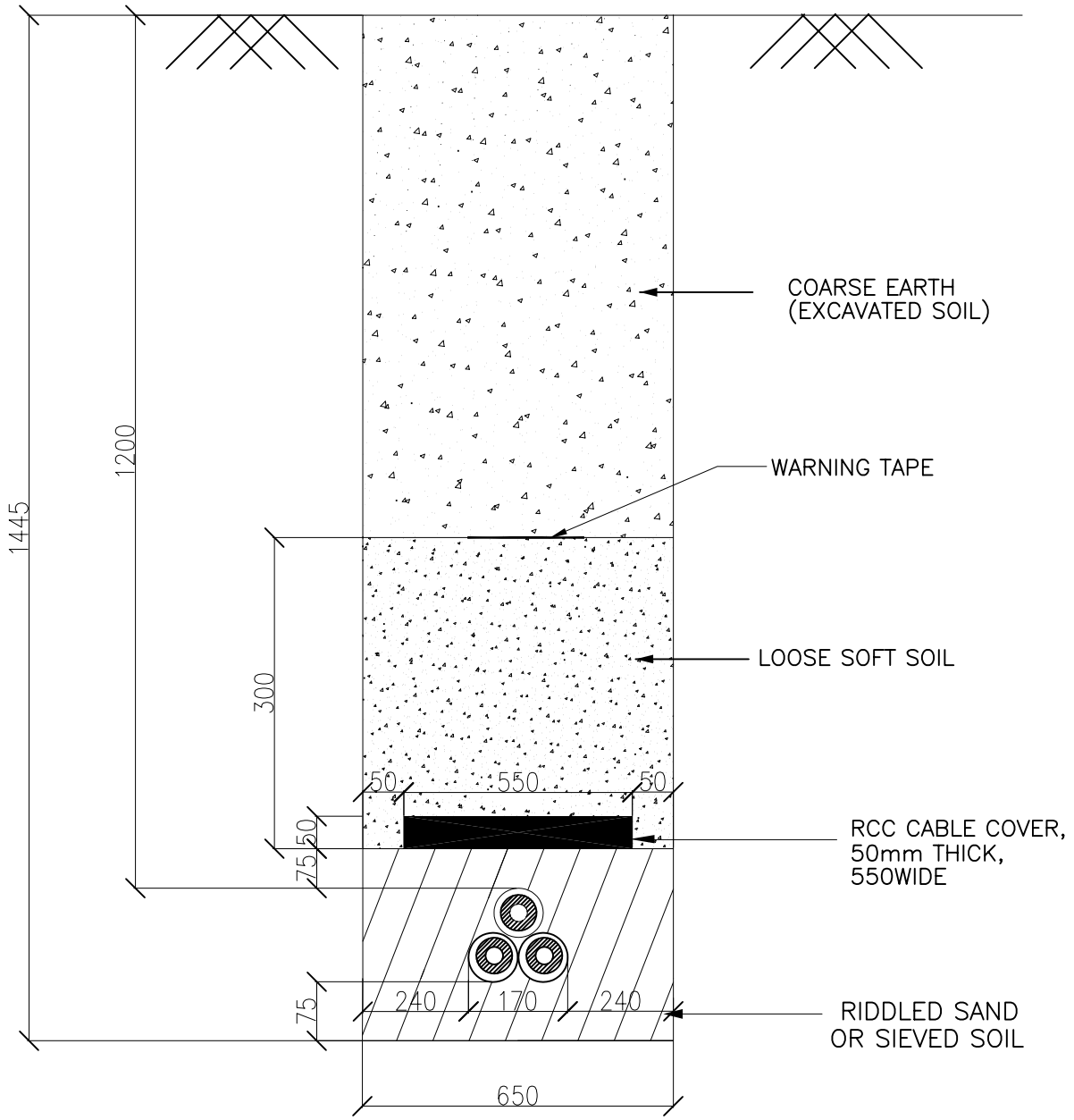
Chequerred Tiles .



Asphaltic Road .

Annexure # 6 – DRAWINGS (CABLE TRENCH AND RCC CABLE COVER)

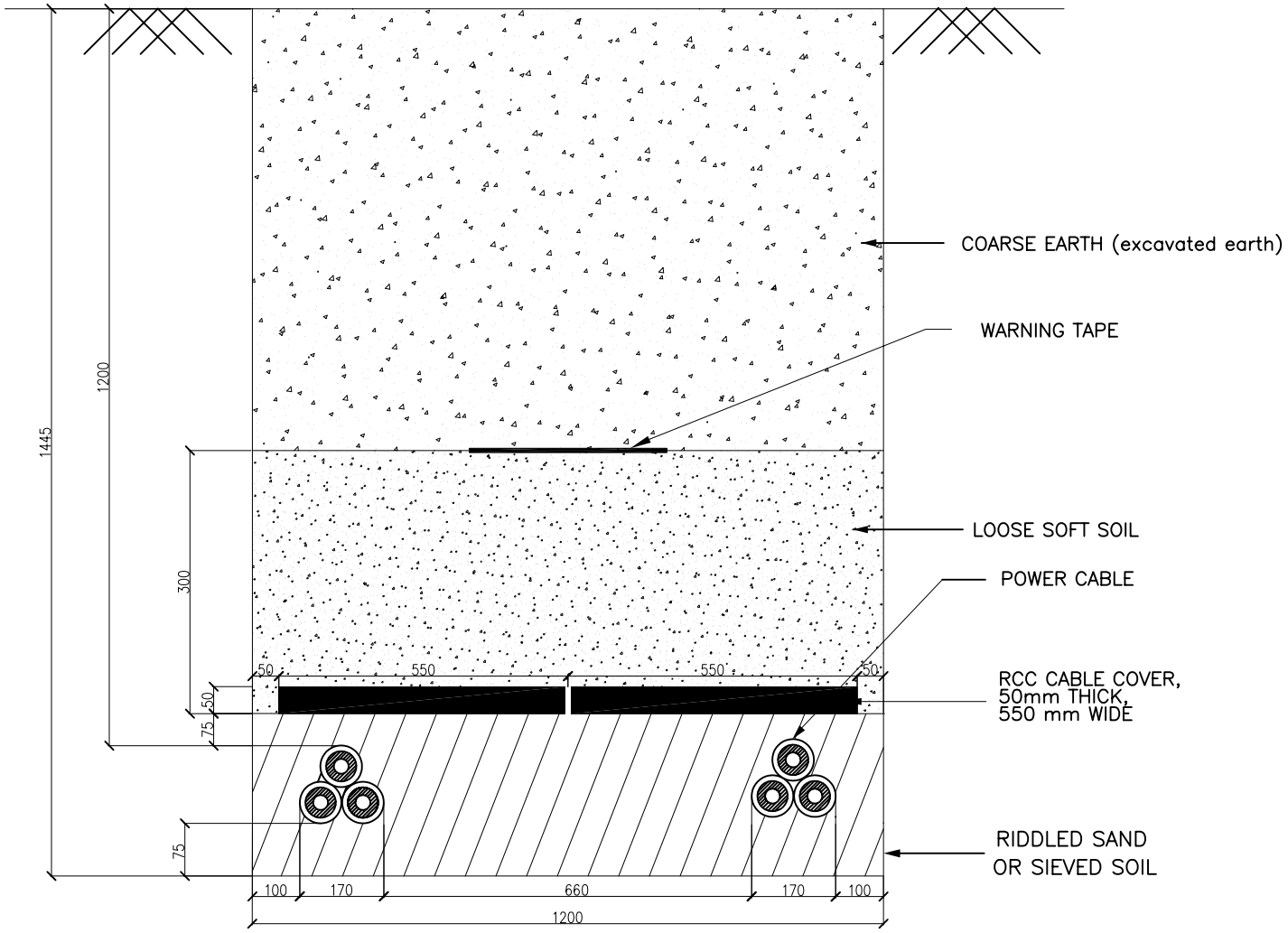
DRAWING # 1



TYPICAL DETAILS FOR 66KV BURRIED CABLE FOR SINGLE CIRCUIT
TYPE – B 4

DRAWN	DS	TITLE:– TRENCH DRAWING FOR 1C X 630 Sq. mm 66KV SINGLE CIRCUIT XLPE CABLE	BSES
CHECKED	SGD		
APPD.	D.GUHA		
DATE			REV. 00
SCALE			

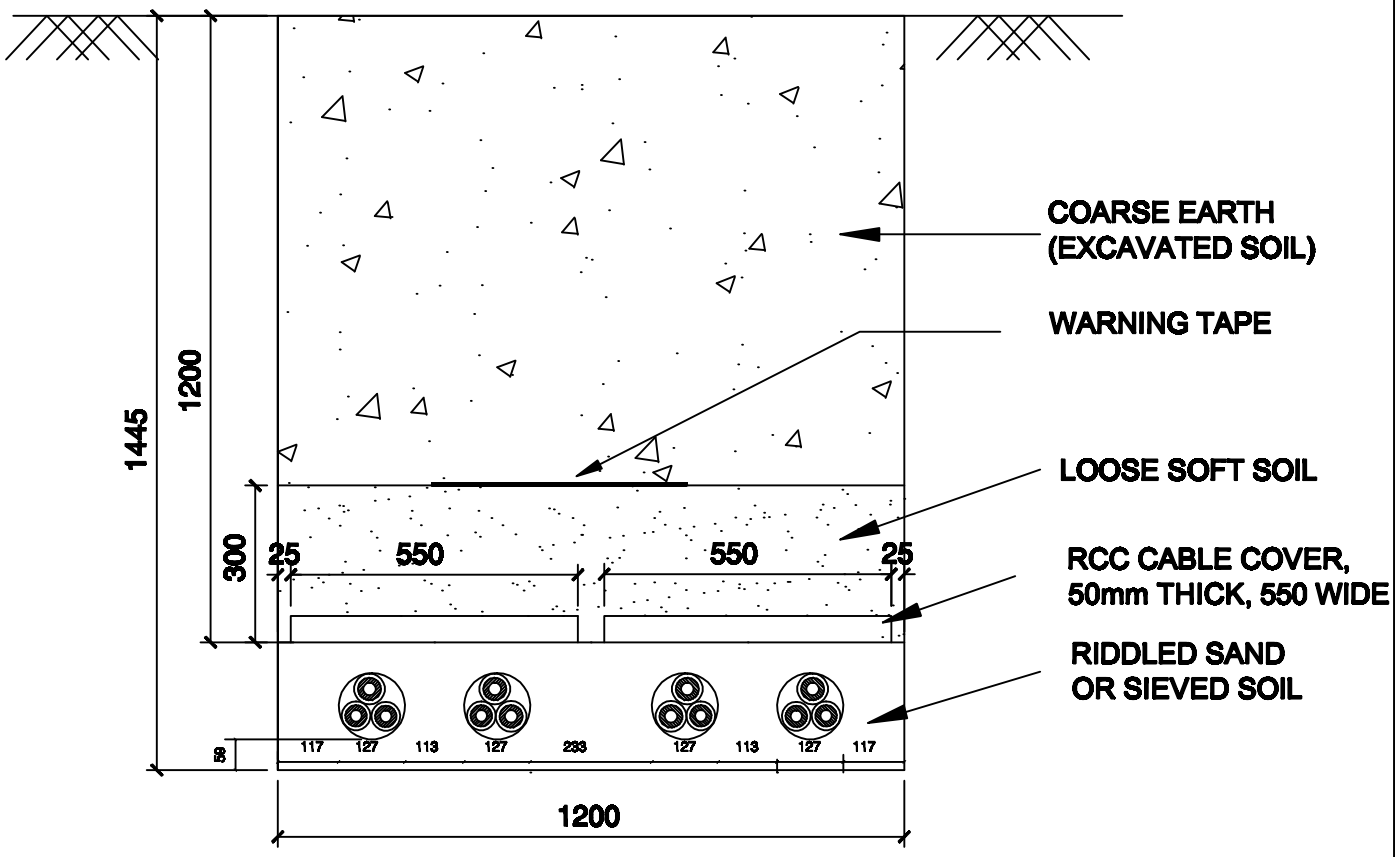
DRAWING # 2



TYPICAL DETAILS FOR 66KV BURRIED CABLE FOR TWO CIRCUIT
TYPE – C 2

DRAWN	DS	TITLE:– TRENCH DRAWING FOR 1C X 630 Sq. mm 66KV DOUBLE CIRCUIT XLPE CABLE	BSES
CHECKED	SGD		
APPD.	D.GUHA		
DATE			REV. 00
SCALE			

DRAWING # 2 A

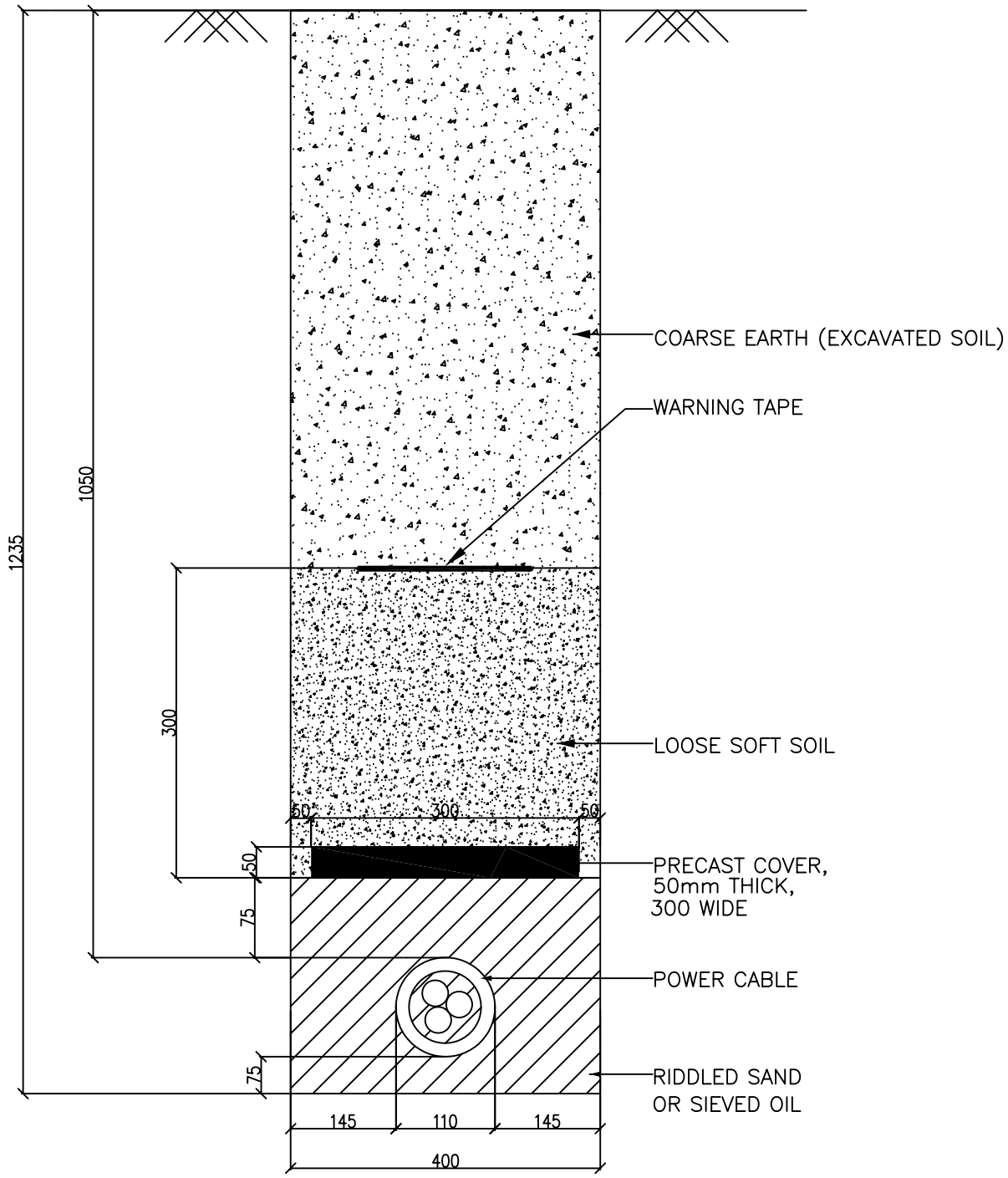


TYPICAL TRENCH SECTION DETAILS FOR 66KV SINGLE CORE 300 Sq. mm. BURRIED CABLE FOR DOUBLE CIRCUIT

TYPE - C 2

DRAWN	SAURABH	TITLE:–	BSES Rajdhani Power Limited
CHECKED	A.S	TYPICAL TRENCH SECTION DETAILS FOR 66KV SINGLE CORE 300 mm BURRIED CABLE FOR DOUBLE CIRCUIT	
APPD.	K.S		
DATE	09.01.15		REV. 00
SCALE			

DRAWING # 3

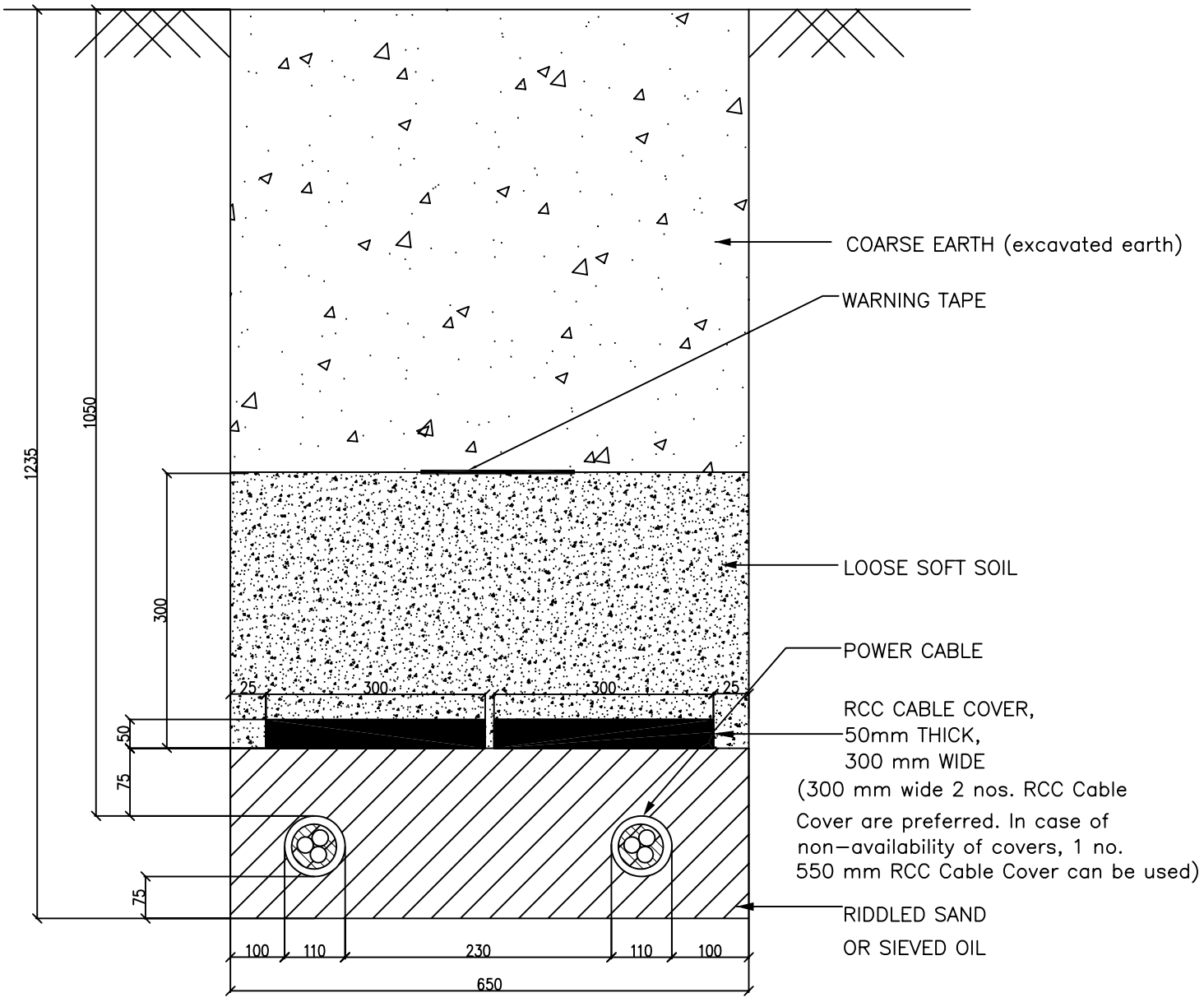


TYPICAL DETAILS FOR 33KV BURRIED CABLE FOR SINGLE CIRCUIT

TYPE – A 3

DRAWN	DS	TITLE:–	BSES
CHECKED	SGD	TRENCH DRAWING FOR	
APPD.	D.GUHA	33KV 3CX 400 mm sq.	
DATE		SINGLE CIRCUIT	REV. 00
SCALE		XLPE CABLE	

DRAWING # 4

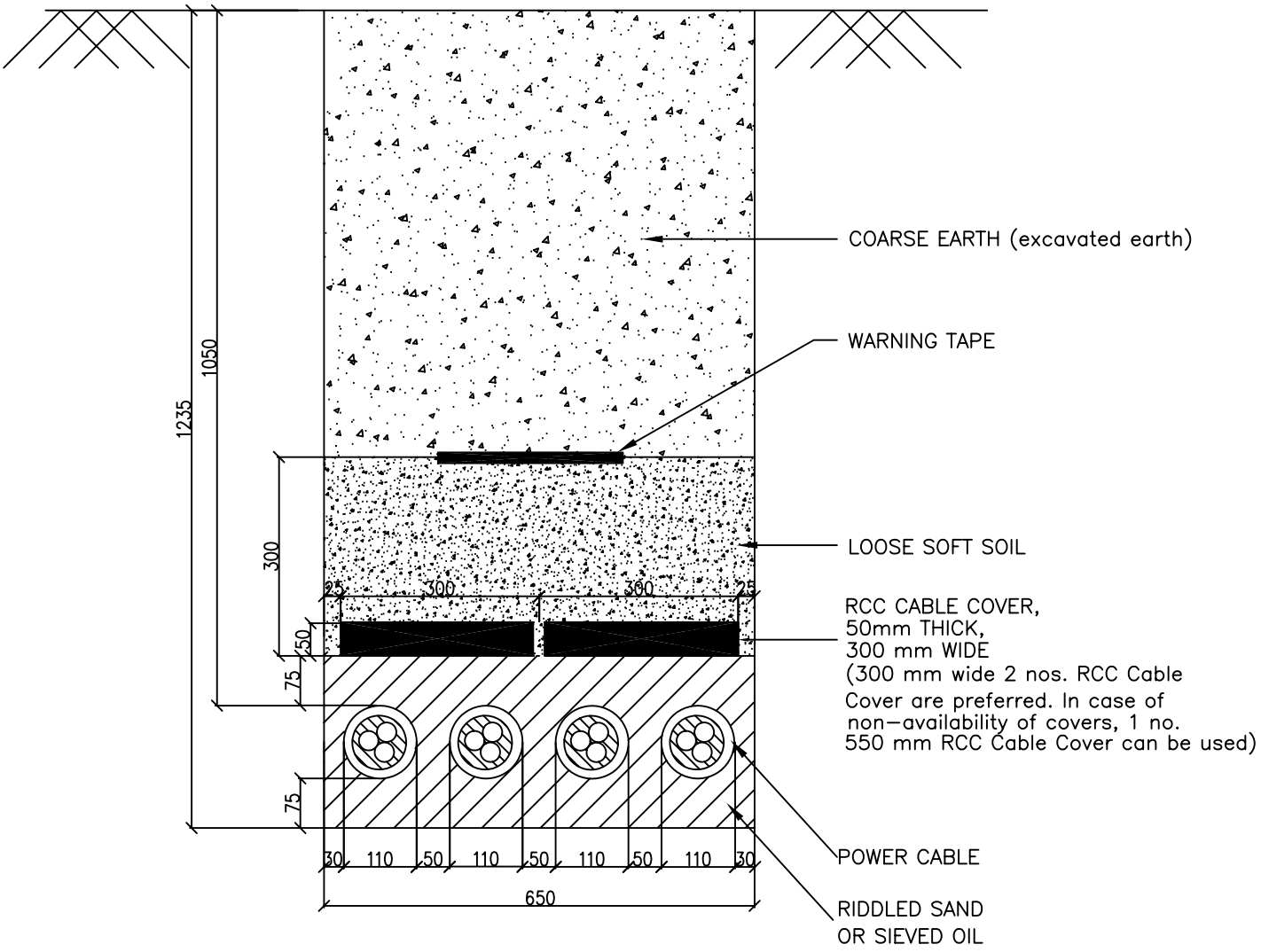


TYPICAL DETAILS FOR 33KV BURRIED CABLE FOR TWO CIRCUIT

TYPE – B–2

DRAWN	DS	TITLE:– TRENCH DRAWING FOR 3C X 400MM2, 33KV DOUBLE CIRCUIT XLPE CABLE	BSES
CHECKED	SGD		
APPD.	D.GUHA		
DATE			REV. 00
SCALE			

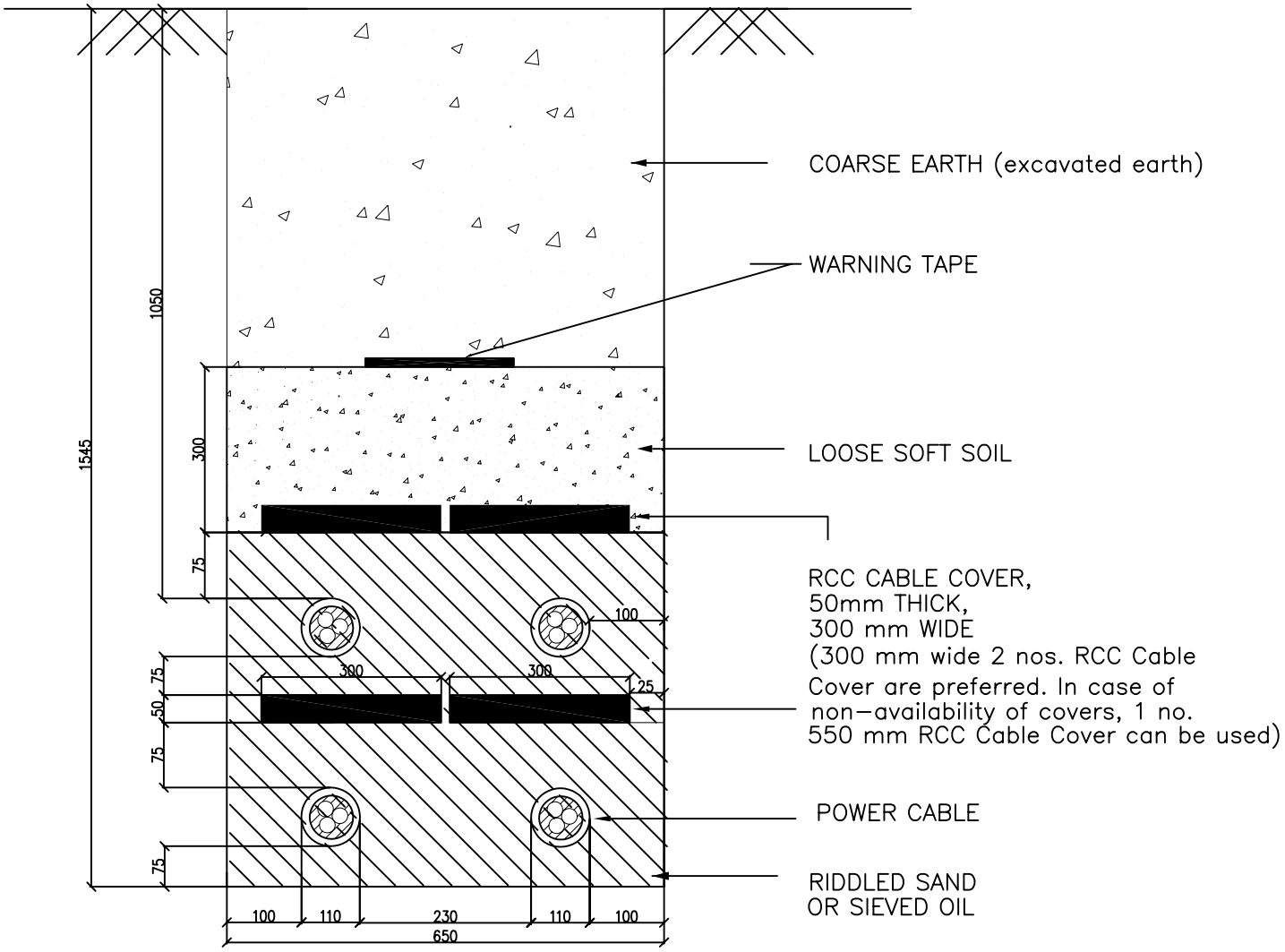
DRAWING # 5 A



TYPICAL DETAILS FOR 33KV BURRIED CABLE FOR FOUR CIRCUIT
TYPE – B 2

DRAWN	DS	TITLE:–	BSES
CHECKED	SGD	TRENCH DRAWING FOR	
APPD.	D.GUHA	3C X 400MM2, 33KV	
DATE		FOUR CIRCUIT	REV. 00
SCALE		XLPE CABLE	

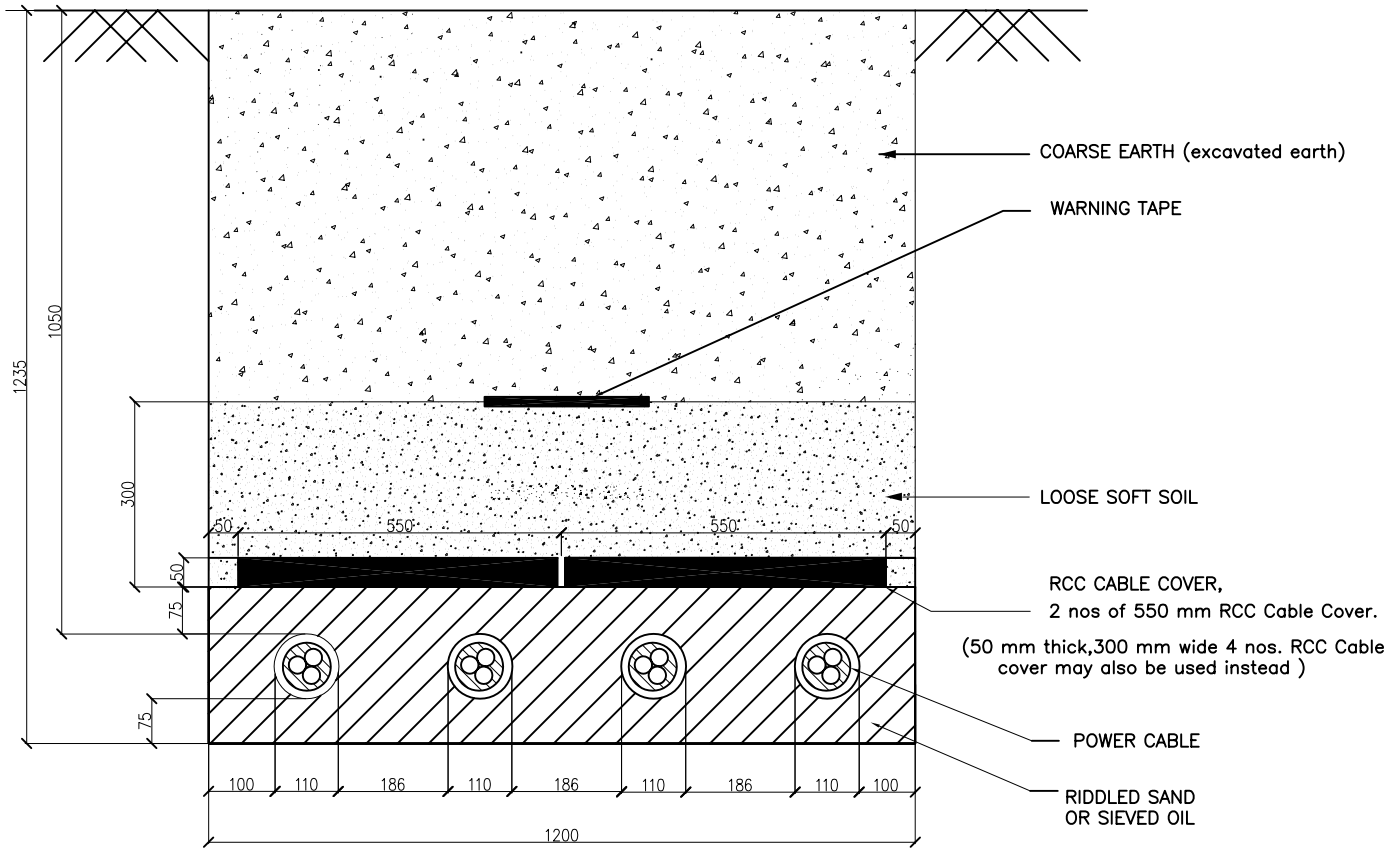
DRAWING # 5 B



TYPICAL DETAILS FOR 33KV BURRIED CABLE FOR FOUR CIRCUIT
TYPE – B 3

DRAWN	DS	TITLE:–	BSES
CHECKED	SGD	TRENCH DRAWING FOR	
APPD.	D.GUHA	3C X 400MM2, 33KV	
DATE		FOUR CIRCUIT	REV. 00
SCALE		XLPE CABLE	

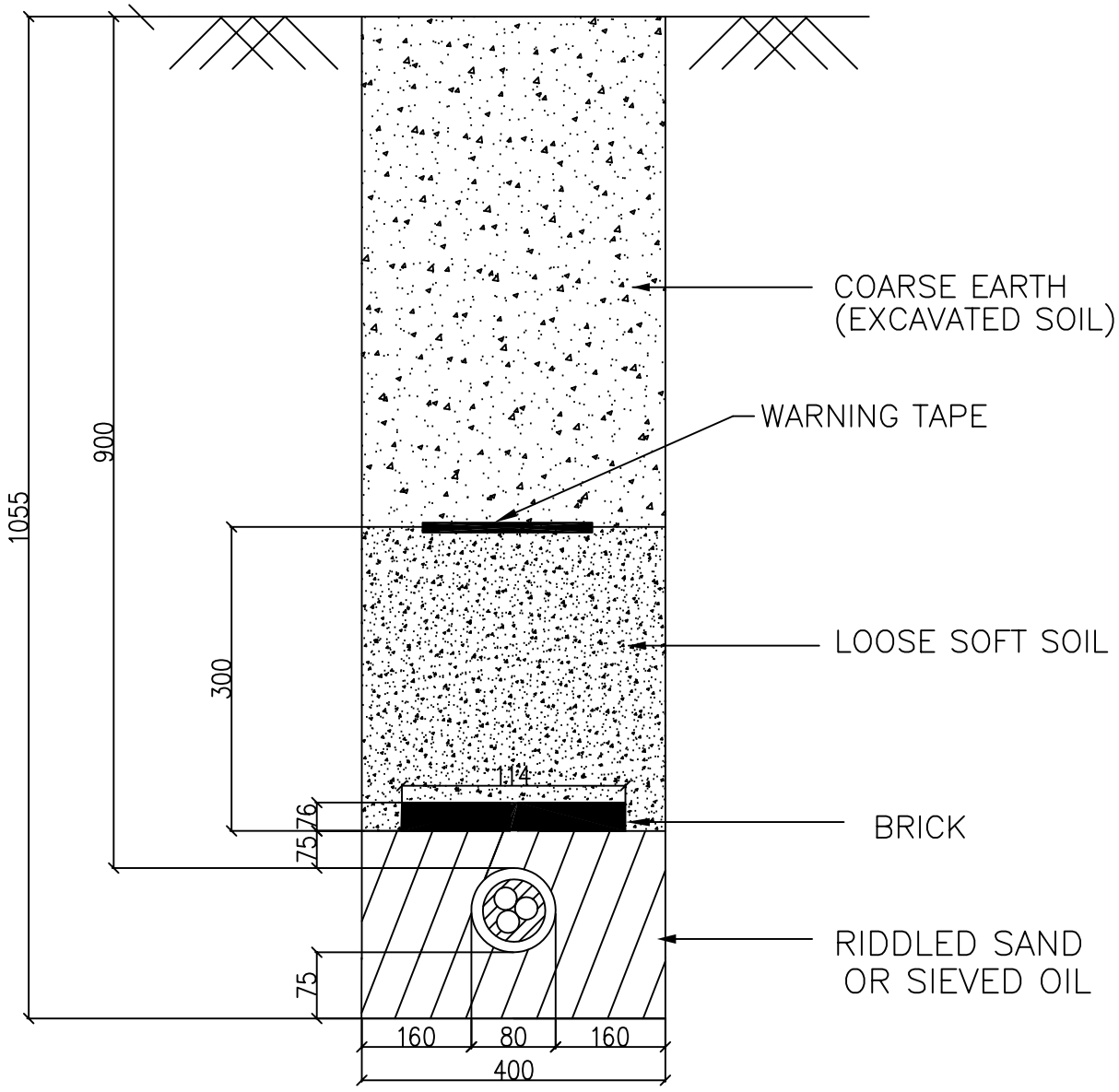
DRAWING # 5 C



TYPICAL DETAILS FOR 33KV BURRIED CABLE FOR FOUR CIRCUIT
TYPE – C 1

DRAWN	DS	TITLE:–	BSES
CHECKED	SGD	TRENCH DRAWING FOR	
APPD.	D.GUHA	3C X 400MM2, 33KV	
DATE		FOUR CIRCUIT	REV. 00
SCALE		XLPE CABLE	

DRAWING # 6

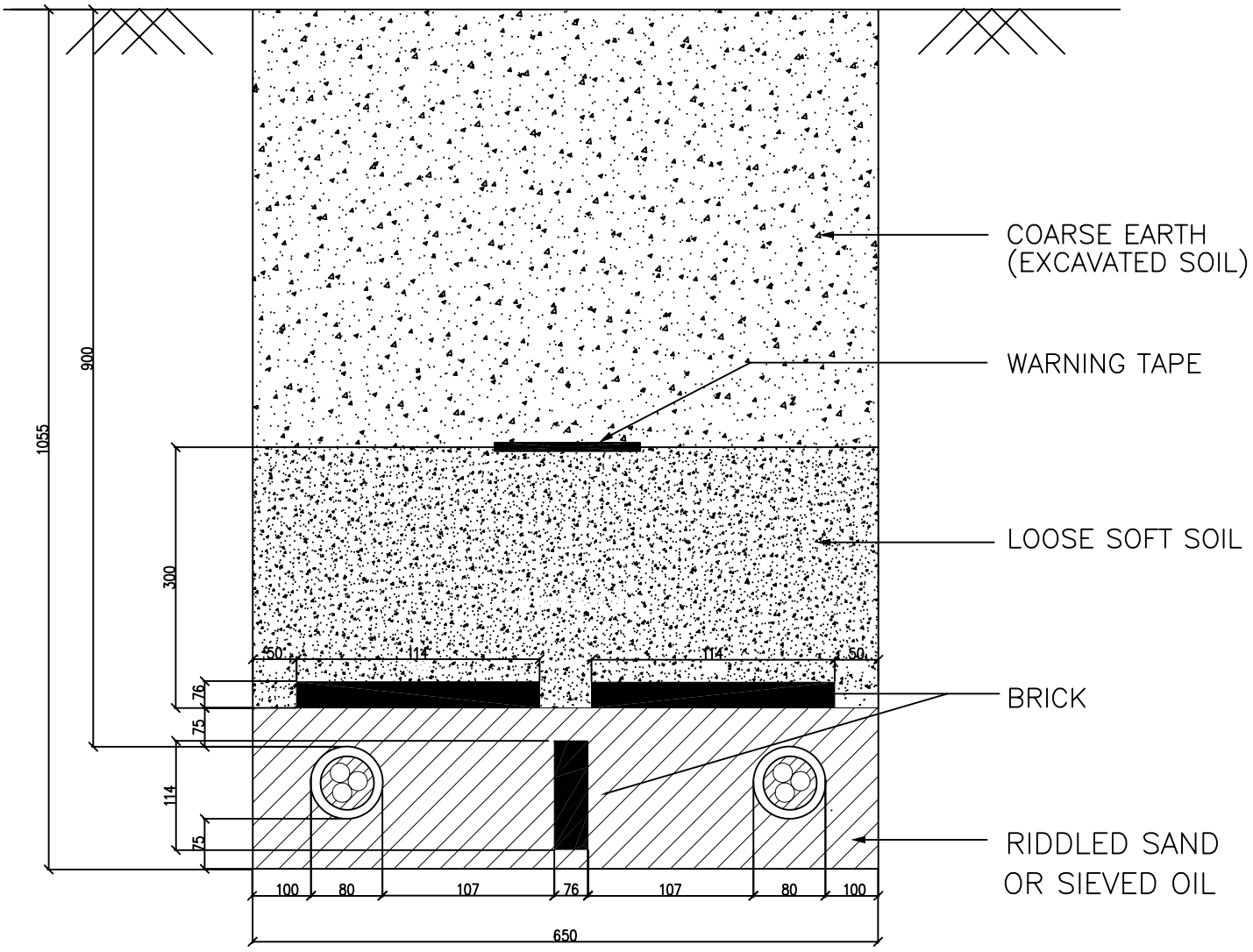


TYPICAL DETAILS FOR 11KV BURRIED CABLE FOR SINGLE CIRCUIT

TYPE – A 2

DRAWN	DS	TITLE:–	BSES
CHECKED	SGD	TRENCH DRAWING FOR	
APPD.	D.GUHA	3C X 300 Sq. mm	
DATE		11KV SINGLE CIRCUIT	REV. 00
SCALE		XLPE CABLE	

DRAWING # 7

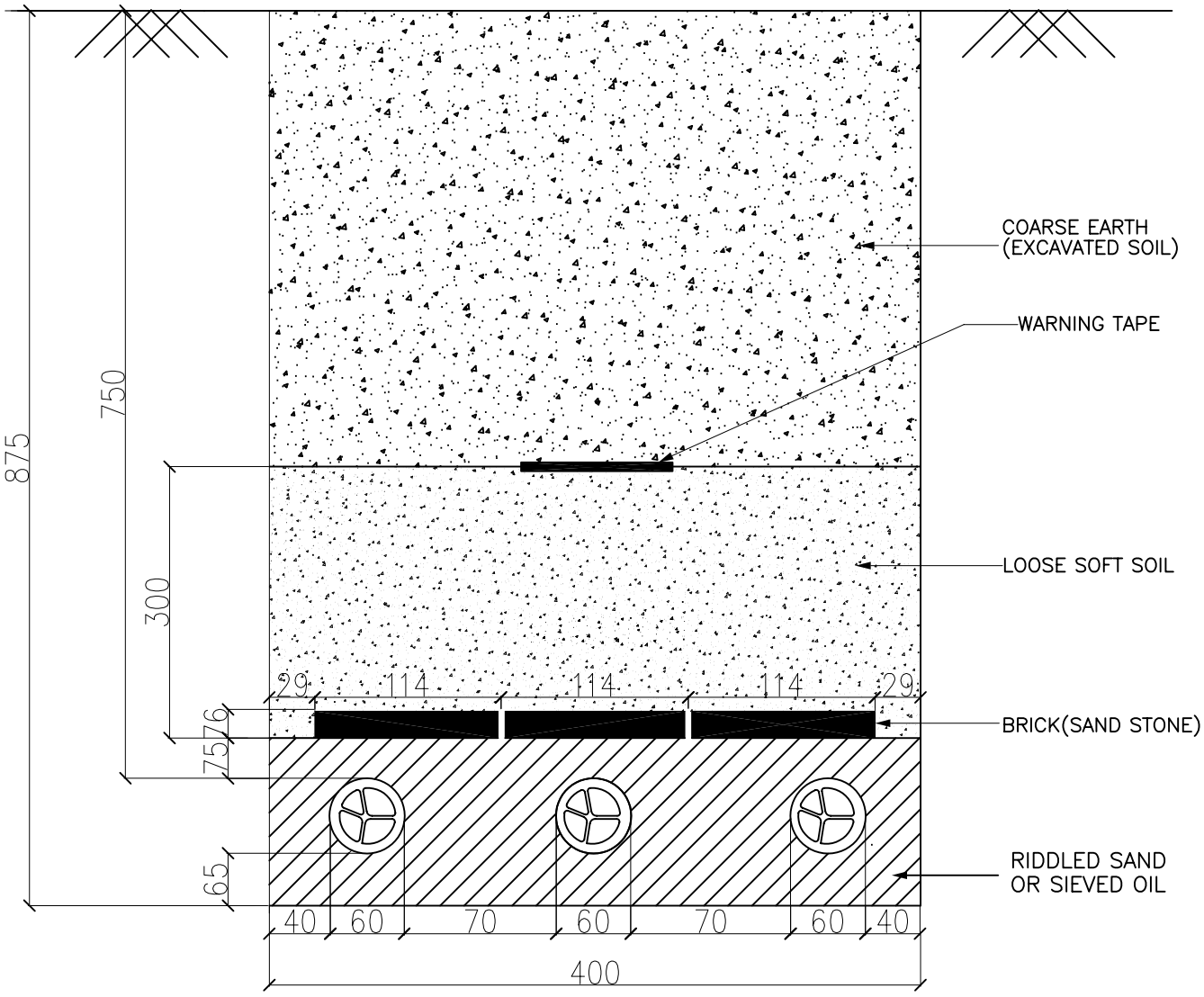


TYPICAL DETAILS FOR 11KV BURRIED CABLE FOR TWO CIRCUIT

TYPE – B 1

DRAWN	DS	TITLE:– TRENCH DRAWING FOR 3C X 300 mm Sq. or 3C X 150 mm sq II KV DOUBLE CIRCUIT XLPE CABLE	BSES
CHECKED	SGD		
APPD.	D.GUHA		
DATE			REV. 00
SCALE			

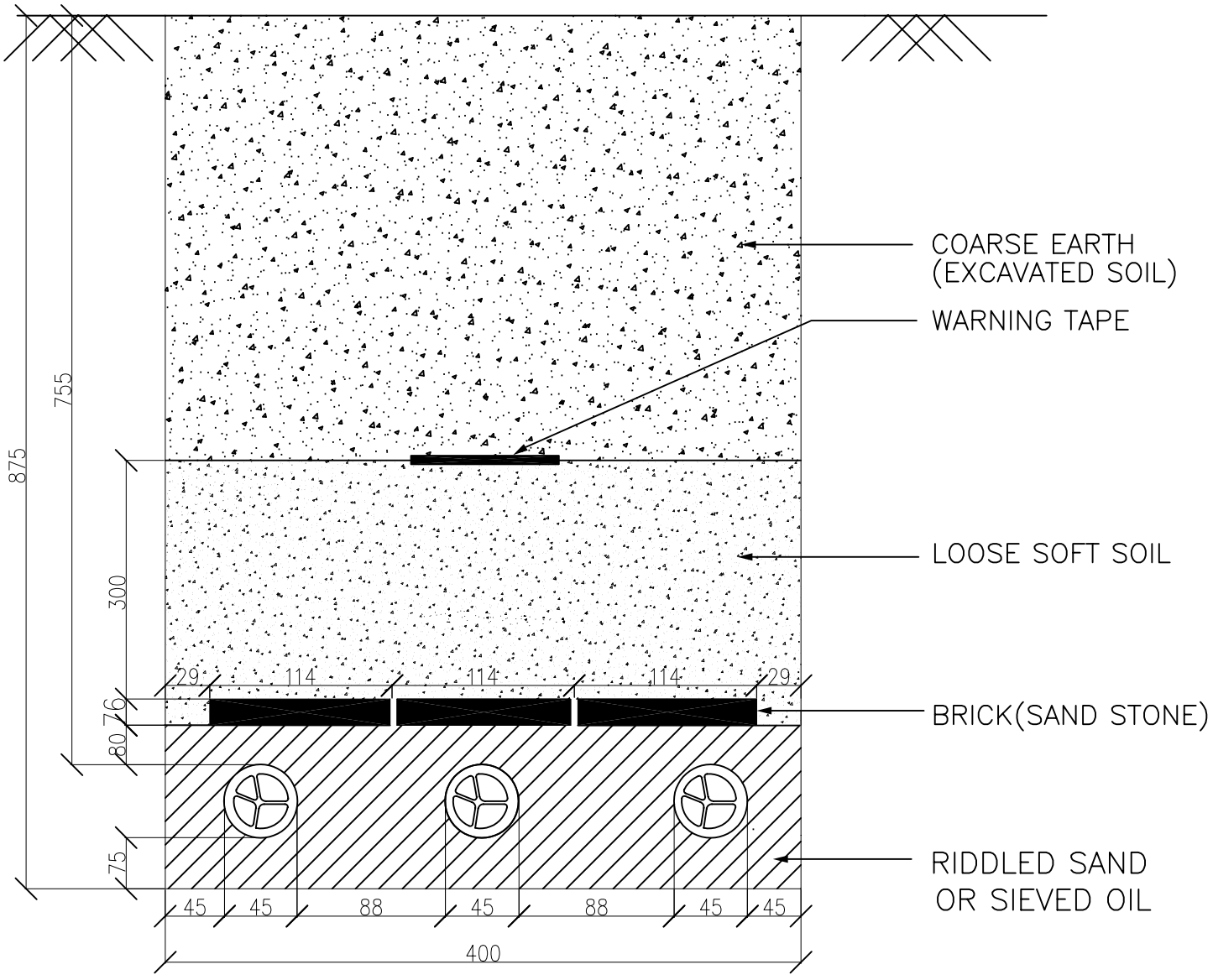
DRAWING # 8



TYPICAL DETAILS FOR 1.1KV BURRIED CABLE
TYPE – A 1

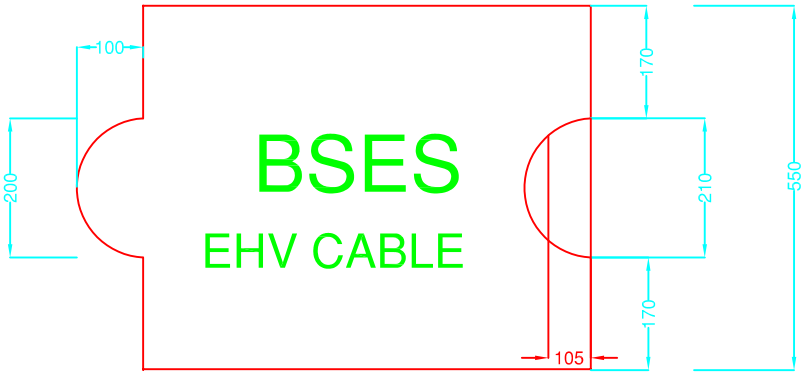
DRAWN	DS	TITLE:– TRENCH DRAWING FOR 3.5Cx300Sqmm 1.1 KV XLPE CABLE	BSES
CHECKED	SGD		
APPD.	D.GUHA		
DATE			REV. 00
SCALE			

DRAWING # 9



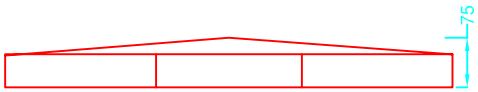
TYPICAL DETAILS FOR 1.1KV BURRIED CABLE
TYPE – A 1

DRAWN	DS	TITLE:–	BSES
CHECKED	SGD	TRENCH DRAWING FOR	
APPD.	D.GUHA	3.5Cx150Sqmm 1.1 KV	
DATE		XLPE CABLE	REV. 00
SCALE			

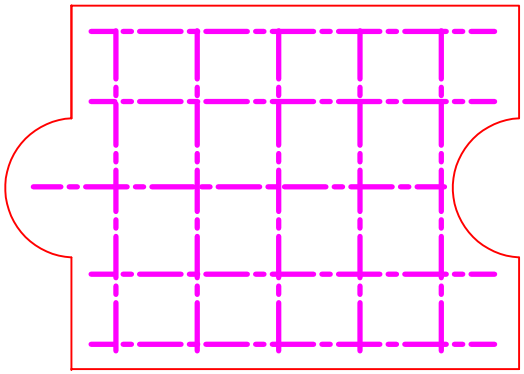


PLAN

ELEVATION



SIDE VIEW



NOTE -

(i) All dimensions are in MM.

(ii) Concrete Mix 1 : 2 : 4

(iii) MS rod - 6 MM Ø

CABLE COVER FOR EHV CABLES TYPE - A.

1. STEEL ROD - AS PER IS 432/1139

2. CONCRETE MIX SHALL BE NOT LESS THAN M200 GRADE AS PER IS 456.

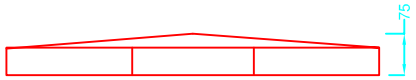
3. MOULDING SHALL BE WITH COMPACTION NOT LESS THAN 7 MN/Sq.m.(70 kgf/Sqcm)

DRAWN		TITLE:– CABLE COVER FOR EHV CABLE TYPE – A	BSES
CHECKED			
APPD.			
DATE			REV. 00
SCALE			

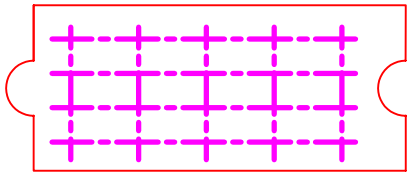
PLAN

1. STEEL ROD - AS PER IS 432/1139
2. CONCRETE MIX SHALL BE NOT LESS THAN M200 GRADE AS PER IS 456.
3. MOULDING SHALL BE WITH COMPACTION NOT LESS THAN 7 MN/Sq.m.(70 kgf/Sqcm)

ELEVATION



SIDE VIEW



NOTE -

(i) All dimensions are in MM.

(ii) Concrete Mix 1 : 2 : 4

(iii) MS rod - 6 MM Ø

CABLE COVER FOR EHV CABLES TYPE B.

DRAWN		TITLE:– CABLE COVER FOR EHV CABLES TYPE – B	BSES
CHECKED			
APPD.			
DATE			REV. 00
SCALE			

Annexure-7: Barricading and Safety

1. Dimensions of barricading- Height- 2 mtr, Length- 1.5 mtr. Refer drawing enclosed with tech spec for more details.
2. There shall not have any gap in between two barricades. Edge to edge shall be intact.
3. LED Bacon light shall be placed at 1st and 4th barricade and same shall be continue
4. Name, painting, colour, clean ness etc. shall be done on regular basis.
5. Vendor to ensure that traffic management shall not be excuse of work execution. The contactor shall not undertake loading and unloading at carriageways obstructing the free flow of vehicular traffic and encroachment of existing roads by the contactor applying the excuse of work execution.
6. Full height fence, barriers, barricades etc. shall be erected around the site in order to prevent the working area from the risk of accidents due to speedy vehicular movement. Same the way barricades protect the road users from the danger due to construction equipment and temporary structures.
7. The structure dimensions of the barricades , material and composition, its colour scheme, BSES logo and details shall be in accordance with specification and drawing laid down in the tender documents.
8. All the barricades shall be erected as per the design requirements of employer, numbered painted and maintained in good condition and also barricade in charge maintain a barricade register at site
9. All barricades shall be conspicuously seen in the dark/night time by the road users so that no vehicle hits the barricades. Conspicuity shall be ensured by affixing retro reflective strips of required size and shape at appropriate angle at bottom and middle portion of the barricades at a minimum gap of 1000 mm. In addition minimum one red light /red blinker and red beacon light should be placed at the top of each barricade.
10. No dust deposit at the front side of barricades.
11. Cable drum shall be returnable and vendor shall take it back (by bye back process) from site at their own risk and cost.
12. Once cable lying complete of a drum, within two days empty drum shall be removed from site by bye back process.
13. Trained traffic marshal with all PPE and traffic control light (Red and Green) shall be placed at site for 24x7.
14. No excuse of theft (beyond 6 hrs. of FIR) shall be acceptable.
15. During execution of job, any damage to other agency's properties shall be counted in vendor account and necessary action shall be taken by vendor to recover, repair etc.
16. Excess earth shall be removed from site after back filling. Site to be cleared to avoid flowing of dust. Barricades to be removed from site with in 24 hrs. after completion of job.
17. During non working hrs. vendor to ensure presence of supervisor for controlling any event from locals.
18. PPEs

    - Helmets

- Mask
- Jacket
- Shoes
- First Aid Box etc.

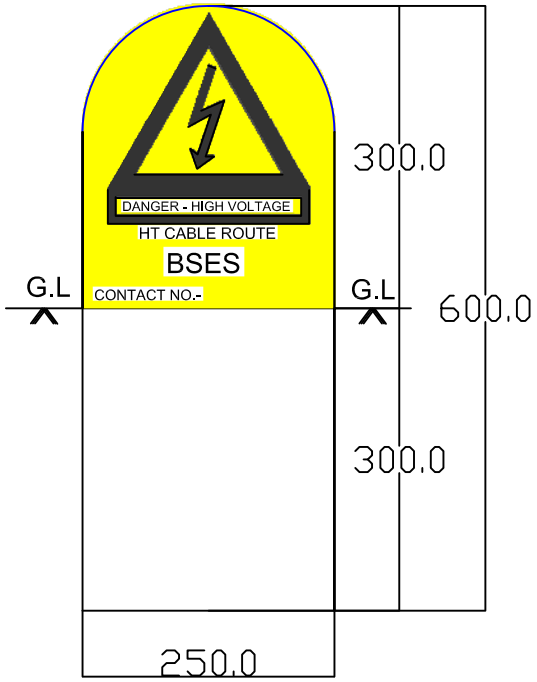
Shall be available at site 24x7. Zero tolerance on absence of PPEs to the working personnel. No excuse shall be acceptable in this regards.

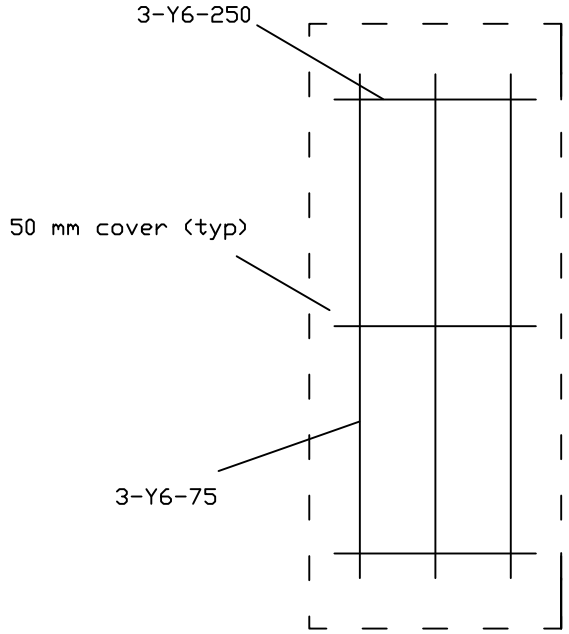
19. GPR/Scanning shall be done by vendor of whole the route and same shall be submitted to BRPL. This work shall be done by vendor before execution of job.
20. Jointing TAT- Jointing to start within 48 hrs. and shall be completed by 96 hrs.+1 day.
21. Lifting of cable drums with hydraulic machine, pulling of cable from top end of drum with pulling machine (hydraulic winch) is mandatory.
22. Violation on barricading guideline and safety norms, a fine of Rs.5000 /day shall be imposed. BRPL inspector/engineer in-charge shall be empowered to impose the above penalty.

Annexure # 8 – ROUTE MARKER AND BARRICADING DRAWING

Reinforcement Detail

DETAIL OF HT CABLE ROUTE MARKER (RCC) - BSES





Notes:-

1	RCC Cable route marker with 6 mm Dia. Road and M25 concrete grade.
2	The litter/number shall be engraved on both the side route marker.
3	All dimentions are in mm unless specified.
4	Thickness of RCC shall be 75mm.
5	Yellow colour shall be visible above ground level.
6	Each route marker to be placed at an internal 50 mtr. and at every turn of route.
7	All kind of paint on route marker shall be in the scope of manufacturer.

DRAWN	R.K.JANA
CHECKED	P.B
REVIEWED	M.B
APPO.	K.A
DATE	16.08.16

TITLE:-

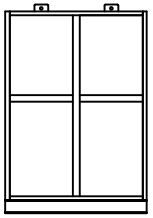
DETAIL OF HT CABLE ROUTE MAKER (RCC).

BSES Rajdhani Power Ltd.

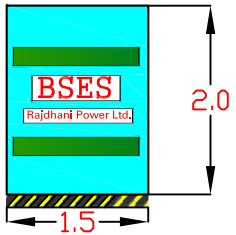
DWG. NO.

BSES-RM-RCC-01, R0

BARRICADING FOR CABLE LAYING WORK



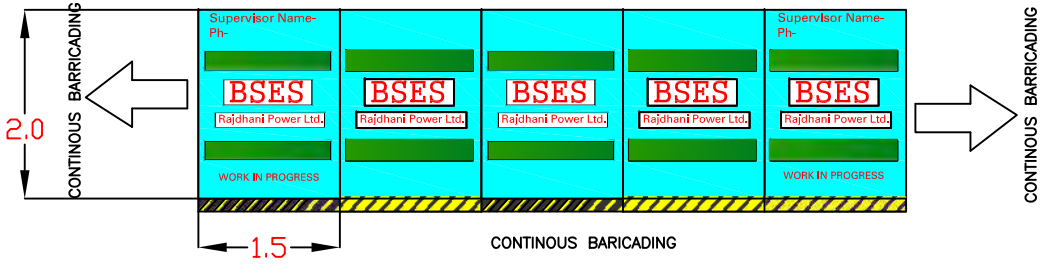
BACK SIDE VIEW



FRONT SIDE VIEW

NOTE:

1. Barricading shall provided through out the route length as well as project location.
2. Plate shall be MS
3. Supervisour name, ph no, work in progress, shall be mentioned at every 1st and 4th plate of barricading through out the route.
4. Becon Light shall be provided through out the length.
5. Traffic marshal shall be Provided for traffic control by vendor.
6. Violation of safety norms and barricading shall be reviewed by BRPL and shall impose fine of Rs.5000/day as well as termination of work and short close of award.
7. After finishing of job vendor shall take return all the plate at their own risk and cost.
8. PPE's like Helmet, Mask, Jacket, safety boot etc. shall be provided vendor to all worker.



CONTINOUS BARICADING

DRAWN	R.K.JANA	TITLE:– DRAWING–BARRICADING FOR CABLE LAYING WORK	BSES Rajdhani Power Limited
CHECKED	P.B.		
REVIEWED	A.S.		
APPD.	V.P.		
DATE	29.06.17		

Annexure#9-Note for HDPE Pipe Diameter in Cable Laying

1) Primarily our intent for laying cable will be through open trench only.
2) Trench dimensions shall be as per the standards which mentioned as below table

Sl. no.	Cable	Trench Details (mm)		
		Depth (single and double run)	Width (Single Run)	Width (Double Run)
1	LT Cable	875	400	400
2	11 kv	1055	400	650
3	33 kv	1235	400	650
4	66 Kv	1445	650	1200

3) QC team will do stage inspection after completion of digging to validate the depth of trench and will give approval for issuing of cable.
4) Execution in charge to ensure the cable laying work.
5) QC team will also inspection the laying work to validate the laying as per standards before back filling.
6) In case of site constraints, trench less cable laying shall be allowed as per the followings-
   a) Cable laying up to 50 mtr through trenchless will be allowed with approval of circle head (O&M) for road crossing or site constraints. Site photos of constraints shall be reviewed before approval by circle head.
   b) Absence of permission for digging- written disapproval by road owing agency and appropriate approval by circle head (for O&M Jobs), by O&M head (for 11kV, P&C job) and by EHV head (for EHV Jobs)
   c) The size of HDPE (PN6, PE80) pipe shall be as per the guidelines of IS-1255, 1983, clause no-6.3.4.3. Details mentioned below in below table-

Sl. No	Cable	Recommended Dia of HDPE pipe (mm)
1	66kV, 3CX300	225
2	66kV, 1CX630	180
3	66kV, 1CX1000	180
4	33kV, 3CX400	180
5	11kV, 3CX300	160
6	11kV, 3CX150	160

d) In-case of using lower size of HDPE pipe due to site conditions, the deviation for using lower HDPE pipe from above table, written approval must be taken through technical committee. Photos of the challenges while apparently the same will be reviewed by technical committee.

(However, HDPE pipe size with less than 1.5XOD of cable shall not be allowed at any stage)

BSES

Technical Specification

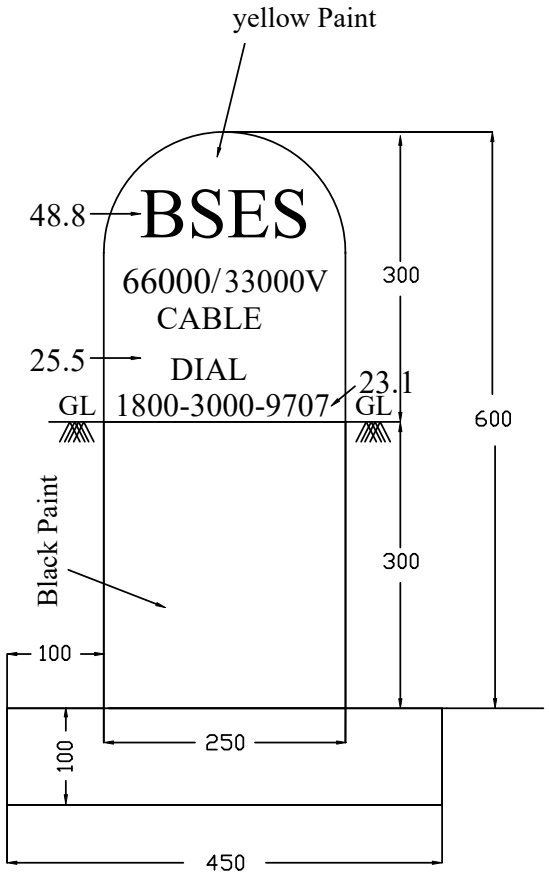
for

Drawings of Miscellaneous RCC Hardware Items

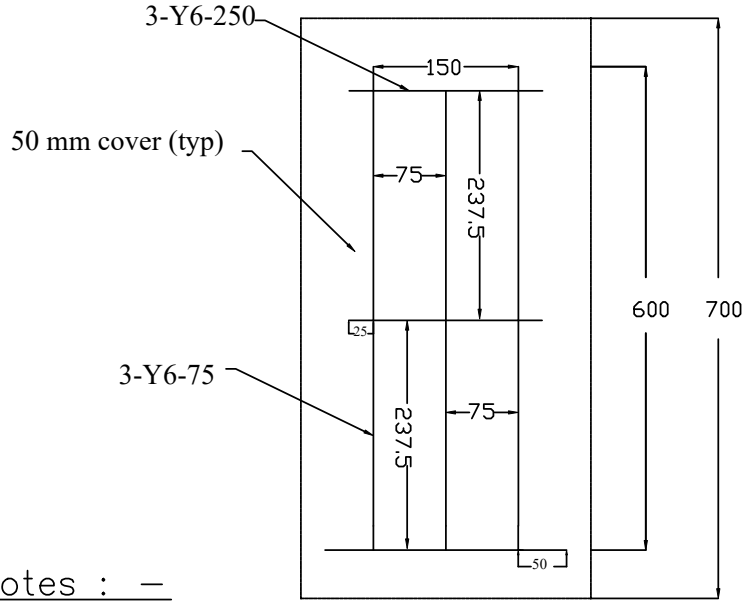
Specification no – BSES-TS-59-RCCH-R0

Rev:		0
Date:		17 May 2022
Pages:		6
Prepared by	Akhilesh Chaudhary	
	Gautam Deka	
Reviewed by	Srinivas Gopu	
	Amit Tomar	
Approved by	Gaurav Sharma	
	Gopal Nariya	

DETAIL OF HIGH VOLTAGE CABLE ROUTE MARKER (RCC) -BSES



Reinforcement Detail



Notes : –

1	RCC cable route marker with 6mm Dia Rod and M25 concrete grade.
2	All the details shall be emgraved on both the sides of route maker
3	All dimentions are in mm, unless specified.
4	Thickness of RCC shall be 75mm.
5	Yellow colour shall be visible about ground level.
6	Eachcable joint marker to be placed at cable joints.
7	All kind of point on route marker shall be in the scope of manufacturer.
8	RCC Marker shall be painted with "Texture Paint" & quality shall be maintainted.

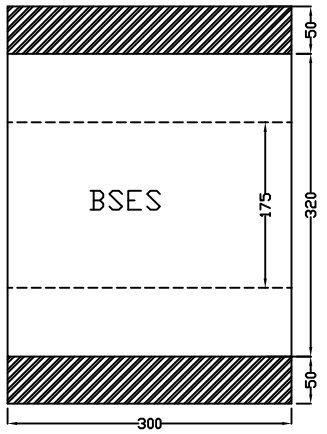
Title : –

DETAIL OF HIGH VOLTAGE CABLE ROUTE MARKER (RCC)

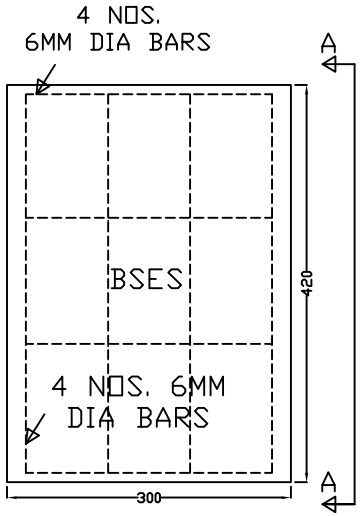
BSES

DWG. NO.

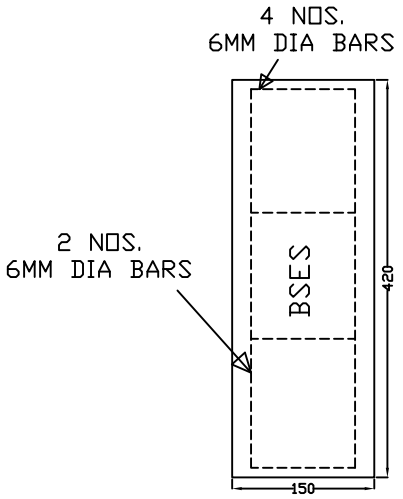
BSES–RM–RCC–01,R0



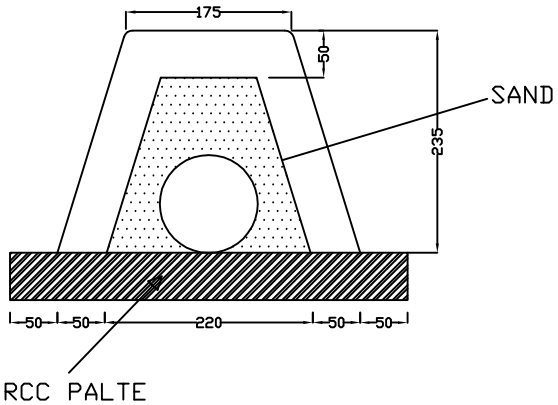
A. PLAN



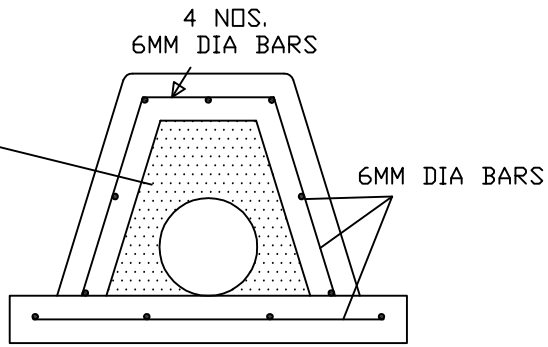
B. REINFORCEMENT DETAILS
300MM LENTH RCC PLATE



C. REINFORCEMENT DETAILS
150MM LENTH RCC PLATE



D. ELEVATION



E. REINFORCEMENT DETAILS

NOTE-

1. ALL DIMENSIONS ARE IN MM
2. CONCRETE MIX 1: 1.5: 3
3. STEEL TMT/RIB BAR 6MM DIA AS PER IS 432/1139
4. CONCRETE MIX SHALL BE NOT LESS THAN M20 /1: 1.5: 3 GRADE AS PER IS 456
5. MOULDING SHALL BE WITH COMPACTION NOT LESS THAN 7N/MMSQ (70 KGF/SQCM)
6. REINFORCEMENT DETAIL AS PER IS 5820/IS 456
7. COVER- 20MM

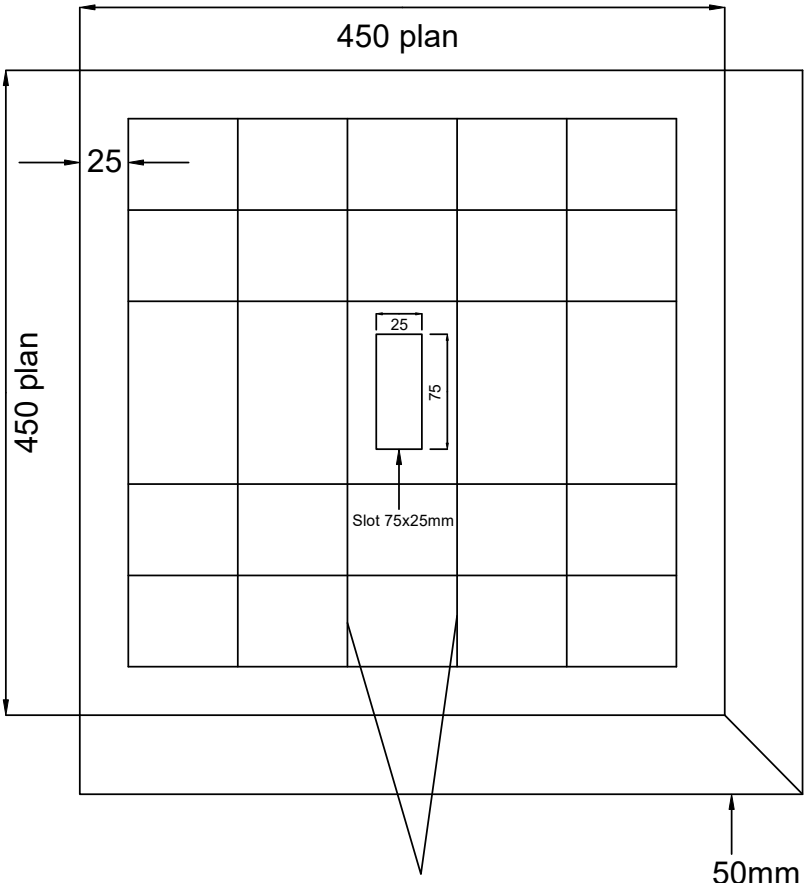
DRAWING OF CABLE COVER AT CABLE JOINTS

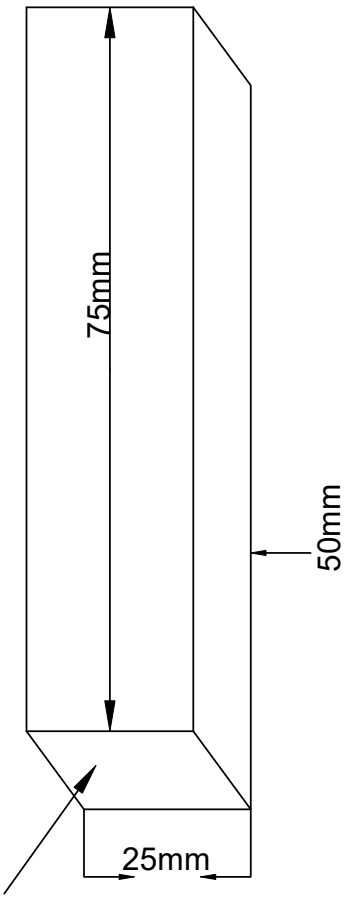
DRAWN	RAJESH
CHECKED	S.G
APPD.	G.S
DATE	12.04.22
SCALE	NTS

BSES Yamuna Power Limited

TITLE:-
DRAWING OF CABLE COVER AT CABLE JOINTS

RCC BASE PLATE SIZE 450X450X50mm



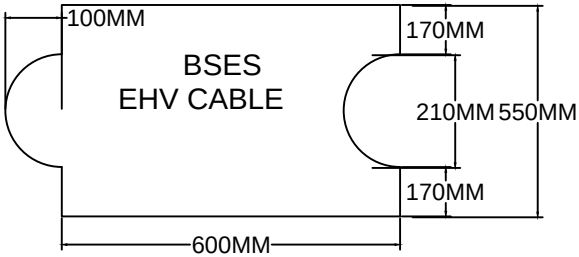


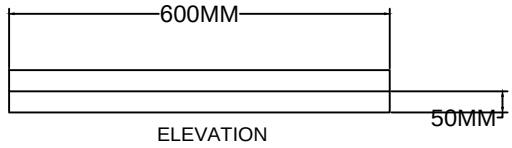
NOTES :-

1. Nominal Mix of concrete 1:2:4:M:20
2. Reinforcement shall be welded / Binded at Junctions.
3. Reinforcement :- 8mm dia for 6 nos. each side.
4. IS AND ITS LATEST AMMENDMENTS SHALL BE APPLICABLE.

TITLE :-	BSES
RCC BASE PLATE	DRAWING NO.

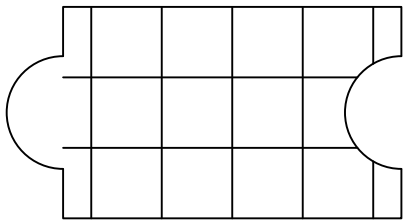
PLAN





ELEVATION

SIDE VIEW



REINFORCEMENT DETAILS

NOTES:-

1.ALL DIMENSIONS ARE IN MM

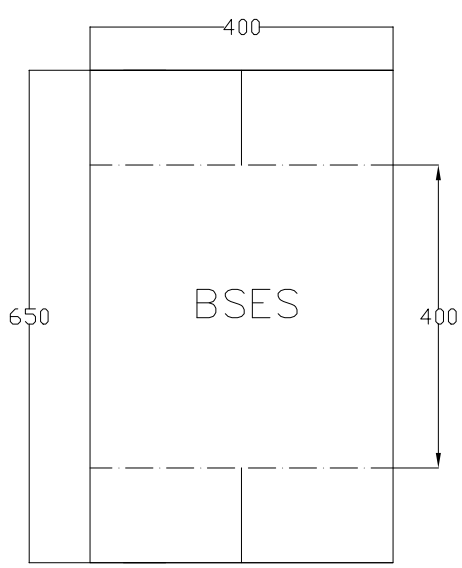
2.CONCRETE MIX 1:2:4

3.MS ROD -6MM ⌀

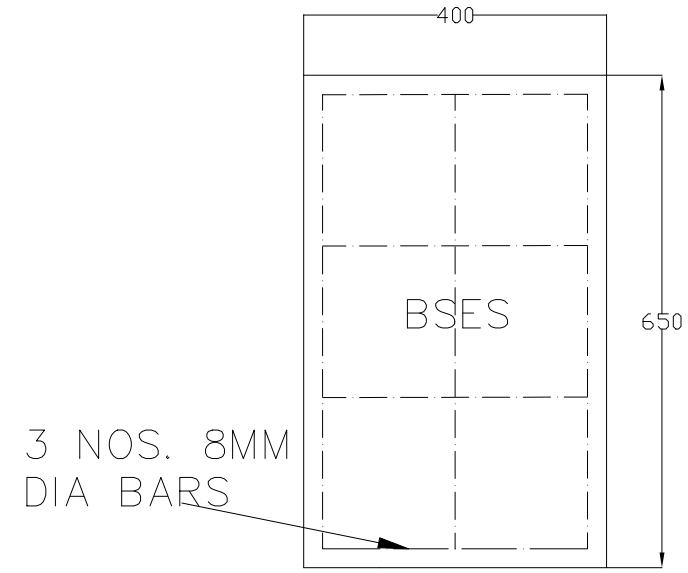
4.STEEL ROD -AS PER IS 423/1139

OWNER- BSES		
TITLE-CABLE COVER (SLAB) DATE-13.04.2022		
DRAWN BY	CHECKED BY	APPROVED BY

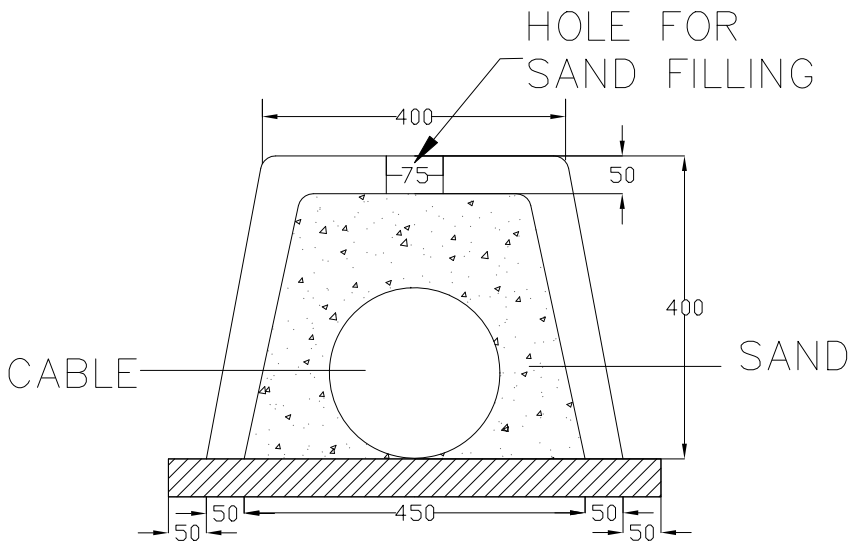
DRAWING OF COFFIN FOR JOINTS



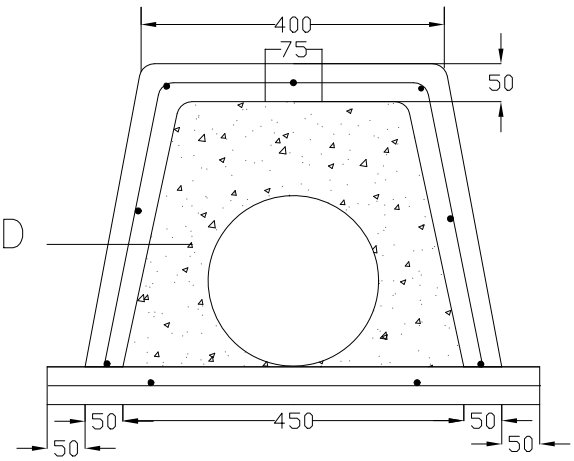
A. PLAN



B. REINFORCEMENT DETAILS 300 MM LENGTH RCC PLATE



D. ELEVATION



E. REINFORCEMENT DETAILS

NOTES :-

1. ALL DIMENSIONS ARE IN MM
2. CONCRETE MIX 1:1.5:3

TITLE :-

DRAWING OF COFFIN COVER AT CABLE JOINTS

BSES

DRAWING NO.

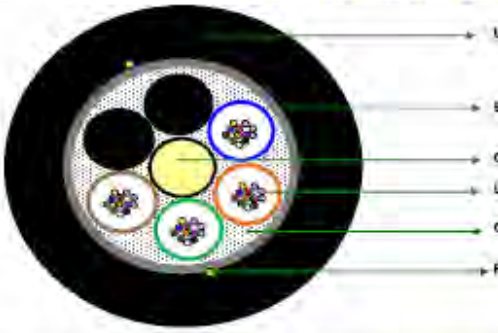
Annexure I:
Details of Optical Fiber Cable

48F Composite Fiber Multitube (MDPE) Single Sheath Duct Lite Optical Fiber Cable

PRODUCT INFORMATION

Fiber		
Single Mode Optical Fiber	**36 Nos.**	**Fiber ITU.T - G.657A1**
Maximum Cabled Fiber Attenuation dB/Km		1310nm : 0.36 & 1550nm : 0.23 & 1625nm : 0.26
Multi Mode Optical Fiber	**12 Nos.**	**Fiber OM2 : 50/125**
Maximum Cabled Fiber Attenuation dB/Km		850nm : 3.5 & 1300nm : 1.5
Loose Tube		
Filling Gel		Thixotropic gel to prevent water ingress in loose tube (ITCC T 250)
Fiber Per Tube	12 Nos.	
Tube	4 Nos.	Thermoplastic Material (PBT)
Core		
Central Strength Member		Fibre Reinforced Plastic (FRP) to provide tensile strength and antibuckling properties.
Filler	2 Nos.	Polyethylene Black
Water blocking elements		Cable flooding gel is added in interstices of core to prevent water ingress in the cable core (ITCC C 460)
Core Covering		Binder and Polyester Tape
Cable		
Rip Cord	2 Nos.	Polyester Based Twisted Yarn — Applied below Outer Sheath
Outer Sheathing		UV Proof Black MDPE (ME 6052/ME 6050) — 2.2 mm Nominal Thickness

CONSTRUCTIONAL DETAILS



Typical construction Diagram - Not to Scale

OPTICAL FIBER CABLE PERFORMANCE

MECHANICAL				ENVIRONMENTAL	
Max. Tensile strength	2500 N	**Crush Resistance**	2000 N / 100x100 mm	**Temp. Performance**	
Minimum Bend Radius	20 D	**Impact strength**	25 Nm.	**Installation**	-20°C to +80°C
Repeated Bending Test	20 D,30Cycle	**Torsion**	±180°	**Service**	-20°C to +80°C
				Storage	-20°C to +80°C
Water Penetration	1m head, 3m samples, 24 Hr			**Drip Test**	30 cm, 70°C, 24 hr

Tests shall be carried out as per IEC 60793 & IEC 60794-1-2/GR 20 Standards. Change in attenuations shall be ≤ 0.05 dB.

COLOR DETAILS

Optical Fibre Colour	Blue, Orange, Green, Brown, Slate, White, Red, Black, Yellow, Violet, Pink, Aqua.
Loose Tube Colour	For G657A1 : Blue, Orange, Green & For OM2 : Brown.
Outer Sheath Colour	Black

PHYSICAL PARAMETERS

Cable Diameter (mm)	11.75 ± 0.25	**Cable Wt. (Kg/Km)**	114 ± 10%	**Cable Length**	2 Km ± 5%

PRINTING DETAILS

Cable Printing details (White - Hot Foil Emb.)	«48F TELEPHONE SYMBOL LASER SYMBOL MONTH & YEAR OF MANUFACTURE LENGTH CODE METER MARKING

The accuracy of marking shall be ± 0.5%. Occasional lost of printing & remarking shall be as per Bell core GR 20 and this supercedes the earlier markings.

BSES

TECHNICAL SPECIFICATION

FOR

RFID ACTIVE & PASSIVE BALL / RING

Specification No: GN101-03-SP-148-00

BSES RAJDHANI POWER LTD			
Prepared By	Abhay Gupta		R0
	Pronab Bairagi	05/11/18	
Reviewed By	Amit Tomar	05.11.18	2-Nov-18
Approved By	K. Sheshadri	05/11/18.	Page 1 of 13
Registered Office: BSES Bhawan, Nehru Place, Delhi - 110019			

BSES Rajdhani Power Ltd	GN101-03-SP-148-00

TECHNICAL SPECIFICATIONS OF RFID ACTIVE & PASSIVE BALL / RING

CONTENTS

REVISION RECORD

Rev. No.	Revision Date	Item/ clause no:	Page No.	Nature of Change	Approved by

TECHNICAL SPECIFICATIONS OF RFID ACTIVE & PASSIVE BALL / RING

1. SCOPE

The specification provides technical requirements and usage of RFID Active & Passive Ball / Ring. It shall be traced with a portable route tracer device specified herein to quickly pinpoint the location of buried facilities like cable runs, cable joints, splices, vaults, conduits etc. during the construction, installation or maintenance work across BSES Rajdhani Power Ltd, network, New Delhi.

The portable route tracer device shall be able to find the location of ball / ring and define the place and depth's position. In addition, the RFID route tracer device shall have the capability to save RFID serial number of Ball / Ring being installed on site during installation with an inbuilt GPS module that should allow the RFID route tracer to allow navigation back to the RFID route tracer.

2. CLIMATIC CONDITIONS

2.1	Average grade atmospheric condition	Heavily polluted, dry
2.2	Maximum altitude above sea level	1000m
2.3	Ambient Air temperature	Highest : 50°C Average: 30°C Minimum : 0°C
2.4	Relative Humidity	100% max
2.5	Thermal resistivity of soil	150°C cm/W (max)
2.6	Seismic Zone	4
2.7	Rainfall	750mm concentrated in four months

3. GENERAL TECHNICAL REQUIREMENT

- Every RFID ball / ring shall have a unique Hexadecimal code
- The data fed in the active electronic ball / ring shall be accessible from computer and mobile from anywhere which can be saved in the computer or mobile also
- The identification code of passive electronic ball/ring shall be accessible from computer and mobile from anywhere which can be saved in computer and mobile also
- While assessing the data of RFID active ball/ring from computer or mobile, the user shall be able to-
    - See the location of the electronic Ball / Ring
    - See the Hexadecimal code of the electronic Ball / Ring
    - Shall be able to see the Ball / Ring and feeder details
    - Further details shall be as per Clause 4.1 of this technical specification
- The ball / ring shall be detectable if placed horizontally / vertically or at any angle inside the ground
- The Route Tracer (with GPS module) shall have USB accessibility to allow data transfer to computer/mobile
- Google mapping facility of feeder by using active and passive RFID ring/ball.

3.1 ACTIVE BALL / RING

- The Active Ball / Ring shall have facility to feed data by tracer or by computer/mobile as per the BRPL requirement.
- Following are the technical requirements of the active ball / ring-

S. No	Specification	BRPL Requirement
1	Data Storage	Ability to write, read and lock programmed information into the Ball / Ring using locator or by computer/mobile for accessing feeder information.

TECHNICAL SPECIFICATIONS OF RFID ACTIVE & PASSIVE BALL / RING

S. No	Specification	BRPL Requirement
2	Data	Below data shall be feed inside the active Ball / Ring or locator- • BRPL | Vendor Name | Feeder Details • BRPL site supervisor | Vendor's supervisor at site • Jointing details – Make of jointing kit | Cable grade and type | Joint type • PO No. of jointing kit • Date of installation of ball | Jointer name
3	Design and shape	Ball / Ring
4	Free floating coil	Free floating coil for self leveling, horizontal position (floating coil will always be horizontal and provide accurate location of joint)/ Ring capable of being detectable from all directions.
5	Temperature effect	Non freezing fluid/ Other
7	Material	Made of High dense plastic
8	Frequency range	169.8 kHz standard / As per manufacturer's standard for power utility
9	Colour	Red/orange
10	Diameter	Outer Dia- 150mm max for ball, 250 mm for ring
11	Minimum Depth range	As per the table mentioned in the clause 4.1
12	Weight	0.4 kg max for both ring and ball
13	Power Source	Self generated, no batteries required for signal transmission

3.2 PASSIVE BALL / RING

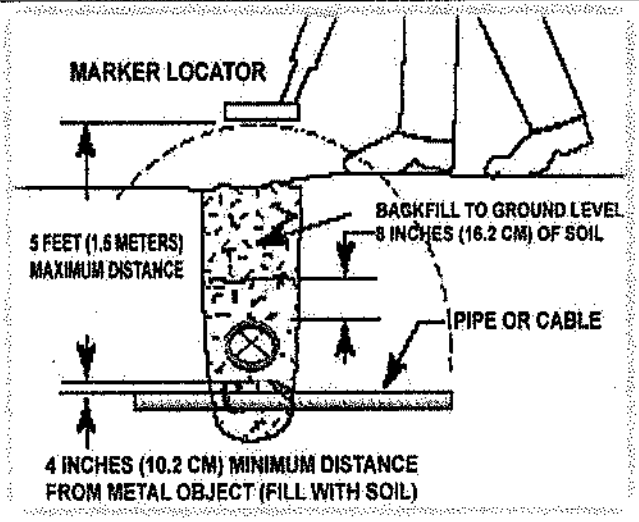
The Passive ball / Rings shall be buried at every 50m on the cable route from the point of starting of circuit.

Following are the technical requirements-

S. No	Specification	BRPL Requirement
1	Design and Shape	Ball / Ring
2	Free Floating Coil	Free floating coil for self leveling, horizontal position (floating coil will always be horizontal and provide accurate location of cable route)/ Or ring coil should be detectable from all direction.
3	Temperature effect	Non freezing liquid/ Other
4	Application	To trace cable route
5	Material	Made of high density plastic
6	Frequency Range	169.8 kHz standard / As per manufacturer's standard
7	Colour	Red/orange
8	Diameter	Outer dia- 150 mm max for ball, 250 mm max for ring.
9	Depth Range	Applicable as mentioned in the clause no-4.1
10	Weight	0.4 kg for both ball and ring
11	Power Source	Self generated, no batteries required for signal transmission

4. INSTALLATION OF BALL / RING

- During Backfill of trench in which pipe or cable is being laid.
- Continue Backfilling by sand or earth



4.1 CABLE TRENCH DETAILS

A	11 KV Cables	Width (mm)	Depth (mm)
a	3Cx150 / 300 mm² - Single Circuit	400	1055
b	3Cx150 / 300 mm² -Double Circuit	650	1055
B	33 kV Cables	Width (mm)	Depth (mm)
a	3Cx400 mm² - Single Circuit	400	1235
b	3Cx400 mm² - Double Circuit	650	1235
c	3Cx400 mm² - Quadruple Circuit	650	1235
d	3Cx400 mm² - Quadruple Circuit	650	1545
e	3Cx400 mm² - Quadruple Circuit	1200	1235
C	66 kV Cables	Width (mm)	Depth (mm)
a	1Cx630/1000 mm² - Single Circuit	650	1445
b	1Cx630/1000 mm² - Double circuit	1200	1445
c	3Cx300 mm² - Double circuit	1200	1445

5. GUARANTEE PERIOD

A guarantee period for RFID Ball / Ring of 25 years shall be provided the manufacturer.

6. TESTS

6.1 ACCEPTANCE TESTS RFID ACTIVE BALL

Sr. no.	Specification	Manufacturer to provide	Inspection Method by BRPL
1	Data Storage	Ability to write, read and lock programmed information into the Marker	Perform
2	Design and shape	Ball shape	Visual inspection
3	Free floating Coil	a free floating Coil for self leveling, Horizontal position	Visual inspection
4	Temperature effect	Non freezing fluid	Sample shall be sealed for NABL lab testing
5	Design and Shape	Made of high dense plastic	Visual inspection
6	Frequency Range	169.8 KHz	Review of document/Test Certificates
7	Colour	Red/Orange	Visual inspection
8	Dimension	As mentioned above	Perform and Measurement
9	Depth range	As per the table mentioned in the clause no-4.1	Perform
10	Weight	As mentioned above	Perform and Measurement

6.2 ACCEPTANCE TESTS RFID PASSIVE BALL

Sr. no.	Specification	Manufacturer to provide	Inspection Method by BRPL
1	Design and shape	Ball/ring shape	Visual inspection
2	Free floating Coil	A free floating Coil for self leveling, Horizontal position	Visual inspection
3	Temperature effect	Non freezing fluid	Sample shall be sealed for NABL lab testing
4	Design and Shape	Made of high dense plastic	Visual inspection
5	Frequency Range	169.8 KHz	Review of document/Test Certificates
6	Colour	Red/Orange	Visual inspection
7	Dimension	As per the requirement	Perform and Measurement
8	Depth range	As per the table mentioned in the clause no-4.1	Perform
9	Weight	As per the requirement	Perform and Measurement

7. INSPECTION

8.1	BRPL representative shall at all times be entitled to have access to the works and all places of the manufacturer/ distributor where RFID Active / Passive ball / ring shall be manufactured and the representative shall have full facilities for unrestricted inspection of the Manufacturer's works/ distributors place, raw materials, store process and process of manufacture and conducting necessary tests as may be deemed fit, for certifying the quality of product.

8.2	The Manufacturer shall keep BRPL informed in advance of the time of starting and of the progress of manufacturing of RFID active and passive ball / ring and route tracer in its various stages so that arrangements can be made for inspection.
8.3	No material shall be dispatched from its point of manufacture and works before it has been satisfactorily inspected, tested, and necessary dispatch instructions are issued in writing, except for the cases where waiver of Inspection is granted by BRPL, and even in this case also, written dispatch instructions will be issued. Any dispatches before the issue of Dispatch Instructions in writing will be liable for rejection and non acceptance by the consignee.
8.4	The acceptance of any quantity of material shall in no way relieve the Manufacturer of any of his responsibilities for meeting all requirements of the specification, and shall not prevent subsequent rejection if such material is later found to be defective.
8.5	Only soft copy of inspection report shall be furnished by manufacturer through mail. BRPL shall not receive any hard copy of report for their office record.

8. DOCUMENTATION

Submission of drawings, calculations, catalogues, manuals, test reports shall be as mentioned below:

8.1 DRAWING, DATA AND MANUALS

Cross-Sectional drawing shall show every feature of construction. This drawing shall also state the hexadecimal code to be printed on the ball / ring.

8.2 DOCUMENTS TO BE SUBMITTED ALONG WITHBID FOR TECHNICAL JUSTIFICATION

The vendor shall submit-

- Cross sectional drawing
- GTP (all data to appear)
- Type test certificates if any

Document Submission

- Submission of drawings, calculations, catalogues, manuals, test reports shall be as follows.

  Legend:

TECHNICAL SPECIFICATIONS OF RFID ACTIVE & PASSIVE BALL / RING

GTP : Guaranteed Technical Particulars
TTR : Type Test Report
RTR : Routine Test Report

	Documents Along with offer	After award of contract- for Approval	Final documents(after Approval)
GTP	1 copies	** 1 soft copy	** 1 soft copy + CD
Drawings	1 copies	** 1 soft copy	** 1 soft copy + CD
Calculations	1copies	** 1 soft copy	** 1 soft copy + CD
Catalogues & Manual	1 copy each		** 1 soft copy + CD
Test Report	1 copy each of TTR and sample RTR		** 1 soft copy + CD

** Soft copy and CD shall contain documents duly approved, signed and scanned

- The manufacturing of the RFID Ball/ Ring shall be strictly in accordance with the approved drawings and no deviation shall be permitted without the written approval of the BRPL. All manufacturing and fabrication work in connection with the RFID Ball/ Ring prior to the approval of the drawing shall be at manufacturer's risk.
- Approval of drawing etc. by the BRPL shall not relieve the Manufacturer of his responsibility and liability for ensuring correctness and correct interpretation of the latest revision of applicable standards, rules and codes of practices. The RFID Ball/ Ring shall conform in all respects to high standards of engineering, design, workmanship and latest revisions of relevant standards at the time of ordering and BRPL shall have the power to reject any work or material which in his judgment is not in full accordance therewith.

9. DELIVERY SCHEDULE

- Delivery period Start Date : From date of LOI / LOA
- Delivery period End Date : As agreed with manufacturer
- Material dispatch Clearance : After inspection, shall be issued by BRPL.

10. DEVIATION

- Deviations from this specification shall be listed separately by bidder clause wise (format given below) along with optional offer and has to submit the list along with bid/quotation. BRPL will review the deviations and if BRPL is agreed with the deviation, seller has to take written confirmation from BRPL on deviation during tender evaluation.

- In the absence of any separate list of deviations from the bidders with bid as well as written confirmation from BRPL on deviations, it will be assumed by the Buyer that the Seller complies with the Specification fully.

- Any deviations mentioned in any other submitted bid documents (i.e.in filled GTP, Catalog, BRPL old approval, buyer's/seller's standards etc) by seller without separate deviation sheets will not consider as a deviation from this tech spec at any stage of contract.

Deviation sheet format—

Sino	Document Name	Clause No.	Deviation	Reason	Merits to BRPL