BHARAT HEAVY ELECTRICALS LTD.
(TRANSMISSION BUSINESS GROUP)

GENERAL TERMS AND CONDITIONS FOR TENDER ENQUIRY / CONTRACT

This is to be submitted duly signed by bidder in original. Clause-wise deviations and / or additional conditions / clarifications, if any, are to be brought out clearly in "Schedule of Commercial Deviation". Deviations and / or additional conditions / clarifications, if any, mentioned elsewhere in the bid / offer, shall not be considered.

Sr. No.	
1.	**INSTRUCTION TO BIDDERS :** 1.1 Sealed bids are invited for the items mentioned in the tender enquiry conforming to the NIT including Technical Specifications. Bids should be typed and free from overwriting and erasures. Corrections or additions / deletions, if any, must be clearly written and attested, otherwise offer may be rejected. 1.2 Bidder must ensure that their bid is submitted / dropped in the tender box on or before **14-00 Hrs.** IST on the due date of opening, unless otherwise specified in the NIT, at the address as follows :- Tender Box, Materials Management, Transmission Business Group, Bharat Heavy Electricals Limited, 5th Floor, Tower-A, Advant Navis IT Business Park, Plot-7, Sector-142, Noida Expressway, Noida, Dist. G. B. Nagar, U. P. ï 201305 1.3 In case tender enquiry is floated though the e-procurement system, offer / bid has to be submitted through the e-procurement system **ONLY** as per instructions given in the e-procurement portal (https://bheleps.buyjunction.in). 1.4 The bids shall be opened at 14-30 Hrs. IST on the due date of opening, in the presence of participating bidders who may like to be present, unless otherwise specified in the NIT. Bids received late are liable for rejection. Bidders sending bids by courier or post will have to ensure that it is timely delivered at the above address. 1.5 Bids are to be submitted duly signed with seal in two parts :- a) **Techno-commercial Bid (Part-I**) ï To be submitted in 2 sets (original + copy). A copy of Price Bid (Part-II) clearly mentioning all the necessary information as per format **without prices** ñUn-Priced Bidò is also to be enclosed in Part-I Bid. b) **Price Bid (Part-II)** ï To be submitted only in one set in a separate sealed envelope. This should not contain any Technical and / or Commercial Terms and Conditions. The rates should be quoted both in figures and words. 1.6 The Part-I and Part-II Bids are to be sealed in separate envelopes and marked

Sr. No.	
	as ñTechno-commercial Bid (Part-I)òand ñPrice Bid (Part-II)òrespectively. Both the envelopes are to be kept in another common envelope and marked as ñBIDò. Each envelope should be sealed and super scribed with tender enquiry no., item / package name, project name and due date of opening. Bidderôs name and address shall also be mentioned on each envelope. 1.7 For any technical clarification, please contact official mentioned in the tender enquiry / NIT. 1.8 For any commercial clarification please contact official issuing tender enquiry / NIT. 1.9 Price bid (Part-II) should not contain any additional information / description other than given in ñUn-Priced Bidò submitted with ñTechno-commercial Bid (Part-I)òexcept prices, otherwise bid is liable for rejection. 1.10 Price Bid submitted along with the bid shall remain valid up to validity of offer. Any discount / revised offer submitted by the bidder on its own shall be accepted provided it is received before the due date and time of offer submission (i.e. Part-I Bid). The discount shall be applied on pro-rata basis to all items including optional items, if any, unless specified otherwise by the bidder. Discount offered shall be valid for full duration of validity of the offer including extension of validity, if any. Unsolicited Supplementary / Revised Price Bid submitted after the due date and time of offer submission (i.e. Part-I Bid), during validity period of offer, unless asked by BHEL, shall not be considered. Withdrawal of quotation by the bidder, at any stage after its opening, may entail suitable action against such bidder by BHEL. 1.11 The consultants / firm (and any of its affiliates) shall not be eligible to participate against tender enquiry for the related goods or works or services for the same project, if they were engaged by BHEL-TBG for the consultancy services. 1.12 In case any Foreign OEM / Foreign Principal insists on engaging the services of an agent, such agent shall not be allowed to represent more than one manufacturer / supplier in the same tender. Moreover, either the agent could bid on behalf of the manufacturer / supplier or the manufacturer / supplier could bid directly but not both. In case bids are received from the manufacturer / supplier and the agent, bid received from the agent shall be ignored. 1.13 Non-conformities / errors / discrepancies in quoted prices in price bids shall be dealt as follows :- a) If, in the price structure quoted for the required goods / services / works, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly, unless in the opinion of BHEL there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price corrected accordingly. b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected. c) If there is a discrepancy between words and figures, the amount in

Sr. No.	
	words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above. d) If there is such discrepancy in an offer as mentioned in (a), (b) & (c) above, the same shall be conveyed to the bidder with target date upto which the bidder has to send his acceptance on the above lines and if the bidder does not agree to the decision of the BHEL, the bid is liable to be ignored. 1.14 In case the scope of the successful bidder / supplier against this tender enquiry includes Erection, Testing and Commissioning (ETC) of the equipment / material at site in addition to Supply, Purchase Order shall be placed for Supply Portion and Contract shall be separately awarded for ETC at Site Portion. General Terms and Conditions for Tender Enquiry / Contract mentioned herein shall be applicable for both Supply & ETC at Site. Additional Terms and Conditions for Tender Enquiry / Contract for Erection, Testing and Commissioning at Site ñBHEL/TBG/GTC-ETC/2016 Rev. 01ò shall be applicable for ETC at Site only which is to be read in conjunction with General Terms and Conditions for Tender Enquiry / Contract mentioned herein. However, any breach of either the Purchase Order or the Contract shall be deemed to be breach of the other. 1.15 Taxes and Duties payable extra as per Clause No. 2.3 in NIT, if not specified/quoted clearly as extra shall be considered as included in Ex-works Price and therefore shall not be reimbursed. Taxes and duties not payable extra as per NIT shall be deemed to be included in Ex-works Price. 1.16 If the rates for taxes and duties in respect of the quoted materials and / or services assumed by the Supplier are less than the tariff prevailing at the time of tendering, Supplier will be responsible for such under quotations. However if the rates assumed are higher than the correct rates prevailing at the time tendering, the difference will be to the credit of BHEL. Note : Representative / official deputed by the bidder to witness tender opening must produce authorization letter for the same.
2.	**PRICES :** 2.1 Unless specifically indicated in the NIT, all prices shall be FIRM. No enhancement of rate for whatsoever reasons unless and until asked by BHEL shall be allowed. 2.2 Unless specifically indicated in the NIT, the prices shall be on INR basis. 2.3 Unless specifically indicated in the NIT, the prices are to be quoted on FOR (Site / Destination) basis excluding GST. The break-up of prices shall be as under :- a) **Ex-works Price**: Ex-works price including packing & forwarding charges. b) **Freight**: Freight for door delivery up to destination / site / store are to be quoted separately. c) **Insurance**: Insurance for door delivery up to destination / site / store are to be quoted separately.

Sr. No.	
	d) **Type Test Charges**: If asked in the technical specification, it is to be quoted separately for each test. e) **Charges for Supervision of Erection, Testing & Commissioning (ETC) at Site**: To be quoted separately if specified in NIT/Price Schedule. f) **Charges for Testing & Commissioning at Site**: To be quoted separately if specified in NIT/Price Schedule. g) **Charges for Erection, Testing & Commissioning at Site**: To be quoted separately if specified in NIT/Price Schedule. h) Training Charges: To be quoted separately if specified in NIT/Price Schedule. 2.4 **GST rates** along with HSN/SAC code as applicable on Sr No (a) to (h) above is to be mentioned separately in percentage in both un-priced bid and price bid. Note : i) Unless otherwise specified in the NIT, the purchase order shall be placed on Ex-works basis for Indian bidders. ii) Prices quoted by Indian bidders shall be in Indian Rupees only. iii) In case Supervision of Erection, Testing & Commissioning (ETC) at Site or Testing & Commissioning at Site or Erection, Testing & Commissioning at Site is also in scope of the bidder along with supply, bidder has to ensure that prices quoted for such services also are in line with special terms & conditions of the NIT, if any. iv) Unless otherwise specified in the NIT, Unloading at Site / Destination shall not be in the scope of the supplier. v) Prices in respect of Sr No (a) to Sr No (h) of Clause 2.3 above are to be quoted inclusive of all taxes & Duties, charges. Levies, royalty etc. if any, excluding GST.
3.	**TERMS OF PAYMENT :** 3.1 **For Supply only in scope of the supplier** 100% of payment within 60 days from the date of receipt of complete invoice along with documents in 3 sets (original + 2 copies) as follows : · LR / GR duly endorsed by BHEL Site Official. · Material Receipt Certificate issued by BHEL Site Official. . GST Compliant Tax Invoice · Packing List (Case-wise) · Copy of Transit Insurance Certificate from underwriters. · Material Inspection Clearance Certificate (MICC) issued by BHEL Quality Management · Guarantee Certificate · Copy of Performance Bank Guarantee (PBG) · Certificate of acceptance of Type Test Reports issued by BHEL Engineering Management wherever specifically mentioned in the Purchase Order. 3.2 **For Supply where Supervision of Erection, Testing & Commissioning (ETC) at Site is in scope of the supplier or Supply where Testing & Commissioning at Site is in scope of the supplier**

Sr. No.	
	a) 95% of payment within 60 days from the date of receipt of complete invoice along with documents in 3 sets (original + 2 copies) as follows : · LR / GR duly endorsed by BHEL Site Official. · Material Receipt Certificate issued by BHEL Site Official. . GST Compliant Tax Invoice · Packing List (Case-wise) · Copy of Transit Insurance Certificate from underwriters. · Material Inspection Clearance Certificate (MICC) issued by BHEL Quality Management · Guarantee Certificate · Copy of Performance Bank Guarantee (PBG) · Certificate of acceptance of Type Test Reports issued by BHEL Engineering Management wherever specifically mentioned in the Purchase Order. b) 5% of payment within 60 days from the date of receipt of complete invoice along with documents in 3 sets (original + 2 copies) as follows : · Certificate of successful completion of Supervision of Erection, Testing & Commissioning at Site if it is in the scope of the supplier or Certificate of successful completion of Testing & Commissioning at Site if it is in the scope of the supplier. · Certificate of completion of final documentation as per Purchase Order / Technical Specification issued by BHEL Engineering Management 3.3 **For Supply where Erection, Testing & Commissioning (ETC) at Site is in scope of the supplier** a) 90% of payment within 60 days from the date of receipt of complete invoice along with documents in 3 sets (original + 2 copies) as follows : · LR / GR duly endorsed by BHEL Site Official. · Material Receipt Certificate issued by BHEL Site Official. · GST Compliant Tax Invoice · Packing List (Case-wise) · Copy of Transit Insurance Certificate from underwriters. · Material Inspection Clearance Certificate (MICC) issued by BHEL Quality Management · Guarantee Certificate · Copy of Performance Bank Guarantee (PBG) · Certificate of acceptance of Type Test Reports issued by BHEL Engineering Management wherever specifically mentioned in the Purchase Order b) 10% of payment within 60 days from the date of receipt of complete invoice along with documents in 3 sets (original + 2 copies) as follows : · Certificate of successful completion of Erection, Testing & Commissioning at Site issued by BHEL Site Official / Construction Management · Certificate of completion of final documentation as per Purchase Order / Technical Specification issued by BHEL Engineering Management 3.4 For Type Test Charges 100% payment along with applicable GST within 60 days from the date of receipt of complete GST compliant Tax invoice along with copy of Certificate of acceptance of Type Test Reports issued by BHEL Engineering Management in 3 sets (original + 2 copies) on completion of delivery (at site, if F&I is in scope of

Sr. No.	
	supplier) of main supplies (excluding spares) for which Type Tests are applicable. List of main supplies (excluding spares) for which Type Tests are applicable shall be certified by BHEL Engineering Management. 3.5 For Charges for Supervision of Erection, Testing & Commissioning at Site 100% payment along with applicable GST within 60 days from the date of receipt of complete GST compliant Tax invoice along with certificate of successful completion of Supervision of Erection, Testing & Commissioning at Site issued by BHEL Site Official / Construction Management in 3 sets (Original + 2 copies). 3.6 For Charges for Testing & Commissioning at Site 100% payment along with applicable GST within 60 days from the date of receipt of complete GST compliant Tax invoice along with certificate of successful completion of Testing & Commissioning at Site issued by BHEL Site Official / Construction Management in 3 sets (Original + 2 copies). 3.7 For Training Charges 100% payment along with applicable GST within 60 days from the date of receipt of complete GST compliant Tax invoice along with certificate of completion of training issued by BHEL Engineering Management in 3 sets (original + 2 copies). Note : i) Supplier has to submit invoice(s) as per PO or approved billing break-up of prices (if applicable as per NIT). ii) In case of supplies for overseas project, Material Receipt Certificate issued by BHEL Authorized Representative shall also be acceptable. iii) In case of Transit Insurance under Open Insurance Policy, Intimation / Declaration of Transit Insurance as per terms of the relevant Open Insurance Policy along with copy of Open Insurance Policy from underwriters shall also be acceptable. iv) Supplier has to ensure commencement of transit insurance from the date not later than LR / GR date. v) Supplier has to submit Tax Invoice(s). Supplier should ensure that Tax Invoice should comply all statutory requirements under GST Law to enable BHEL to avail input credit vi) MSMED Act, 2006 and the rules made thereunder as amended from time to time shall be applicable for release of payment to suppliers qualified & registered as Micro & Small Enterprises based on documents mentioned in the NIT for MSME. vii) Supplier has to submit PBG (as per BHEL format) & Guarantee Certificate as per PO terms. viii) In case any shortages and / or damages in supplies, an amount calculated

Sr. No.	
	based on comments against Material Receipt Certificate issued by the BHEL Site Official shall be withheld from the supply payment against 3.1(a) or 3.2(a) above to be deemed fit by BHEL subject to a minimum of 10% of the total ex-works value of the invoice corresponding to the LR / GR against which any shortages and / or damages are reported. The withheld amount shall be released after the shortages and / or damages in supplies are supplied / replenished against Certification by BHEL Site Official. ix) Payment of GST component shall be made only if vendor has deposited the Tax and credit for the same is reflected in GSTN (GST Network). In case credit of the same is not reflected in GSTN , vendor may alternatively furnish BG of GST Amount for a period valid for not less than 1 month .In case of disallowance of credit /non reflection of credit in GSTN , amount will be recovered from supplier along with applicable Interest , penalty etc from any of his dues. x) If GST is payable by BHEL on reverse Charge Mechanism basis, vendor should ensure the submission of GST compliant Tax invoice immediately on dispatch/ performance of service. In case of non-compliance any additional charges towards interest, penalty etc, will be to vendors account. xi) TDS under GST Act, if applicable, shall be deducted unless Exemption Certificate If applicable, from the appropriate authority is furnished to BHEL along with Invoice.
4.	**INTEREST LIABILITY :** In case of any delay in payment due to any reason, BHEL shall not pay any interest on delayed payment. Also, no interest shall be payable by BHEL on the bank guarantee / deposit amount or balance payment or any other money which may become due owing to difference or misunderstanding or any dispute before any quasi judicial authority between BHEL and the Supplier / Contractor.
5.	**GUARANTEE :** The equipment / material supplied and services rendered (if applicable) shall be guaranteed to be free from all defects and faults in design & engineering, material, workmanship & manufacture and in full conformity with the Purchase Order / Contract, Technical Specifications & approved drawings / data sheets, if any, for 18 months from the date of last delivery or 12 months from the date of commissioning, whichever is earlier. Wherever Erection, Testing & Commissioning at Site are also in the scope of the Supplier, the guarantee period shall be 18 months from the date of last delivery or 12 months from the date of commissioning, whichever is later. The defective equipment / material / component shall be replaced free of cost at site. Freight & Insurance during transit shall also be in the scope of the supplier / contractor. Any expenditure for dismantling and re-erection of the replaced equipment / material / component shall be to supplierôs / contractorôs account. All replacements during the guarantee period shall be delivered at site promptly and satisfactorily within a period not more than 45 days from the date of reporting the defect / rejection etc. In the event of the supplier / contractor failing to replace the defective equipment / material / component within the time period mentioned above, BHEL may proceed to undertake the replacement of such defective equipment / material / component at the risk and cost of the supplier / contractor without prejudice to any other rights under the contract and recover the same from PBG / other dues of this Purchase

Sr. No.	
	Order / Contract or any other Purchase Order / Contract executed by the supplier / contractor. Note : i) In case of Illumination System, items viz. Lamps, Tubes, Ballast, Starters, Capacitors & Fuses will not be under Guarantee after commissioning. ii) In addition to the above guarantee period, Extended Guarantee / Warranty, if any, shall be as per NIT / Technical Specifications. iii) In case offer of agent of Foreign OEM / Foreign Principal is considered, as per Clause No. 1.12 above, Guarantee as mentioned above has to be provided by the Foreign OEM / Foreign Principal also.
6.	**LATENT DEFECT :** Liability for latent defects shall be for defects inherently lying within material or arising out of design deficiency which does not manifest itself during guarantee period but later and shall be limited to five years from the expiry of the guarantee period.
7.	**PERFORMANCE BANK GUARANTEE (PBG) :** Supplier shall arrange to submit Performance BG / Deposit on a non-judicial stamp paper of appropriate value along with first invoice or within 60 days from placement of Purchase Order (PO) whichever is earlier, in line with one of the applicable options as follows :- <u>Option ñAò</u> A single rolling PBG for Rs. 50 Lakhs initially valid for 18 months with claim period of 3 months extra over and above 18 months for all the Purchase Orders being executed for Transmission Business Group, BHEL. However, validity of the PBG shall be extended till 18 months from the date of last delivery with 3 months claim period extra over and above 18 months. Single Rolling PBG option shall not be applicable in case Ex-works value of the PO at the time of placement of PO exceeds Rs. One Crore. <u>Option ñBò</u> PBG for 10% of the total Ex-works PO value, valid for 18 months from the date of last delivery with claim period of 3 months extra over and above 18 months. Ex-works PO value at the time of placement of PO shall be considered for calculation of the PBG amount. <u>Option ñCò</u> In case the total Ex-works PO value at the time of placement of PO does not exceed Rs. Ten Lakhs, interest free Deposit of 10% of the total Ex-works PO value at the time of placement of PO in form of Demand Draft favouring ñBharat Heavy Electricals Limitedò and payable at New Delhi / Delhi / Noida shall also be acceptable to BHEL in lieu of PBG, which shall be released after expiry of 21 months from the date of last delivery after deduction, if any, within 60 days from receipt of invoice in 3 sets (original + 2 copies) to be submitted by the supplier. Note : i) The Bank Guarantee shall be from any bank as per Annexure for List of Banks (32 Nos.). The original PBG should be sent by issuing Bank directly to AGM (Finance), TBG, BHEL, Noida. ii) Extension of validity of the PBG in original, as per above clause, should be sent by issuing Bank directly to AGM (Finance), TBG, BHEL, Noida at least 45 days before expiry of validity of the PBG. iii) Unless otherwise specified in the NIT, deviation taken for non-submission of PBG / Deposit, as applicable, shall not be accepted.

Sr. No.	
	iv) Supplier has to confirm one of the applicable options for submission of PBG / Deposit before placement of PO. v) In case of nonï submission PBG / Deposit, as applicable, BHEL reserve the right for Risk Purchase as per terms of the NIT and impose Suspension of Business Dealings with the Supplier / Contractor. vi) BHEL reserve the right to encash the Bank Guarantee and forfeit the amount in the event of any default, failure or neglect on part of the Supplier in fulfilment of performance of the Purchase Order. vii) Value of the Bank Guarantee (at the time of submission) shall remain unchanged for any subsequent variations in Purchase Order value up to ± 20%. Beyond this variation of ± 20%, the Supplier shall arrange to enhance or may reduce the value of the Bank Guarantee accordingly for the total variation promptly. viii) Vendor to ensure submission of Certificate of Final Documentation /Confirmation regarding Non applicability of Final Documentation, as the case may be, as referred in clause No 9 regarding Final Documentation. BG shall be released only after submission of the same to BHEL TBMM.
8.	**SUBMISSION OF DRAWINGS / DOCUMENTS FOR APPROVAL :** Supplier shall submit the master document list within 7 days from date of Purchase Order / Contract, unless otherwise specified in the NIT, with planned dates for submission which shall be in line with activity schedule as per Purchase Order / Contract and shall be finalized with BHEL Engineering Management. Date of first submission of drawings / documents shall be certified by BHEL Engineering Management after the receipt of applicable drawings / documents (e.g. project specific cover sheet, GTP, OGA drawings, schemes, type test reports etc.) by BHEL. During detailed engineering stage, necessary hard copies of the engineering drawings / documents shall also be submitted by the supplier as per the Purchase Order / Contract requirement. The supplier shall also submit the packing drawings as per technical specifications. In case item(s) offered require any interface details of other item (not in the scope of supplier & required for operating the equipment), the supplier has to submit interfaces schedule along with submission of engineering drawings / documents. It shall be responsibility of the supplier to get the details of the interfaced item from BHEL before manufacturing to avoid any mismatch at site.
9.	**FINAL DOCUMENTATION :** Final documentation as called in the Technical /contract specification is to be submitted within 3 months from the date of first delivery of respective equipment, item/material. After submission of Final Documentation, BHEL Engineering Management (TBEM) will issue a Certificate of Completion of Final Documentation. Wherever Final Documentation is not applicable, BHEL Engineering Management (TBEM) will issue confirmation regarding the same, Vendor to submit the Certificate of Final Documentation /Confirmation regarding Non applicability of Final Documentation, as the case may be, to BHEL TBMM. In case of Non Submission of Certificate of Final Documentation /Confirmation regarding Non applicability of Final Documentation, BG will be liable for encashment.
10.	**INSPECTION :** BHEL / customer / third party shall inspect equipment / material before despatch. Stage inspection during manufacturing may also be carried out. Material to be despatched only after getting Material Despatch Clearance Certificate (MDCC) / MICC issued by BHEL. Supplier shall send inspection call on prescribed format / web site only, with an advance notice of 15 days. Supplier to ensure submission of all routine / acceptance test reports, inspection

Sr. No.	
	reports and all other documents related to inspection, immediately to BHEL. BHEL representative is authorised to carry out audits along with Third Party Inspection Agency at vendorâs / supplierâs works before clearing the items for despatch.
11.	**DESPATCH DOCUMENTS :** Despatch documents to be immediately sent to BHEL on despatch are as follows :- • Copy of Invoice • Copy of LR / GR in case of Indian suppliers or BL / AWB in case of foreign suppliers • Copy of Packing List (Case-wise) • Copy of Transit Insurance Certificate from underwriters • Copy of Guarantee Certificate
12.	**DELIVERY PERIOD :** Delivery / Completion requirement shall be mentioned in the NIT. Bidder to specify best delivery / completion period possible in weeks from the date of LOI / PO as per activity schedule for consideration by BHEL. Time required for type test, if applicable, is to be separately indicated. Note : LR / GR date or invoice date (whichever is later) for indigenous supplies and BL / AWB date for FOB / CIF (if applicable) contracts shall be considered as delivery date.
13.	**LIQUIDATED DAMAGES FOR DELAYED DELIVERY**: In case of delay in execution of Purchase Order beyond the contractual delivery time, an amount of 0.5% of the total Purchase Order value for supply (incl. taxes and duties, freight & insurance as applicable) per week of delay or part thereof subject to a maximum of 10% of the total Purchase Order value for supply (incl. taxes and duties, freight & insurance as applicable) shall be deducted as Liquidated Damages (LD) along with applicable GST (if any) on LD. However, in case of staggered (lot-wise) contractual delivery schedule, an amount of 0.5% of the total Purchase Order value for supply (incl. taxes, duties, freight & insurance as applicable) of delayed lot per week of delay or part thereof subject to maximum of 10% of the total Purchase Order value. (Incl taxes, duties, Freight &Insurance as applicable) shall be deducted as Liquidated Damages (LD) along with applicable GST (if any) on LD. Note : i) In case of any amendment / revision in PO /WO, the LD shall be linked to the amended / revised Purchase Order / Contract value and delivery / completion time / schedule, if applicable. ii) LR / GR date or invoice date (whichever is later) for indigenous supplies and BL / AWB date for FOB / CIF (if applicable) for imported supplies shall be treated as the date of dispatch for levying LD as above. iii) However, for indigenous supply, if time period between date of receipt of material at site / destination by Site Official & the date of LR / GR or invoice (whichever is later) is more than 30 days, where distance from place of despatch as per LR / GR is upto 1000 Kms or if time period between date of receipt of material at site / destination by Site Official & the date of LR / GR or invoice (whichever is later) is more than 45 days, where distance from place of despatch as per LR / GR is more than 1000 Kms, such excess period shall also be considered for LD purpose. iv) If, as per supplier, delay is not attributable to the supplier, delay analysis with documentary evidence may be submitted by the supplier at the earliest but not

Sr. No.	
	later than six months from the end of the financial year in which the payment is withheld. Based on the above details / documents submitted by the supplier, BHEL shall take final decision and if considered appropriate by BHEL, withheld amount (full or part as the case may be) shall be released, otherwise, full or balance withheld amount shall be treated as deduction of Liquidated Damages (LD) towards delayed delivery.
14.	**VALIDITY OF OFFER :** The offer shall be valid for 120 days from the due date of opening of tender (i.e. techno-commercial bid unless otherwise specified in the NIT). Prices of Spares, wherever they optional items, shall be valid till two years from the date of placement of PO.
15.	**ACCEPTANCE / REJECTION OF TENDER :** BHEL reserve the right to reject in full or part, any or all tender without assigning any reason thereof. BHEL also reserve right to vary the quantities as mentioned in the NIT. Acceptance of offer is subject to vendor approval by customer before opening of price bid. BHEL shall not be bound by any power of attorney granted by tenderer or by changes in composition of the firm made subsequent to award of order / contract. BHEL may however recognize such power of attorney and changes after obtaining proper legal advice, cost of which will be chargeable to the seller / contractor concerned. If the tenderer deliberately gives wrong information, BHEL reserves the right to reject such an offer at any stage or cancel the order / contract, if awarded, and forfeit the security deposit and bank guarantee.
16.	**DEVIATION :** The bids having deviation(s) w.r.t. tender are liable for rejection. However, BHEL, at its discretion, may load the prices for evaluation of offer with prior intimation to bidder.
17.	**TENDER EVALUATION :** Comparative statement shall be prepared and evaluated on total cost basis at destination/site (as per terms of NIT) considering overall quantity indicated in NIT unless contrary to same is specifically mentioned in the tender enquiry / NIT. Total cost for this purpose shall include cost of scope of work as mentioned in NIT along with applicable taxes & duties, and other services etc. (if applicable). GST input credit available to BHEL shall be reduced from prices while determining L1 status. In case all bidders are foreign & Port of Import (destination port) is same for all the bidders, evaluation of offers shall be done on CIF (Port of Import) basis. Otherwise, evaluation of offers shall be done on the basis of delivered cost at site /destination to BHEL. Further, in case of foreign bidders, marine freight & insurance are to be quoted separately & the purchase order may be placed on FOB basis with an option for delivery on CIF / CFR basis, if required, later. In case of foreign bidders, Exchange Rate (TT selling rate of State Bank of India) as on date of tender opening (Part-I Bid in case of two part bid) shall be considered. If the relevant day happens to be a bank holiday, then the forex rate as on the previous bank (SBI) working day shall be taken for tender evaluation.
18.	**LOADING CRITERIA :** List of permissible deviations & loading criteria thereof are as follows :- a) Payment Terms Base rate of SBI (as applicable on the date of bid opening / techno-commercial bid opening in case of two part bids) + 6% shall be considered for loading for the period of relaxation sought by bidder(s) against terms of payment in the NIT. b) Liquidated Damages (LD) for Delayed Delivery

Sr. No.	
	Loading on LD clause shall be to the extent to which it is not agreed to by the bidder (at offered value). c) In case of foreign bidders, if the quoted prices is on CIF basis only, it shall be loaded to arrive at total FOR (Site / Destination) price, as applicable, by factors as follows :- i) Port handling / clearing charges: @ 1% of CIF value to arrive at Customs Assessable Value. ii) Custom Duty (including CVD & SAD) as per NIT prevailing on date of price bid opening. iii) Inland Freight & Transit Insurance: @ 5% of CIF value where distance between site / destination and Port of Discharge is upto 1000 Kms or @ 7% of CIF value where distance between site / destination and Port of Discharge is more than 1000 Kms. Note : Additional deviations (if considered acceptable by BHEL) & the loading criteria shall be communicated to all the qualified bidders before price bid opening.
19.	**ARBITRATION :** In the event of any dispute emanating from and relating to this contract, the matter shall be referred to the sole arbitration of the person appointed by the competent authority of BHEL. Subject to aforesaid, the provisions of ñThe Arbitration and Conciliation Act, 1996òand the rules made thereunder as amended from time to time in India shall apply to the arbitration proceedings. The venue of arbitration shall be in New Delhi. Further there shall be no claim for any pre-reference or pendente-lite interest on the claims and any claim for such interest made shall be void. However, in case of contract with Public Sector Enterprise / Undertaking (PSE/PSU) or Govt. Dept., the extant guidelines of Govt. of India shall be followed.
20.	**LEGAL SETTLEMENT :** Indian Courts at New Delhi / Delhi shall have exclusive jurisdiction to decide the dispute, if any, arising out of or in respect of the contract(s) to which these conditions are applicable. Contract, including all matters connected with contract, shall be governed by the Indian Law, both substantive and procedural, for the time being in force including modification thereto.
21.	**SUB-CONTRACTING :** In case further subcontracting of BHEL Purchase Order / Contract or part thereof is envisaged by supplier, the same can be done after written permission is obtained from BHEL. However it shall not absolve the Supplier / Contractor of the responsibility of fulfilling BHEL Purchase Order / Contract requirements. In case of subcontracting of Purchase Order / Contract awarded by BHEL or part thereof without such permission, BHEL reserve the right to cancel the Purchase Order / Contract and source such material / component / equipment / system from any other agency at the risk and cost of the Supplier / Contractor. If Supplier / Contractor is an individual or proprietary concern and the individual or the proprietor dies or the partnership is dissolved or substantially affected, then unless BHEL is satisfied that legal representative of individual Supplier / Contractor or proprietor of proprietary concern and surviving partners of partnership firm are capable of carrying out and completing the Purchase Order / Contract, BHEL shall be entitled to cancel the Purchase Order / Contract as to its incomplete portion and without being in any way liable to payment of any compensation to legal representative of Supplier / Contractor and / or to surviving partners of Supplierôs / Contractorôs firm on account of cancellation of the Purchase Order / Contract. Decision of BHEL that legal representatives of deceased Supplier / Contractor or

Sr. No.	
	surviving partners of the Supplierõs / Contractorõs firm cannot carry out and complete the Purchase Order / Contract shall be final and binding on the parties hereto. Terms and Conditions shall not get affected in case of de-merger / amalgamation / taking-over / re-constitution etc.
22.	**RISK PURCHASE :** In case the Supplier / Contractor fails to supply or fails to comply with terms & conditions of the Purchase Order / Contract or delivers equipment / material not of the contracted quality or fails to adhere to the contract specifications or fails to perform as per the activity schedule and there are sufficient reasons even before expiry of the delivery / completion period to justify that supplies shall be inordinately delayed beyond contractual delivery / completion period, BHEL reserve the right to cancel the Purchase Order / Contract either in whole or in part thereof without compensation to Supplier / Contractor and if BHEL so desires, may procure such equipment / material / items not delivered or others of similar description where equipment / material / items exactly complying with particulars are not readily procurable in the opinion of BHEL which is final and in such manner as deemed appropriate, at the risk and cost of the Supplier / Contractor and the Supplier / Contractor shall be liable to BHEL for any excess cost to BHEL. However, the Supplier / Contractor shall continue execution of the Purchase Order / Contract to the extent not cancelled under the provisions of this clause. Recovery amount on account of purchases made by BHEL at the risk and cost of Supplier / Contractor shall be the difference of total value of new Purchase Order (PO) value and total value of old Purchase Order for applicable items, where the total value of new PO is more than total value of old PO for applicable items, plus additional 15% of the total ex-works value of new PO as overheads. The Supplier / Contractor shall on no account be entitled to any gain on such risk & cost purchase. In case the purchase order (PO) value of the new PO is less than the PO value of the old PO, 15% of the total ex-works value of the new PO shall be recovered as overheads and the difference between the PO value of the old PO and the new PO shall not be considered for calculation of the recovery amount.
23.	**ADJUSTMENT OF RECOVERY :** Any amount payable by the Supplier / Contractor under any of the condition of this contract shall be liable to be adjusted against any amount payable to the Supplier / Contractor under any other Purchase Order / Contract awarded to him by any BHEL unit. This is without prejudice to any other action, as may be deemed fit, by BHEL.
24.	**FORCE MAJEURE CONDITION :** If by reason of war, civil commotion, act of god, Government restrictions, strike, lockout which are not in control of Supplier / Contractor the deliveries / services are delayed, Supplier / Contractor shall not be held responsible. If at any time during the continuance of the Purchase Order / Contract, the performance in whole or in part by either party of any obligations under the Purchase Order / Contract is prevented or delayed by reason of any war hostilities, acts of the public enemy, restrictions by Govt. of India, civil commotion, sabotage, fires, floods, explosion, epidemics, quarantine restrictions, strike, lock-outs or acts of God (hereinafter referred to as õeventõ), which are not in control of Supplier / Contractor or BHEL, then provided notice of the happening of such event is given by either party to the other within fifteen (15) days from the date of occurrence thereof, neither party shall by reason of such event be entitled to terminate the Purchase Order / Contract nor shall have any claim for damages against each other in respect of such non-performance and delay in performance. Performance under the Purchase Order / Contract shall be resumed immediately after such event has come to an end or

Sr. No.	
	ceased to exist and decision of BHEL as to whether the deliveries have to be resumed or not shall be final, conclusive and binding on the parties hereto. In the event of the parties hereto not able to agree that a force majeure event has occurred, the parties shall submit the disputes for resolution pursuant to the provisions hereunder, provided that the burden of proof as to whether a force majeure event has occurred shall be upon the party claiming such an event. Notwithstanding above provisions, BHEL shall reserve the right to cancel the Purchase Order / Contract, wholly or partly, in order to meet the overall project schedule and make alternative arrangements for completion of delivery and other schedules.
25.	**MANUFACTURING QUALITY PLAN (MQP) :** Supplier to submit approved MQP in line with requirement of BHEL/customer.
26.	**SUPPLIER PERFORMANCE MONITORING AND RATING SYSTEM :** BHEL reserve the right for evaluation of Supplier Performance Rating as per Supplier Performance Monitoring and Rating System of BHEL for necessary action. Details are available at BHEL Website www.bhel.com for reference.
27.	**DEALING WITH BANNED SUPPLIERS / CONTRACTORS IN BHEL :** Offers of the bidders, who are on the banned list, as also the offers of the bidders who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL website www.bhel.com for reference.
28.	**ORDER OF PRECEDENCE :** The order of precedence shall be as follows :- a) Special Terms & Conditions (STC) for Tender Enquiry / Contract, if any b) General Terms & Conditions (GTC) for Tender Enquiry / Contract & Additional General Terms & Conditions (GTC) for Tender Enquiry / Contract for Erection Testing & Commissioning (ETC) at Site, if applicable Provisions in (a) above shall prevail over (b). In case of conflict, between Technical Specifications and STC / GTC, bidder to seek necessary clarifications from BHEL concerned official as specified in NIT.
29.	**PACKING :** Packing shall be in conformity with specifications and shall be such as to ensure prevention of damages, corrosion, deterioration, shortages, pilferage and loss in transit or storage. In case of shipment by sea or air, the packing shall be sea-worthy or air-worthy respectively and of international standards. Different types of spares i.e. start-up / commissioning spares and initial spares (mandatory spares and recommended O&M spares) are to be packed separately. Packing List shall be submitted as per standard format along with advance set of documents for claiming payment which shall also indicate :- a) Case / Packing size (as applicable). b) Gross weight and net weight of each package. c) Detailed contents of the package with quantity of each item separately. Project, Item / Package Description, BHELôs PO No. with date & Case / Packing Mark should also be clearly mentioned on the Case / Packing and Packing List for identification. Also, Packing List must be duly signed & should include respective Invoice No. & LR No. Note : Foreign suppliers to furnish details to arrange inland transportation by BHEL, if applicable, as follows :- i) No. of Packages ii) Size with Weight (Gross & Net) of each Package iii) No. of Containers with type & size required for inland transportation

Sr. No.	
	iv) Type of Cargo (Break Bulk / LCL / FCL) v) Customs Tariff No.
30.	**COLOUR CODING :** Aluminium stickers are required to be attached to large components but plastic sheet tags should be tied with small components, giving details like purchase order, description of the component, quantity etc. Tags should be of the colour as follows :- a) Main equipment : Yellow or White tag b) Start-up / Commissioning spares : Blue tag c) Mandatory spares : Pink or Red tag d) Recommended / O&M spares : Green tag
31.	**MICRO, SMALL & MEDIUM ENTERPRISES (MSME) :** MSMED Act 2006 as amended from time to time & extant regulations of Govt. of India for MSME will be applicable. Micro & Small Enterprises (MSE) can avail the intended benefits only if they submit along with the offer / bid, attested copies of either Acknowledgement of Entrepreneur Memorandum Part-II (EM-II certificate) having deemed validity (five years from the date of issue of acknowledgement in EM-II) or valid NSIC certificate or EM-II certificate along with attested copy of a CA certificate (As per BHEL format where deemed validity of EM-II certificate of five years have expired) applicable for the relevant financial year (latest audited). Date to be reckoned for determining the deemed validity will be the date of opening (for Techno-commercial Bid : Part-I in case of two part bid). Non-submission of such documents will lead to consideration of their bid at par with other bidders. No benefit shall be applicable for this enquiry if any deficiency in the above required documents are not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal. Documents should be notarized or arrested (in original) by a Gazetted officer. Copy of Udyog Aadhaar Memorandum with Acknowledgement of Ministry of Micro, Small & Medium Enterprises should also be furnished.
32.	**BUSINESS ETHICS / SUSPENSION OF BUSINESS DEALINGS WITH SUPPLIERS / CONTRACTORS :** If any bidder / supplier / contractor during pre-tendering / tendering / post tendering / award / execution / post-execution, indulges in malpractices cheating, bribery, fraud or other misconduct or formation of cartel so as to influence the bidding process or influences the price or fails to perform or is in default without any reasonable cause etc or performs any act considered objectionable as per extant guidelines, action may be taken against such bidders/supplier/contractor as per extant ñGuidelines for Suspension of Business Dealings with Suppliers/Contractorsò. Abridged version of same is available at BHEL website (www.bhel.com) on ñSupplier Registrationò Page.
33.	**REVERSE AUCTION :** BHEL reserve the right to go for Reverse Auction (RA) instead of opening the sealed envelope price bid, submitted by the bidder or price bid submitted by the bidder through e-procurement system. This will be decided after techno-commercial evaluation. All bidders to give their acceptance for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides to go for RA. In case BHEL decides to go for Reverse Auction, only those bidders who have given their unconditional acceptance to participate in RA will be allowed to participate in the Reverse Auction. Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit ñonline sealed bid in the Reverse Auction. Non-submission of ñonline sealed bid by the bidder will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue. General Terms and Conditions of RA are available at Annexure. Business Rules for

Sr. No.	
	RA shall be sent to the bidders before conducting RA. Abridged Version of ñCommon Guidelines for Conducting Reverse Auctionòmay also be seen at BHEL website (www.bhel.com) on ñSupplier Registrationò Page & ñTender NotificationsòPage.
34.	**INTEGRITY PACT :** Bidders shall have to enter into Integrity Pact with BHEL, duly signed with seal in original, if specified in NIT / RFQ failing which bidderôs offer shall be liable for rejection.
35.	**TERMINATION OF CONTRACT :** BHEL shall have the right to cancel the Purchase Order / Contract without any financial implication to BHEL if vendor approval by end user / customer is withdrawn or in case of Suspension of Business Dealings with the Suppliers / Contractors by BHEL. BHEL shall have the right to cancel Purchase Order / Contract, wholly or in part, in case they are obliged to do so on account of any decline, diminution, curtailment or stoppage of their business and in that event, the Supplierôs / Contractor' compensation claim shall be settled mutually. In case of cancellation of Purchase Order / Contract for main supply, all other associated Purchase Orders / Contracts like those for Mandatory Spares / Recommended Spares / Erection, Testing & Commissioning (ETC) / Supervision of ETC, if any, would also get cancelled.
36.	**SHELF LIFE :** Supplier has to inform the list of the items / sub-items which have limited shelf life like consumables or those required for the first fill and shall indicate the corresponding shelf life period in the offer. Such items / sub-items shall be manufactured / despatched only after getting formal clearance from BHEL.
37.	**LIMITATION OF LIABILITY :** Notwithstanding any other provisions, except in cases of wilful misconduct and / or criminal negligence / acts, a) Neither the Supplier / Contractor nor BHEL shall be liable to the other, whether in Purchase Order / Contract, tort, or otherwise, for any consequential loss or damage, loss of use, loss of production or loss of profits or interest costs, provided however that this exclusion shall not apply to any obligation of the Supplier / Contractor to pay Liquidated Damages to the BHEL and b) Notwithstanding any other provisions incorporated elsewhere in the contract, the aggregate liability of the Contractor in respect of this contract, whether under the Contract, in tort or otherwise, shall not exceed total Contract Price, provided however that this limitation shall not apply to any obligation of the Vendor to indemnify BHEL with respect to Patent Infringement or Intellectual Property Rights.
38.	**SHORTAGES / DAMAGES :** a) Against Supply only or Supply where Supervision of Erection, Testing & Commissioning (ETC) at Site or Supply where Testing & Commissioning at Site is in scope of the supplier : Any shortages and / or damages in supplies shall be supplied / replenished free of cost by the supplier as early as possible but not later than 30 days from the date of intimation by BHEL to the supplier. b) Against Supply where Erection, Testing & Commissioning (ETC) at Site is in scope of the supplier :

Sr. No.	
	Any shortages and / or damages in supplies and during handling / storage, erection, testing and commissioning at site shall be supplied / replenished free of cost by the Supplier / Contractor, as early as possible, to meet the contractual completion time / schedule. Note: There shall not be any extension in the contractual delivery time / schedule due to any shortages and / or damages in supplies.
39.	**VARIATION OF CONTRACT VALUE / QUANTITY VARIATION :** BHEL shall have the right to variation in quantities of items within ± 30% of the total Purchase Order / Contract value at the time of placement of PO or award of Contract on overall basis for all amendments together within two years from the date of original Purchase Order / Contract or completion of execution of the Purchase Order / Contract whichever is earlier but quantities of individual items may vary to any extent or may get deleted unless otherwise specified in the technical specifications. No compensation is payable due to variation in the quantities and the Supplier / Contractor shall be bound to accept the same the contracted prices / rates without any escalation. However, if the Purchase Order / Contract is on ñLumpsumò basis, no variation of Purchase Order / Contract value shall be admissible to the Supplier / Contractor within the scope of Purchase Order / Contract, as long as the inputs remain unchanged.
40.	**STATUTORY VARIATION :** GST rates prevailing at the time of dispatch of goods / completion of services shall be payable by BHEL. All other taxes, duties, charges, royalty, cess, other levies shall be deemed to be included in the Ex Works Prices / Charges quoted by bidders and no variations shall be payable in respect thereof. No other variations such as on customs duty, exchange rate, minimum wages, prices of controlled commodities, any other input etc. shall be payable by the BHEL. Notwithstanding anything above, where the actual completion of the supply / services occurs beyond the period stipulated in the Purchase Order / Contract or any extension thereof, variations referred to above, will be limited to the rates prevailing on the dates of such agreed completion periods only. For variations after the agreed completion periods, the Supplier / Contractor alone shall bear the impact for the upward revisions and for downward revisions BHEL shall be given the benefit of reduction in applicable taxes /GST. This will be without prejudice to the levy of liquidated damages for delay in delivery / completion. If new tax is introduced by Central/ State Govt / Municipality becomes directly applicable on items specified in Bill of Quantities/Purchase Order/Contract, full reimbursements shall be made provided it becomes applicable on items specified in Bill of Quantities. However, any additional tax implication due to delay in delivery, beyond the Contractual Delivery, attributable to supplier shall be borne by supplier.
41.	**MODE OF PAYMENT :** Payment shall be made directly to the Supplier / Contractor by BHEL through NEFT / RTGS.
42.	**CONFIDENTIALITY :** Supplier / Contractor shall, at all times, undertake to maintain complete confidentiality of all data, information, software, drawings & documents etc. belonging to BHEL and also of systems, procedures, reports, input documents, manuals, results and any other BHEL documents discussed and / or finalized during the course of execution of Purchase Order / Contract.
43.	**INDEMNIFICATION :** The Supplier / Contractor shall indemnify and keep indemnified and hold harmless BHEL and its employees and officers from and against any and all claims, suits, actions or administrative proceedings, demands, losses, damages, costs and

Sr. No.	
	expenses and any other claim of whatsoever nature in respect of the death or injury of any person or loss of or damage to any property arising during the course and out of the execution of the Purchase Order / Contract.
44.	**TITLE OF GOODS :** a) Ownership of the equipment / material procured in India, shall be transferred to BHEL upon loading on to the mode of transport to be used for transportation of the said equipment / material from the works to the site / destination and upon endorsement of the dispatch documents in favour of BHEL. b) Ownership of the equipment / material to be imported into the country where the site is located, if not procured in India, shall be transferred to BHEL upon loading on the mode of transport to be used for transportation of the equipment / material from the country of origin to that country / destination and upon endorsement of despatch document in favour of BHEL. c) Notwithstanding the transfer of ownership of the equipment / material, the responsibility for care and safe custody thereof together with the risk of loss or damage thereto for whatsoever reason shall remain with the Supplier.
45.	**COMPLIANCE OF STATUTORY REQUIREMENTS :** The vendor shall comply with all State and Central Laws / Acts, Statutory Rules, Regulations etc., as may be enacted by the Government during the tenure of the Purchase Order / Contract and having in force and applicable to the Purchase Order / Contract and nothing shall be done by the Supplier / Contractor in contravention of any Law / Act and / or Rules / Regulations, thereunder or any amendment thereof. The Supplier / Contractor shall pay all taxes, fees, licence charges / deposits, duties, tolls, royalty, commissions or other charges which may be levied on account of any of his operations connected with the Purchase Order / Contract. In case BHEL is constrained to make any of such payments, BHEL shall recover the same from the Supplier / Contractor either from moneys due to him or otherwise as deemed fit.
46.	**ACCEPTANCE OF ORDER :** Supplier should acknowledge and accept the Letter of Award / Purchase Order issued by BHEL within 7 days of the issue of Letter of Award / Purchase Order. In case of any discrepancy / typographical error in issue of Purchase Order / Contract, the agreed terms & conditions, scope of work, rates / prices for placement of PO / award of contract shall be applicable and BHEL reserves the right to issue amendment(s) to PO / Contract for correction of discrepancies / typographical errors in the PO / Contract at a later date.
47.	**FRAUD PREVENTION POLICY :** The Bidder along with its associate / collaborators / sub-contractors / sub-vendors / consultants / service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website http://www.bhel.com and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice.

Signature of Bidder (Authorized Signatory) with Date & Seal

BHARAT HEAVY ELECTRICALS LIMITED

TRANSMISSION BUSINESS ENGINEERING MANAGEMENT

NEW DELHI

DOCUMENT No.	TB-395-316-040	Rev	00		Prepared	Checked	Approved
CUSTOMER Doc. No.				NAME	GV	MM	VK
TYPE OF DOC.	TECHNICAL SPECIFICATION			SIGN			
TITLE				DATE	01/07/19	15.07.19	16/7/19
Cable Transit System				GROUP	TBEM		
				W.O. No			

CUSTOMER	POWER GRID CORPORATION OF INDIA LIMITED
PROJECT	SUBSTATION PACKAGE-SS01 FOR ESTABLISHMENT OF 765/400KV S/S AT MEDINIPUR & JEERAT (NEW) ASSOCIATED WITH TRANSMISSION SYSTEM PROJECT "765kV STRENGTHENING IN EASTERN REGION (ERSS-XVIII) UNDER TARIFF BASED COMPETITIVE BIDDING (TBCB) ROUTE.

List of Contents — No. of Pages

Cover Sheet — 01

- Section -1- Scope & Technical Requirements — 05
- Enclosures (Listed Below)
- Section -2- Specific Technical Requirements — 01
- Section -3- Project Details and General Specifications — 10
- Annexure-A - Schedule of Technical Deviation — 01

Enclosures:

- Annexure I – Tentative number of Type of Cable Entering Various Switchyard Buildings — 02
- 9m x 4.5m SPR Standard Drawing - C/ENGG/STD/PR/2017 — 03
- 6m x 4.5m SPR Standard Drawing - C/ENGG/STD/PR/2017 — 03
- CRB Plinth Beam for Medinipur SS (Layout and RCC details) – C/ENGG/ERII/MED/CRB/PLINTH/01 — 02
- CRB Plinth Beam for Jeerat SS (Layout and RCC details) – C/ENGG/ERII/MED/CRB/PLINTH/01 — 02
- Auxiliary Building (Plinth Beam Framing Plan) - C/ENGG/ERII/MED/AUX/PLINT/01 — 02
- Standard Fire Fighting Pump House - C/ENGG/STD/FFPH/2016 — 05
- Typical Panel layout in 400 kV and 765kV SPR for Medinipur SS - TB-3-395-316-036 — 02
- Trench and Panel layout in CRB for 765/400kV Medinipur SS - TB-3-395-316-040 — 01
- Trench and Panel layout in Auxiliary Building for 765/400kV Medinipur SS - TB-3-395-316-038 — 01
- Single Line Diagram for 765/400kV Medinipur SS - TB-3-395-510-021 — 02
- Single Line Diagram for 765/400kV Jeerat SS - TB-3-395-510-001 — 02
- SLD for LT AC and DC system at Medinipur SS - TB-3-395-510-034 — 01
- SLD for LT AC and DC system at Jeerat SS - TB-3-395-510-014 — 01

Rev.	Date	Altered	Checked	Approved	REVISION DETAILS		
00					First Issue		

Distribution	CUSTOMER	TBMM	O/C	
	-			

COPYRIGHT & CONFIDENTIAL
THE INFORMATION CONTAINED IN THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED
THIS MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY MANNER DETRIMENTAL TO THE INTEREST OF THE COMPANY

SECTION - 1

1.1 SCOPE

The scope of work includes design, engineering, manufacturing, assembly, testing before supply, Inspection, packing, loading at works, transportation to sites of CABLE TRANSIT SYSTEM including all the required items and accessories as mentioned in this section and in various other sections of this specification. The scope of work also includes supervision and verification of installation of the Cable Transit System at Site. The bidder shall provide information/demonstrate to POWERGRID/BHEL employees at site regarding installation and maintenance of Cable Transit system.

The equipment is required for the following project:

Customer : Power Grid Corporation of India Ltd.
Project : 765kV/400kV POWERGRID Medinipur and Jeerat S/S

The scope of supplies shall be as per commercial terms and conditions enclosed separately with the enquiry.

1.2 TECHNICAL REQUIREMENTS

Modular multi-diameter Cable Transit system consisting of frames, blocks and accessories shall be installed where the underground and over ground cables enter or leave concrete bay kiosks/switchyard panel room & control rooms in the substations. Cable Transit system shall consist of multi-diameter type peel-able or adjustable blocks of different sizes to suit the various cables. It should be simple, easy and quick to assemble & re-assemble the Cable Transit system.

Solid blocks shall not be used on frame. Frames & stay-plate material shall be of galvanized steel and for compression, single piece wedge with galvanized steel bolts shall be used. 30% spare blocks on the frame shall be provided for expansion in future. Cable Transit system should have been tested for fire/water/smoke tightness.

1.3 BILL OF QUANTITIES

The following items are required for 765/400kV Powergrid Medinipur and Jeerat projects.

A. For Medinipur SS:

S.No	ITEM DESCRIPTION	Unit	Qty. (Nos)
1	Supply of Frames for:		
a)	CRB - Cable Trench Entry	Lot	3
b)	Aux Building - Cable Trench Entry	Lot	3
c)	FFPH Building Entry	Lot	1
d)	SPR-7.x Entry – for 765kV SPR (1 Lot = For each entry in 765kV Swyd Panel Room)	Lot	8
e)	SPR-4.x Entry – for 400kV SPR (1 Lot = For each entry in 400kV Swyd Panel Room)	Lot	8
2	Supply of modules consisting of peel able/adjustable blocks of different sizes as per requirement and accessories:	Sq. Meter	5.8
3	Installation of Cable Transit System for complete switchyard	Lot	1

B. For Jeerat SS:

S.No	ITEM DESCRIPTION	Unit	Qty. (Nos)
1	Supply of Frames for:		
a)	CRB - Cable Trench Entry	Lot	3
b)	Aux Building - Cable Trench Entry	Lot	3
c)	FFPH Building Entry	Lot	1
d)	SPR-7.x Entry – for 765kV SPR (1 Lot = For each entry in 765kV Swyd Panel Room)	Lot	6
e)	SPR-4.x Entry – for 400kV SPR (1 Lot = For each entry in 400kV Swyd Panel Room)	Lot	6
2	Supply of modules consisting of peel able/adjustable blocks of different sizes as per requirement and accessories:	Sq. Meter	5.5
3	Installation of Cable Transit System for complete switchyard.	Lot	1

1) For items in S. No. 1, 1 Lot shall include full frame alongwith all the items which are necessary for successful installation of frames.
2) For items in S.No. 2, 1 Lot shall include all the items which are necessary for successful installation (including nuts and bolts, stay plates, Wedge and Lubricants etc.) and satisfactorily working/maintenance of the offered cables.
3) For items in S. No. 3, 1 Lot shall include installation of the Cable Transit system for complete project. Multiple vendor visits for the same is anticipated. Vendor has to co-ordinate with Site In-charge for availability of fronts for its work.
4) Vendor shall provide detailed bill of quantity (defining 1 LOT) required for meeting the complete functionality of the project and specification as per standard Powergrid practice.
5) Compression tools and accessories necessary in the installation shall be considered in the supply scope that shall be required at a later stage for new cables.
6) The Contract shall be on lump-sum basis for the package. Within the scope of the contract, no variation shall be admissible to the Contractor so far the input remains unchanged. In case of change in scope after award of the contract, the additions/ deletions to the scope shall be as per the breakup unit rates for all the equipment and services furnished by the bidder in his offer.
7) Overall quantity may vary from -30% to +30%.
8) Building details in 765/400kV substation (For Cable Openings):

i) For Medinipur SS:

S.No	Building Description	Civil Drawing No.	Panel Layout Drawing No.	No. of Buildings/Cable Openings per Building	Opening size (mm x mm)
1	9m x 4.5m SPR	C/ENGG/STD/PR/2017	TB-3-395-316-036	4/2	1350x600
2	6m x 4.5m SPR	C/ENGG/STD/PR/2017	TB-3-395-316-036	4/2	1350x600
3	Control Room Building (Plinth Beam)	C/ENGG/ERII/MED/CRB/ PLINTH/01, R01	TB-3-395-316-040	1/3	T1- 1200x500 T2- 1350x500 T3- 400x400
4	Auxiliary Room Building (Plinth Beam)	C/ENGG/ERII/MED/AUX/ PLINTH/01, R00	TB-3-395-316-038	1/3	T1- 1850x800 T2- 1700x500 T3- 1850x600
5	FFPH	C/ENGG/STD/FFPH/2016	-	1/1	400x400

ii) For Jeerat SS:

S.No	Building Description	Civil Drawing No.	Panel Layout Drawing No.	No. of Buildings/Cable Openings per Building	Opening size (mm x mm)
1	9m x 4.5m SPR	C/ENGG/STD/PR/2017	TB-3-395-316-036	2/2 (765kV SS)	1350x600
2	9m x 4.5m SPR	C/ENGG/STD/PR/2017	TB-3-395-316-036	2/3 (400kV SS)	1350x600
3	6m x 4.5m SPR	C/ENGG/STD/PR/2017	TB-3-395-316-036	1/2	
4	Control Room Building (Plinth Beam)	C/ENGG/ERII/JRT/ CRB/PLINTH/01, R01	TB-3-395-316-040	1/3	T1- 1200x500 T2- 1350x500 T3- 400x400
5	Auxiliary Room Building (Plinth Beam)	C/ENGG/ERII/MED/ AUX/PLINTH/01, R00	TB-3-395-316-038	1/3	T1- 1850x800 T2- 1700x500 T3- 1850x600
6	FFPH	C/ENGG/STD/FFPH/2016	-	1/1	400x400

6) For computation of LOT quantity, bidder has to refer following:

a) A tentative number of cables and their type are described in Annexure –I for the reference of the bidder.

b) Single line diagrams giving details of 765/400kV diameters in projects.
For Medinipur SS: Doc No. TB-3-395-510-021, Rev 02
For Jeerat SS: Doc No. TB-3-395-510-001, Rev 02

c) LT SLD for the projects:
For Medinipur SS: TB-395-510-034, Rev 01
For Jeerat SS: TB-395-510-014, Rev 01

7) The vendor should include in their offer 30% spare blocks on each frame for the purpose of future expansion.

1.4 DOCUMENTS REQUIRED

Following document shall be submitted along with the offer –

a) Catalogue and Data sheet.
b) In-scale Auto-Cad drawing of frames for all cut-outs.
c) List of Past Supplies in India
d) Test Certificates
e) Deviations, if any, in the Technical Deviation format.

All the equipment shall be inspected prior to dispatch in line with the relevant IS /IEC Standards etc.

1.5 DEVIATIONS

The bidder shall list all the deviation from the specification separately. Offers without specific deviation will be deemed to be totally in compliance with the specification and NO DEVIATION on any account will be entertained at a later date.

1.6 PACKING

1.6.1 All equipment shall be suitably protected, coated, covered or boxed and crated to prevent damage or deterioration during transit, handling and outdoor storage (for a minimum period of 1 years) at site till the time of erection. While packing all the materials, the limitations from the point of view of availability of transportation facilities in India should be taken into account. The Bidder shall be responsible for any loss or damage during transportation, handling and storage.

1.6.2 The Bidder shall include and provide for security, protection and packing the equipment so as to avoid loss or damage during transport by any mode.

1.6.3 All packing shall allow for easy removal and checking at site. Wherever necessary, proper arrangement for attaching slings for lifting shall be provided. All packages shall be clearly marked for with signs showing 'UP' and 'DOWN' side of boxes, and handling and unpacking instructions as considered necessary. Special precautions shall be taken to prevent rusting of steel and iron parts during transit and storage. Gas seals or other methods proposed to be adopted for protection against moisture during transit shall be to the satisfaction of the purchaser.

1.6.4 The cases containing easily damageable material shall be very carefully packed and marked with appropriate caution symbols i.e. FRAGILE, HANDLE WITH CARE, USE NO HOOKS etc.

1.6.5 Each package delivered under the contract shall be marked by the Bidder at his expense and such marking must be distinct (all previous irrelevant marking being carefully obliterated). Such marking shall show the description and quantity of contents, the name of consignee and address, the gross and net weights of the package, the name of Bidder with a distinctive number of mark sufficient for purpose of identification. All markings shall be carried out with such materials as to ensure quickness of drying, fastness and legibility.

1.6.6 Each Package shall contain a note quoting specifically the name of the Bidder, the number and date of contract or order and the name of office placing the contract, nomenclature of the stores and include a schedule of parts for each complete equipment giving the parts number with reference to the General Arrangement/ Assembly drawing and the quantity of each part, drawing number and tag numbers.

1.6.7 All equipment/ material shall be suitably packed for transport, carriage at site and outdoor storage during transit. The Bidder shall be responsible for any damage to the equipment during transit. The contents of each package shall bear marking that can be readily identified from the package list and packing shall provide complete protection from moisture, termites and mechanical shocks etc.

1.6.8 Any material found short inside the packing cases shall be supplied by the Bidder without any extra cost.

1.6.9 Notwithstanding anything stated in this clause the Bidder shall be entirely responsible for any loss, damage or depreciation to the stores.

1.7 QUALITY PLAN

Bidder to follow valid Powergrid approved Quality Plan as per Powergrid procedure. In case the bidder don’t have Powergrid approved QP, it will be the bidder’s responsibility to get its QP approved directly from the ultimate customer.

1.8 Project title block: -

CUSTOMER: POWERGRID MEDINIPUR JEERAT TRANSMISSION LTD.(PMJTL) **CONSULTANT: POWERGRID CORPORATION OF INDIA LTD.** **PROJECT:** SUBSTATION PACKAGE-SS01 FOR ESTABLISHMENT OF **765/400KV S/S at MEDINIPUR & JEERAT(NEW)** ASSOCIATED WITH TRANSMISSION SYSTEM PROJECT "765kV STRENGTHENING IN EASTERN REGION (ERSS-XVIII)"UNDER TARIFF BASED COMPETITIVE BIDDING (TBCB) ROUTE **NOA No: MJTL/765kV/ERSS-XVIII/SS01/NOA-I/03(I) & NOA-II/03(II) dated 29.09.2017** **CONTRACTOR: BHARAT HEAVY ELECTRICALS LIMITED** **BHEL PO No. :** **SUPPLIER –**

ANNEXURE I - THE TENTATIVE NUMBER OF TYPES OF CABLE ENTERING/EXITING VARIOUS BULDINGS

S. NO.	TYPE OF CABLE (Voltage Class 1.1 kV)	BUILDING DESCRIPTION																							
		CRB -400kV Entry			AUX. BLDG. - 765kV Entry			FFPH Entry	SPR 4.1		SPR 4.2		SPR 4.3		SPR 4.4		SPR 7.1		SPR 7.2		SPR 7.3		SPR 7.4	
	Cable Opening	T1	T2	T3	T1	T2	T3	1 no. opening	2 no. opening		2 no. opening		2 no. opening		2 no. opening		2 no. opening		2 no. opening		2 no. opening		2 no. opening	
1																								
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13																								
14																								

Note :

i) The bidder shall provide 30% of the blocks on the frame as spare .

Ii) The galvanised steel frame shall be openable type .

iii) For the space available at the entry point of various building please refer to the attached drawings.

Iv) for OD of the Cable Types mentioned above , Standard Catalogues of 1.1 kV Class Cables shall be referred.

ANNEXURE I - THE TENTATIVE NUMBER OF TYPES OF CABLE ENTERING/EXITING VARIOUS BULDINGS

S. NO.	TYPE OF CABLE (Voltage Class 1.1 kV)	BUILDING DESCRIPTION																			
		CRB -400kV Entry			AUX. BLDG. - 765kV Entry			FFPH Entry	SPR 4.1			SPR 4.2			SPR 7.1		SPR 7.2		SPR 7.3	
	Cable Opening	T1	T2	T3	T1	T2	T3	1 no. opening	3 no. opening			3 no. opening			2 no. opening		2 no. opening		2 no. opening	
1																				
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				
13																				
14																				

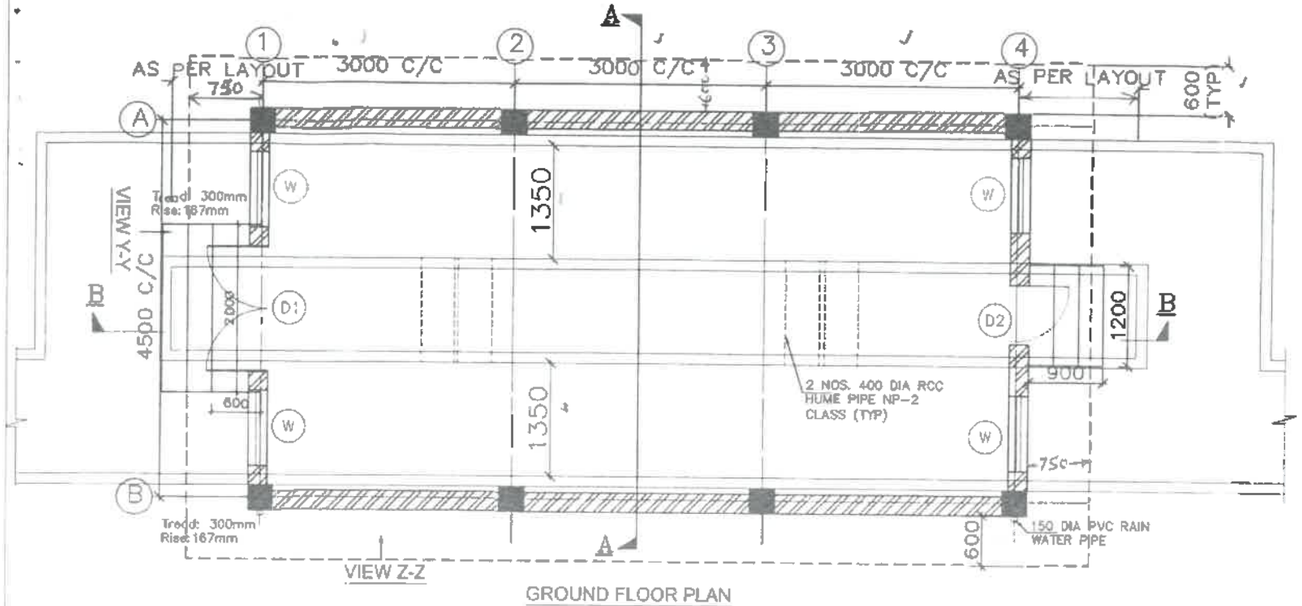
Note :

i) The bidder shall provide 30% of the blocks on the frame as spare .

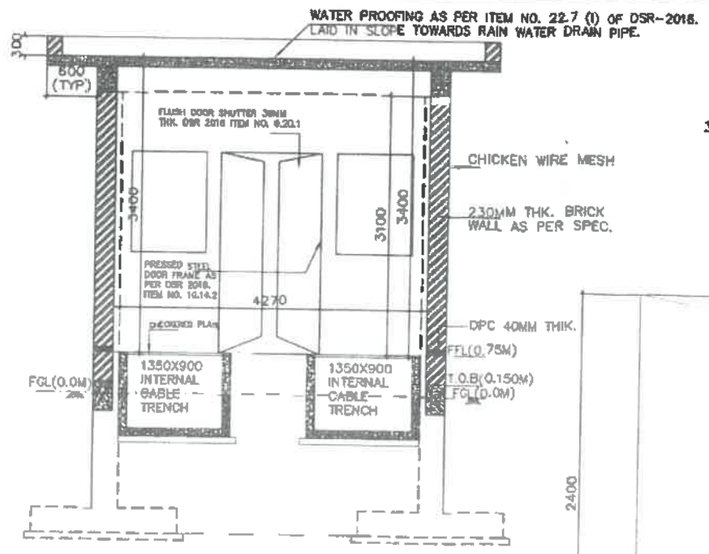
Ii) The galvanised steel frame shall be openable type .

iii) For the space available at the entry point of various building please refer to the attached drawings.

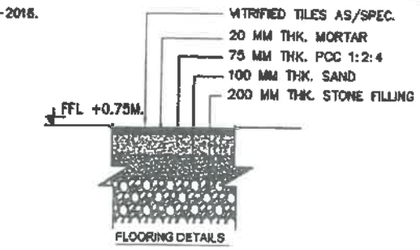
Iv) for OD of the Cable Types mentioned above , Standard Catalogues of 1.1 kV Class Cables shall be referred.



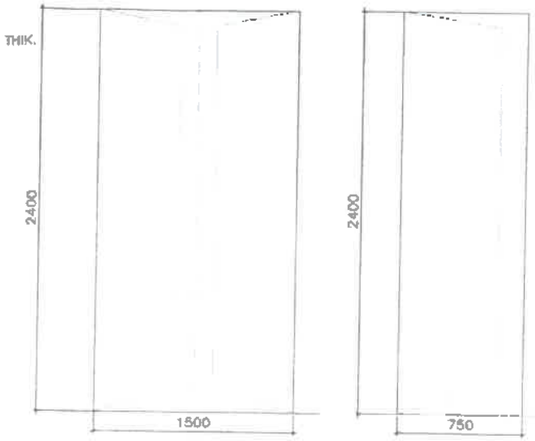
GROUND FLOOR PLAN



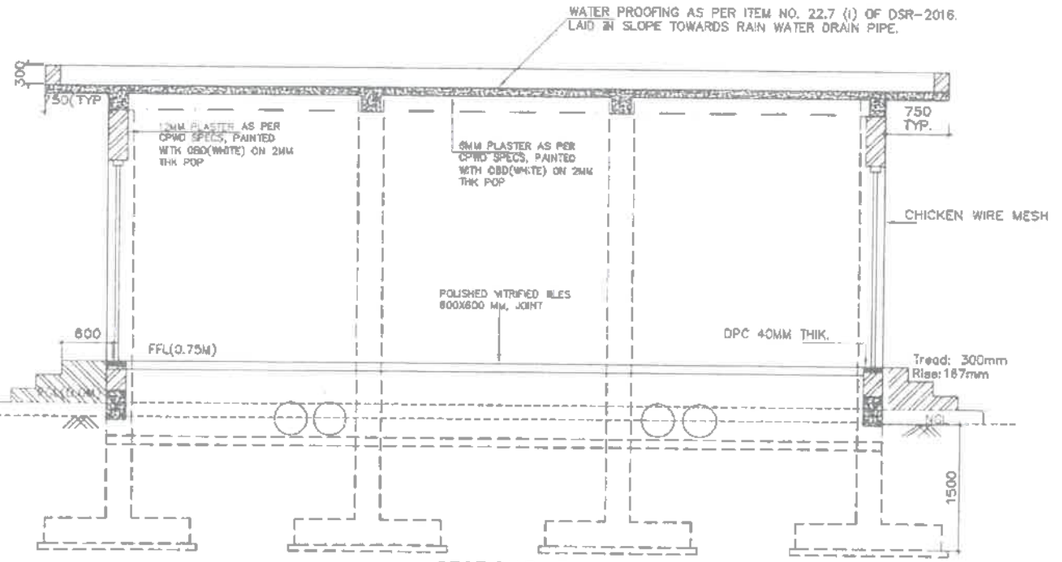
SECTION A-A



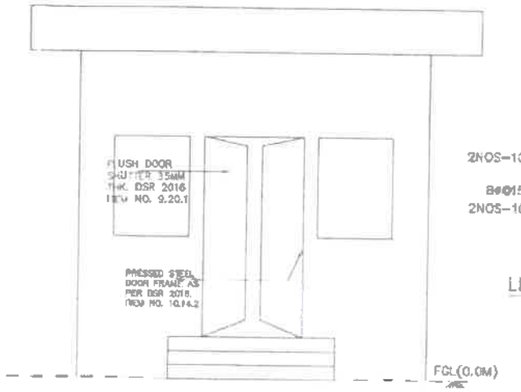
FLOORING DETAILS



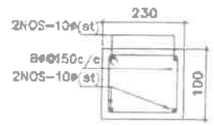
DOOR -D1 DOOR -D2



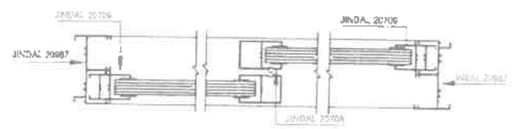
SECTION B-B



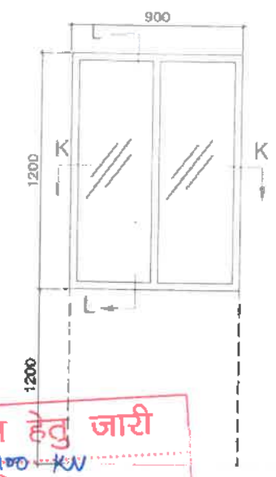
VIEW Y-Y

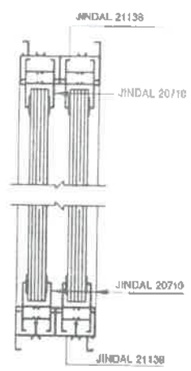


LINTEL BEAM (TYP.)

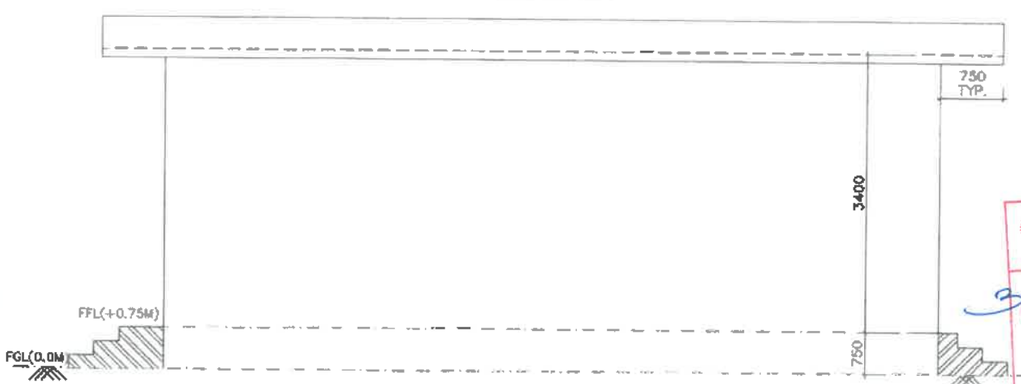


SECTION K-K
(2-TRACK)





SECTION L-L
(2-TRACK)



VIEW Z-Z

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MM. AND LEVELS ARE IN MTR.
2. ALL EXTERNAL SURFACE SHALL HAVE 18MM PLASTER AS PER CPWD SPECS, PAINTED WITH WITH EXTERIOR GRADE PAINT HAVING SILICON ADDITIVES.
3. THE WIRE MESH SHALL BE CONNECTED WITH EARTHING SYSTEM THROUGH 75X12MM FLAT FIXED ON DIAGONALLY OPPOSITE COLUMNS ON ITS OUTER SURFACE .
4. INTERNAL CABLE TRENCH SHALL HAVE SLOPE OF 1:1000 TOWARDS THE EXTERNAL CABLE TRENCH.
5. ALL MISC. STEEL SHALL BE PAINTED WITH ONE COAT OF ANTI CORROSIVE PAINT OVER APPROVED PRIMER COAT.
6. INTERNAL CABLE TRENCH LAYOUT SHALL BE VERIFIED/MODIFIED AS PER THE FINAL APPROVED CABLE TRENCH LAYOUT BEFORE CONSTRUCTION.
7. ALL WELDS ARE 6MM FILLET CONTINUOUS WELD UNLESS OTHERWISE SPECIFIED.
8. 22GX12 MM. CHICKEN WIRE MESH TO BE PROVIDED FOR OUTER WALL, AND ROOF. CHICKEN WIRE MESH SHALL BE CONNECTED WITH EARTHING SYSTEM THROUGH 75X12MM FLAT FIXED ON DIAGONALLY OPPOSITE COLUMNS ON ITS OUTER SURFACE.
9. FOR OPENING OF AIR CONDITIONER SUITABLE LOCATION AND SIZE TO BE DECIDED AT SITE.
10. ALL STEPS SHALL BE FINISHED WITH 18MM THK. POLISHED GRANITE STONE AS PER SPECIFICATION.

R1 – DIMENSIONS REVISED.

निर्माण हेतु जारी
765/400 KV
उपकेन्द्र के लिए।
Jeerat & WINDOW-W
Medinipur S/S
(हस्ताक्षर) 3-10-18
(पदनाम) AEPT
(तिथि) 16/1/18
पावरग्रिड कारपोरेशन ऑफ इंडिया लि०
अभियांत्रिकी (सिविल), गुड़गाँव, हरियाणा

REV.	DESCRIPTION	PREP. (ENGG-CIVIL)	REVD. (ENGG-ELECT.)	REVD. (ENGG-CIVIL)	REVD. AGM (ENGG-CIVIL)	REVD. (ENGG-ELECT.)	APPD. (ENGG-O/N.MGMT.)	DATE
0.	REVISED AS MARKED							12/1/18

RELEASED FOR TENDER/CONSTRUCTION.

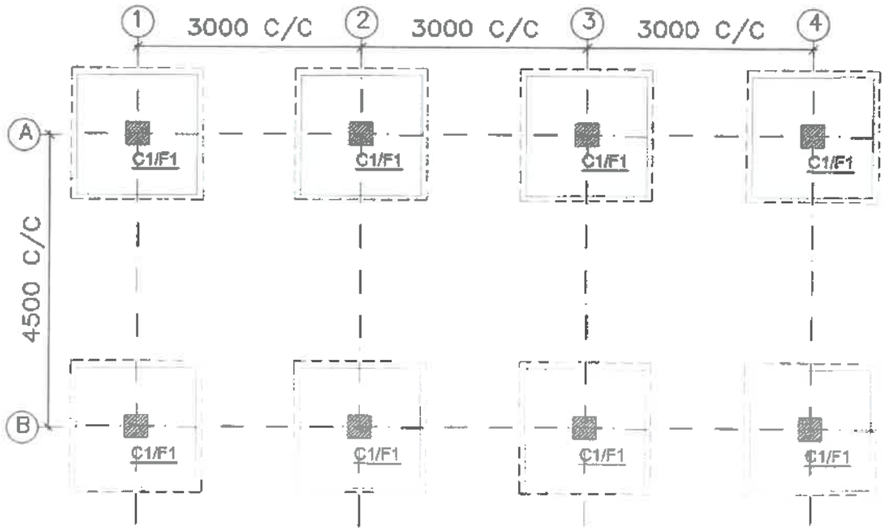
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

TITLE: STANDARD PANEL ROOM (9 M.)

SUB TITLE: STANDARD SWITCHYARD PANEL ROOM GENERAL ARRANGEMENT DETAIL OF PANEL ROOM

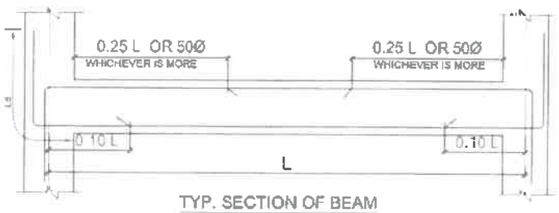
DRAWING NO: C/ENGG/STD/PR/2017 (01 OF 03)

SCALE: NTS | REV: 01

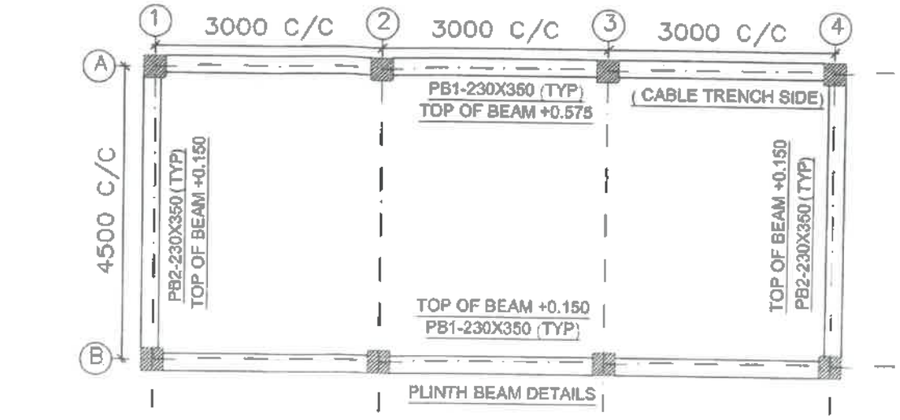


Footing Size

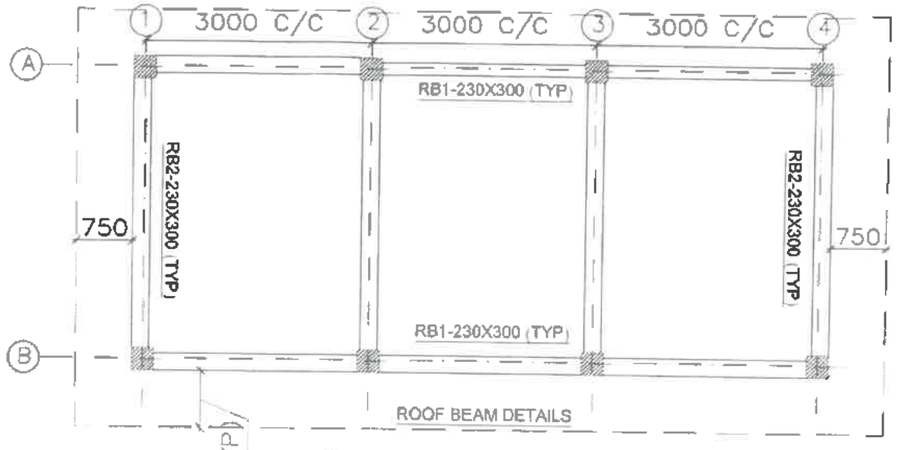
Sno	Bearing capacity	L(mm)	B (mm)	H (mm)
1	5 T/m2	1750	1750	300
2	9T/m2	1400	1400	300



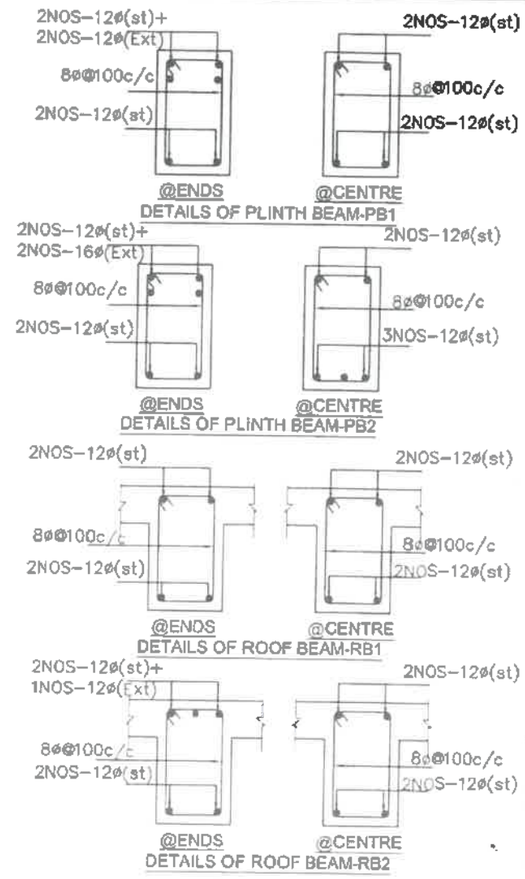
TYP. SECTION OF BEAM

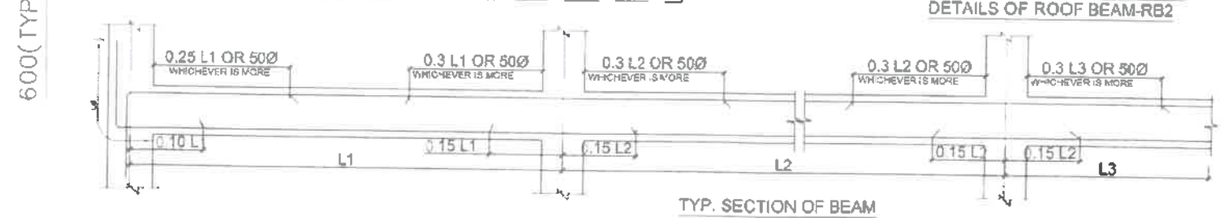


PLINTH BEAM DETAILS



ROOF BEAM DETAILS





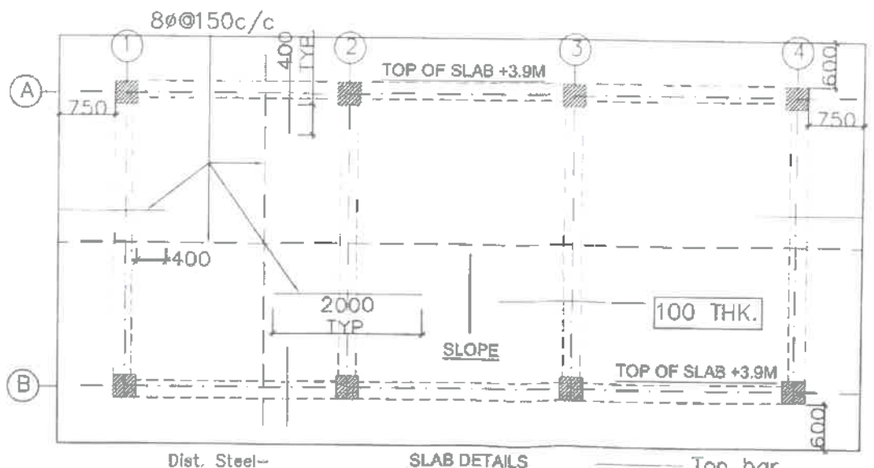
TYP. SECTION OF BEAM

(NOTE:- WHERE "d" IS EFFECTIVE DEPTH OF BEAM)

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MM AND LEVELS IN METERS.
2. THIS DRAWING IS NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
3. 0.00 CORRESPONDS TO FINISHED GROUND LEVEL. (F.G.L.)
4. ALL R.C.C. USED SHALL BE OF GRADE AS PER SPECIFICATION.
5. ALL R/F STEEL SHALL BE HYSD (Fe 500) CONFORMING TO IS:1786./TMT BARS (EQUIVALENT GRADE)
6. CLEAR COVER FOR MAIN R/F BARS SHALL BE 40MM FOR COLUMN,25MM FOR BEAMS, 15MM FOR SLAB. 50MM FOR FOOTINGS
7. LAP LENGTH FOR R/F BARS SHALL BE 50 X DIA OF BAR.
8. LAP SHALL NOT BE PROVIDED WITHIN A JOINT, OR WITHIN A DISTANCE 2 X DEPTH FROM THE EACH JOINT FACE, OR ¼ OF MEMBER LENGTH FROM JOINT FACE.
9. ALL FOUNDATION SHALL BE TAKEN AT LEAST 500MM BELOW VIRGIN SOIL. LOOSE POCKET IF ANY SHALL BE COMPLETELY REMOVED AND BACK FILLED WITH P.C.C. (1:4:8)
10. NET SAFE BEARING CAPACITY AT 1.5M BELOW FGL SHALL BE VERIFIED BEFORE EXECUTION AND THE SIZE OF THE FOOTING SHALL BE ADOPTED BASED ON THE SBC. IN-CASE OF ANY DESCRIPANCY PLEASE CONTACT ENGG.
11. IN CASE OF EXPANSIVE SOIL FOUND AT FOUNDATION LEVEL, IT SHALL BE REPLACED WITH 300MM THK OF AVAILABLE LOCAL SAND.

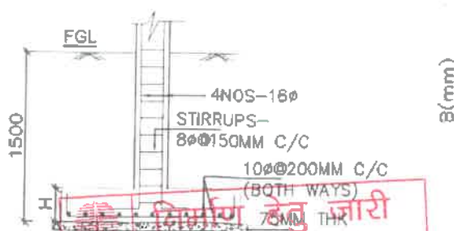
MIP:-
1.STRUCTURE MODIFIFIED IN LINE WITH CHANGES MADE IN ARCHITECTRAL DRAWING



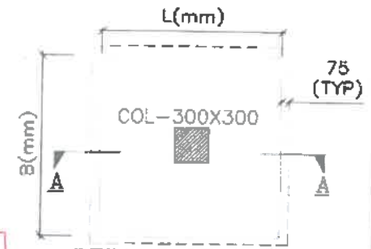
Dist. Steel-
8ø@200mm c/c TYP.

SLAB DETAILS

Top bar
Bottom bar



SECTION A-A



DETAILS OF C1/F1

निर्माण हेतु जारी
उपकेन्द्र के लिए।
765/400 KV
Jeerat & Modinipur
S/S
(हस्ताक्षर)
ACDF
(पदनाम)
16/1/18
(तिथि)
पावरग्रिड कारपोरेशन ऑफ इंडिया लि0
अभियांत्रिकी (सिविल), गुड़गाँव, हरियाणा

REV	DESCRIPTION	PREP. (ENGG-CIVIL)	REVD. (DEPUTY MANAGER)	REVD. (MANAGER)	REVD. (ENGG-CIVIL)	REVD. (ENGG-ELECT.)	APPD.	DATE
0	REVISED AS MARKED							

RELEASED FOR TENDER/CONSTRUCTION

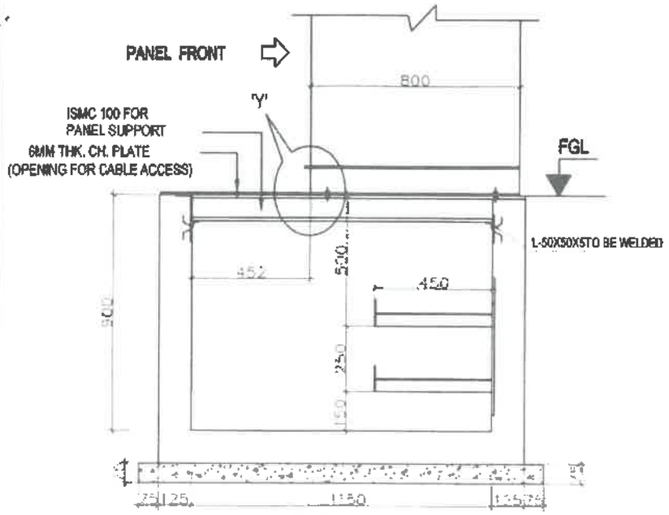
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

TITLE: STANDARD PANEL ROOM (9M)

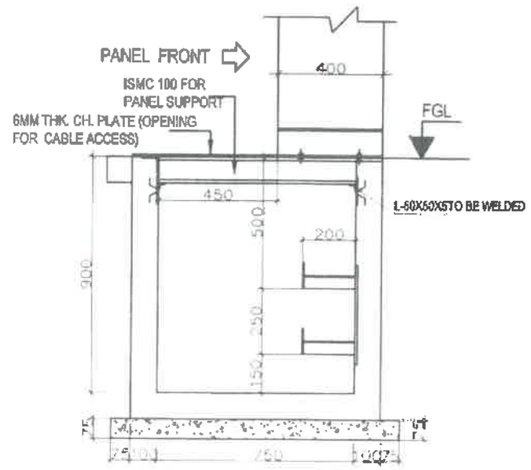
SUB TITLE: — FOUNDATIONS
STANDARD SWITCHYARD PANEL ROOM RCC DETAIL OF PANEL ROOM (9M)

DRAWING NO: C/ENGG/STD/PR/2017 (02 OF 03)

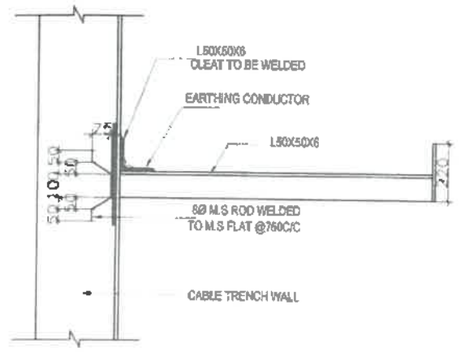
SCALE NTS | REV 0



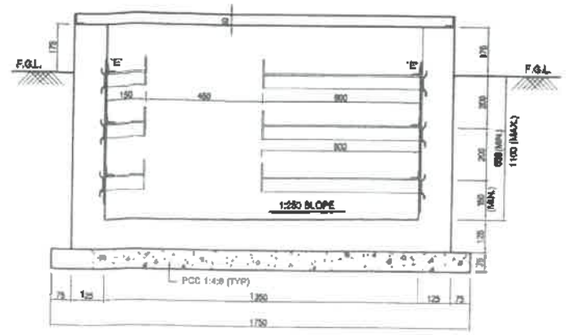
SECTION 1-1
(SHOWING GENERAL ARRANGEMENT DETAILS)



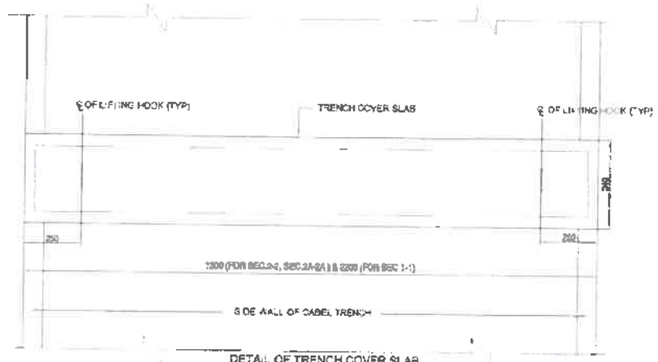
SECTION 2-2
(SHOWING GENERAL ARRANGEMENT DETAILS)



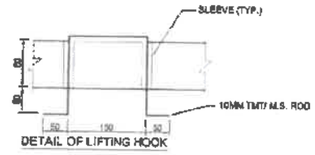
TYPICAL CABLE SUPPORT



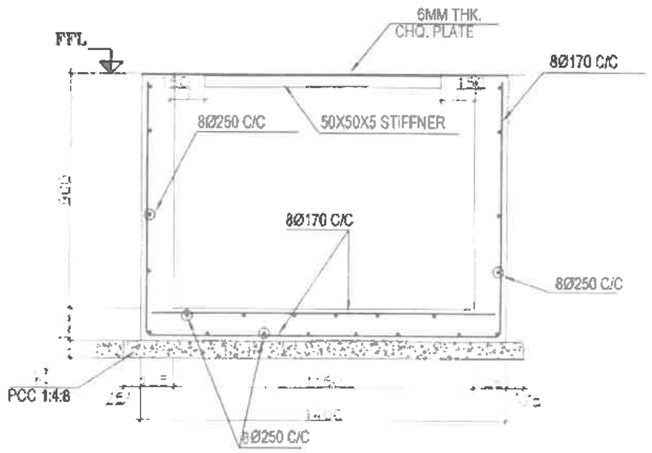
SECTION 2A-2A



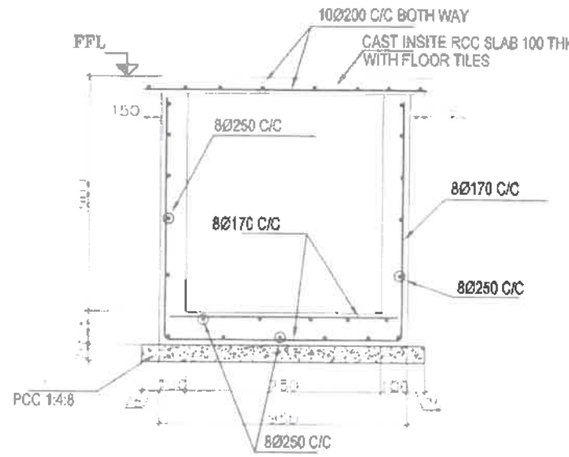
DETAIL OF TRENCH COVER SLAB
FOR SECTION 1-1, 2-2 & 2A-2A



DETAIL OF LIFTING HOOK



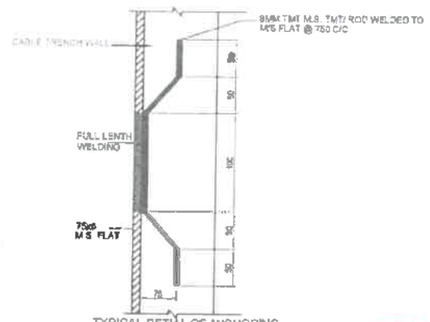
SECTION 1-1
(SHOWING REINFORCEMENT DETAILS)



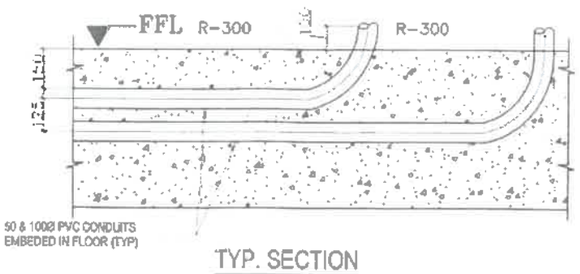
SECTION 2-2
(SHOWING REINFORCEMENT DETAILS)

NOTES :-

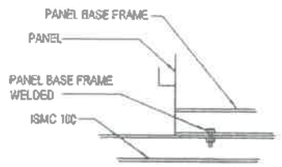
1. ALL DIMENSION ARE IN MM UNLESS NOTED OTHERWISE.
2. FOR NOTES REFER DRG. NO : C-ENGG-STD-PR-TS-10-01
3. FOR STRUCTURE NOTES REFER DRG. NO : C-ENGG-STD-PR-2016, 02,03 & 04.
4. TOP OF CHEQUERED PLATE TO FLUSH WITH FINISHED FLOOR LEVEL
5. THIS DRAWING SHALL BE MATCHED WITH VENDOR'S APPROVED INTERNAL CABLE TRENCH LAYOUT DRAWING BEFORE START OF CONSTRUCTION
6. ALL WELDS ARE 6MM FILLET CONTINUOUS WELD UNLESS OTHERWISE SPECIFIED
7. ISMC 100 SHALL BE PROVIDED @1000 C/C TO SUPPORT CHEQUERED PLATE WHEREVER CABLE TRENCH WIDTH EXCEEDS 1000 MM.
8. ISMC 100 SHALL BE PROVIDED BELOW PANELS ALSO.
9. FOR CABLE TRENCH WITH LESSER WIDTH L50x50x5 STIFFENER SHALL BE WELDED WITH CHEQUERED PLATE @ 1000 C/C.



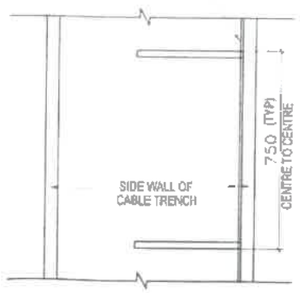
TYPICAL DETAIL OF ANCHORING
75X8 M.S.FLAT



TYP. SECTION



DETAIL - 'Y'
TYPICAL BOLT ARRANGEMENT



CABLE TRAY SUPPORT (TYP)

निर्माण हेतु जारी
765/400 kV GIS Jeerat & Medinipur
उपकेन्द्र के लिए।
S/S
(हस्ताक्षर)
(पदनाम)
16/1/18
(तिथि)
पावरग्रिड कारपोरेशन ऑफ इंडिया लि०
अभियांत्रिकी (सिविल), गुड़गाँव, हरियाणा

REV.	DESCRIPTION	PREP. (ENGG-CIVIL)	REVD. (ENGG-ELECT.)	REVD. (ENGG-CIVIL)	REVD. AGM (ENGG-CIVIL)	REVD. GM (ENGG-ELECT.)	APPD. ED (ENGG-S/S,T&LINE)	DATE
0.	REVISED AS MARKED							

RELEASED FOR TENDER/CONSTRUCTION

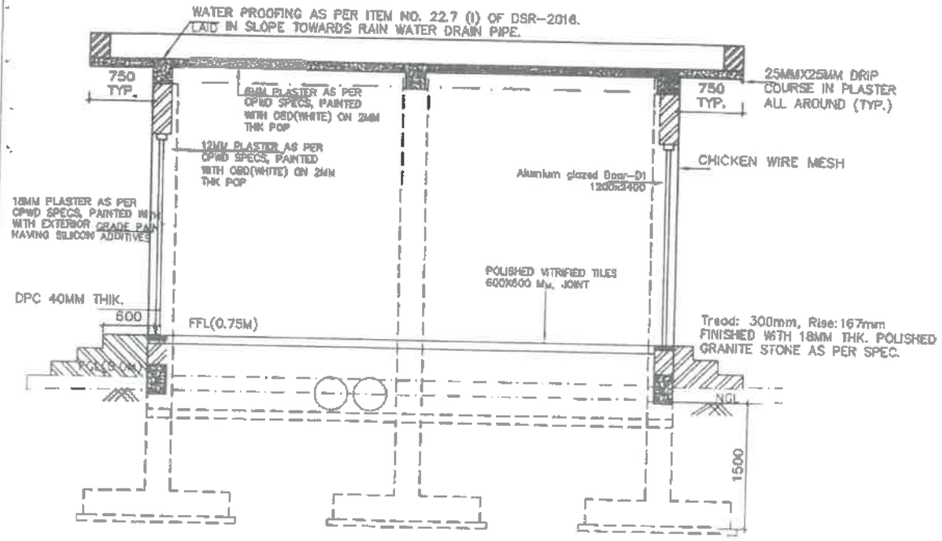
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

TITLE:
STANDARD PANEL ROOM

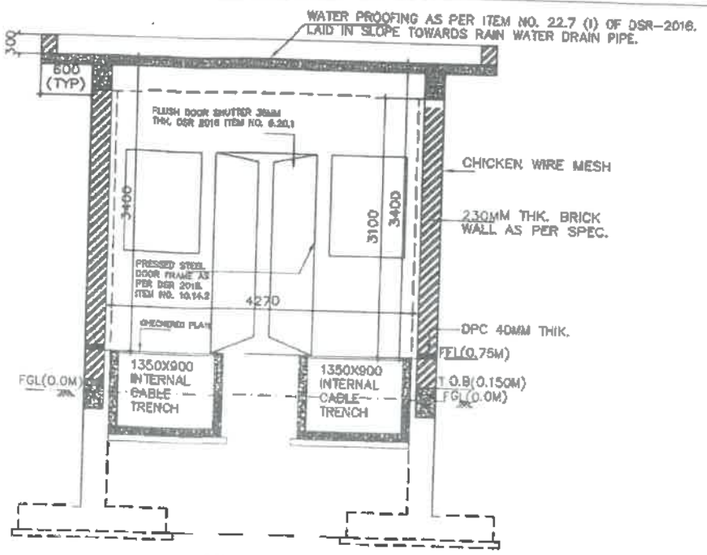
SUB TITLE: STANDARD SWITCHYARD PANEL ROOM R.C.C DETAIL OF INTERNAL CABLE TRENCH

DRAWING NO:
C/ENGG/STD/PR/2017
(03 OF 03)

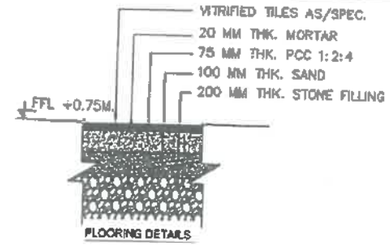
SCALE	REV
NTS	0



SECTION C-C (6M)

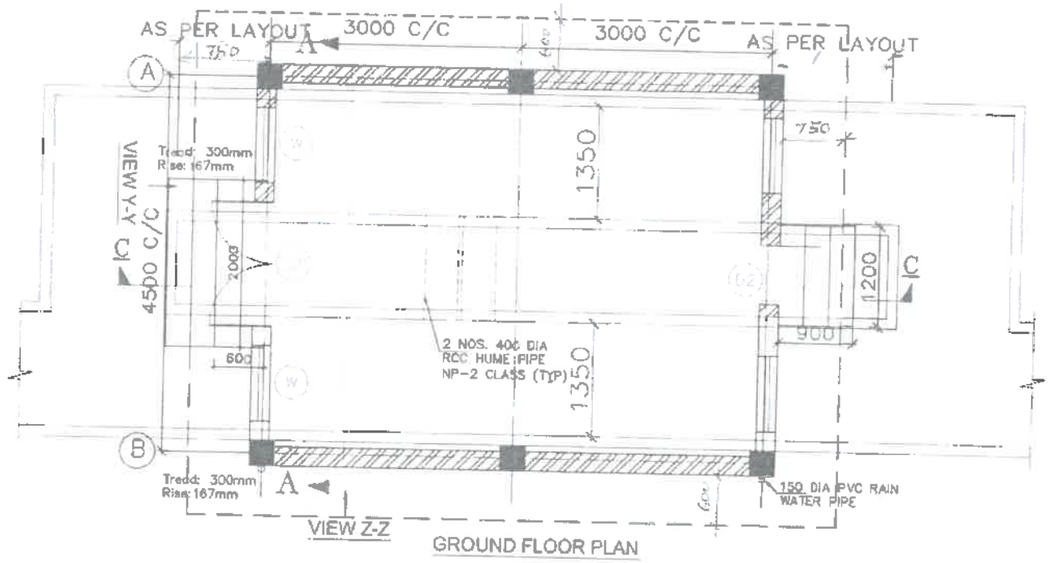


SECTION A-A



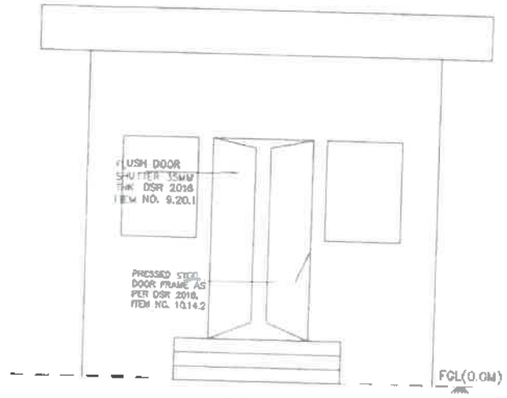
FLOORING DETAILS

DOOR-D1 DOOR-D2

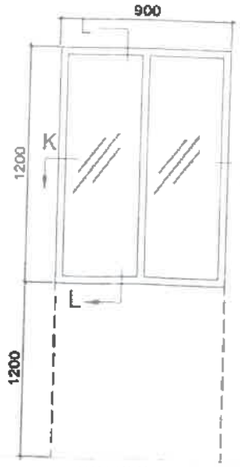


VIEW Z-Z

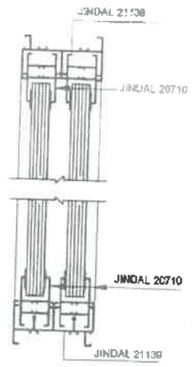
GROUND FLOOR PLAN



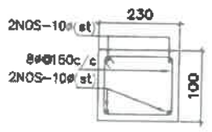
VIEW Y-Y



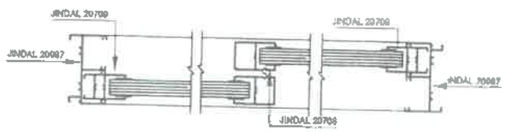
WINDOW - W



SECTION L-L (2-TRACK)



LINTEL BEAM (TYP.)



SECTION K-K (2-TRACK)

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MM. AND LEVELS ARE IN MTR.
2. ALL EXTERNAL SURFACE SHALL HAVE 18MM PLASTER AS PER CPWD SPECS, PAINTED WITH WITH EXTERIOR GRADE PAINT HAVING SILICON ADDITIVES.
3. THE WIRE MESH SHALL BE CONNECTED WITH EARTHING SYSTEM THROUGH 75X12MM FLAT FIXED ON DIAGONALLY OPPOSITE COLUMNS ON ITS OUTER SURFACE
4. INTERNAL CABLE TRENCH SHALL HAVE SLOPE OF 1:1000 TOWARDS THE EXTERNAL CABLE TRENCH.
5. ALL MISC. STEEL SHALL BE PAINTED WITH ONE COAT OF ANTI CORROSIVE PAINT OVER APPROVED PRIMER COAT.
6. INTERNAL CABLE TRENCH LAYOUT SHALL BE VERIFIED/MODIFIED AS PER THE FINAL APPROVED CABLE TRENCH LAYOUT BEFORE CONSTRUCTION.
7. ALL WELDS ARE 6MM FILLET CONTINUOUS WELD UNLESS OTHERWISE SPECIFIED.
8. 22GX12 MM. CHICKEN WIRE MESH TO BE PROVIDED FOR OUTER WALL, AND ROOF. CHICKEN WIRE MESH SHALL BE CONNECTED WITH EARTHING SYSTEM THROUGH 75X12MM FLAT FIXED ON DIAGONALLY OPPOSITE COLUMNS ON ITS OUTER SURFACE.
9. FOR OPENING OF AIR CONDITIONER SUITABLE LOCATION AND SIZE TO BE DECIDED AT SITE.
10. ALL STEPS SHALL BE FINISHED WITH 18MM THK. POLISHED GRANITE STONE AS PER SPECIFICATION.

R1 – DIMENSIONS REVISED.

निर्माण हेतु जारी
765/400 kV
उपकेन्द्र के लिए। Jeerat & Medinipur S/s
(हस्ताक्षर)
(पदनाम) AEE
तिथि 16/01/18
पावरग्रिड कारपोरेशन ऑफ इंडिया लि0
अभियांत्रिकी (सिविल), गुड़गाँव, हरियाणा

REV.	DESCRIPTION	PREP. (ENGG-CIVIL)	REVD. (ENGG-ELECT.)	REVD. (ENGG-CIVIL)	REVD. ADM (ENGG-CIVIL)	REVD. GM (ENGG-ELECT.)	APPD. ED (ENGG-C/S/T/ADM)	DATE
0.	REVISED AS MARKED							

RELEASED FOR TENDER/CONSTRUCTION

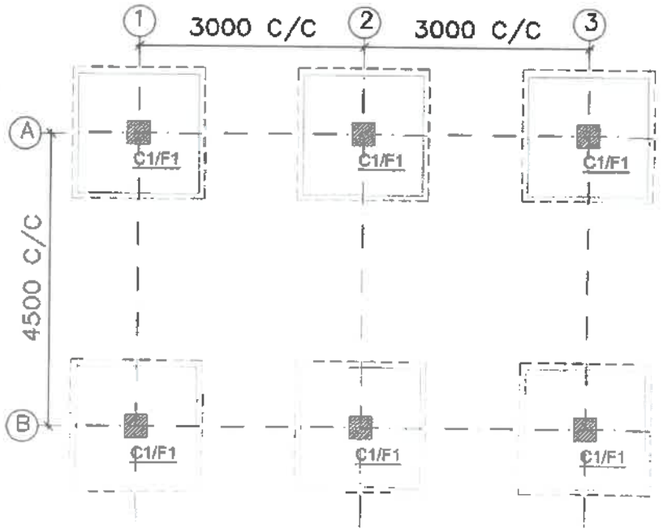
POWER GRID CORPORATION OF INDIA LIMITED (A Government of India Enterprise)

TITLE: STANDARD PANEL ROOM (6 M.)

SUB TITLE: STANDARD SWITCHYARD PANEL ROOM GENERAL ARRANGEMENT DETAIL OF PANEL ROOM

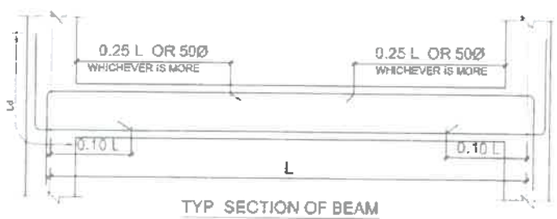
DRAWING NO: C/ENGG/STD/PR/2017 (01 OF 03)

SCALE: NTS REV: 01

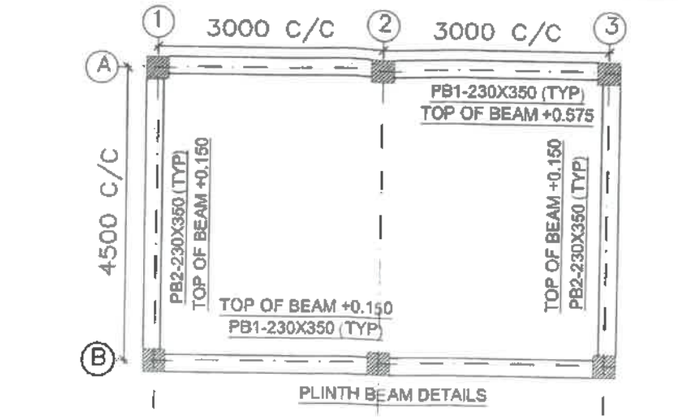


Footing Size

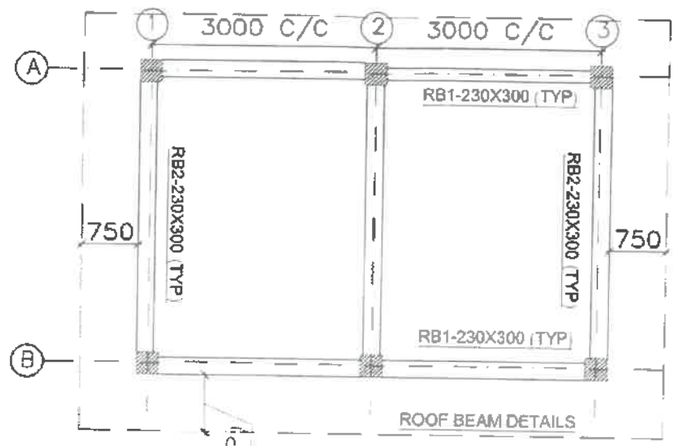
Sno	Bearing capacity	L(mm)	B (mm)	H (mm)
1	5 T/m2	1750	1750	300
2	9T/m2	1400	1400	300



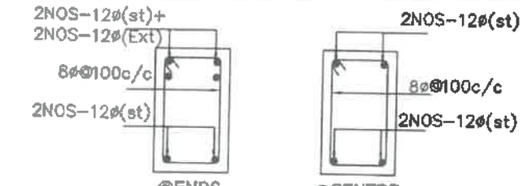
TYP SECTION OF BEAM



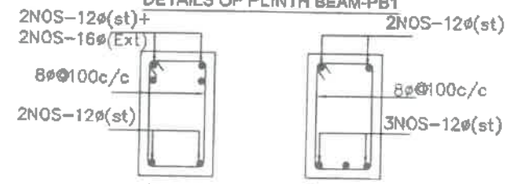
PLINTH BEAM DETAILS



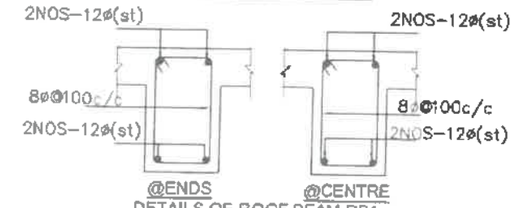
ROOF BEAM DETAILS



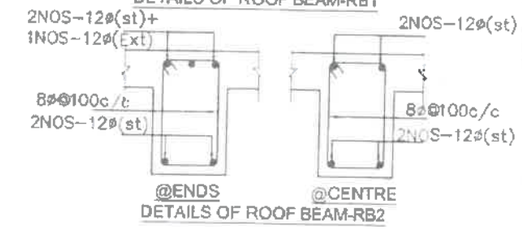
DETAILS OF PLINTH BEAM-PB1



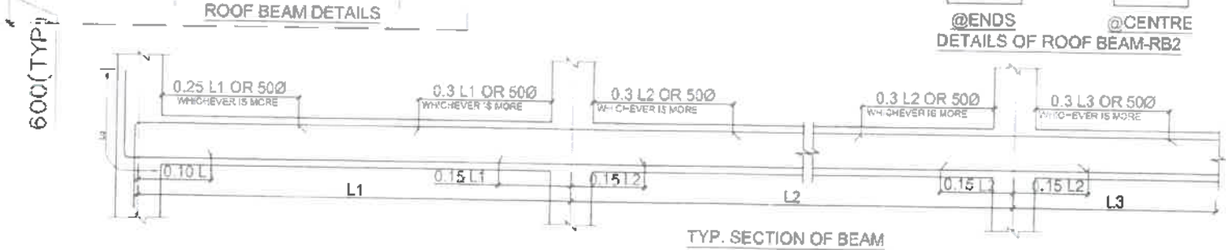
DETAILS OF PLINTH BEAM-PB2



DETAILS OF ROOF BEAM-RB1



DETAILS OF ROOF BEAM-RB2



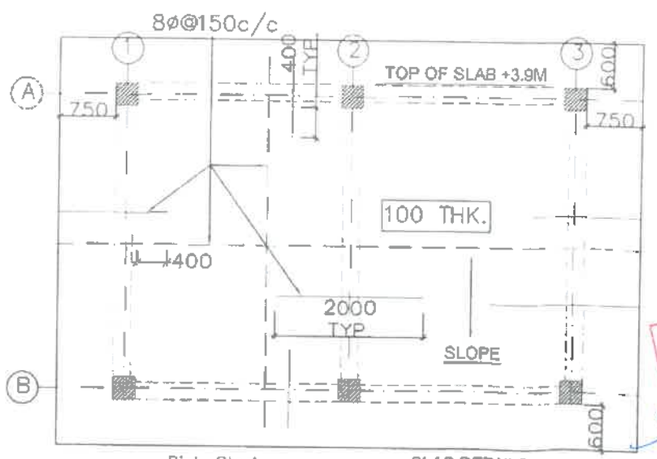
TYP. SECTION OF BEAM

(NOTE:- WHERE "d" IS EFFECTIVE DEPTH OF BEAM)

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MM AND LEVELS IN METERS.
2. THIS DRAWING IS NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
3. 0.00 CORRESPONDS TO FINISHED GROUND LEVEL. (F.G.L.)
4. ALL R.C.C. USED SHALL BE OF GRADE AS PER SPECIFICATION.
5. ALL R/F STEEL SHALL BE HYSD (Fe 500) CONFORMING TO IS:1786./TMT BARS (EQUIVALENT GRADE)
6. CLEAR COVER FOR MAIN R/F BARS SHALL BE 40MM FOR COLUMN,25MM FOR BEAMS, 15MM FOR SLAB. 50MM FOR FOOTINGS
7. LAP LENGTH FOR R/F BARS SHALL BE 50 X DIA OF BAR.
8. LAP SHALL NOT BE PROVIDED WITHIN A JOINT, OR WITHIN A DISTANCE 2 X DEPTH FROM THE EACH JOINT FACE, OR ¼ OF MEMBER LENGTH FROM JOINT FACE.
9. ALL FOUNDATION SHALL BE TAKEN AT LEAST 500MM BELOW VIRGIN SOIL. LOOSE POCKET IF ANY SHALL BE COMPLETELY REMOVED AND BACK FILLED WITH P.C.C. (1:4:8)
10. NET SAFE BEARING CAPACITY AT 1.5M BELOW FGL SHALL BE VERIFIED BEFORE EXECUTION AND THE SIZE OF THE FOOTING SHALL BE ADOPTED BASED ON THE SBC. IN-CASE OF ANY DESCRIPANCY PLEASE CONTACT ENGG.
11. IN CASE OF EXPANSIVE SOIL FOUND AT FOUNDATION LEVEL, IT SHALL BE REPLACED WITH 300MM THK OF AVAILABLE LOCAL SAND.

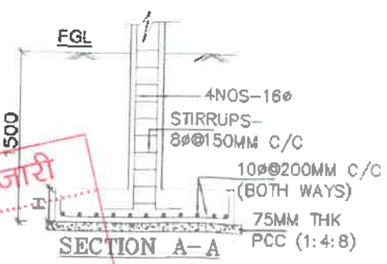
MIP:-
1.STRUCTURE MODIFIFIED IN LINE WITH CHANGES MADE IN ARCHITECTRAL DRAWING



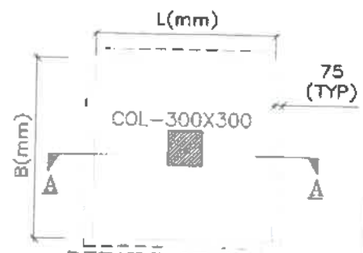
Dist. Steel-
8ø@200mm c/c TYP.

SLAB DETAILS

——— Top bar
— — — Bottom bar



SECTION A-A



DETAILS OF C1/F1

निर्माण हेतु जारी
765/400 100
उपकेन्द्र के लिए।
Jeerat & Medinipur S/s
पावरग्रिड कारपोरेशन ऑफ इंडिया लि०
अभियांत्रिकी (सिविल), गुड़गाँव, हरियाणा
पावरग्रिड
(कर्मचारी)
(पदनाम)
16/1/18
(तिथि)

REV.	DESCRIPTION	PREP.	REVD.	REVD.	REVD.	REVD.	APPD.	DATE
0.	REVISED AS MARKED							

RELEASED FOR TENDER/CONSTRUCTION

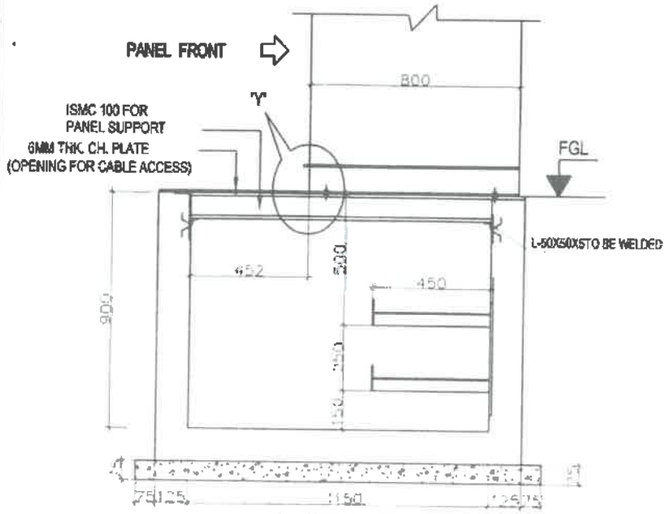
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

TITLE: STANDARD PANEL ROOM (6.M)

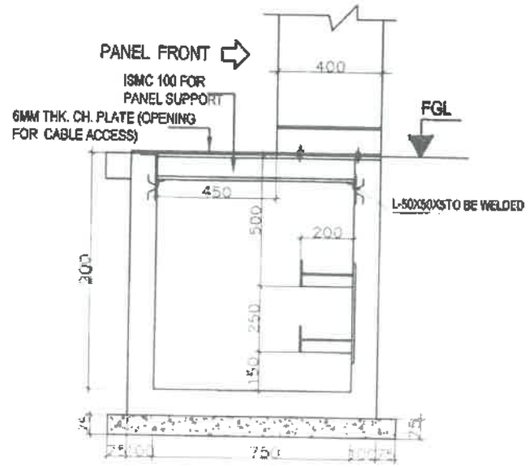
SUB TITLE: FOUNDATION STANDARD SWITCHYARD PANEL ROOM RCC DETAIL OF PANEL ROOM

DRAWING NO: C/ENGG/STD/PR/2017 (02 OF 03)

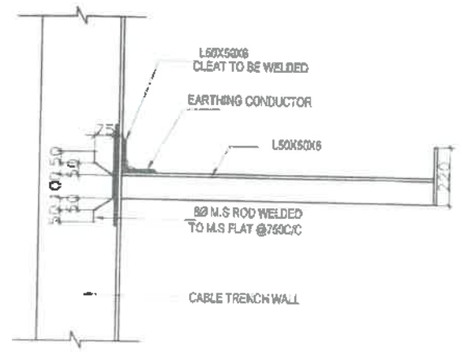
SCALE: NTS | REV: 0



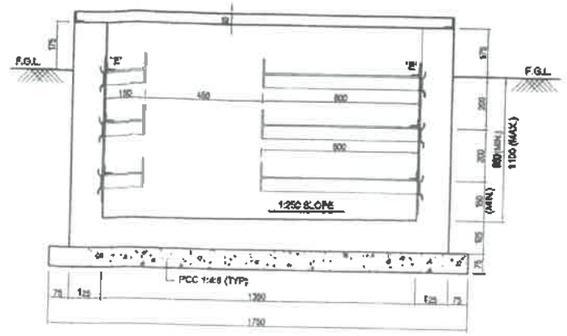
SECTION 1-1
(SHOWING GENERAL ARRANGEMENT DETAILS)



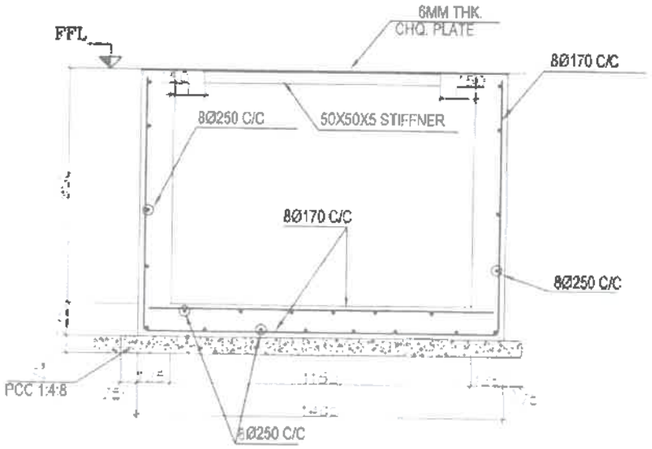
SECTION 2-2
(SHOWING GENERAL ARRANGEMENT DETAILS)



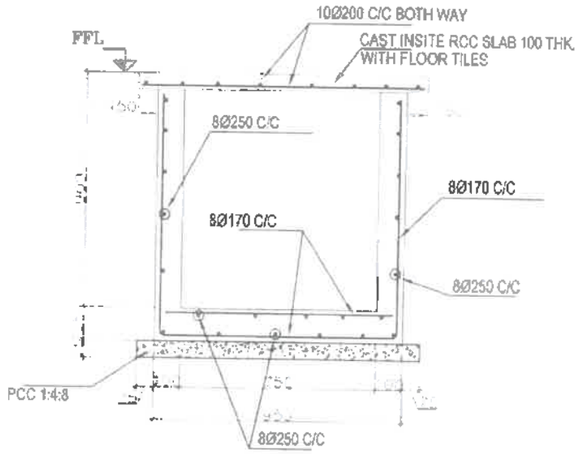
TYPICAL CABLE SUPPORT



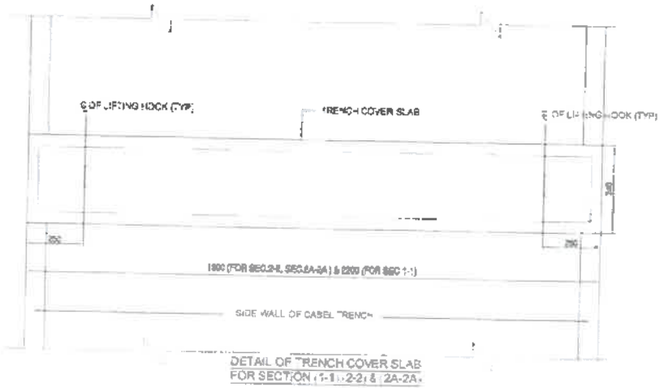
SECTION 2A-2A



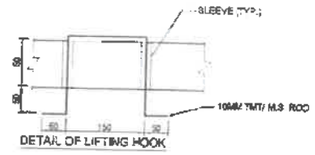
SECTION 1-1
(SHOWING REINFORCEMENT DETAILS)



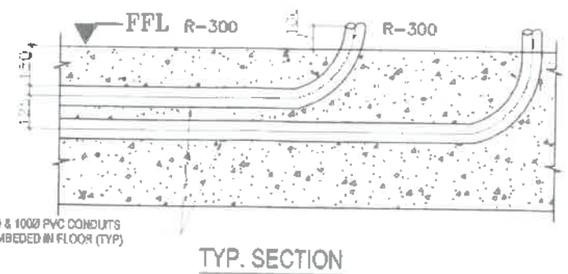
SECTION 2-2
(SHOWING REINFORCEMENT DETAILS)



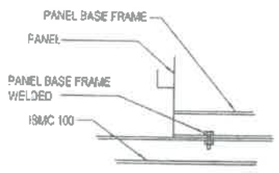
DETAIL OF TRENCH COVER SLAB
FOR SECTION (1-1), (2-2) & (2A-2A)



DETAIL OF LIFTING HOOK

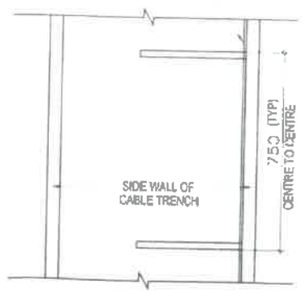


TYP. SECTION

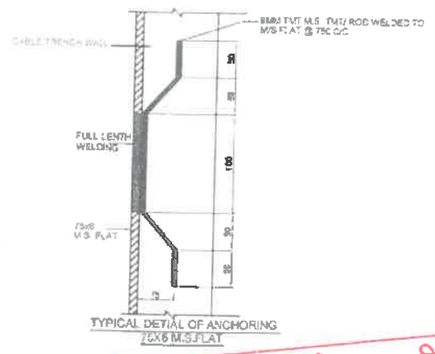


DETAIL - 'Y'
TYPICAL BOLT ARRANGEMENT

EARTHING CONDUCTOR 'E' (ON TOP TIER ONLY)



CABLE TRAY SUPPORT (TYP)



TYPICAL DETAIL OF ANCHORING
75X6 M.S.FLAT

NOTES :-

1. ALL DIMENSION ARE IN MM UNLESS NOTED OTHERWISE
2. FOR NOTES REFER DRG. NO : C-ENGG-STD-PR-TS-10-01
3. FOR STRUCTURE NOTES REFER DRG. NO. : C-ENGG-STD-PR-2316, 02,03 & 04.
4. TOP OF CHEQUERED PLATE TO FLUSH WITH FINISHED FLOOR LEVEL.
5. THIS DRAWING SHALL BE MATCHED WITH VENDOR'S APPROVED INTERNAL CABLE TRENCH LAYOUT DRAWING BEFORE START OF CONSTRUCTION
6. ALL WELDS ARE 6MM FILLET CONTINUOUS WELD UNLESS OTHERWISE SPECIFIED
7. ISMC 100 SHALL BE PROVIDED @1000 C/C TO SUPPORT CHEQUERED PLATE WHEREVER CABLE TRENCH WIDTH EXCEEDS 1000 MM.
8. ISMC 100 SHALL BE PROVIDED BELOW PANELS ALSO.
9. FOR CABLE TRENCH WITH LESSER WIDTH L50x50x5 STIFFENER SHALL BE WELDED WITH CHEQUERED PLATE @ 1000 C/C.

निर्माण हेतु जारी
765/400 KV
उपकेन्द्र के लिए। Jeerat & Medinipur S/S
(हस्ताक्षर)
(पदनाम)
16/1/18
(तिथि)
पावरग्रिड कारपोरेशन ऑफ इंडिया लि0
अभियांत्रिकी (सिविल), गुड़गाँव, हरियाणा

REV.	DESCRIPTION	PREP. (ENGG-CIVIL)	REVD. (ENGG-ELECT.)	REVD. (ENGG-CIVIL)	REVD. ANI (ENGG-CIVIL)	REVD. GM (ENGG-ELECT.)	APPD. (ENGG-S/STR.&CIVIL)	DATE
0.	REVISED AS MARKED							

RELEASED FOR TENDER/CONSTRUCTION

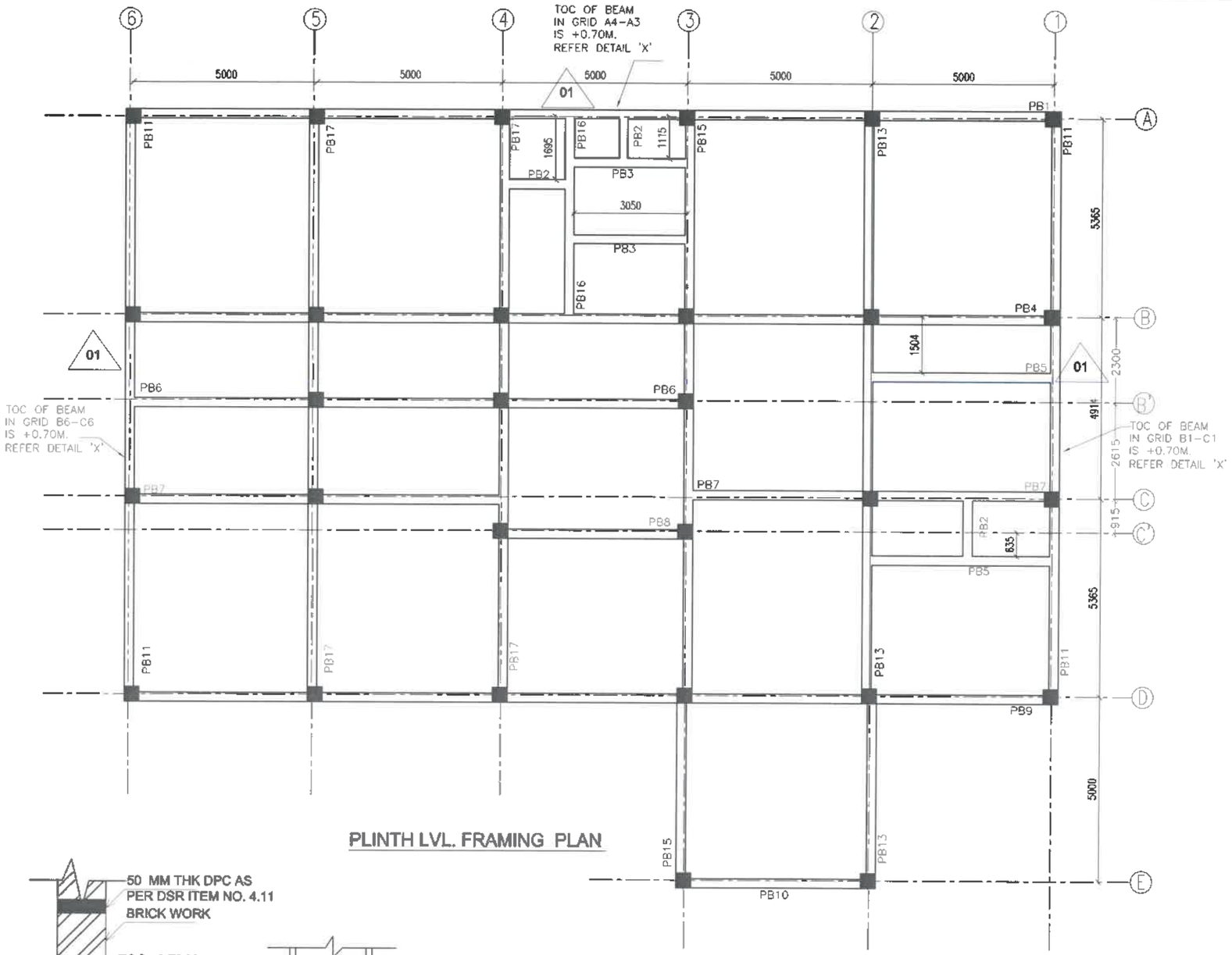
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

TITLE:
STANDARD PANEL ROOM

SUB TITLE: STANDARD SWITCHYARD PANEL ROOM R.C.C DETAIL OF INTERNAL CABLE TRENCH

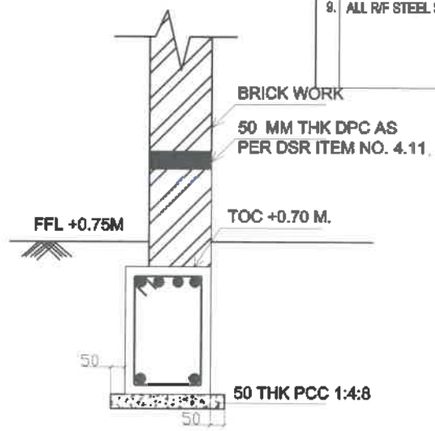
DRAWING NO:
C/ENGG/STD/PR/2017
(03 OF 03)

SCALE NTS | REV 0

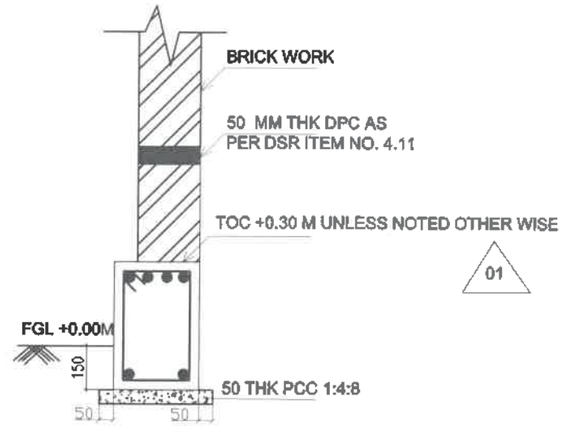


PLINTH LVL. FRAMING PLAN

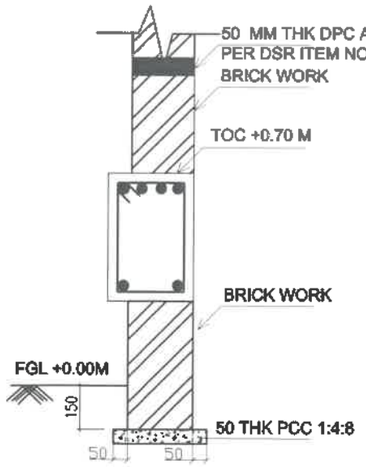
NO	NOTES
1.	THIS DRG SHALL BE READ IN CONJUNCTION WITH RELEVANT ARCH. & SERVICES DRGS.
2.	THIS BLDG. IS DESIGNED FOR GROUND FLOOR ONLY.
4.	ALL LOOSE POCKETS FOUND IN EXCAVATION SHALL BE WELL COMPACTED AS PER TECHNICAL SPECIFICATION.
5.	CONC. MIX M-25 SHALL BE USED FOR ALL RCC WORK UNLESS OTHERWISE SPECIFIED.
6.	CLEAR COVER TO OUTER BARS SHALL BE AS FOLLOW:- IN FTGS= 50, COLS.=40, BEAMS=25, SLABS = 20MM.
7.	LAP LENGTH FOR ALL BARS SHALL BE 47X DIA OF BARS.
8.	230TH. & 115MM TH. BK. WORK SHALL BE IN CEM. SAND 1:6 & 1:4 RESPECTIVELY.
9.	ALL R/F STEEL SHALL BE OF GRADE FE 500D.



TYP. SECTION OF PLINTH BEAM AT INSIDE

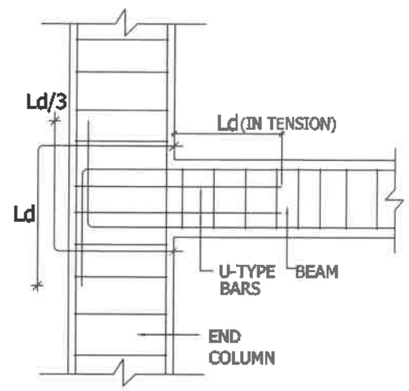


TYP. SECTION OF PLINTH BEAM AT PERIPHERY

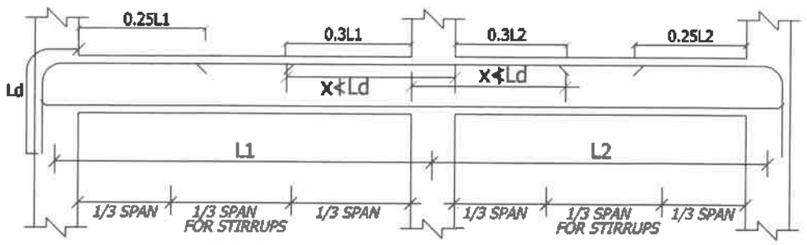


TYP. SECTION OF PLINTH BEAM AT PERIPHERY WITH TOC +0.70 M DETAIL 'X'

01



TYPICAL DETAILS OF A BEAM-COLUMN JUNCTION AT EXTERIOR COLUMN



TYPICAL BEAM LONGITUDINAL SECTION

RELEASED FOR CONSTRUCTION

R01				
DESCRIPTION	PREP :	REVD :	APPD:	DATE :

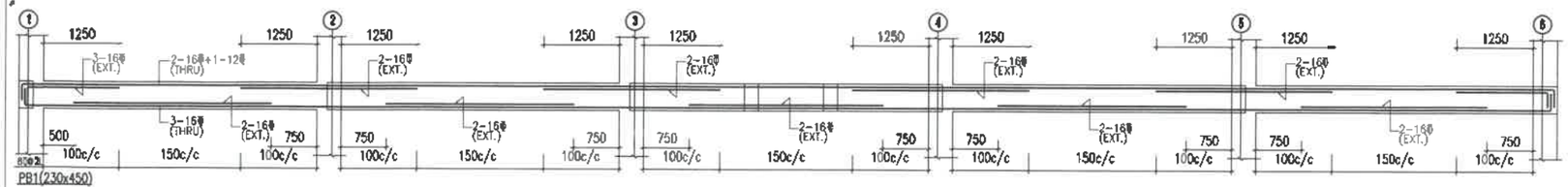
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

PROJECT: 765/400kV MEDINIPUR SUBSTATION

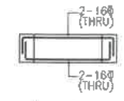
TITLE: CRB: PLINTH BEAM (LAYOUT & RCC DETAILS)

DRAWING NO: C/ENGG/ERII/MED/CRB/PLINTH/01
SHEET 01 OF 02

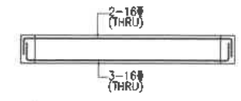
SCALE	N.T.S.		REV. 01



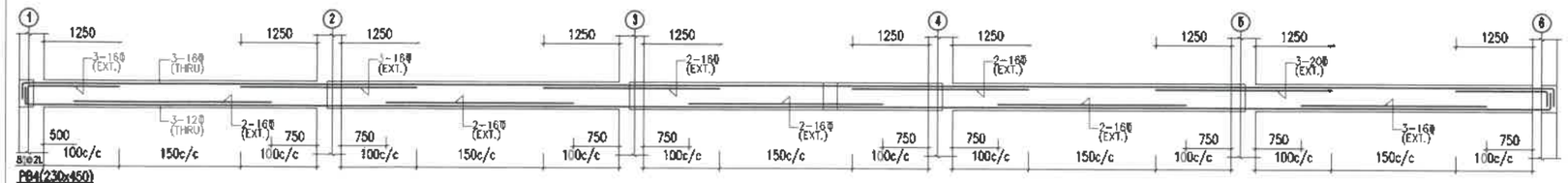
PB1(230x450)



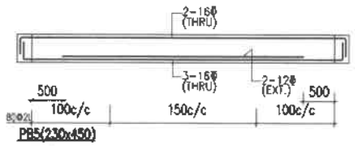
PB2(230x450)



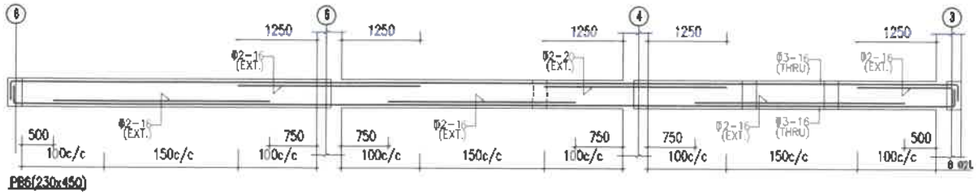
PB3(230x450)



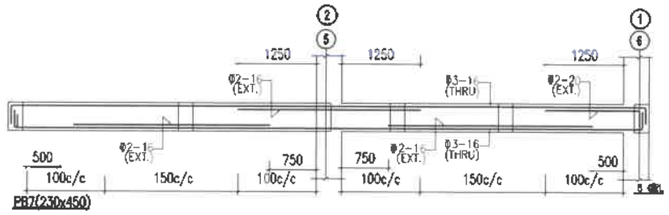
PB4(230x450)



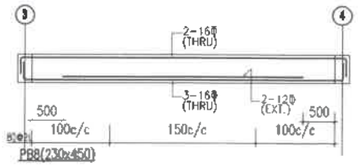
PB5(230x450)



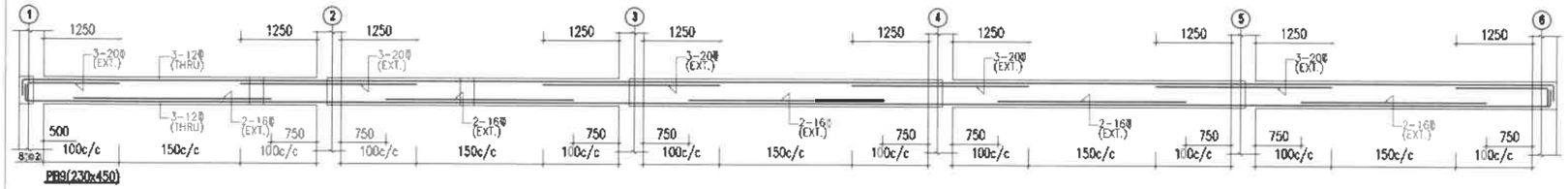
PB6(230x450)



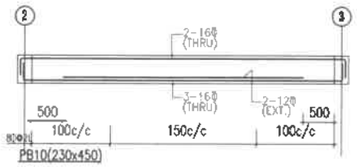
PB7(230x450)



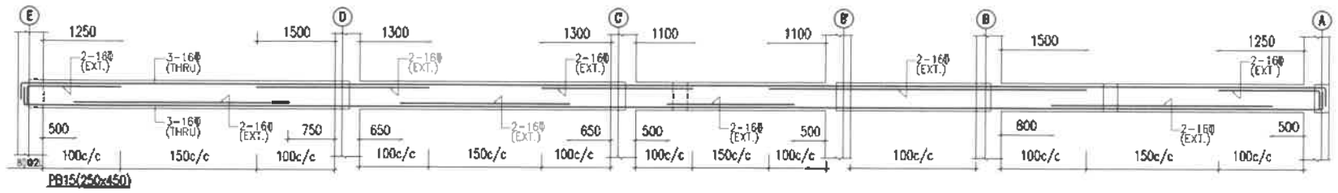
PB8(230x450)



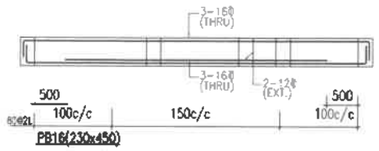
PB9(230x450)



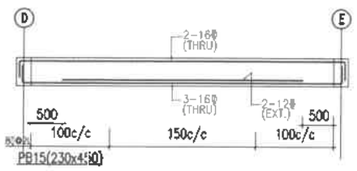
PB10(230x450)



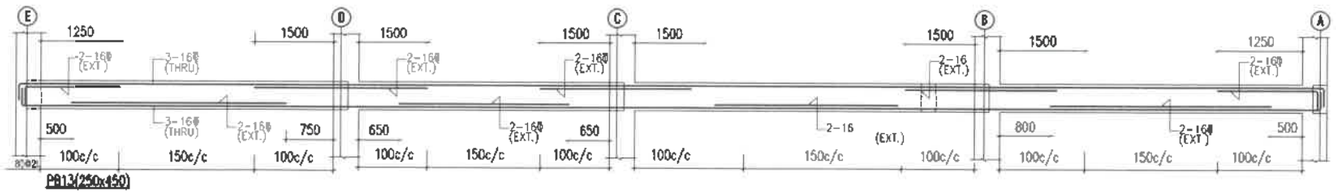
PB15(250x450)



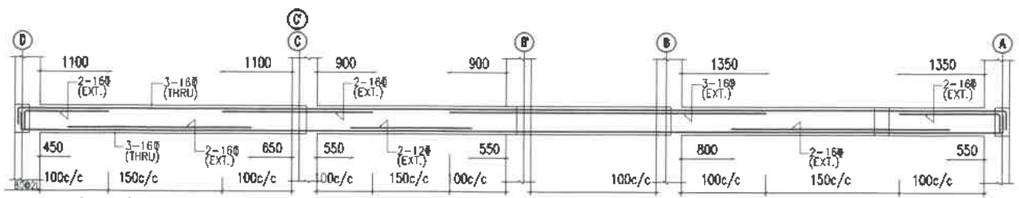
PB16(230x450)



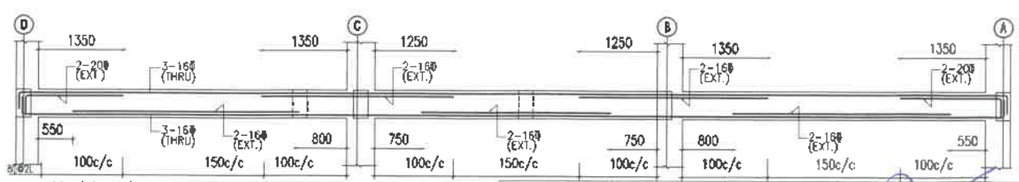
PB15(230x450)



PB13(250x450)



PB17(230x450)



PB11(230x450)

FOR NOTES REFER SHEET 01 OF 02

RELEASED FOR CONSTRUCTION

R01				
DESCRIPTION	PREP:	REVD:	APPD:	DATE:

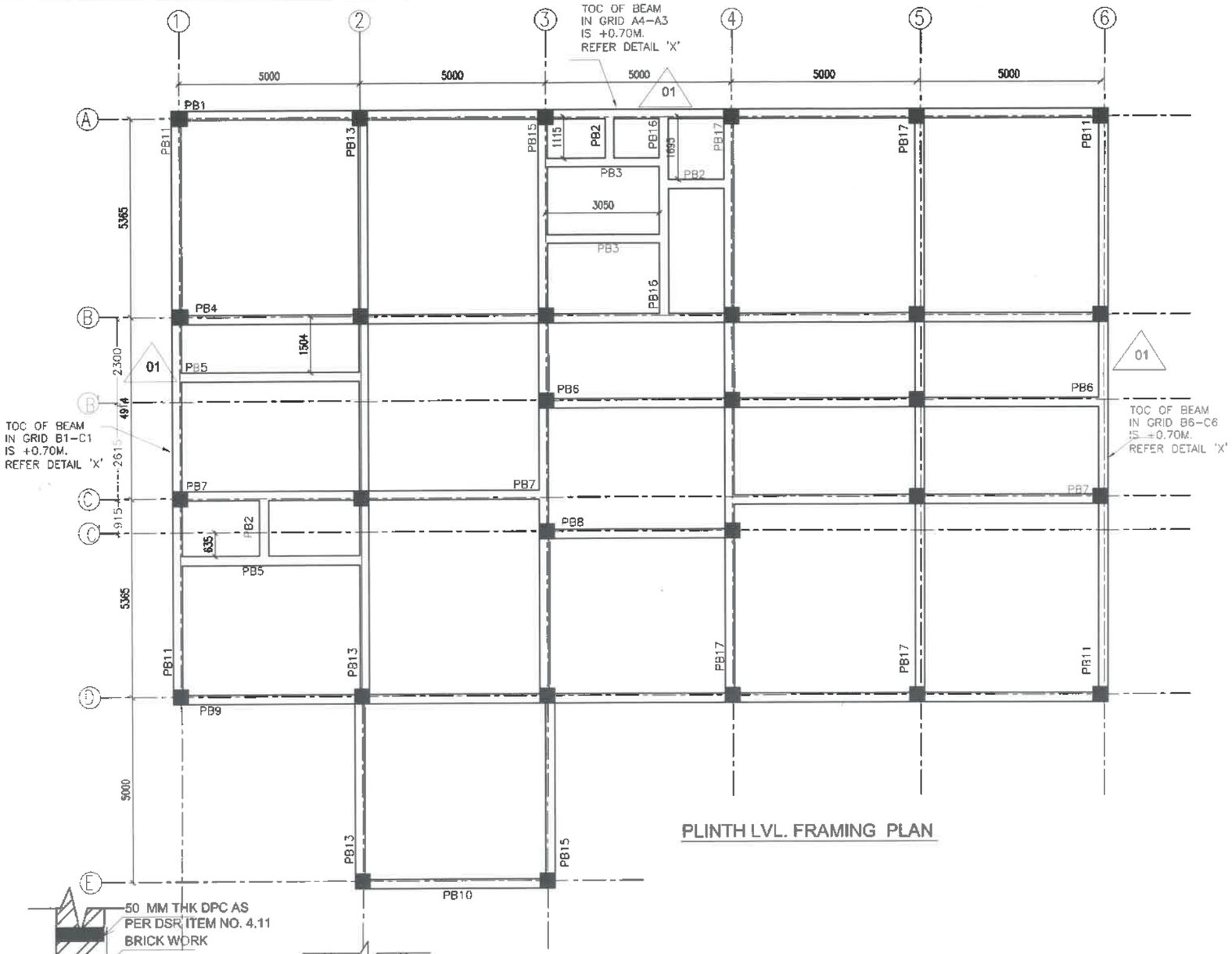
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

PROJECT: 765/400kV MEDINIPUR SUBSTATION

TITLE: CRB: PLINTH BEAM (LAYOUT & RCC DETAILS)

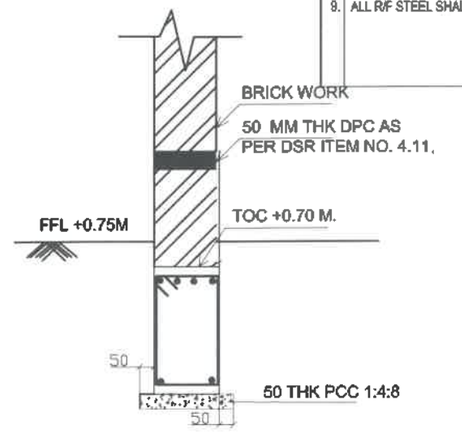
DRAWING NO: C/ENGG/ERII/MED/CRB/PLINTH/01 SHEET 02 OF 02

SCALE	N.T.S.		REV. 01

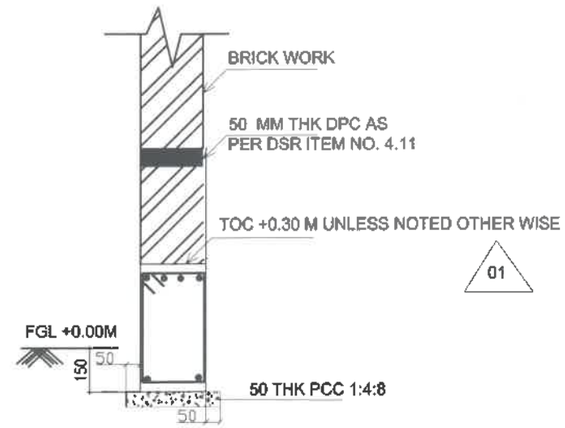


PLINTH LVL. FRAMING PLAN

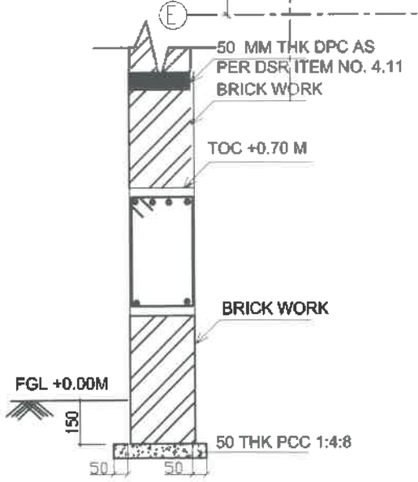
NO	NOTES
1.	THIS DRG SHALL BE READ IN CONJUNCTION WITH RELEVANT ARCH. & SERVICES DRGS.
2.	THIS BLDG. IS DESIGNED FOR GROUND FLOOR ONLY.
4.	ALL LOOSE POCKETS FOUND IN EXCAVATION SHALL BE WELL COMPACTED AS PER TECHNICAL SPECIFICATION.
5.	CONC. MIX M-25 SHALL BE USED FOR ALL RCC WORK UNLESS OTHERWISE SPECIFIED.
6.	CLEAR COVER TO OUTER BARS SHALL BE AS FOLLOW:- IN FTGS= 50, COLS.=40, BEAMS=25, SLABS = 20MM.
7.	LAP LENGTH FOR ALL BARS SHALL BE 47X DIA OF BARS.
8.	230TH. & 115MM TH. BK. WORK SHALL BE IN CEM. SAND 1:6 & 1:4 RESPECTIVELY.
9.	ALL R/F STEEL SHALL BE OF GRADE FE 500D.



TYP. SECTION OF PLINTH BEAM AT INSIDE

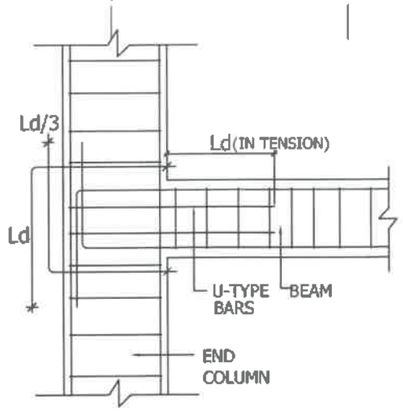


TYP. SECTION OF PLINTH BEAM AT PERIPHERY

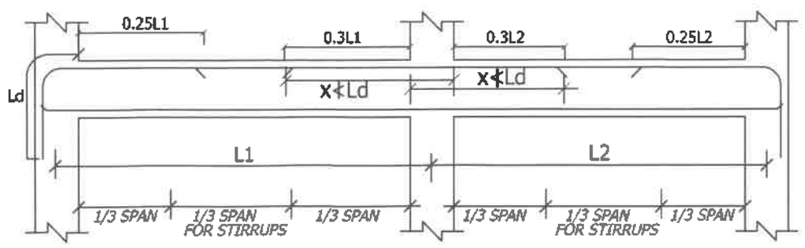


TYP. SECTION OF PLINTH BEAM AT PERIPHERY WITH TOC +0.70 M DETAIL 'X'

01



TYPICAL DETAILS OF A BEAM-COLUMN JUNCTION AT EXTERIOR COLUMN



TYPICAL BEAM LONGITUDINAL SECTION

RELEASED FOR CONSTRUCTION

DESCRIPTION	PREP :	REVD :	APPD:	DATE :

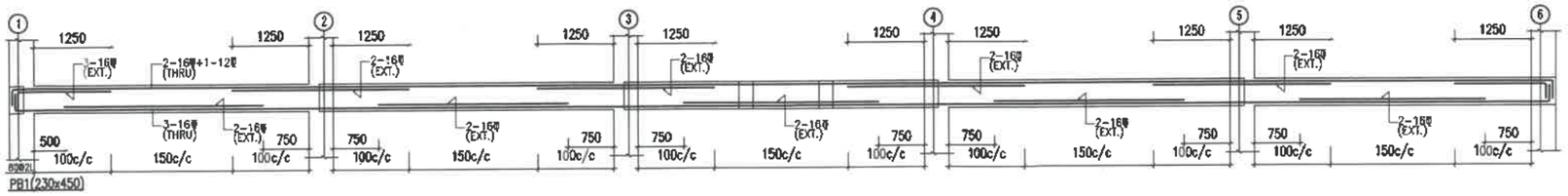
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

PROJECT: 765/400kV JEERAT SUBSTATION

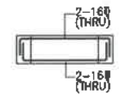
TITLE: CRB: PLINTH BEAM (LAYOUT & RCC DETAILS)

DRAWING NO: C/ENGG/ERII/JRT/CRB/PLINTH/01
SHEET 01 OF 02

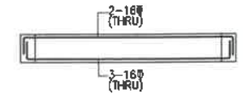
SCALE	N.T.S.		REV. 01



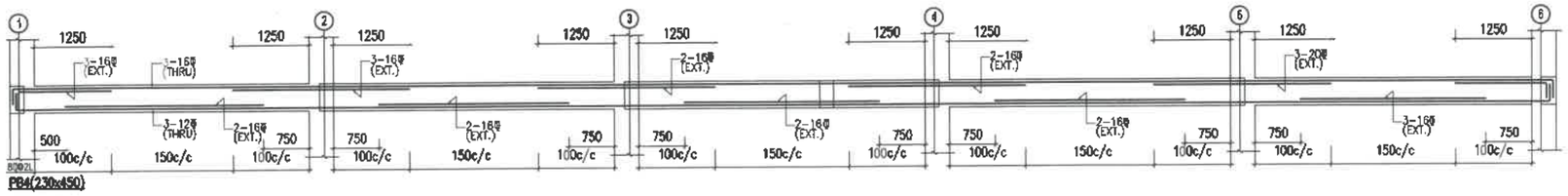
PB1(230x450)



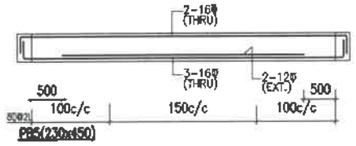
PB2(230x450)



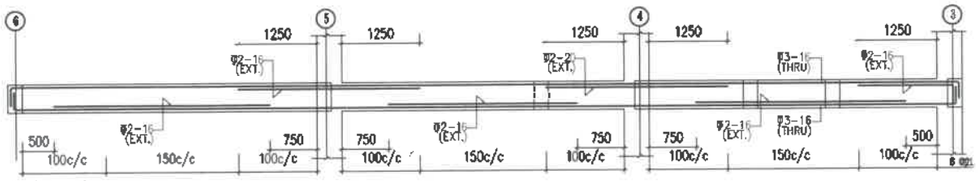
PB3(230x450)



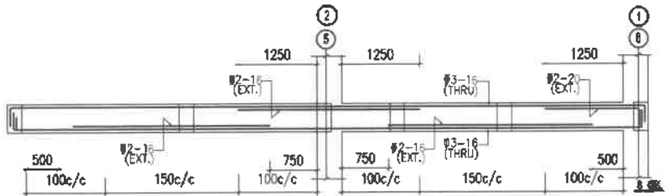
PB4(230x450)



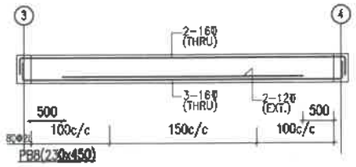
PB5(230x450)



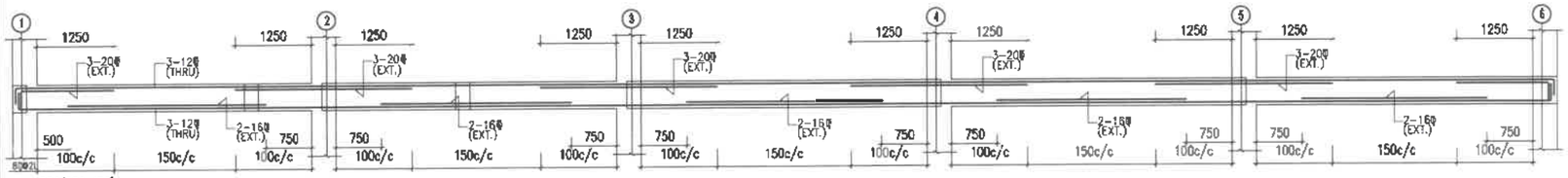
PB6(230x450)



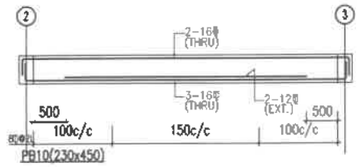
PB7(230x450)



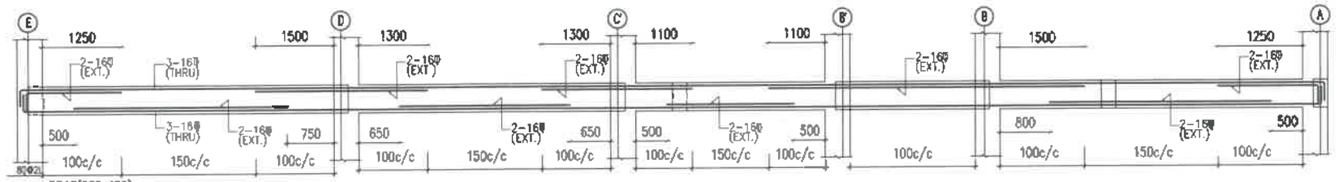
PB8(230x450)



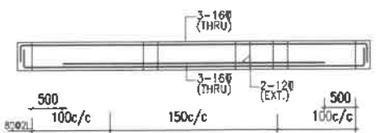
PB9(230x450)



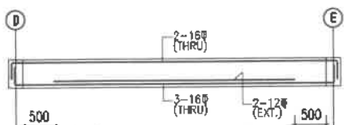
PB10(230x450)



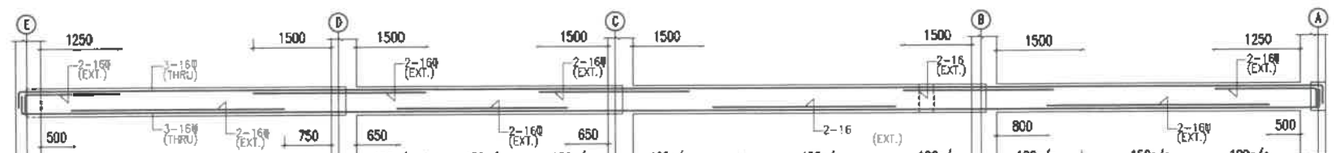
PB15(230x450)



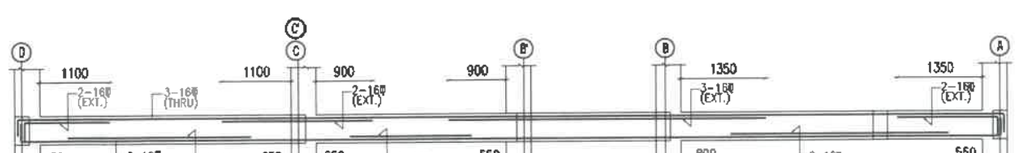
PB16(230x450)



PB15(230x450)



PB13(250x450)



PB17(230x450)

PB11(230x450)

FOR NOTES REFER SHEET 01 OF 02

RELEASED FOR CONSTRUCTION

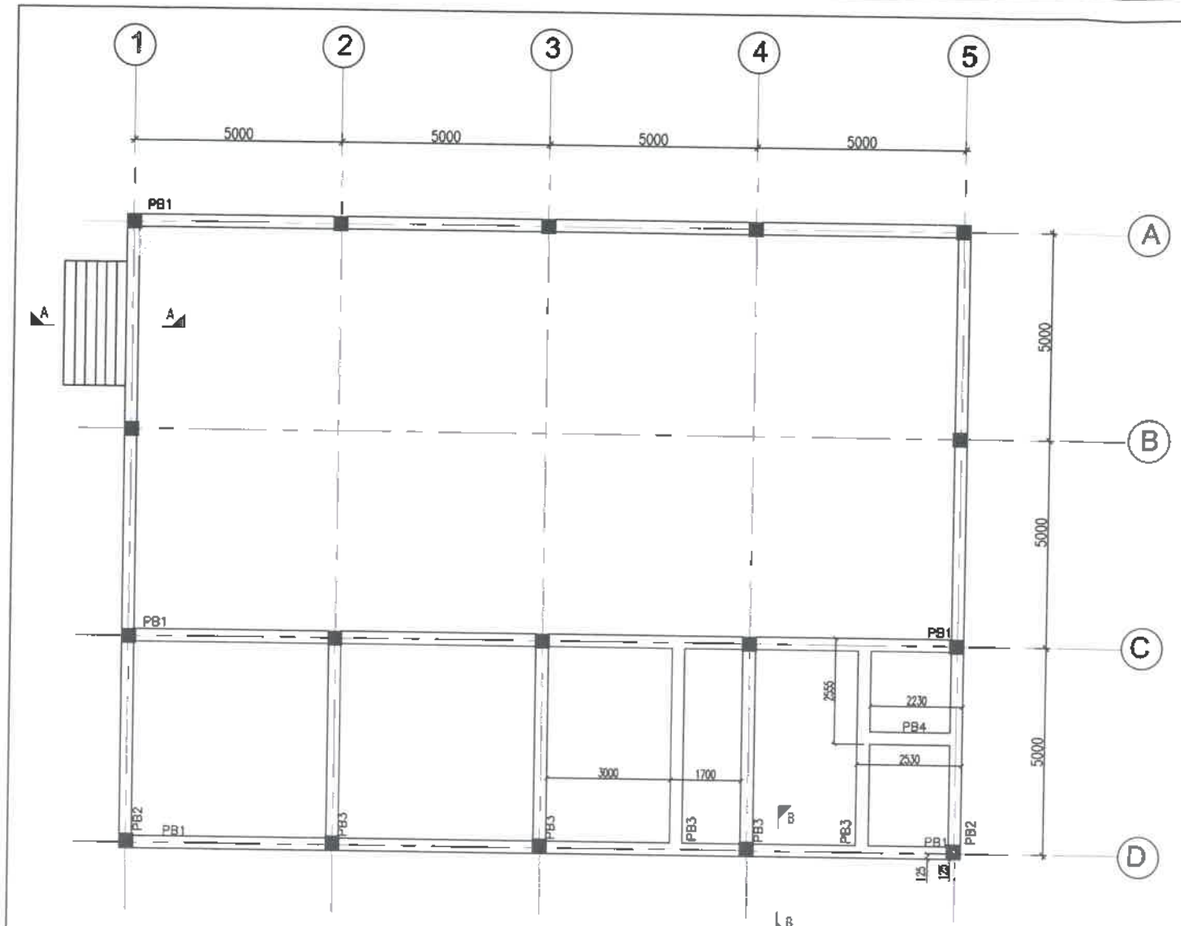
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

PROJECT: 765/400kV JEERAT SUBSTATION

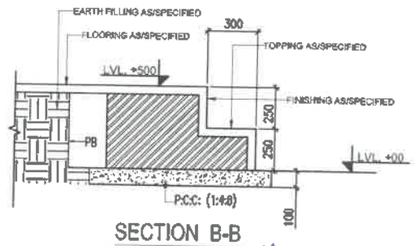
TITLE: CRB: PLINTH BEAM (LAYOUT & RCC DETAILS)

DRAWING NO: C/ENGG/ERII/JRT/CRB/PLINTH/01 SHEET 02 OF 02

DESCRIPTION	PREP:	REVD:	APPD:	DATE:	SCALE	N.T.S.		REV. 01
				27/12/2016				

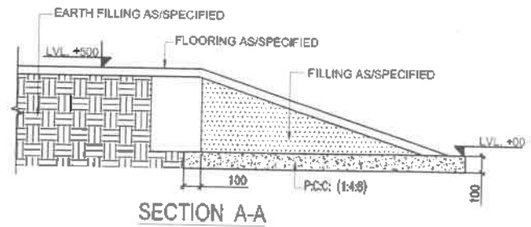


PLINTH BEAM FRAMING PLAN

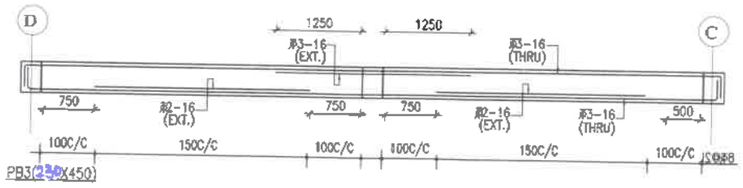


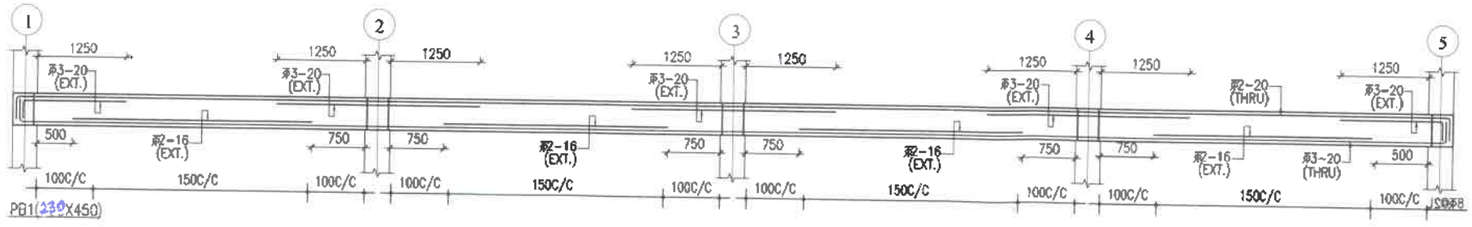
SECTION B-B
(AT ENTRY)

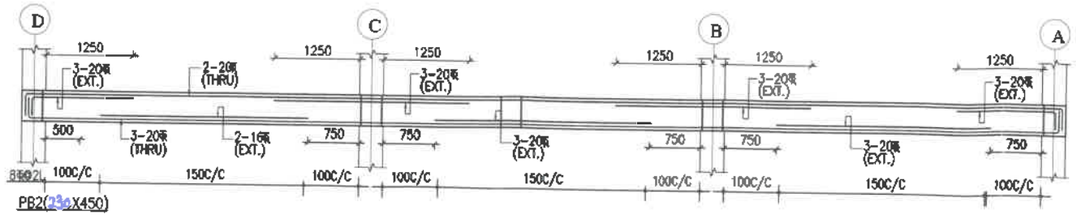
NO	NOTES
1.	THIS DRG SHALL BE READ IN CONJUNCTION WITH RELEVANT ARCH. & SERVICES DRGS.
2.	THIS BLDG. IS DESIGNED FOR GROUND FLOOR ONLY.
3.	ALL LOOSE POCKETS FOUND IN EXCAVATION AND BACK FILL SHALL BE WELL COMPACTED AS PER TECHNICAL SPECIFICATION.
5.	CONC. MIX M-25 SHALL BE USED FOR ALL RCC WORK UNLESS OTHERWISE SPECIFIED.
6.	CLEAR COVER TO OUTER BARS SHALL BE AS FOLLOW:- IN FTGS= 50, COLS.=40, BEAMS=25, SLABS = 20MM.
7.	LAP LENGTH FOR ALL BARS SHALL BE 50X DIA OF BARS.
8.	230TH. & 115 MM TH. BK. WORK SHALL BE IN CEM. SAND 1:6 & 1:4 RESPECTIVELY.
9.	REINFORCEMENT STEEL OF GRADE FE 500 D SHALL BE USED
10.	ALL FOUNDATION SHALL REST MIN 1.0 M BELOW NGL

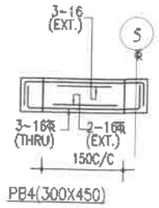


SECTION A-A









PB4(300X450)

RELEASED FOR CONSTRUCTION.

POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

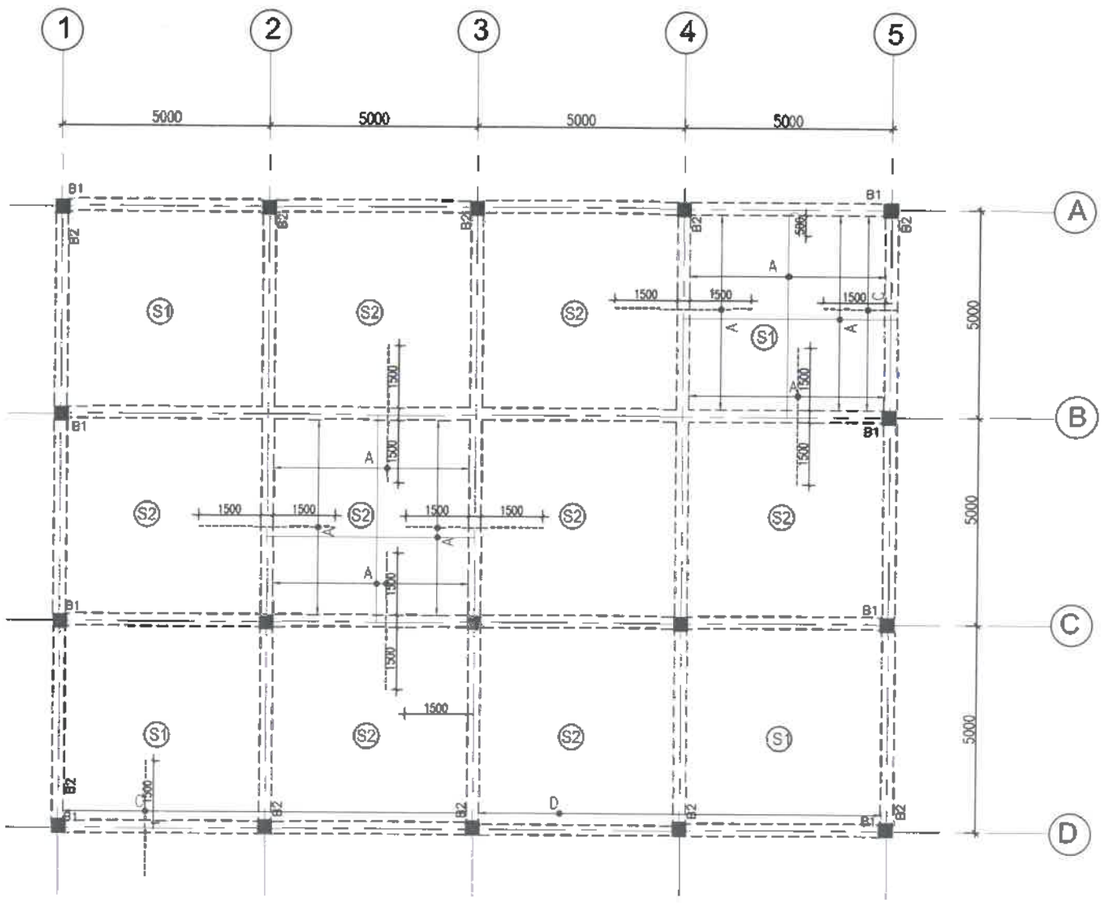
PROJECT: 765/400kV MEDINIPUR SUBSTATION

TITLE: AUXILIARY BUILDING
PLINTH BEAM FRAMING PLAN

DRAWING NO: C/ENGG/ERII/MED/AUX/PLINT/01

DESCRIPTION	PREP :	REVD :	APPD:	DATE :
				18/18

SCALE	N.T.S.		REV. 00



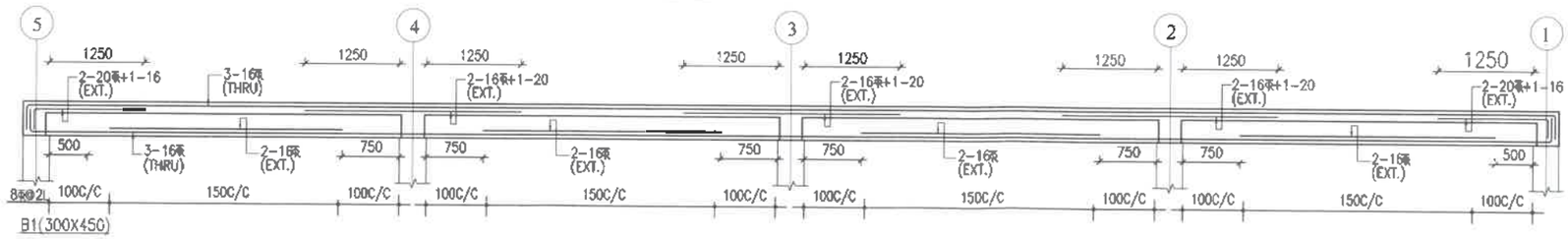
TERRACE LVL. FRAMING PLAN

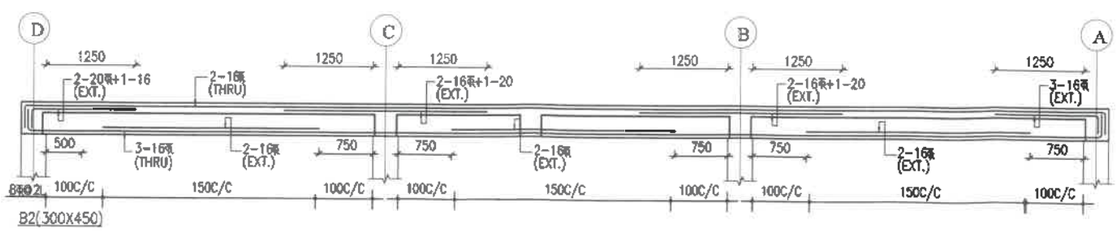
SCHEDULE OF SLAB REINF

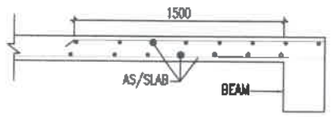
BAR MARKED	DIA & SPACING
A	8φ@150C/C
B	8φ@200C/C
C	10φ@100C/C
D	12φ@100C/C

SLAB THK. 150MM
TOP BARS SHOWN AS
BOTTOM BARS SHOWN AS
ALL DISTRIBUTION STEEL SHALL BE 8 φ200c/c WHEREVER REQD.

NO	NOTES
1.	THIS DRG SHALL BE READ IN CONJUNCTION WITH RELEVANT ARCH. & SERVICES DRGS.
2.	THIS BLDG. IS DESIGNED FOR GROUND FLOOR ONLY.
3.	ALL LOOSE POCKETS FOUND IN EXCAVATION AND BACK FILL SHALL BE WELL COMPACTED AS PER TECHNICAL SPECIFICATION.
5.	CONC. MIX M-25 SHALL BE USED FOR ALL RCC WORK UNLESS OTHERWISE SPECIFIED.
6.	CLEAR COVER TO OUTER BARS SHALL BE AS FOLLOW:- IN FTGS= 50, COLS.=40, BEAMS=25, SLABS = 20MM.
7.	LAP LENGTH FOR ALL BARS SHALL BE 50X DIA OF BARS.
8.	230TH. & 115 MM TH. BK. WORK SHALL BE IN CEM. SAND 1:6 & 1:4 RESPECTIVELY.
9.	REINFORCEMENT STEEL OF GRADE FE 500 D SHALL BE USED
10.	ALL FOUNDATION SHALL REST MIN 1.0 M BELOW NGL







SECTION D-D

RELEASED FOR CONSTRUCTION.

POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

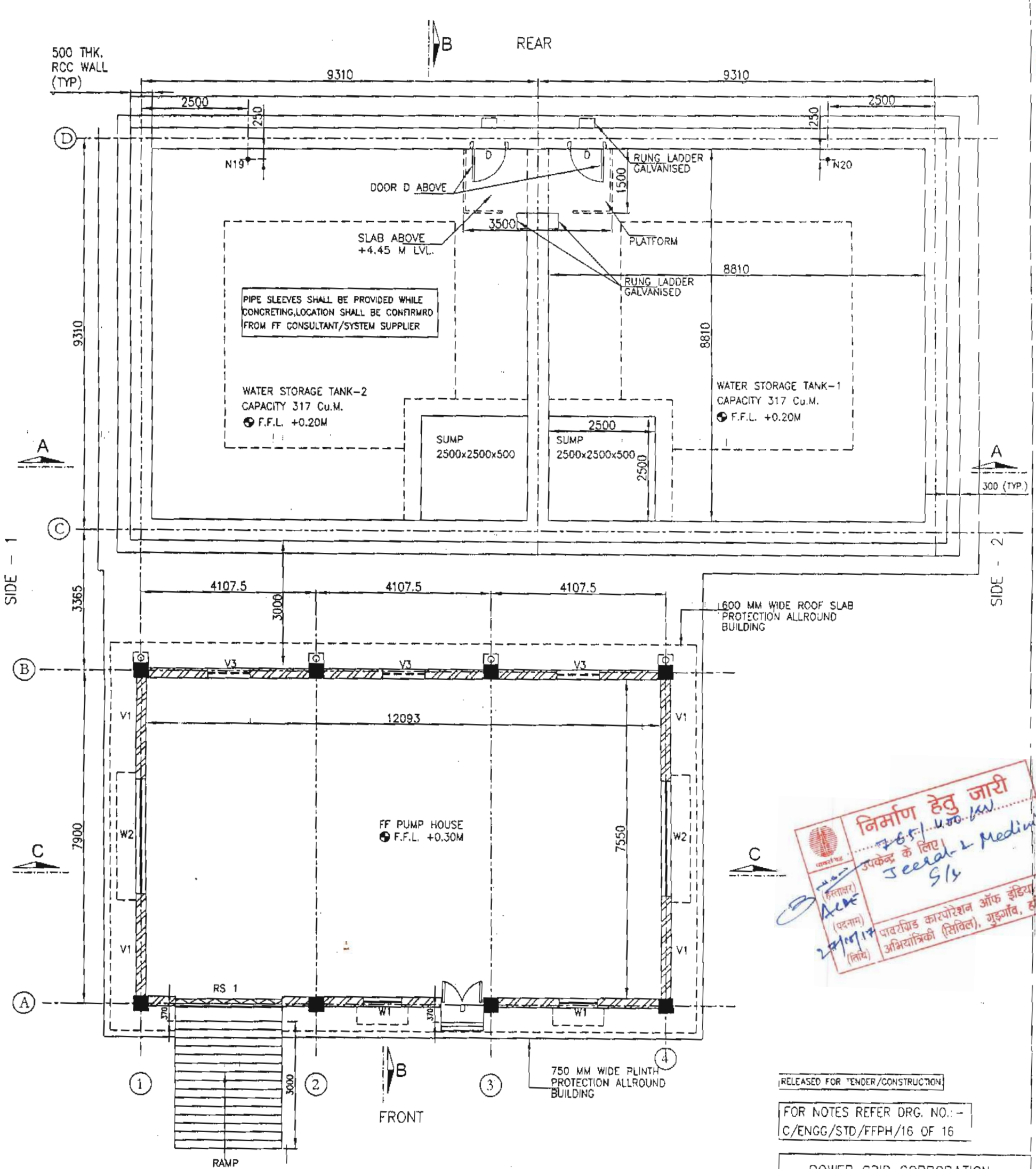
PROJECT: 765/400kV MEDINIPUR SUBSTATION

TITLE: AUXILIARY BUILDING ROOF FRAMING PLAN

DRAWING NO: C/ENGG/ERII/MED/AUX/ROOF/01

DESCRIPTION	PREP :	REVD :	APPD:	DATE :
				5/08 18/8

SCALE	N.T.S.		REV. 00



GROUND FLOOR PLAN FOR FFPH & WATER TANK

निर्माण हेतु जारी
उपकेन्द्र के लिए
Jeerah-2 Medinipur S/S
(हस्ताक्षर)
(पदनाम) ACE
(तिथि) 27/07/17
पावरग्रिड कारपोरेशन ऑफ इंडिया लि० अभियांत्रिकी (सिविल), गुड़गाँव, हरियाणा

APPROVED BY ED (ENGG.TL-SS-CIVIL) VIDE NOTE REFERENCE NO. C/ENGG/STD.DRG. /Civil Works/ 03/2016,DTD. 20.12.2016

RELEASED FOR TENDER/CONSTRUCTION

FOR NOTES REFER DRG. NO.:- C/ENGG/STD/FFPH/16 OF 16

POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

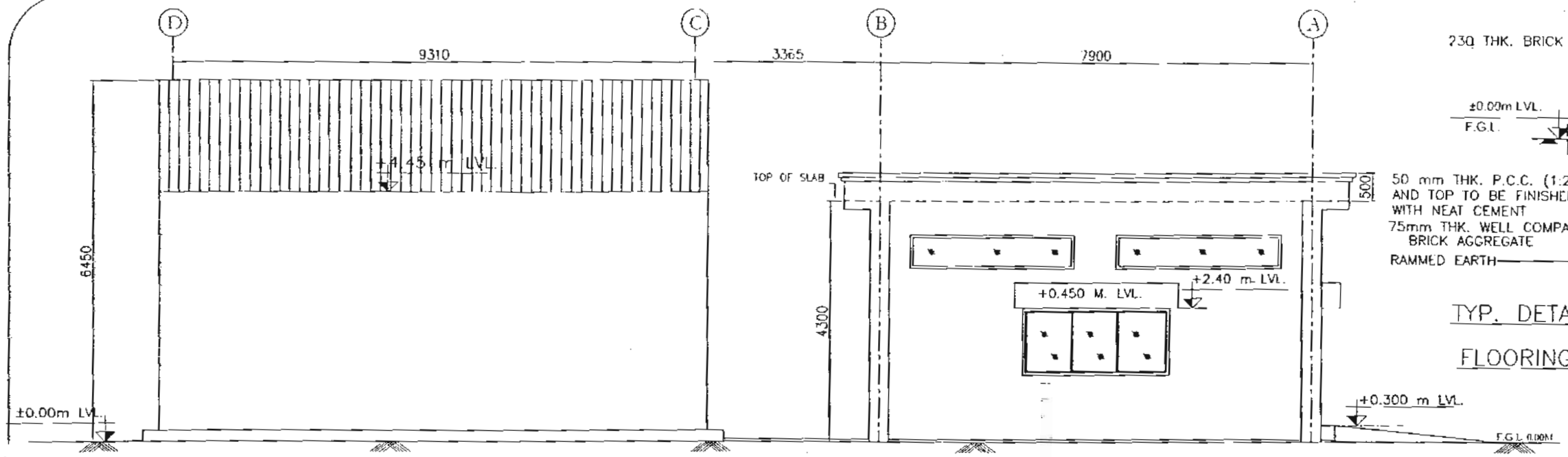
TITLE: STANDARD FIRE FIGHTING PUMP HOUSE & WATER TANK.

SUB TITLE: GROUND FLOOR PLAN FOR FIRE FIGHTING PUMP HOUSE & WATER TANK

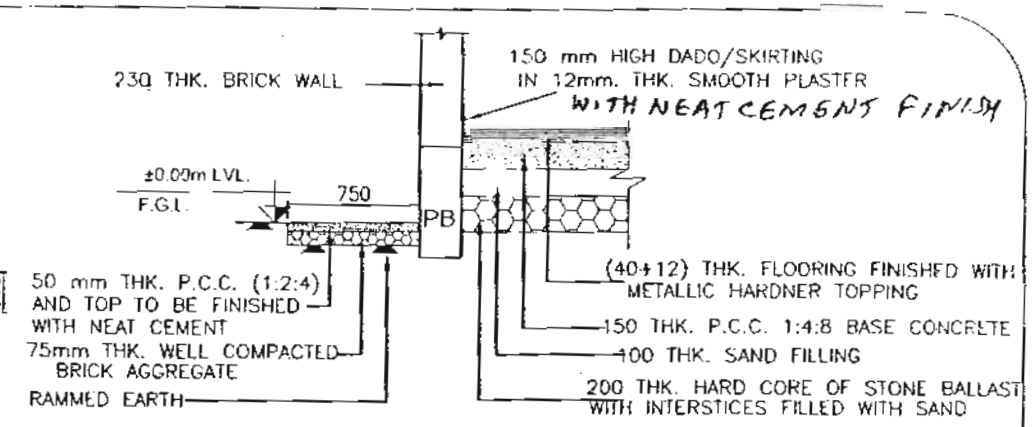
DRAWING NO: C/ENGG/STD/FFPH/2016/1 OF 16

REV.	DESCRIPTION	PREP. JE(ENGG-CIVIL)	REVD. ACDE(ENGG-CIVIL)	REVD. (ENGG-ELECT.)	REVD. CDE (ENGG-CIVIL)	REVD. ASTT.GM (ENGG-CIVIL)	REVD. AGM (ENGG-CIVIL)	REVD. (ENGG-ELECT.)	APPD. GM (ENGG-CIVIL)	DATE
0.	REVISED AS [illegible]									10/1/17

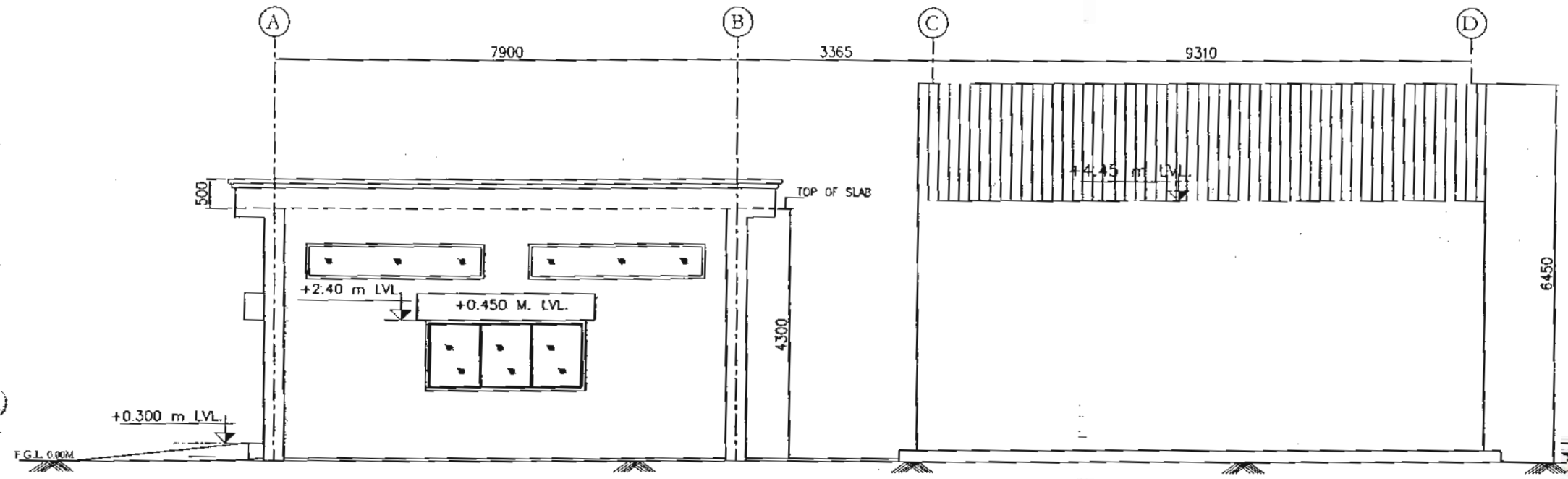
SCALE	REV
NTS	0



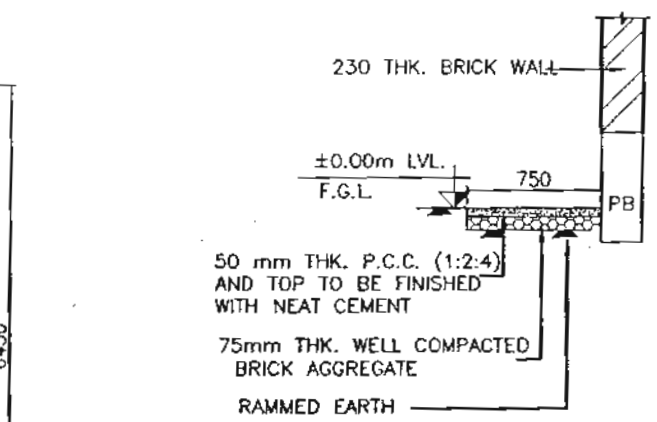
ELEVATION SIDE – 1



TYP. DETAILS FOR PLINTH PROTECTION AND FLOORING DETAILS FOR FFPH BUILIDING



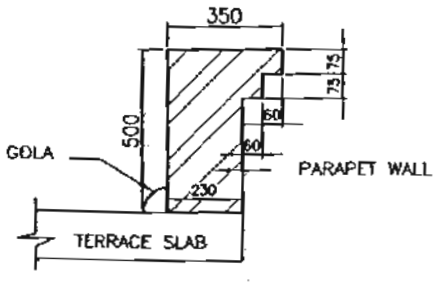
ELEVATION SIDE – 2



TYP. DETAILS FOR PLINTH PROTECTION

SCHEDULE OF OPENING:-

SR. NO.	OPENING MARK	SIZE WXD mm	CILL LVL mts.	LINTEL LVL mts.	NOS.	DESCRIPTION
01	ROLLING SHUTTER RS1	2500X3400	+0.300	+3.70	01	STANDERED STEEL ROLLING SHUTTER
02	DOOR D	1000X2100	+0.300	+2.40	01	M.S. DOOR FRAME WITH M.S. SHEET DOUBLE SHUTTER
03	DOOR D1	900X1850	+4.45	+6.3	02	Aluminm glazed With 5.5mm,Thik Glass Separately under relevant BPS item along with hydrolic floor spring & mortic lock
04	WINDOW W1	900X1200	+1.20	+2.40	02	Sliding Glazed Windows With Aluminium Grill
05	WINDOW W2	2700X1200	+1.20	+2.40	02	Sliding Glazed Windows With Aluminium Grill
06	VENTILATOR V1	3010X600	AT BEAM	BOTTOM	04	as per manufacture speciation
07	VENTILATOR V3	1000X600	AT BEAM	BOTTOM	03	as per manufacture speciation



TYP. DETAILS OF CORBELLING FOR PARAPET AT ROOF LEVEL

निर्माण हेतु जारी
उपकेन्द्र के लिए। Jeerat
Medinipur S/S.
(हस्ताक्षर)
(पदनाम)
(तिथि)
पावरग्रिड कारपोरेशन ऑफ इंडिया लि0
अभियांत्रिकी (सिविल), गुड़गाँव, हरियाणा

APPROVED BY ED (ENGG.TL-SS-CIVIL) VIDE NOTE REFERENCE NO. C/ENGG/STD.DRG. /Civil Works/03/2016. DTD. 20.12.2016

REV.	DESCRIPTION	PREP.	REVD.	REVD.	REVD.	REVD.	REVD.	REVD.	APPD.	DATE
0.	REVISED AS MARKED									

RELEASED FOR TENDER/CONSTRUCTION

FOR NOTES REFER DRG. NO.:- C/ENGG/STD/FFPH/16 OF 16

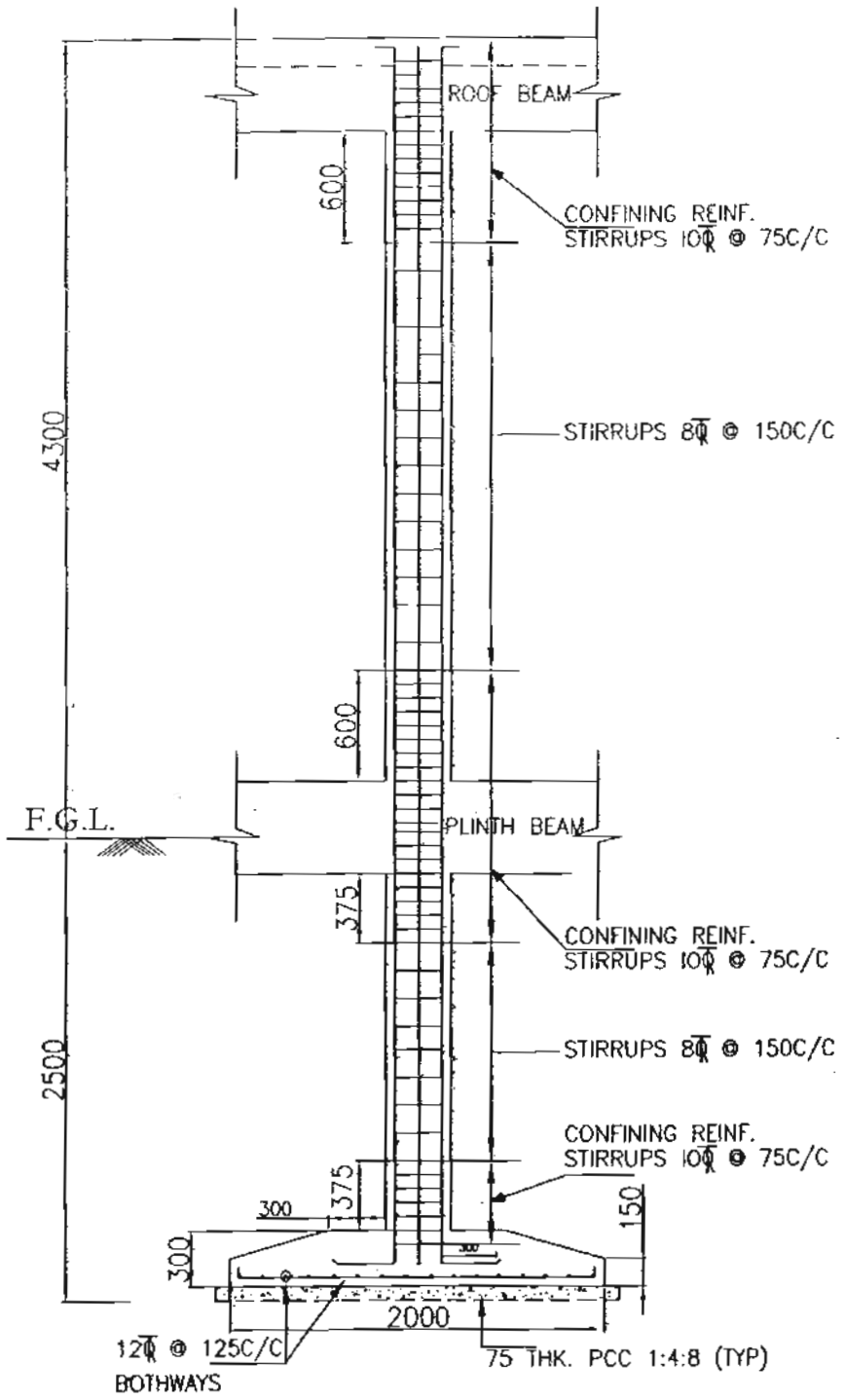
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

TITLE: STANDARD FIRE FIGHTING PUMP HOUSE & WATER TANK.

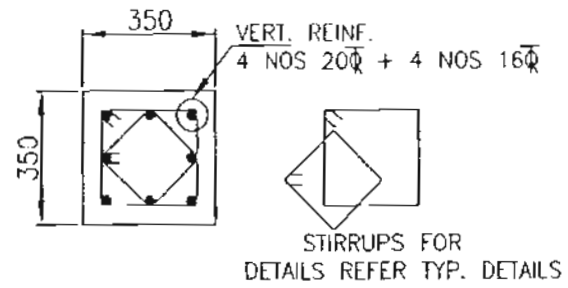
SUB TITLE: ELEVATION FOR FIRE FIGHTING PUMP HOUSE & WATER TANK

DRAWING NO: C/ENGG/STD/FFPH/2016/2 OF 16

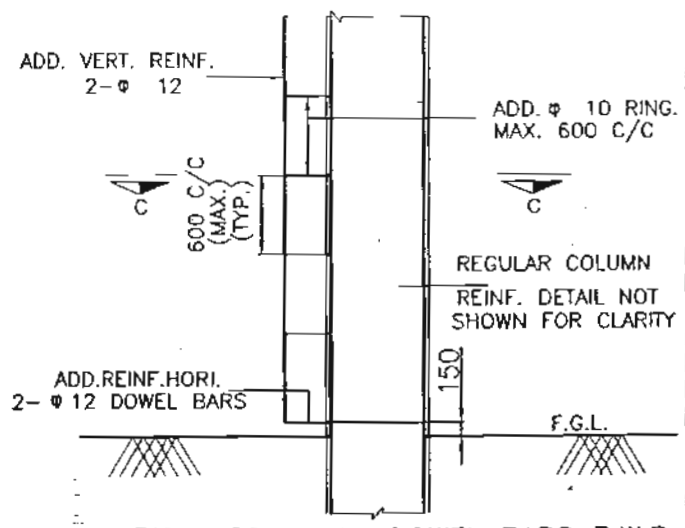
SCALE NTS | REV 0



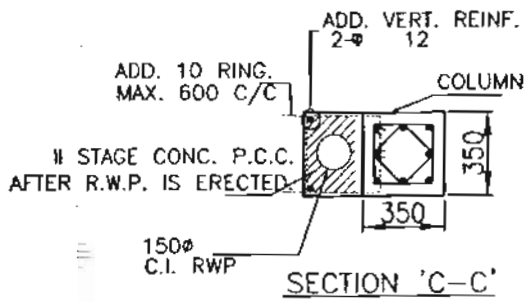
TYP. DETAILS FOR FOOTING F1 & F2
& COLUMN TYPE – C1 & C2



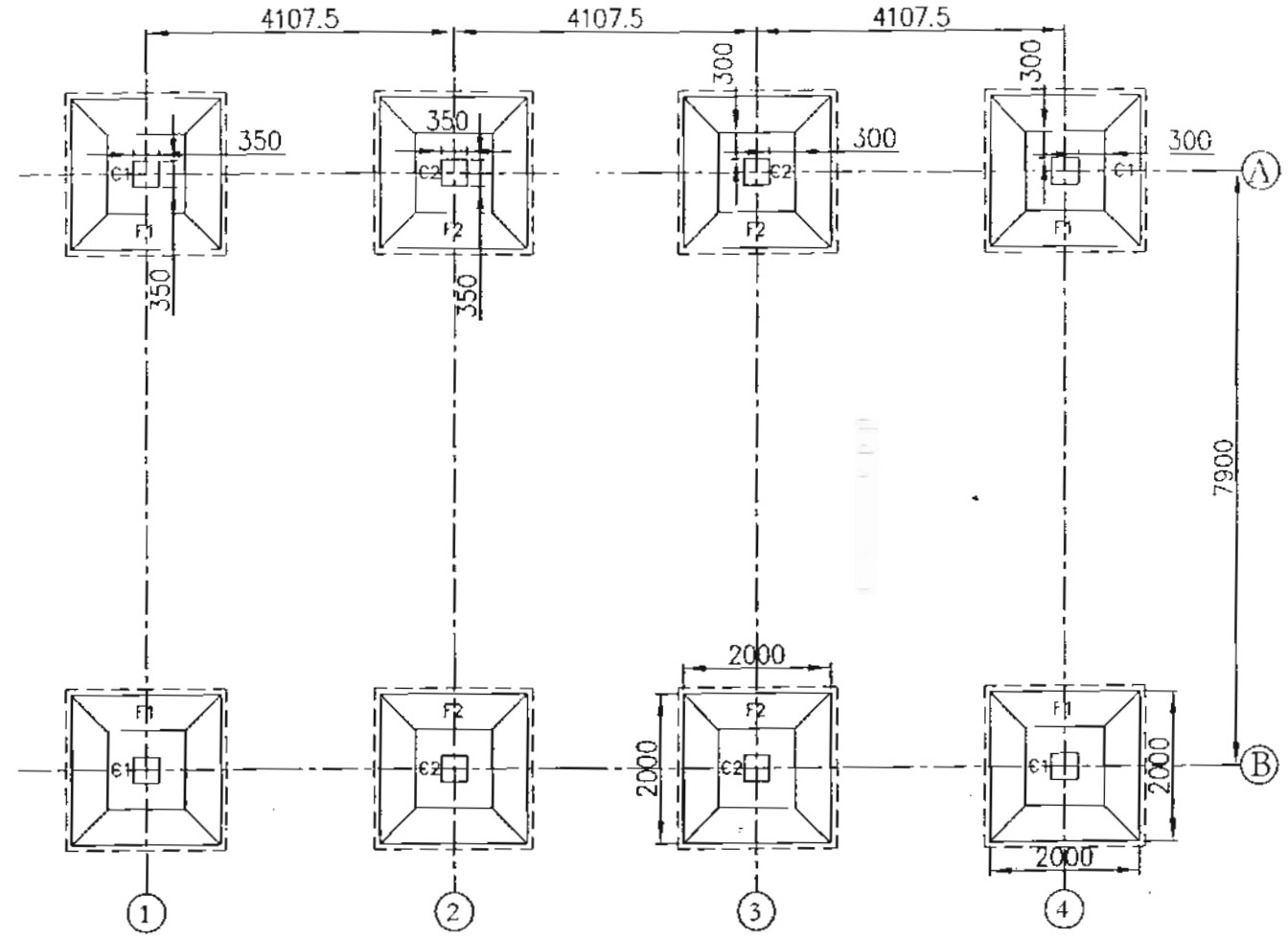
TYP. REINF. DETAILS FOR
COLUMN TYPE – C1 & C2



TYPICAL DETAIL OF DOWEL BARS R.W.P.
CONCEALMENT IN P.C.C.



SECTION 'C–C'



FOUNDATION LAYOUT FOR FFPH

निर्माण हेतु जारी
उपकेन्द्र के लिए।
(हस्ताक्षर)
(पदनाम)
(तिथि)
पावरग्रिड कारपोरेशन ऑफ इंडिया लि०
अभियांत्रिकी (सिविल), गुड़गाँव, हरियाणा

APPROVED BY ED (ENGG.TL-SS-CIVIL) VIDE
NOTE REFERENCE NO. C/ENGG/STD.DRG.
/Civil Works/03/2016 DTD 20.12.2016

RELEASED FOR TENDER/CONSTRUCTION

FOR NOTES REFER DRG. NO.:–
C/ENGG/STD/FFPH/16 OF 16

POWER GRID CORPORATION
OF INDIA LIMITED
(A Government of India Enterprise)

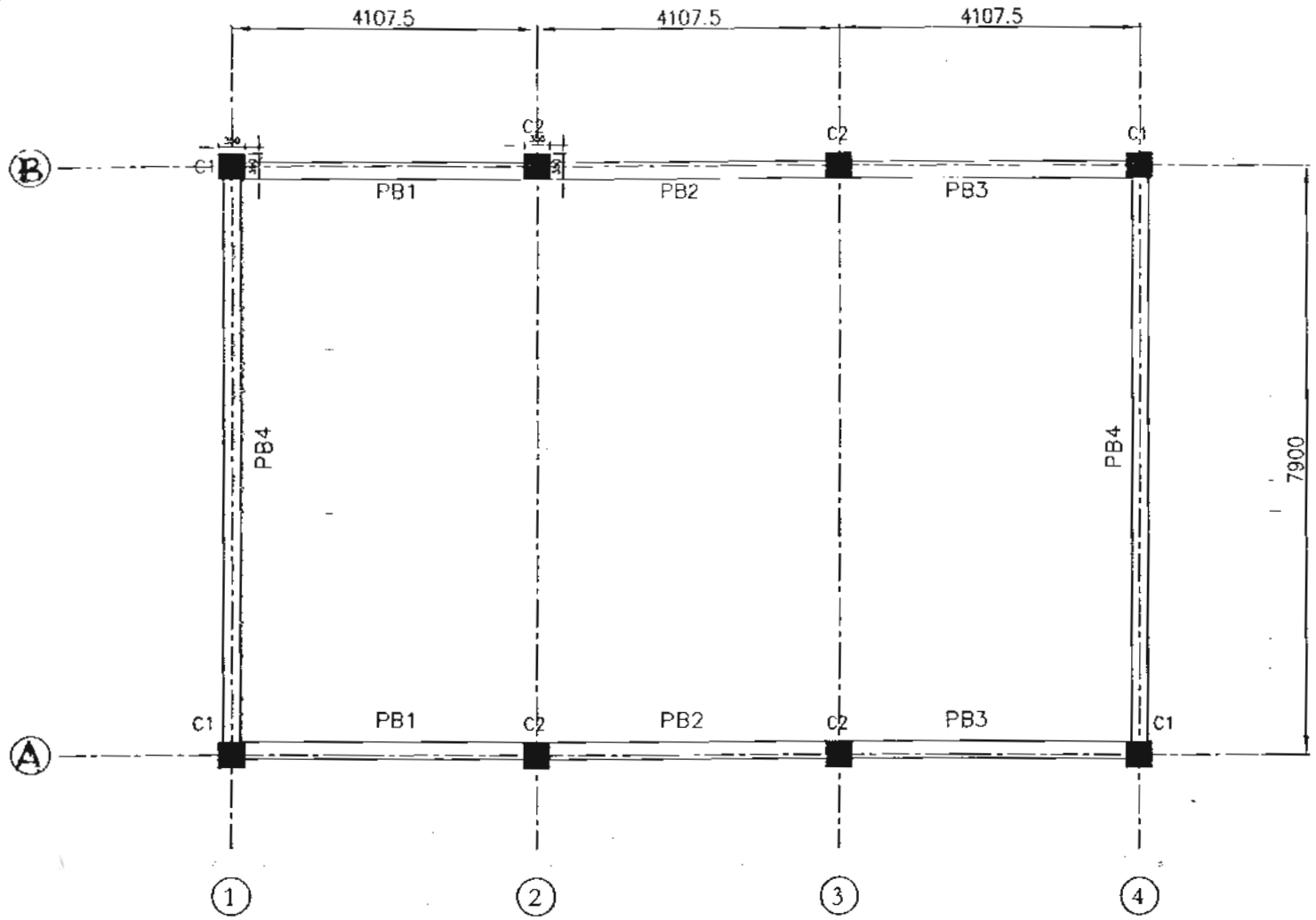
TITLE:
STANDARD FIRE FIGHTING
PUMP HOUSE & WATER TANK

SUB TITLE:
FOUNDATION LAYOUT &
DETAILS FOR 'F.F.'
PUMP HOUSE

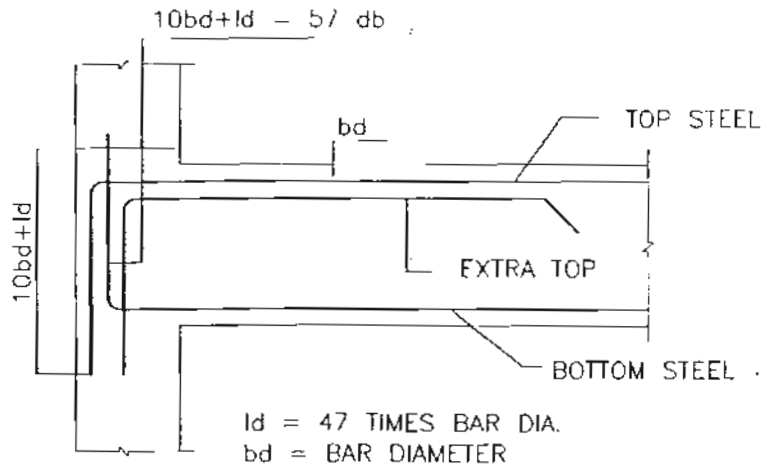
DRAWING NO:
C/ENGG/STD/FFPH/2016/7 OF 16

REV.	DESCRIPTION	PREP. JE(ENGG–CIVIL)	REVD. ACDE(ENGG–CIVIL)	REVD. (ENGG–ELECT.)	REVD. CDE (ENGG–CIVIL)	REVD. ASTI.GM (ENGG–CIVIL)	REVD. AGM (ENGG–CIVIL)	REVD. (ENGG–ELECT.)	APPD. GM (ENGG–CIVIL)	DATE
0.	REVISED AS MARKED									10/1/17

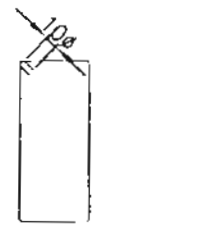
SCALE	REV
NTS	0



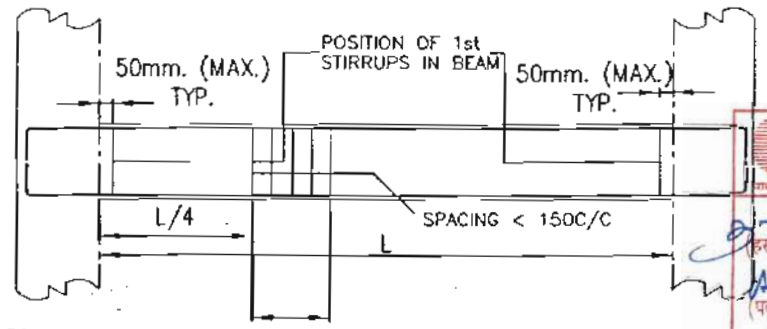
PLINTH LEVEL LAYOUT FOR FFPH



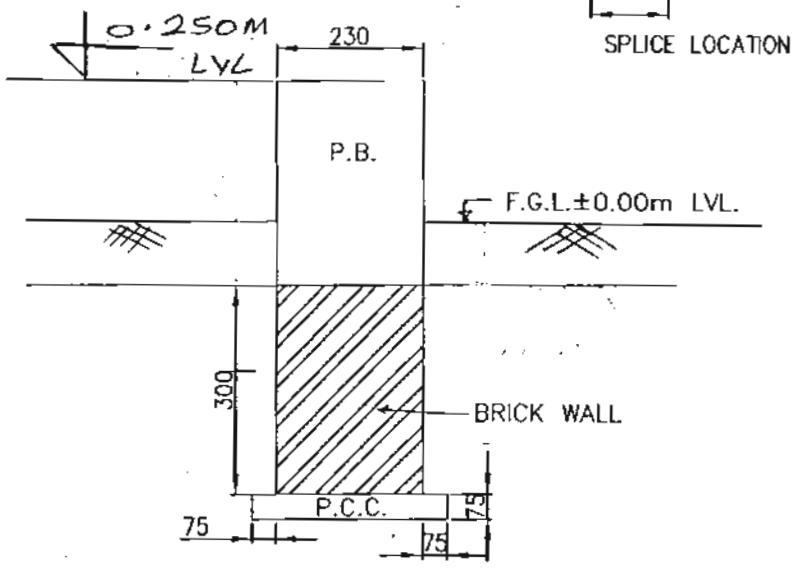
ANCHORAGE OF BEAM BARS IN AN EXTERNAL COLUMN (TYP.)



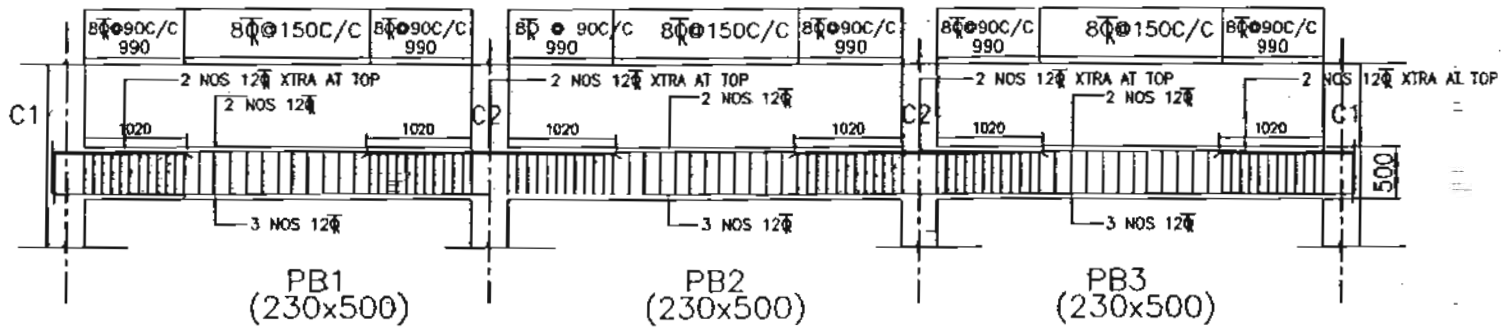
TYP. HOOK DETAILS OF STIRRUPS



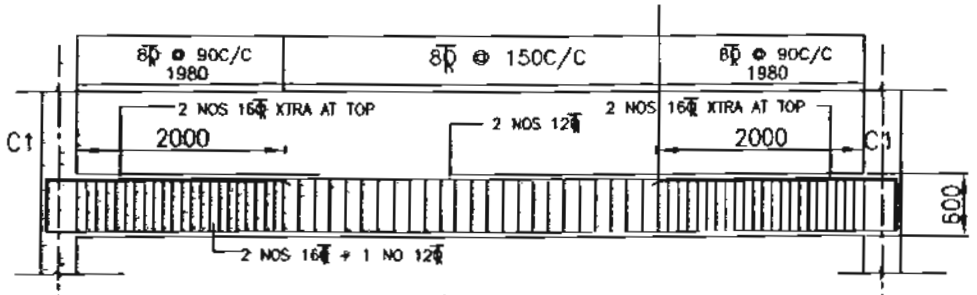
SPLICE LOCATION IF REQUIRED



TYP. DETAIL OF P.B.



PB1 (230x500) PB2 (230x500) PB3 (230x500)



PB4 (230x600)

APPROVED BY ED (ENGG.TL-SS-CIVIL) VIDE NOTE REFERENCE NO. C/ENGG/STD.DRG. /Civil Works/03/2016 DTD. 20.12.2016

निर्माण हेतु जारी
उपकेन्द्र के लिए।
(हस्ताक्षर)
(पदनाम)
(तिथि)
पावरग्रिड कारपोरेशन ऑफ इंडिया लि० अभियांत्रिकी (सिविल), गुड़गाँव, हरियाणा

RELEASED FOR TENDER/CONSTRUCTION.

FOR NOTES REFER DRG. NO.:– C/ENGG/STD/FFPH/16 OF 16

POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

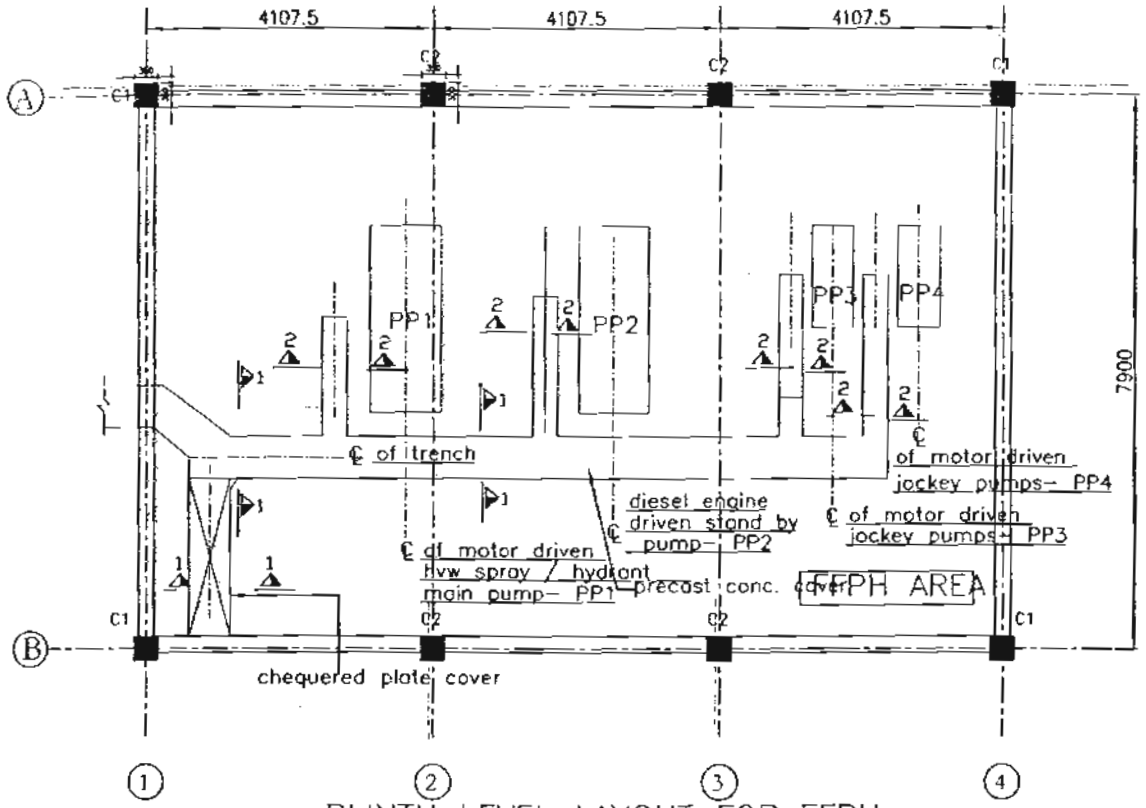
TITLE: STANDARD FIRE FIGHTING PUMP HOUSE & WATER TANK.

SUB TITLE: PLINTH LEVEL LAYOUT & DETAILS OF PLINTH BEAM FOR FFPH

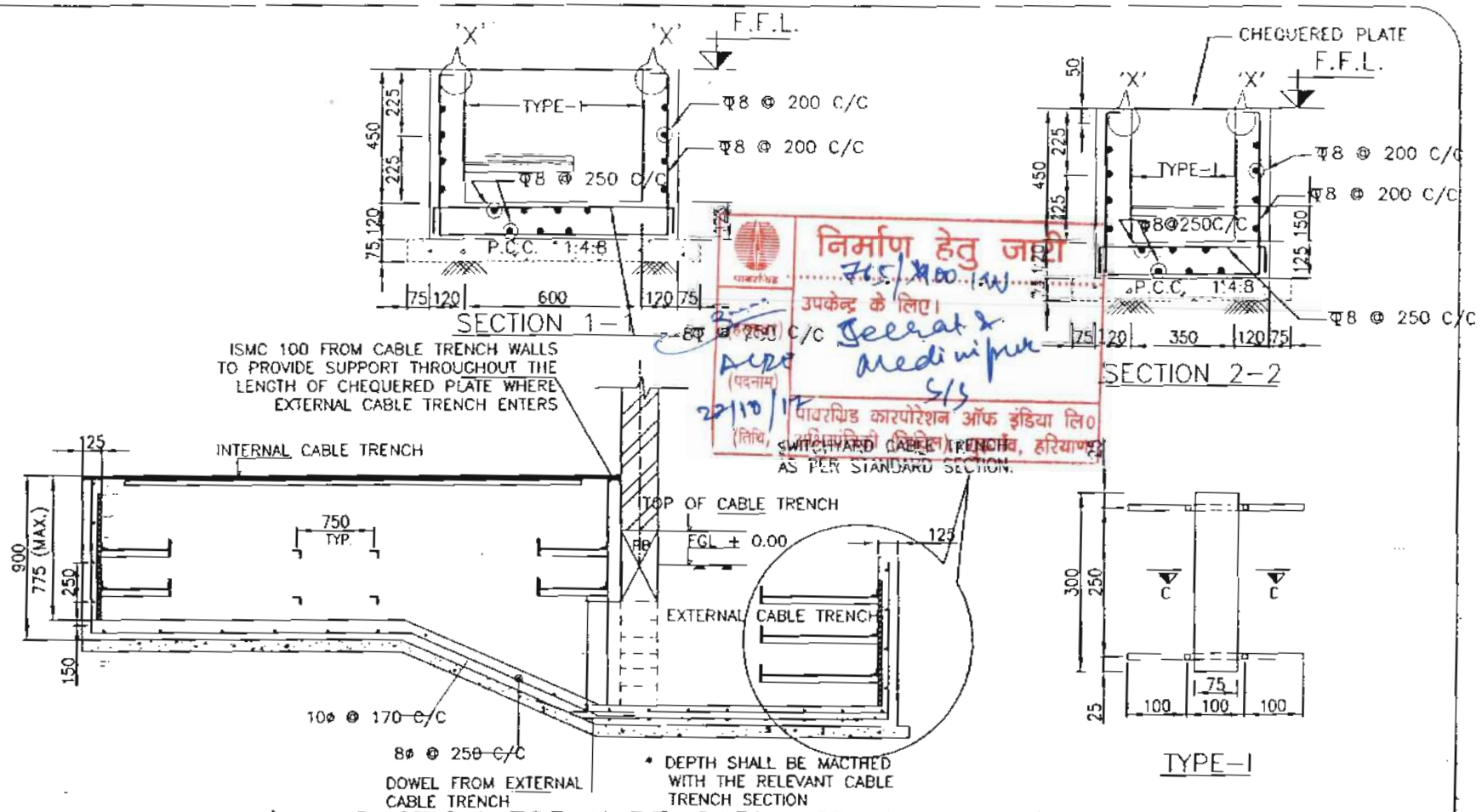
DRAWING NO: C/ENGG/STD/FFPH/8 OF 16

REV.	DESCRIPTION	PREP. JE(ENGG–CIVIL)	REVD. ACDE(ENGG–CIVIL)	REVD. (ENGG–ELECT.)	REVD. CDE (ENGG–CIVIL)	REVD. ASTT.GM (ENGG–CIVIL)	REVD. AGM (ENGG–CIVIL)	REVD. (ENGG–ELECT.)	APPD. GM (ENGG–CIVIL)	DATE
0.	REVISED AS MARKED									10/1/17

SCALE	REV
	0

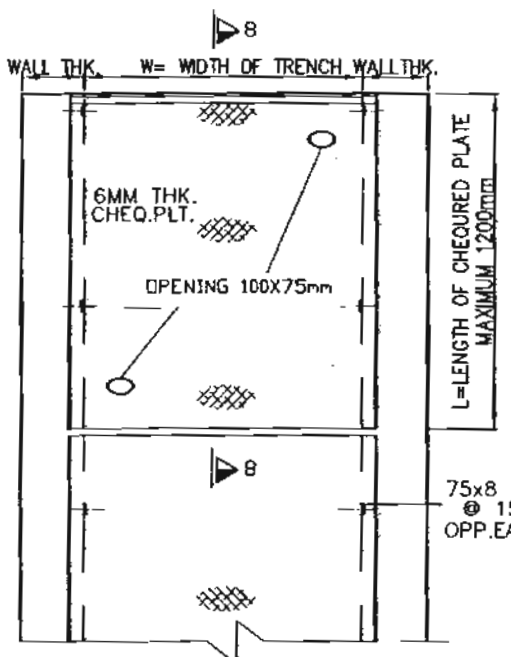


PLINTH LEVEL LAYOUT FOR FFPH



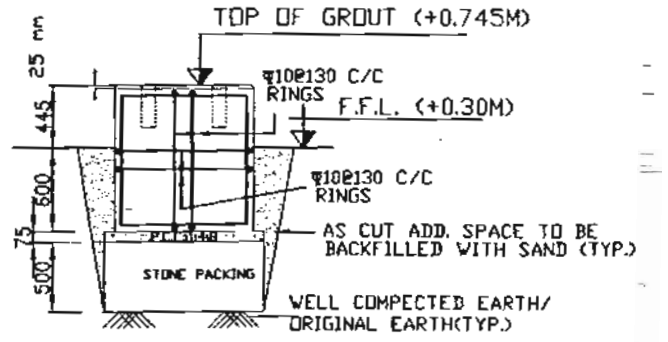
SECTION FOR TYPE CABLE TRENCH DETAIL

निर्माण हेतु जारी
उपकेन्द्र के लिए।
पावरग्रिड कारपोरेशन ऑफ इंडिया लि०

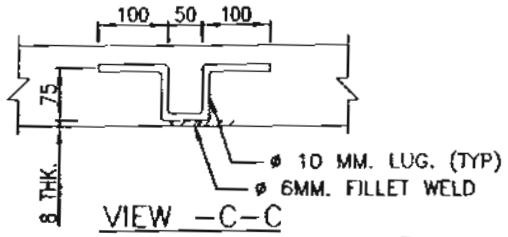


KEY PLAN FOR CHEQUERED PLATE PLACEMENT

IMP:-
LOCATION OF CABLE TRENCHES AND DIMENSIONS OF PUMP FOUNDATIONS SHALL BE AS PER DETAIL PIPING LAYOUT OF FIRE WATER PUMPING SYSTEM.



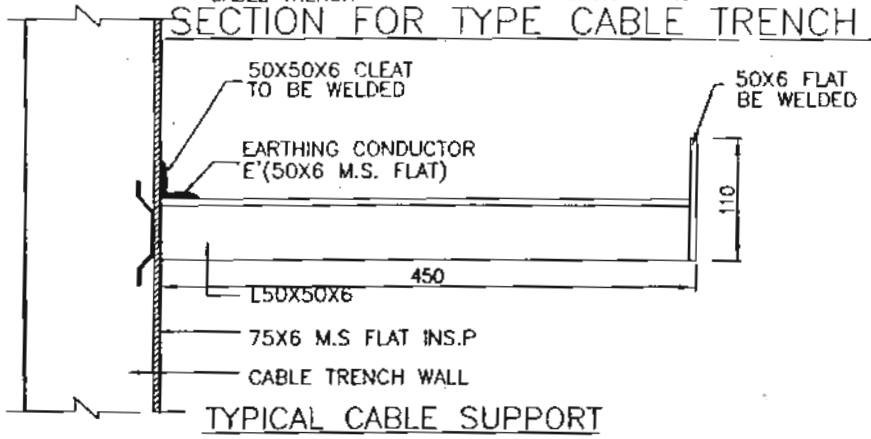
SECTION B-B



VIEW -C-C

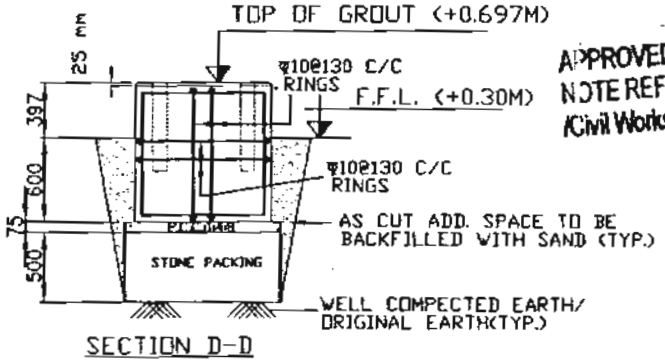
TYP. INSERT FLAT SECTION FOR LUG

ALL TRENCHES WITHIN THE BUILDING SHALL HAVE LONGITUDINAL BED SLOPE 1 IN 1000 TOWARDS A CENTRAL SUMP THE SUMP SHALL BE CONNECTED BY A 100mm DIA PVC PIPE TO THE NEAREST DRAIN OUTSIDE THE BUILDING.

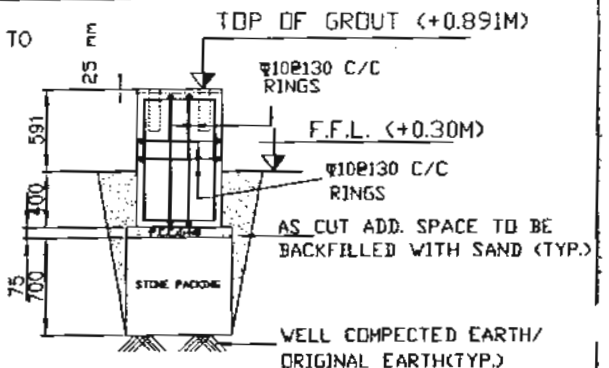


TYPICAL CABLE SUPPORT

PROVIDE:-
ONE PAIR OF HOOKS FOR W =UP TO 350 mm.
TWO PAIR OF HOOKS WHEN WIDTH IS MORE THAN 350 mm.



SECTION D-D



SECTION E-E

RELEASED FOR TENDER/CONSTRUCTION

FOR NOTES REFER DRG. NO.:- C/ENGG/STD/FFPH/16 OF 16

APPROVED BY ED (ENGG.TL-SS-CIVIL) VIDE NOTE REFERENCE NO. C/ENGG/STD.DRG. /Civil Works/03/2016 DTD. 20.12.2016

POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

TITLE: STANDARD FIRE FIGHTING PUMP HOUSE & WATER TANK.

SUB TITLE: DETAILS OF PUMP/MOTOR FOUNDATION AT PLINTH LEVEL FOR FFPH

DRAWING NO: C/ENGG/STD/FFPH/2016/14 OF 16

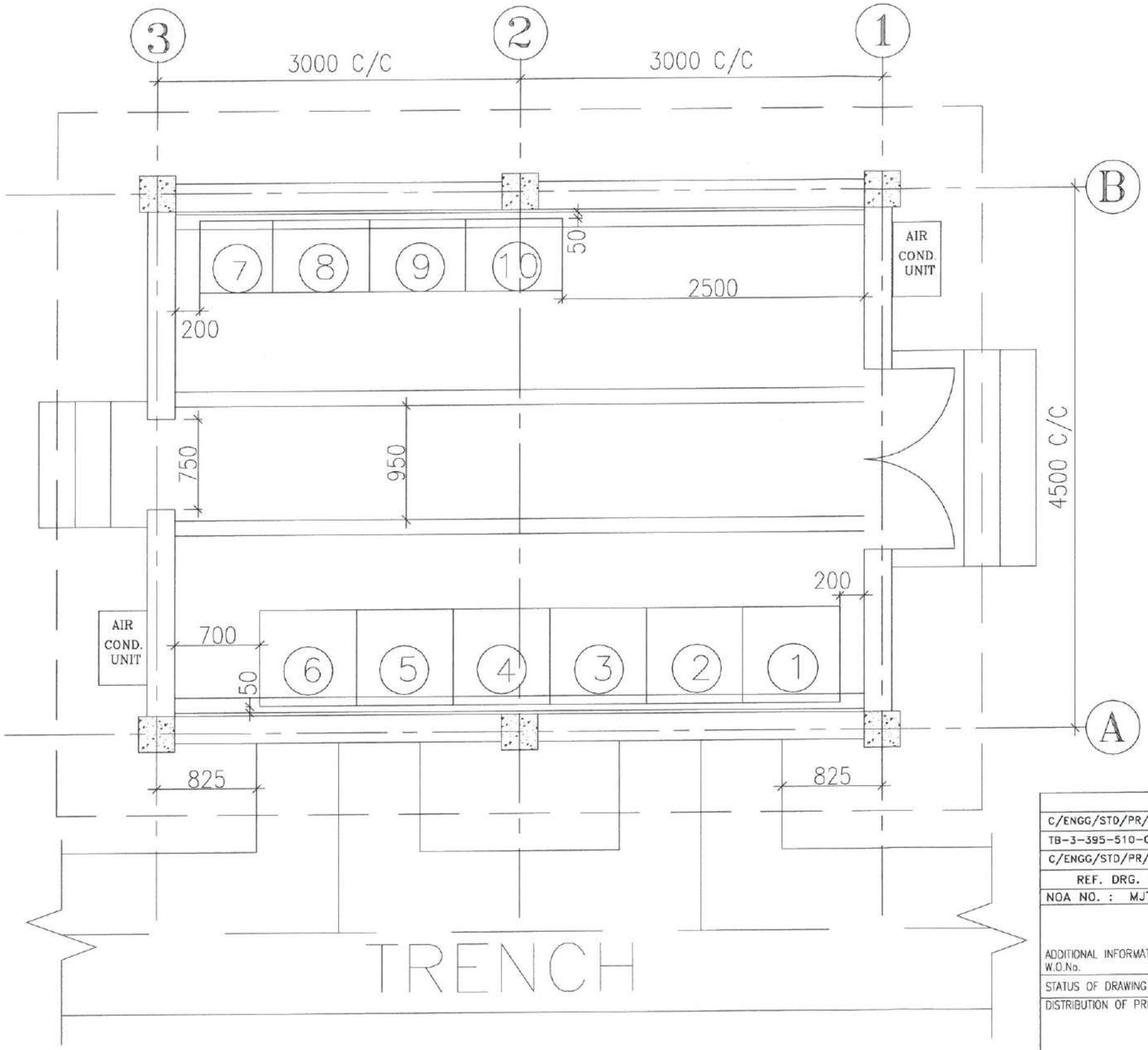
REV.	DESCRIPTION	PREP.	REVD.	REVD.	REVD.	REVD.	REVD.	REVD.	APPD.	DATE
D	REVISED AS MARKED									10.1.17

SCALE NTS | REV 0

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG NO TB-3-395-316-036

SPR 4.1



Cat-I

पावरग्रिड
श्रेणियां
I. फेसीलिटेशन / निर्माण / हेतु अनुमोदित / जारी।
II. फेसीलिटेशन / निर्माण / हेतु अनुमोदित / जारी। दर्शाये गये टिप्पणियों एवं आशोधनों को शामिल किया जाए। कृपया आशोधित एस्टीमेट अनुमोदनार्थ प्रस्तुत करें।
IA. टिप्पणियों को शामिल कर पुनः अनुमोदनार्थ प्रस्तुत करें।
IV. सूचनार्थ एवं रिकार्ड हेतु।
V. अनुमोदित नहीं।
(हस्ताक्षर)
(नाम)
(तिथि) 16.04.19
पावर ग्रिड कारपोरेशन ऑफ इंडिया लि०
अभियांत्रिकी (उपकेन्द्र) गुड़गाँव, हरियाणा

NOTE:-

SWITCHYARD PANEL ROOM FOR DIA- 400kV ICT#1 TIE KHARAGPUR LINE

S.No.	DESCRIPTION	DESIGNATION OF PANEL	PANEL DIMENSION (WXDXH)
1.	400kV ICT#1 PROTECTION PANEL	401RA	800X800X2312
2.	400kV ICT#1 PROTECTION PANEL	401RB	800X800X2312
3.	400kV TIE PROTECTION PANEL	402TE	800X800X2312
4.	400kV TIE PROTECTION PANEL	402A	800X800X2312
5.	400kV LINE PROTECTION PANEL	403LA	800X800X2312
6.	400kV LINE PROTECTION PANEL	403LB	800X800X2312
7.	PMU		600X600X800
8.	PLCC-1		800X600X1915
9.	PLCC-2		800X600X1915
10.	PLCC-3		800X600X1915

NOTE: LOCATION/SIZE OF AIR-CONDITIONING UNIT IS FOR REFERENCE ONLY.

REF. DRG. NO.	TITLE
C/ENGG/STD/PR/2017 (Sh.1,2)	STANDARD SWITCHYARD PANEL ROOM GA/RCC DETAIL OF PANEL ROOM
TB-3-395-510-021	SINGLE LINE DIAGRAM FOR 765/400 kV MEDINIPUR S/S.
C/ENGG/STD/PR/2017 (Sh.3)	STANDARD SWITCHYARD PANEL ROOM RCC DETAIL OF INTERNAL CABLE TRENCH

NOA NO. : MJTL/765kV/ERSS-XVIII/SS01/NOA-I/03(I) & NOA-II/03(II) dated 29.09.2017

ADDITIONAL INFORMATION
W.O.No.
STATUS OF DRAWING
DISTRIBUTION OF PRINTS

ग्राहक/परियोजना का नाम
NAME OF CUSTOMER/PROJECT — POWERGRID MEDINIPUR JEERAT TRANSMISSION LIMITED
NAME OF CONSULTANT — POWER GRID CORPORATION OF INDIA LIMITED

SUBSTATION PACKAGE-SS01 FOR ESTABLISHMENT OF 765/400KV S/S AT MEDINIPUR & JEERAT (NEW) ASSOCIATED WITH TRANSMISSION SYSTEM PROJECT "765kV STRENGTHENING IN EASTERN REGION (ERSS-XVIII)"UNDER TARIFF BASED COMPETITIVE BIDDING (TBCB) ROUTE.

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
ट्रांसमिशन परियोजना विभाग
BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION PROJECTS DIVISION

	नाम /NAME	हस्ता./SIGN.	दि./DATE
बनाया DRAWN	MM/GV		28.12.18
जाँचा CHECKED	MM		
स्वीकृत APPROVED	DKM		

REV.	DATE	ALTERED / CHECKED / APPROVED	REV.	DATE	ALTERED / CHECKED / APPROVED	REV.	DATE	ALTERED / CHECKED / APPROVED
ZONE			ZONE			01	12.03.19	ALTERED GV; CHECKED MM; APPROVED VK
						ZONE	Drwg. revised as per Powergrid comments dated 06.02.19. Tentative location of Air Conditioning units is shown.	

विभाग DEPT. / कोड CODE / अनुपात / SCALE 930 / कार्ड कोड CARD CODE

शीर्षक/TITLE
PANEL LAYOUT IN SPR 4.1
FOR 765/400kV MEDINIPUR S/S.

ड्राईंग क्र./DRAWING NO. TB-3-395-316-036
पुनः/REV. 00
पत्रक क./SHEET No. 01 अगला पत्रक/NEXT SHEET 02

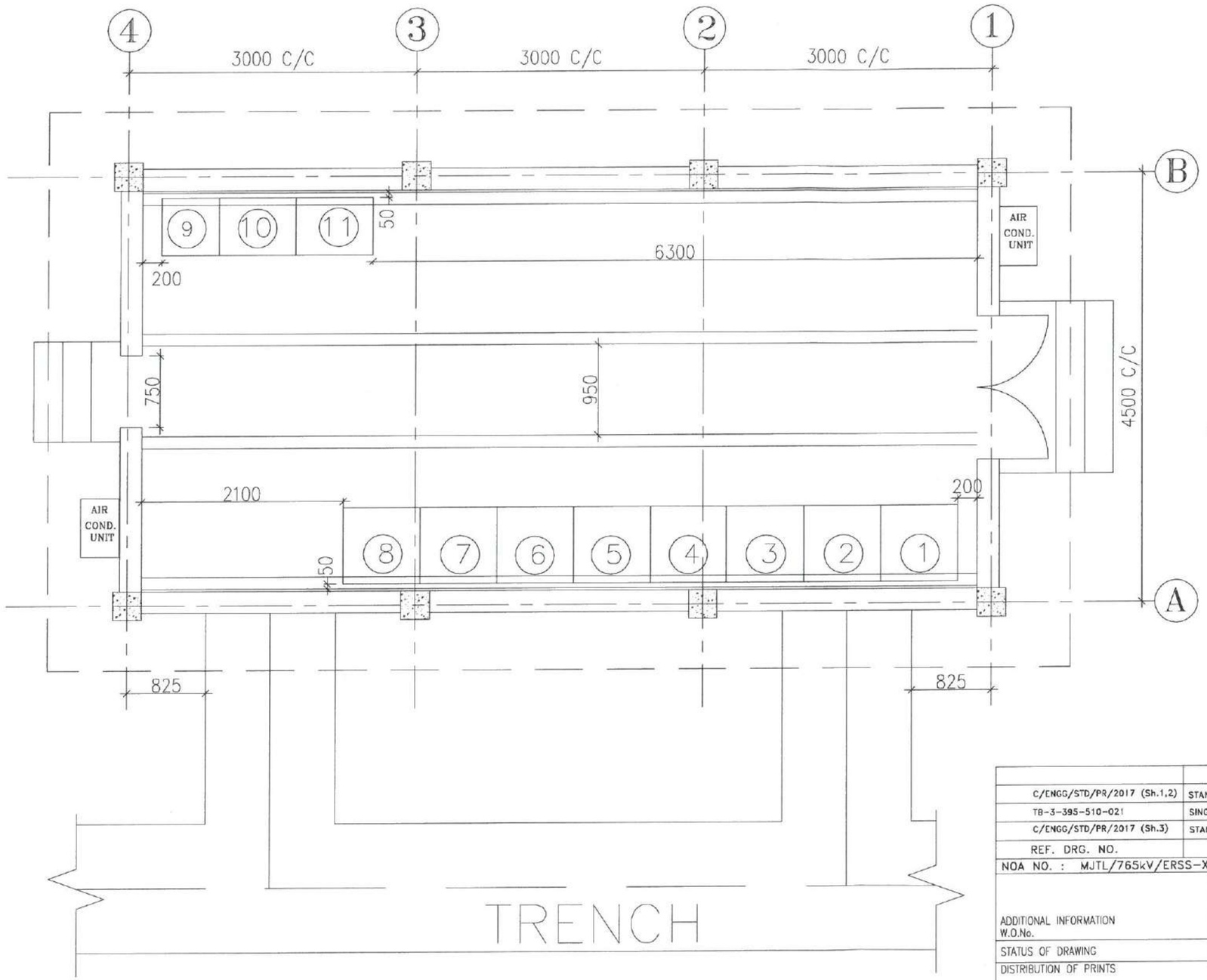
THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPAY

COMPUTER FILE NAME | REF. DRG. NO | SIGN AND DATE | INVENTORY NO

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG. NO. TB-3-395-316-036

SPR 7.1



Cat-1

पावरग्रिड / POWERGRID
स्वीकृति / अनुमोदित / जारी।
II. पोजीकरण / निर्माण / हेतु अनुमोदित / जारी।
पोजीकरण / निर्माण / हेतु अनुमोदित / जारी। वर्णित की गई टिप्पणियों एवं आशोधनों को सम्मिलित किया जाए। कृपया आशोधित हस्ताक्षेप अनुमोदनार्थ प्रस्तुत करें। टिप्पणियों सम्मिलित कर पुन: अनुमोदन हेतु प्रस्तुत करें।
IV. सूचनार्थ एवं रिकार्ड हेतु।
V. अनुमोदित नहीं।
पावर ग्रिड कारपोरेशन ऑफ इंडिया लि० अभियांत्रिकी (उपकेन्द्र) गुरुग्राम, हरियाणा
(हस्ताक्षर) (पदनाम) (तिथि)
16.04.19

NOTE:-
SWITCHYARD PANEL ROOM FOR DIA- 765kV BUS REACTOR#1 TIE RANCHI#1 LINE REACTOR BAY

S.No.	DESCRIPTION	DESIGNATION OF PANEL	PANEL DIMENSION (WXDXH)
1.	765kV BUS REACTOR PROTECTION PANEL	701BRA	800X800X2312
2.	765kV BUS REACTOR PROTECTION PANEL	701BRB	800X800X2312
3.	765kV TIE PROTECTION PANEL	702TE	800X800X2312
4.	765kV TIE PROTECTION PANEL	702A	800X800X2312
5.	765KV LINE PROTECTION PANEL	703LA	800X800X2312
6.	765KV LINE PROTECTION PANEL	703LB	800X800X2312
7.	765KV LINE REACTOR PROTECTION PANEL	703LRA	800X800X2312
8.	765KV LINE REACTOR PROTECTION PANEL	703LRB	800X800X2312
9.	PMU		600X600X800
10.	PLCC		800X600X1915
11.	DPC		800X600X1915

NOTE: LOCATION/SIZE OF AIR-CONDITIONING UNIT IS FOR REFERENCE ONLY.

REF. DRG. NO.	TITLE
C/ENGG/STD/PR/2017 (Sh.1,2)	STANDARD SWITCHYARD PANEL ROOM GA/RCC DETAIL OF PANEL ROOM
TB-3-395-510-021	SINGLE LINE DIAGRAM FOR 765/400 kV MEDINIPUR S/S.
C/ENGG/STD/PR/2017 (Sh.3)	STANDARD SWITCHYARD PANEL ROOM RCC DETAIL OF INTERNAL CABLE TRENCH

NOA NO. : MJTL/765kV/ERSS-XVIII/SS01/NOA-I/03(I) & NOA-II/03(II) dated 29.09.2017

ADDITIONAL INFORMATION
W.O.No.
STATUS OF DRAWING
DISTRIBUTION OF PRINTS

ग्राहक/परियोजना का नाम
NAME OF CUSTOMER/PROJECT
NAME OF CONSULTANT

POWERGRID MEDINIPUR JEERAT TRANSMISSION LIMITED
POWER GRID CORPORATION OF INDIA LIMITED

SUBSTATION PACKAGE-SS01 FOR ESTABLISHMENT OF 765/400KV S/S AT MEDINIPUR & JEERAT (NEW) ASSOCIATED WITH TRANSMISSION SYSTEM PROJECT "765kV STRENGTHENING IN EASTERN REGION (ERSS-XVIII)"UNDER TARIFF BASED COMPETITIVE BIDDING (TBCB) ROUTE.

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
ट्रांसमिशन परियोजना विभाग
BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION PROJECTS DIVISION

	नाम /NAME	हस्ता./SIGN.	दि./DATE
बनाया DRAWN	MM/GV		28.12.18
जाँचा CHECKED	MM		
स्वीकृत APPROVED	DKM		

REV.	DATE	ALTERED / CHECKED / APPROVED	REV.	DATE	ALTERED / CHECKED / APPROVED	REV.	DATE	ALTERED / CHECKED / APPROVED
						01	12.03.19	ALTERED GV; CHECKED MM; APPROVED VK
ZONE			ZONE			ZONE		Drwg. revised as per Powergrid comments dated 06.02.19. Tentative location of Air Conditioning units is shown.

विभाग DEPT.
कोड CODE
अनुपात / SCALE: 930
कार्ड कोड CARD CODE

शीर्षक/TITLE
PANEL LAYOUT IN SPR 7.1
FOR 765/400kV MEDINIPUR S/S.

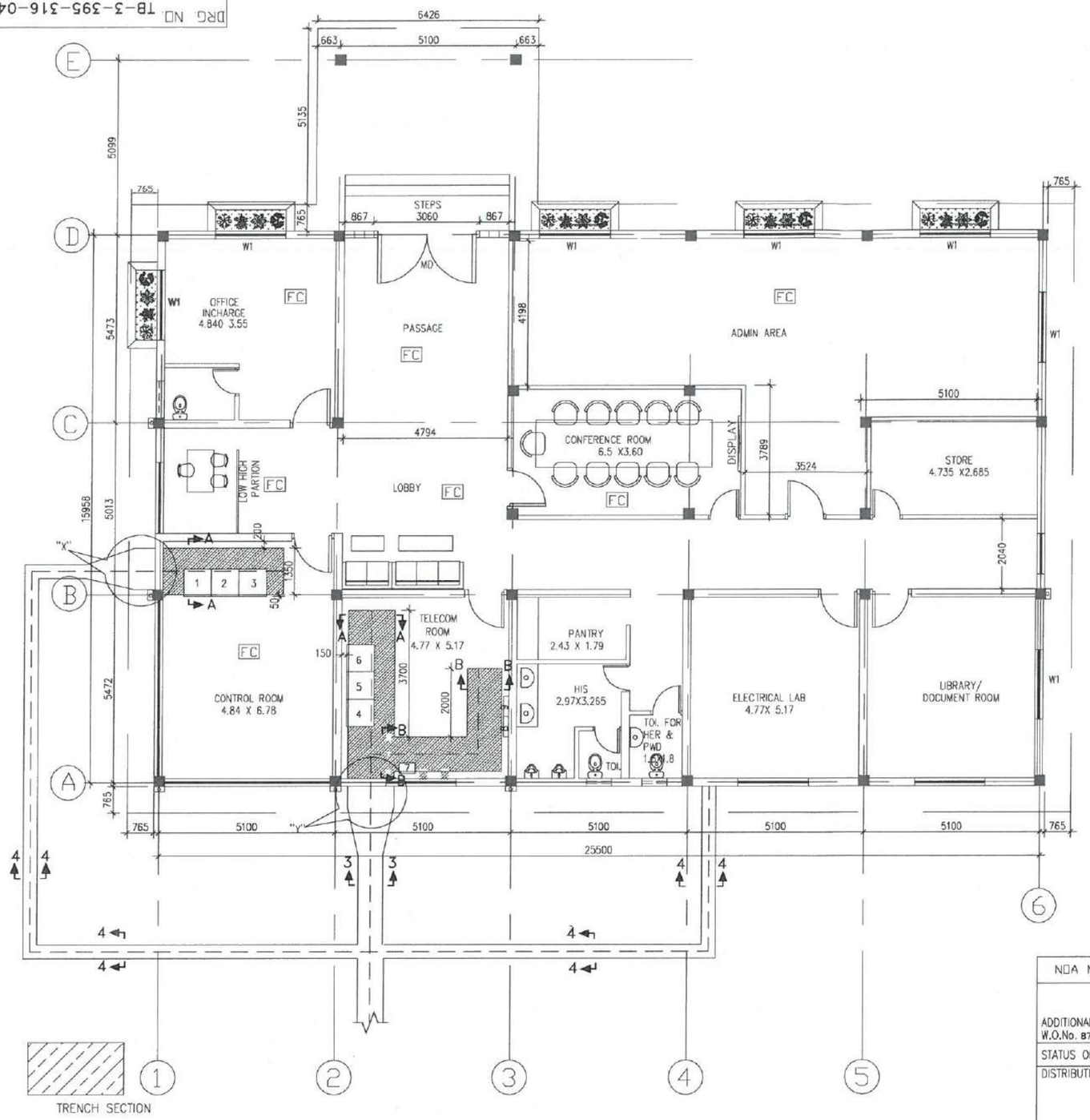
ड्राईंग क्र./DRAWING NO. TB-3-395-316-036
पुनः/REV. 00
पत्रक क./SHEET No. 05
अगला पत्रक/NEXT SHEET 06

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY

INVENTORY NO. | SIGN. AND DATE | REF. DRG. NO. | COMPUTER FILE NAME

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG. NO. TB-3-395-316-040



TRENCH SECTION

SL.NO.	DESCRIPTION OF PANEL/EQUIPMENT	QTY.	QTY. APPROX DIMENTION OF ONE SET		
			W	D	H
			DIMENSION IN MM		
01	SUX	1 Set	800	800	2312
02	SAS – I	1 Set	800	800	2312
03	SAS – II	1 Set	800	800	2312
04	FODP–I	1 Set	800	800	2000
05	FODP – II	1 Set	800	800	2000
06	SDH	1 Set	800	800	2000
07	EPAX	1 Set	455	300	340
08	DCLP – I (WALL MOUNTED)	1 Set	600	150	750
09	DCLP – II (WALL MOUNTED)	1 Set	600	150	750

SL.NO.	REFERENCE DOCUMENT	DRAWING NO.
01	TRENCH LAYOUT PLAN MEDINIPUR	TB–3–395–316–024
02	PLINTH BEAM(LAYOUT, RCC DETAILS)	C/ENGG/ERII/MED/CRB/PLINTH/01

Cat-1

श्रेणियाँ
I. फेब्रीकेशन / निर्माण / हेतु अनुमोदित / जारी।
II. फेब्रीकेशन / निर्माण / हेतु अनुमोदित / जारी। दर्शाये गई टिप्पणियों एवं आशोधनों को सम्मिलित किया जाए। कृपया आशोधित दस्तावेज अनुमोदनार्थ प्रस्तुत करें।
III. टिप्पणियों सम्मिलित कर पुनः अनुमोदनार्थ प्रस्तुत करें।
IV. सूचनार्थ एवं रिकार्ड हेतु।
V. अनुमोदित नहीं।

पावर ग्रिड कारपोरेशन ऑफ इंडिया लि० अभियांत्रिकी (उपकेन्द्र) गुड़गाँव, हरियाणा

(हस्ताक्षर) Shilpa
(पदनाम) Mgr.
(तिथि) 16.04.19

NOA NO. : MJTL/765kV/ERSS-XVIII/SS01/NOA-I/03(I) & NOA-II/03(II) dated 29.09.2017

ADDITIONAL INFORMATION
W.O.No. 87002

STATUS OF DRAWING

DISTRIBUTION OF PRINTS

ग्राहक/परियोजना का नाम
NAME OF CUSTOMER/PROJECT
NAME OF CONSULTANT

MEDINIPUR JEERAT POWERGRID TRANSMISSION LIMITED
POWERGRID CORPORATION OF INDIA LIMITED

SUBSTATION PACKAGE-SS01 FOR ESTABLISHMENT OF 765/400KV S/S AT MEDINIPUR & JEERAT(NEW) ASSOCIATED WITH TRANSMISSION SYSTEM PROJECT "765kV STRENGTHENING IN EASTERN REGION (ERSS-XVIII)"UNDER TARIFF BASED COMPETITIVE BIDDING (TBCB) ROUTE.

भारत हैवी इलेक्ट्रिकल्स लिमिटेड
ट्रांसमिशन परियोजना विभाग
BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION PROJECTS DIVISION

	नाम /NAME	हस्ता./SIGN.	दि./DATE
बनाया DRAWN	PK/GV		
जाँचा CHECKED	GV/MM		
स्वीकृत APPROVED	DKM		

REV.	DATE	ALTERED / CHECKED / APPROVED
01	11.03.19	ALTERED GV; CHECKED MM; APPROVED VK
ZONE		DRG REVISED AS PER PGCIL COMMENTS DATED 20.02.19

विभाग DEPT. TBEM
कोड CODE 422
अनुपात / SCALE NTS
कार्ड कोड CARD CODE

शीर्षक/TITLE
TRENCH AND PANEL LAYOUT IN CRB FOR 765/400 kV MEDINIPUR S/S.

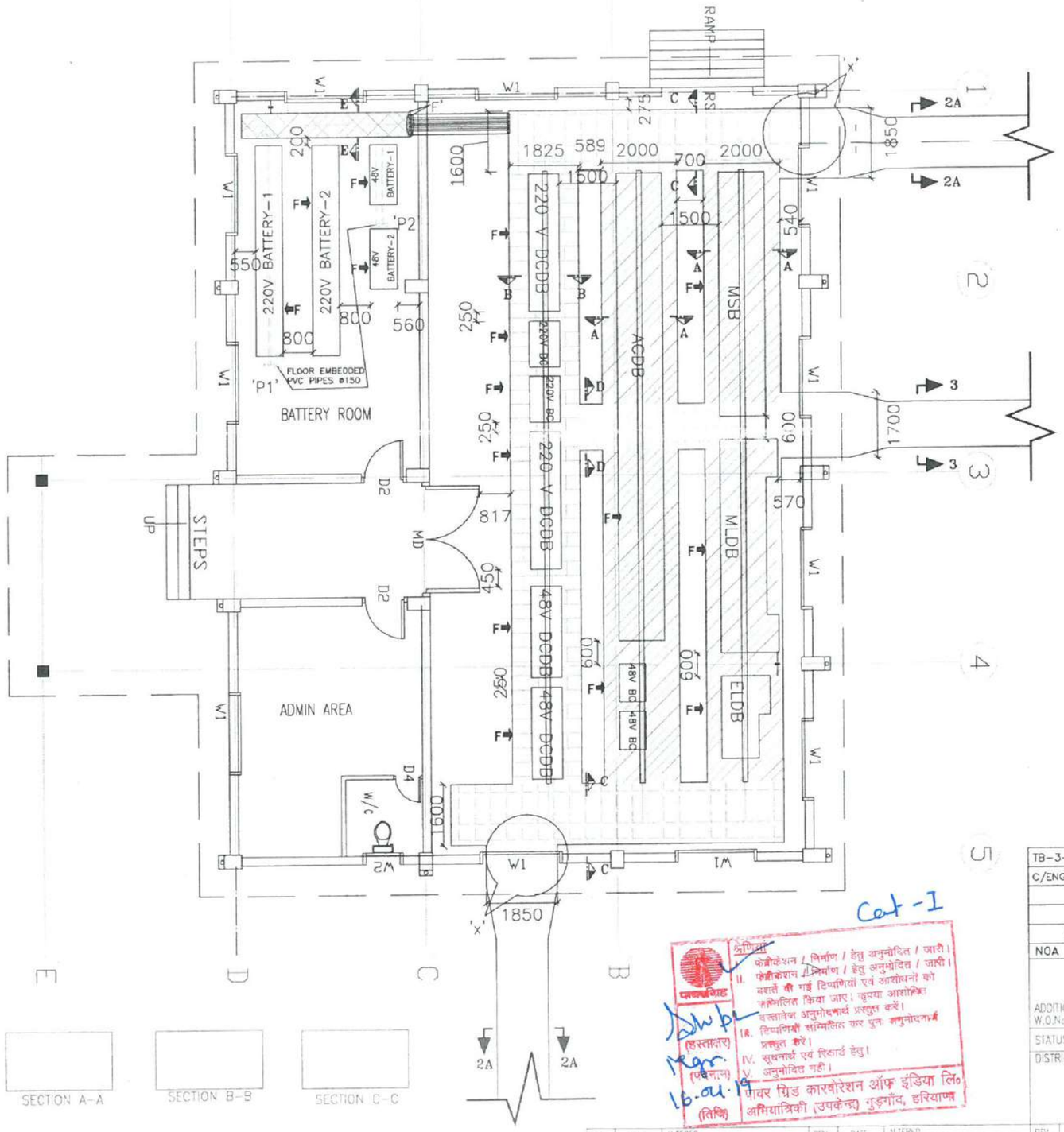
ड्रॉइंग क्र./DRAWING NO. TB-3-395-316-040
पुनः/REV. 00
पृष्ठ क्र./SHEET No. 01
अगला पृष्ठ/NEXT SHEET 02

COPY RIGHT AND CONFIDENTIAL
THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED.
IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPAY

COMPUTER DRG. PATH NAME :
REF. DRG. NO.
SIGN. AND DATE
INVENTORY NO

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM)

DWG NO TB-3-395-316-038



PANEL DESCRIPTION:

SNo.	DESCRIPTION	PANEL SIZE (L x B X H)
1.	MAIN SWITCH BOARD	6400 X 1200 X 2400mm
2.	AC DISTRIBUTION BOARD	12250 X 1200 X 2400mm
3.	MAIN LIGHTING DISTRIBUTION BOARD	3600 X 1200 X 2400mm 1000 X 1500 X 2400mm (FOR LIGHTING TRANSFORMER SECTION)
4.	EMG. LIGHTING DISTRIBUTION BOARD	1150 X 1200 X 2400mm 1000 X 1500 X 2400mm (FOR LIGHTING TRANSFORMER SECTION)
5.	220V DC DISTRIBUTION BOARDS	3600 X 800 X 2400mm
6.	48V DC DISTRIBUTION BOARDS	2400 X 800 X 2400mm
7.	220V DC BATTERY CHARGERS	1200 X 800 X 2400mm
8.	48V DC BATTERY CHARGERS	1100 X 700 X 2400mm
9.	220V DC BATTERY BANK	5502 X 710 X 1416mm
10.	48V DC BATTERY BANK	1572 X 710 X 1242mm
11.	220V DC BATTERY CHARGER	1200 X 800 X 1875mm
12.	48V DC BATTERY CHARGER	1000 X 700 X 1575mm

REFERENCE:

SNo.	Drawing Title	Drawing no.
1.	OUTDOOR CABLE TRENCH LAYOUT	TB-0-395-316-024
2.	GA OF 415V ACDB	2248-102-01, REV-0 (TOTAL SHT-7)
2.	GA OF 415V MSB	2248-101-01, REV-0 (TOTAL SHT-5)
3.	GA OF 415V MLDB	2248-103-01, REV-0 (TOTAL SHT-3)
4.	GA OF 415V ELDB	2248-104-01, REV-0 (TOTAL SHT-2)
5.	GA OF 220V DCDB-1	2248-105-01, REV-0 (TOTAL SHT-2)
6.	GA OF 220V DCDB-2	2248-106-01, REV-0 (TOTAL SHT-2)
7.	GA OF 48V DCDB-1	2248-107-01, REV-0 (TOTAL SHT-2)
8.	GA OF 48V DCDB-2	2248-108-01, REV-0 (TOTAL SHT-2)
9.	GA OF 220V BATTERY BANK	C/ENGG/STD/BAT/12, REV-2(SHT NO-52 OF 88)
10.	GA OF 48V BATTERY BANK	C/ENGG/STD/BAT/12, REV-2 (SHT NO-82 OF 88)
11.	GA OF 220V DC BATTERY CHARGER	STE/GA/BC/MC-0066A/18-19 (ISSUE-1)
12.	GA OF 48V DC BATTERY CHARGER	STE/GA/BC/MC-0067B/18-19 (ISSUE-1)

NOTE: 1. TRENCH SECTION 2A-2A AND TRENCH SECTION 3-3 ARE AS PER APPROVED TRENCH LAYOUT
2. FLOOR EMBEDDED PVC PIPES IS SHOWN AS 'P1' AND 'P2'.

TB-3-395-316-024	CABLE TRENCH LAYOUT FOR 765/400kV MEDINIPUR S/S
C/ENGG/ERII/MED/AUX/PLINTH/01	AUXILIARY BUILDING PLINTH BEAM FRAMING PLAN, REV 00
REF. DRG. NO.	TITLE

NOA NO. : MJTL/765kV/ERSS-XVIII/SS01/NOA-I/03(I) & NOA-II/03(II) dated 29.09.2017

ADDITIONAL INFORMATION
W.O.No.
STATUS OF DRAWING
DISTRIBUTION OF PRINTS

ग्राहक/परियोजना का नाम
NAME OF CUSTOMER/PROJECT
NAME OF CONSULTANT

POWERGRID MEDINIPUR JEERAT TRANSMISSION LIMITED
POWER GRID CORPORATION OF INDIA LIMITED

SUBSTATION PACKAGE-SS01 FOR ESTABLISHMENT OF 765/400kV S/S AT MEDINIPUR & JEERAT (NEW) ASSOCIATED WITH TRANSMISSION SYSTEM PROJECT "765kV STRENGTHENING IN EASTERN REGION (ERSS-XVIII)"UNDER TARIFF BASED COMPETITIVE BIDDING (TBCB) ROUTE.

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
ट्रांसमिशन परियोजना विभाग
BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION PROJECTS DIVISION

	नाम /NAME	हस्ता /SIGN.	दि/DATE
बनाया DRAWN	PK/GV		
जाँचा CHECKED	GV/MM		
स्वीकृत APPROVED	DKM		

REV	DATE	ALTERED	REV	DATE	ALTERED	REV	DATE	ALTERED
		CHECKED			CHECKED	01	18.03.19	CHECKED GV
		APPROVED			APPROVED			APPROVED MM VK
ZONE			ZONE			ZONE		DRG REVISED AS PER POWERGRID COMMENTS VIDE EMAIL 27.02.19 OUTDOOR TRENCH SECTION SHOWN

विभाग DEPT. | कोड CODE | फ्रेम / SCALE 930 | कार्ड कोड CARD CODE

शीर्षक/TITLE TRENCH AND PANEL LAYOUT IN AUXILIARY BUILDING FOR 765/400kV MEDINIPUR S/S

ड्रॉइंग सं./DRAWING NO. TB-3-395-316-038 | संशोधन/REV 00

शीट सं./SHEET No. 01 | अगली शीट/NEXT SHEET 02

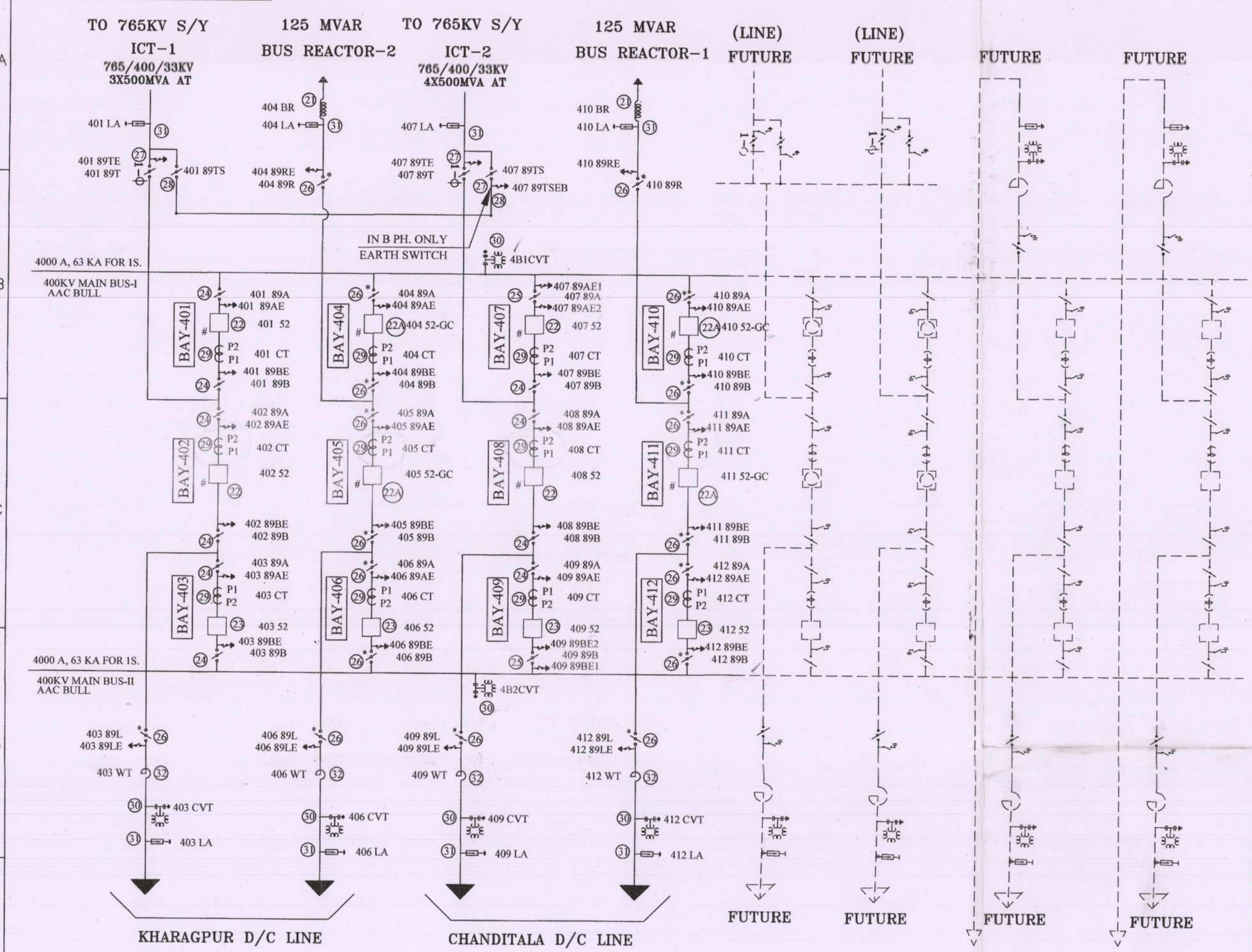
THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

Cat - I

पावरग्रिड
(हस्ताक्षर)
(पदनाम)
(तिथि)
श्रेणियाँ
I. फेब्रीकेशन / निर्माण / हेतु अनुमोदित / जारी।
II. फेब्रीकेशन / निर्माण / हेतु अनुमोदन / जारी। बशर्ते की गई टिप्पणियों एवं आशोधनों को शामिल किया जाए। कृपया आशोधित दस्तावेज अनुमोदनार्थ प्रस्तुत करें।
III. टिप्पणियाँ सम्मिलित कर पुनः अनुमोदनार्थ प्रस्तुत करें।
IV. सूचनार्थ एवं रिकार्ड हेतु।
V. अनुमोदित नहीं।
पावर ग्रिड कारपोरेशन ऑफ इंडिया लि० अभियांत्रिकी (उपकेन्द्र) गुड़गाँव, हरियाणा
16.04.19

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG. NO. TB-3-395-510-021



400KV SINGLE LINE DIAGRAM

CIRCUIT BREAKERS 404 52, 405 52, 410 52 & 411 52 ARE WITH GRADING CAPACITOR

* 407 89TSEB IS ISO WITH 1 E/S IN B PHASE ONLY

BILL OF QTY. FOR 400kV MAIN EQUIPMENTS:

R1

SL.NO.	DESCRIPTION	RATING	S. C. RATING	QTY. (NO.)	SYMBOL	SCOPE OF SUPPLY	LEGEND	MAKE
21	125MVAR BUS REACTOR (3-PH)	420 kV	63 KA FOR 1 S.	2		PMJTL	BR	TBEA
22	SF6 CIRCUIT BREAKER WITHOUT CR,WITHOUT GC,WITH CSD (3-PH)	3150A	63 KA FOR 1 S.	4		BHEL	52	MAKE TO BE INDICATED IN FINAL AS BUILT DRAWING
22A	SF6 CIRCUIT BREAKER WITHOUT CR, WITH GC, WITH CSD (3-PH)	3150A	63 KA FOR 1 S.	4		BHEL	52	
23	SF6 CIRCUIT BREAKER WITHOUT CR,WITHOUT CSD (3-PH)	3150A	63 KA FOR 1 S.	4		BHEL	52	
24	ISOLATOR WITH ONE E/SW (3 PH) DOUBLE BREAK TYPE	3150A	63 KA FOR 1 S.	10		BHEL	89/89E	
25	ISOLATOR WITH TWO E/SW (3 PH) DOUBLE BREAK TYPE	3150A	63 KA FOR 1 S.	2		BHEL	89/89E1 /89E2	
26	ISOLATOR WITH ONE E/SW (3 PH) DOUBLE BREAK TYPE	2000A	63 KA FOR 1 S.	18		BHEL	89/89E1	
27	ISOLATOR WITH ONE E/SW (1 PH) DOUBLE BREAK TYPE	3150A	63 KA FOR 1 S.	7		BHEL	89/89E1	
28	ISOLATOR WITHOUT E/SW (1 PH) DOUBLE BREAK TYPE	3150A	63 KA FOR 1 S.	5		BHEL	89	
29	CURRENT TRANSFORMER (1 PH.) WITH 120% EXTENDED CURRENT RATING.	3000A	63 KA FOR 1 S.	36		BHEL	CT	
30	CVT (1 PH.)	4400pF		18		BHEL	CVT	
31	SURGE ARRESTER (1 PH.)	336 kV		25		BHEL	LA	
32	WAVE TRAP (1 PH.)	1mH, 2000A	63 KA FOR 1 S.	08		BHEL	WT	

R2

R1

R1

Cat-I

श्रेणीकरण
I. फैब्रीकेशन / निर्माण / हेतु अनुमोदित / जारी।
II. फैब्रीकेशन / निर्माण / हेतु अनुमोदित / जारी। बताई गई टिप्पणियों एवं आशोधनों को सम्मिलित किया जाए। कृपया आशोधित दस्तावेज अनुमोदनार्थ प्रस्तुत करें।
III. टिप्पणियों सम्मिलित कर पुनः अनुमोदनार्थ प्रस्तुत करें।
IV. सूचनार्थ एवं रिकार्ड हेतु। अनुमोदित नहीं।
पावर ग्रिड कारपोरेशन ऑफ इंडिया लि० अभियांत्रिकी (उपकेन्द्र) गुड़गाँव, हरियाणा
(तिथि) 14.05.18

NOA NO. : MJTL/765kV/ERSS-XVIII/SS01/NOA-I/03(I) & NOA-II/03(II) dated 29.09.2017

ADDITIONAL INFORMATION
W.O.No. 87002

STATUS OF DRAWING CONTRACT

DISTRIBUTION OF PRINTS

ग्राहक/परियोजना का नाम
NAME OF CUSTOMER/PROJECT — POWERGRID MEDINIPUR JEERAT TRANSMISSION LIMITED
NAME OF CONSULTANT — POWERGRID CORPORATION OF INDIA LIMITED

SUBSTATION PACKAGE-SS01 FOR ESTABLISHMENT OF 765/400KV S/S AT MEDINIPUR & JEERAT(NEW) ASSOCIATED WITH TRANSMISSION SYSTEM PROJECT "765kV STRENGTHENING IN EASTERN REGION (ERSS-XVIII)"UNDER TARIFF BASED COMPETITIVE BIDDING (TBCB) ROUTE.

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
ट्रांसमिशन परियोजना विभाग
BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION PROJECTS DIVISION

	नाम /NAME	हस्ता./SIGN.	दि./DATE
बनाया DRAWN	PK		23.11.15
जाँचा CHECKED	MM/RD		
स्वीकृत APPROVED	DKM/VK		

REV.	DATE	ALTERED	CHECKED	APPROVED	ZONE
02	31.03.18	PK	MM/RD	DKM/VK	DRG REVISED AS PER PGCIL COMMENTS DATED 26.12.17
01	15.11.17	PK	MM/RD	DKM/VK	DRG REVISED AS PER PGCIL COMMENTS DATED 01.11.17

विभाग DEPT. TBEM
कोड CODE 422
अनुपात / SCALE NTS
कार्ड कोड CARD CODE

शीर्षक/TITLE
SINGLE LINE DIAGRAM FOR 765/400 kV MEDINIPUR S/S.

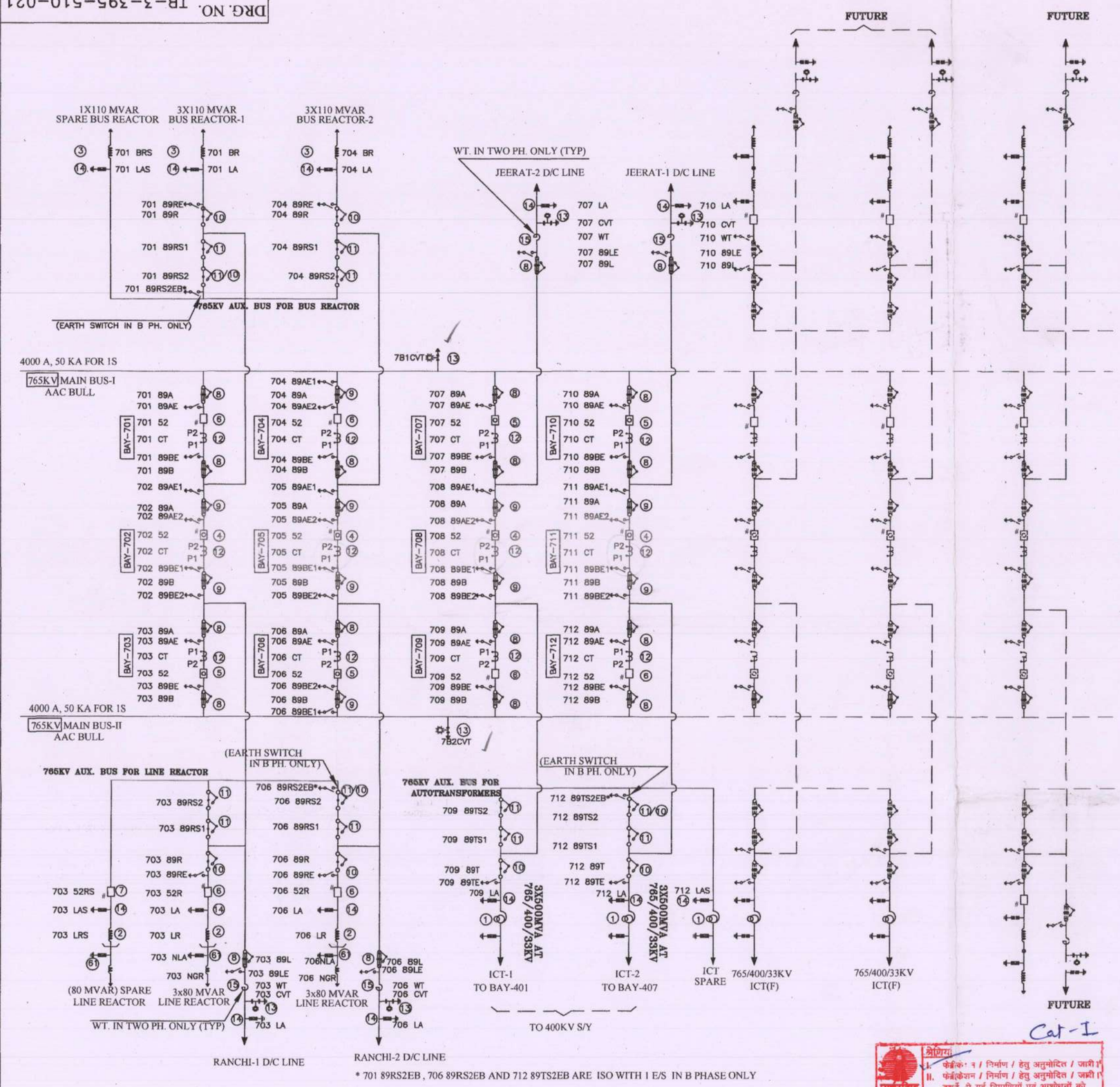
ड्राईंग क./DRAWING NO. TB-3-395-510-021
पुनः/REV. 02
पृष्ठ क./SHEET No. 02 अगला पृष्ठ/NEXT SHEET 03

COPY RIGHT AND CONFIDENTIAL
THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED.
IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPAY

COMPUTER DRG. PATH NAME :
REF. DRG. NO.
SIGN. AND DATE
INVENTORY NO

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG. NO. TB-3-395-510-021



* 701 89RS2EB , 706 89RS2EB AND 712 89TS2EB ARE ISO WITH 1 E/S IN B PHASE ONLY

765KV SINGLE LINE DIAGRAM

BILL OF QTY. FOR 765kV MAIN EQUIPMENTS: R1

SL.NO.	DESCRIPTION	RATING	S. C. RATING	QTY. (NO.)	SYMBOL	SCOPE OF SUPPLY	LEGEND	MAKE
1	500 MVA, (1-PH) AUTOTRANSFORMER,YNa0d11	765/400/33KV	50 KA FOR 1 S.	7		PMJTL	T	TBEA
2	80MVAR LINE REACTOR (1-PH) WITH NGR(750 Ohm).	765KV	50 KA FOR 1 S.	7		PMJTL	LR/NGR	TBEA
3	110MVAR BUS REACTOR (1-PH)	765KV	50 KA FOR 1 S.	7		PMJTL	BR	TBEA
4	SF6 CIRCUIT BREAKER WITH CR, WITH CSD (3-PH)	3150A	50 KA FOR 1 S.	4		BHEL	52	MAKE TO BE INDICATED IN FINAL AS BUILT DRAWING
5	SF6 CIRCUIT BREAKER WITH CR,WITHOUT CSD (3-PH)	3150A	50 KA FOR 1 S.	4		BHEL	52	
6	SF6 CIRCUIT BREAKER WITHOUT CR,WITH CSD (3-PH)	3150A	50 KA FOR 1 S.	6		BHEL	52	
7	SF6 CIRCUIT BREAKER WITHOUT CR,WITH CSD PROVISION (1-PH)	3150A	50 KA FOR 1 S.	1		BHEL	52	
8	ISOLATOR WITH ONE E/SW (3 PH) VERTICAL KNEE TYPE	3150A	50 KA FOR 1 S.	18		BHEL	89/89E	
9	ISOLATOR WITH TWO E/SW (3 PH) VERTICAL KNEE TYPE	3150A	50 KA FOR 1 S.	10		BHEL	89/89E1 /89E2	
10	ISOLATOR WITH ONE E/SW (1 PH) VERTICAL KNEE TYPE	2000A	50 KA FOR 1 S.	21		BHEL	89/89E1	
11	ISOLATOR WITHOUT E/SW (1 PH.) VERTICAL KNEE TYPE	2000A	50 KA FOR 1 S.	33		BHEL	89	
12	CURRENT TRANSFORMER (1 PH.) WITH 120% EXTENDED CURRENT RATING.	3000A	50 KA FOR 1 S.	36		BHEL	CT	
13	CVT (1 PH.)	8800pF		18		BHEL	CVT	
14	SURGE ARRESTER (1 PH.)	624 kV		33		BHEL	LA	
15	WAVE TRAP (1 PH.) PEDESTAL TYPE.	1mH, 3150A	50 KA FOR 1 S.	08		BHEL	WT	

NOTE:

FOR AUX BUS ARRANGEMENT DETAILS FOR ICT,
REFER DRG . NO. TB-3-395-510-012B
FOR AUX BUS ARRANGEMENT DETAILS FOR LINE REACTOR & BUS REACTOR,
REFER DRG. NO. TB-3-395-510-011B

BILL OF QTY. FOR 132 & 33kV MAIN EQUIPMENTS:

SL.NO.	DESCRIPTION	RATING	QTY. (NO.)	SYMBOL	SCOPE OF SUPPLY	LEGEND
61	SURGE ARRESTER (1 PH.)	132 kV, 10 KA 5 KJ/KV	2		PMJTL	LA
62	NEUTRAL CT. (1 PH.) WITH 120% EXTENDED CURRENT RATING.	33KV	4		BHEL	CT

Cat-I

श्रेणीकरण
I. फैब्रिकेशन / निर्माण / हेतु अनुमोदित / जारी।
II. फैब्रिकेशन / निर्माण / हेतु अनुमोदित / जारी। बशर्ते कि गई टिप्पणियों एवं आशोधनों को सम्मिलित किया जाए। कृपया आशोधित दस्तावेज अनुमोदनार्थ प्रस्तुत करें।
III. टिप्पणियों सम्मिलित कर पुनः अनुमोदनार्थ प्रस्तुत करें।
IV. पुनः जमा एवं रिकार्ड हेतु।
अनुमोदित नहीं।
पावर ग्रिड कारपोरेशन ऑफ इंडिया लि. अधिशासी (उपकेन्द्र) गुड़गाँव, हरियाणा
हस्ताक्षर
(दिनांक) 14.05.2018
(तिथि)

NOA NO. : MJTL/765kV/ERSS-XVIII/SS01/NOA-I/03(I) & NOA-II/03(II) dated 29.09.2017

ADDITIONAL INFORMATION
W.O.No. 87002

STATUS OF DRAWING CONTRACT

DISTRIBUTION OF PRINTS

ग्राहक/परियोजना का नाम
NAME OF CUSTOMER/PROJECT: POWERGRID MEDINIPUR JEERAT TRANSMISSION LIMITED
NAME OF CONSULTANT: POWERGRID CORPORATION OF INDIA LIMITED

SUBSTATION PACKAGE-SS01 FOR ESTABLISHMENT OF 765/400KV S/S AT MEDINIPUR & JEERAT(NEW) ASSOCIATED WITH TRANSMISSION SYSTEM PROJECT "765kV STRENGTHENING IN EASTERN REGION (ERSS-XVIII)"UNDER TARIFF BASED COMPETITIVE BIDDING (TBCB) ROUTE.

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
ट्रांसमिशन परियोजना विभाग
BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION PROJECTS DIVISION

	नाम /NAME	हस्ता ./SIGN.	दि./DATE
बनाया DRAWN	PK		23.11.15
जाँचा CHECKED	MM/RD		
स्वीकृत APPROVED	DKM/VK		

REV.	DATE	ALTERED / CHECKED / APPROVED	ZONE
02	31.03.18	ALTERED PK; CHECKED MM/RD; APPROVED DKM/VK	DRG REVISED AS PER PGCIL COMMENTS DATED 26.12.17
01	15.11.17	ALTERED PK; CHECKED MM/RD; APPROVED DKM/VK	DRG REVISED AS PER PGCIL COMMENTS DATED 01.11.17

विभाग DEPT. TBEM
कोड CODE 422
अनुपात / SCALE NTS
कार्ड कोड CARD CODE

शीर्षक/TITLE
SINGLE LINE DIAGRAM
FOR 765/400 kV MEDINIPUR S/S.

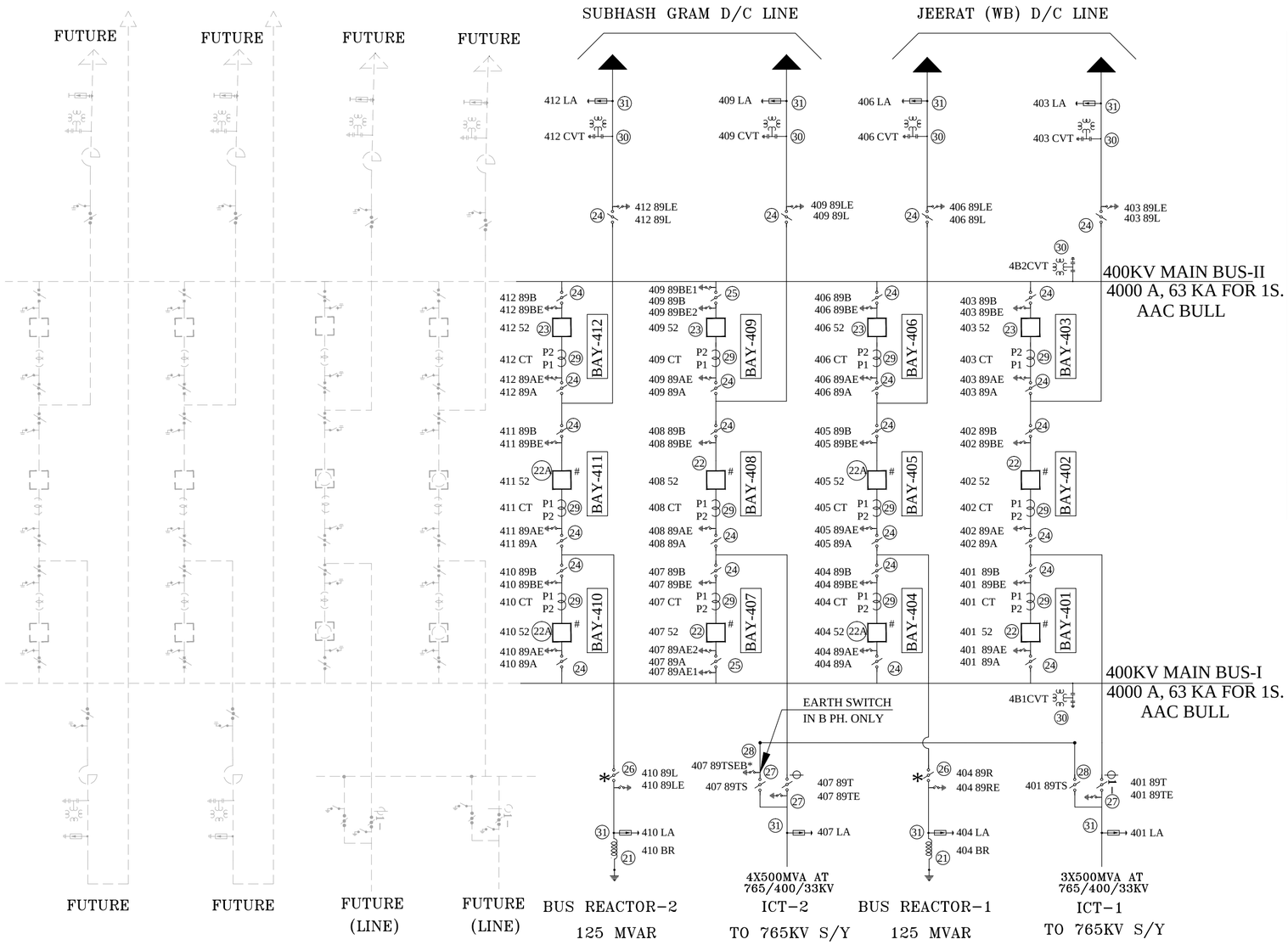
ड्राईंग क्र./DRAWING NO. TB-3-395-510-021
पुनः/REV. 02
पृष्ठ क्र./SHEET No. 01
अगला पृष्ठ/NEXT SHEET 02

COPY RIGHT AND CONFIDENTIAL
THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED.
IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPAY

COMPUTER DRG. PATH NAME :
REF. DRG. NO.
SIGN. AND DATE
INVENTORY NO

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG. NO. TB-3-395-510-001



400KV SINGLE LINE DIAGRAM

CIRCUIT BREAKERS 404 52, 405 52, 410 52 & 411 52 ARE WITH GRADING CAPACITOR

* 40789TSEB ARE ISO WITH 1 E/S IN B PHASE ONLY

BILL OF QTY. FOR 400kV MAIN EQUIPMENTS:

R1

SL.NO.	DESCRIPTION	RATING	S. C. RATING	QTY. (NO.)	SYMBOL	SCOPE OF SUPPLY	LEGEND	MAKE
21	125MVAR BUS REACTOR (3-PH)	420 kV	63 KA FOR 1 S.	2		PMJTL	BR	TBEA
22	SF6 CIRCUIT BREAKER WITHOUT CR,WITHOUT GC,WITH CSD (3-PH)	3150A	63 KA FOR 1 S.	4		BHEL	52	MAKE TO BE INDICATED IN FINAL AS BUILT DRAWING
22A	SF6 CIRCUIT BREAKER WITHOUT CR,WITH GC, WITH CSD (3-PH)	3150A	63 KA FOR 1 S.	4		BHEL	52	
23	SF6 CIRCUIT BREAKER WITHOUT CR,WITHOUT CSD (3-PH)	3150A	63 KA FOR 1 S.	4		BHEL	52	
24	ISOLATOR WITH ONE E/SW (3 PH) DOUBLE BREAK TYPE	3150A	63 KA FOR 1 S.	26		BHEL	89/89E	
25	ISOLATOR WITH TWO E/SW (3 PH) DOUBLE BREAK TYPE	3150A	63 KA FOR 1 S.	2		BHEL	89/89E1 /89E2	
26	ISOLATOR WITH ONE E/SW (3 PH) DOUBLE BREAK TYPE	2000A	63 KA FOR 1 S.	2	*	BHEL	89/89E1	
27	ISOLATOR WITH ONE E/SW (1 PH) DOUBLE BREAK TYPE	3150A	63 KA FOR 1 S.	7		BHEL	89/89E1	
28	ISOLATOR WITHOUT E/SW (1 PH) DOUBLE BREAK TYPE	3150A	63 KA FOR 1 S.	5		BHEL	89	
29	CURRENT TRANSFORMER (1 PH.) WITH 120% EXTENDED CURRENT RATING.	3000A	63 KA FOR 1 S.	36		BHEL	CT	
30	CVT (1 PH.)	4400pF		18		BHEL	CVT	
31	SURGE ARRESTER (1 PH.)	336 kV		25		BHEL	LA	

NOA NO. : MJTL/765kV/ERSS-XVIII/SS01/NOA-I/03(I) & NOA-II/03(II) dated 29.09.2017

ADDITIONAL INFORMATION
W.O.No. 87003

STATUS OF DRAWING CONTRACT

DISTRIBUTION OF PRINTS

ग्राहक/परियोजना का नाम
NAME OF CUSTOMER/PROJECT POWERGRID MEDINIPUR JEERAT TRANSMISSION LIMITED
NAME OF CONSULTANT POWERGRID CORPORATION OF INDIA LIMITED

SUBSTATION PACKAGE-SS01 FOR ESTABLISHMENT OF 765/400KV S/S AT MEDINIPUR & JEERAT (NEW) ASSOCIATED WITH TRANSMISSION SYSTEM PROJECT "765kV STRENGTHENING IN EASTERN REGION(ERSS-XVIII)" UNDER TARIFF BASED COMPETITIVE BIDDING (TBCB) ROUTE.

भारत हैवी इलेक्ट्रिकल्स लिमिटेड
ट्रांसमिशन परियोजना विभाग
BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION PROJECTS DIVISION

	नाम /NAME	हस्ता./SIGN.	दि./DATE
बनाया DRAWN	PK		23.11.15
जाँचा CHECKED	MM/RD		
स्वीकृत APPROVED	DKM/VK		

REV.	DATE	ALTERED / CHECKED / APPROVED	REV.	DATE	ALTERED / CHECKED / APPROVED	REV.	DATE	ALTERED / CHECKED / APPROVED	REV.	DATE	ALTERED / CHECKED / APPROVED	REV.	DATE	ALTERED / CHECKED / APPROVED	REV.	DATE	ALTERED / CHECKED / APPROVED
												02	31.03.18	PK / MM/RD / DKM/VK	01	15.11.17	PK / MM/RD / DKM/VK
ZONE			ZONE			ZONE			ZONE			ZONE	DRG REVISED AS PER PGCIL COMMENTS DATED 26.12.17		ZONE	DRG REVISED AS PER PGCIL COMMENTS DATED 01.11.17	

विभाग DEPT. TBEM
कोड CODE
अनुपात / SCALE NTS
कार्ड कोड CARD CODE

शीर्षक/TITLE
SINGLE LINE DIAGRAM
FOR 765/400 kV JEERAT S/S.

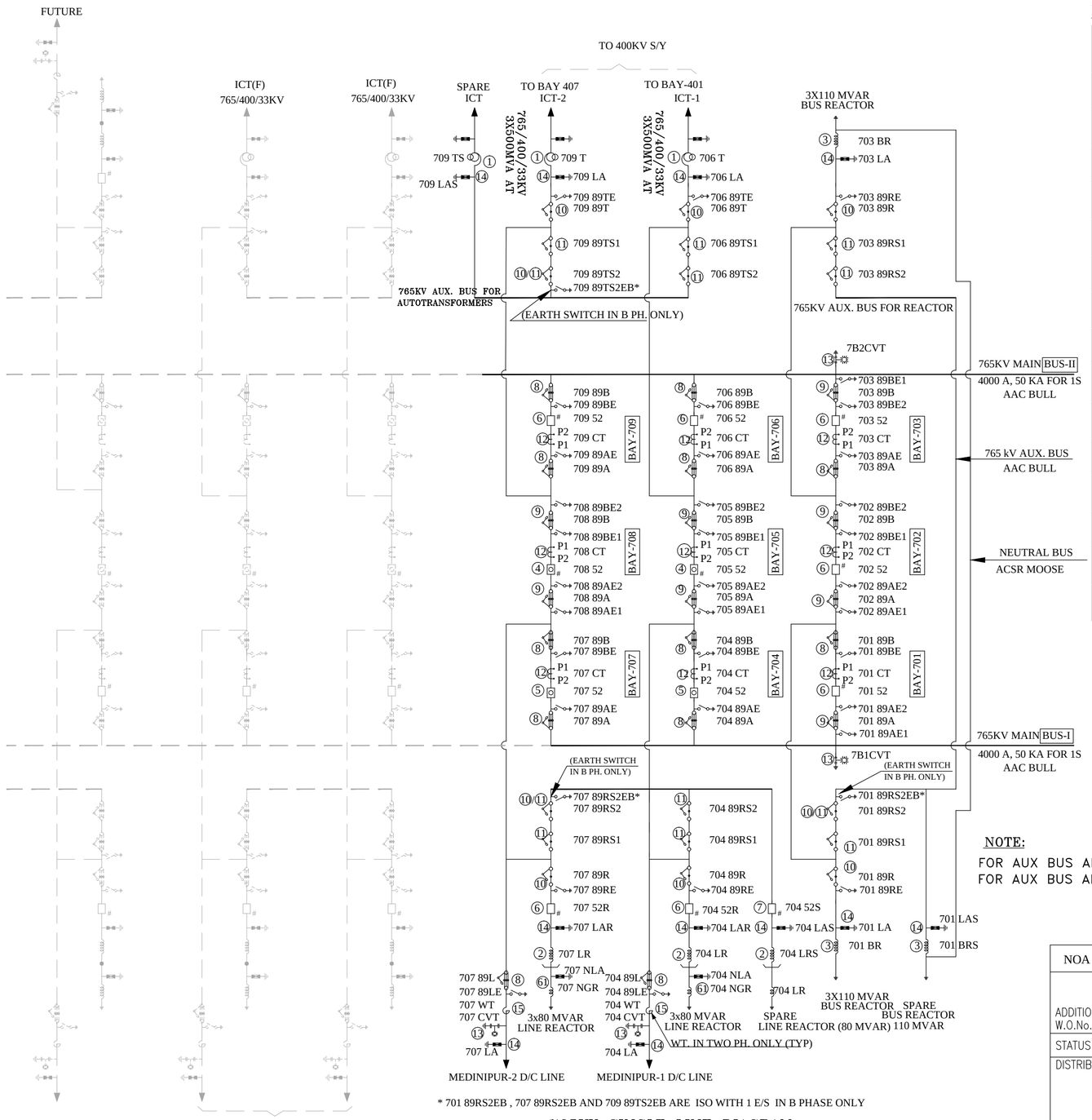
ड्राईंग क्र./DRAWING NO. TB-3-395-510-001
पुनः/REV. 02
पृष्ठ क्र./SHEET No. 02
अगला पृष्ठ /NEXT SHEET 03

COPY RIGHT AND CONFIDENTIAL
THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED.
IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPAY

COMPUTER DRG. PATH NAME :
REF. DRG. NO.
SIGN. AND DATE
INVENTORY NO

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG. NO. TB-3-395-510-001



* 701 89RS2EB , 707 89RS2EB AND 709 89TS2EB ARE ISO WITH 1 E/S IN B PHASE ONLY

765KV SINGLE LINE DIAGRAM

BILL OF QTY. FOR 765kV MAIN EQUIPMENTS:

SL.NO.	DESCRIPTION	RATING	S. C. RATING	QTY. (NO.)	SYMBOL	SCOPE OF SUPPLY	LEGEND	MAKE
1	500 MVA, (1-PH) AUTOTRANSFORMER, YNa0d11	765/400/33KV	50 KA FOR 1 S.	7		PMJTL	T	TBEA
2	80MVAR LINE REACTOR (1-PH) WITH NGR(600 Ohm).	765KV	50 KA FOR 1 S.	7		PMJTL	LR/NGR	TBEA
3	110MVAR BUS REACTOR (1-PH)	765KV	50 KA FOR 1 S.	7		PMJTL	BR	TBEA
4	SF6 CIRCUIT BREAKER WITH CR, WITH CSD (3-PH)	3150A	50 KA FOR 1 S.	2		BHEL	52	MAKE TO BE INDICATED IN FINAL AS BUILT DRAWING
5	SF6 CIRCUIT BREAKER WITH CR,WITHOUT CSD (3-PH)	3150A	50 KA FOR 1 S.	2		BHEL	52	
6	SF6 CIRCUIT BREAKER WITHOUT CR,WITH CSD (3-PH)	3150A	50 KA FOR 1 S.	7		BHEL	52	
7	SF6 CIRCUIT BREAKER WITHOUT CR,WITH CSD (1-PH) PROVISION	3150A	50 KA FOR 1 S.	1		BHEL	52	
8	ISOLATOR WITH ONE E/SW (3 PH) VERTICAL KNEE TYPE	3150A	50 KA FOR 1 S.	12		BHEL	89/89E	
9	ISOLATOR WITH TWO E/SW (3 PH) VERTICAL KNEE TYPE	3150A	50 KA FOR 1 S.	8		BHEL	89/89E1 /89E2	
10	ISOLATOR WITH ONE E/SW (1 PH) VERTICAL KNEE TYPE	2000A	50 KA FOR 1 S.	21		BHEL	89/89E1	
11	ISOLATOR WITHOUT E/SW (1 PH.) VERTICAL KNEE TYPE	2000A	50 KA FOR 1 S.	33		BHEL	89	
12	CURRENT TRANSFORMER (1 PH.) WITH 120% EXTENDED CURRENT RATING.	3000A	50 KA FOR 1 S.	27		BHEL	CT	
13	CVT (1 PH.)	8800pF		12		BHEL	CVT	
14	SURGE ARRESTER (1 PH.)	624 kV		27		BHEL	LA	
15	WAVE TRAP (1 PH.) PEDESTAL TYPE.	1mH, 3150A	50 KA FOR 1 S.	04		BHEL	WT	

BILL OF QTY. FOR 132 & 33kV MAIN EQUIPMENTS:

SL.NO.	DESCRIPTION	RATING	QTY. (NO.)	SYMBOL	SCOPE OF SUPPLY	LEGEND
61	SURGE ARRESTER (1 PH.)	132 kV, 10 KA 5 KJ/KV	2		PMJTL	NLA
62	NEUTRAL CT. (1 PH.) WITH 120% EXTENDED CURRENT RATING.	33KV	4		BHEL	NCT

NOTE:

FOR AUX BUS ARRANGEMENT DETAILS FOR ICT, REFER DRG . NO. TB-3-395-510-012A
FOR AUX BUS ARRANGEMENT DETAILS FOR LINE REACTOR & BUS REACTOR, REFER DRG. NO. TB-3-395-510-011A

NOA NO. : MJTL/765kV/ERSS-XVIII/SS01/NOA-I/03(I) & NOA-II/03(II) dated 29.09.2017

ADDITIONAL INFORMATION
W.O.No. 87003

STATUS OF DRAWING CONTRACT

DISTRIBUTION OF PRINTS

ग्राहक/परियोजना का नाम
NAME OF CUSTOMER/PROJECT POWERGRID MEDINIPUR JEERAT TRANSMISSION LIMITED
NAME OF CONSULTANT POWERGRID CORPORATION OF INDIA LIMITED

SUBSTATION PACKAGE-SS01 FOR ESTABLISHMENT OF 765/400KV S/S AT MEDINIPUR & JEERAT (NEW) ASSOCIATED WITH TRANSMISSION SYSTEM PROJECT "765kV STRENGTHENING IN EASTERN REGION(ERSS-XVIII)" UNDER TARIFF BASED COMPETITIVE BIDDING (TBCB) ROUTE.

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
ट्रांसमिशन परियोजना विभाग
BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION PROJECTS DIVISION

	नाम /NAME	हस्ता./SIGN.	दि./DATE
बनाया DRAWN	PK		23.11.15
जाँचा CHECKED	MM/RD		
स्वीकृत APPROVED	DKM/VK		

REV.	DATE	ALTERED	CHECKED	APPROVED
02	31.03.18	PK	MM/RD	DKM/VK
01	15.11.17	PK	MM/RD	DKM/VK

ZONE: DRG REVISED AS PER PGCIL COMMENTS DATED 26.12.17 (02); DRG REVISED AS PER PGCIL COMMENTS DATED 01.11.17 (01)

विभाग DEPT. TBEM
कोड CODE
अनुपात / SCALE NTS
कार्ड कोड CARD CODE

शीर्षक/TITLE
SINGLE LINE DIAGRAM
FOR 765/400kV JEERAT S/S.

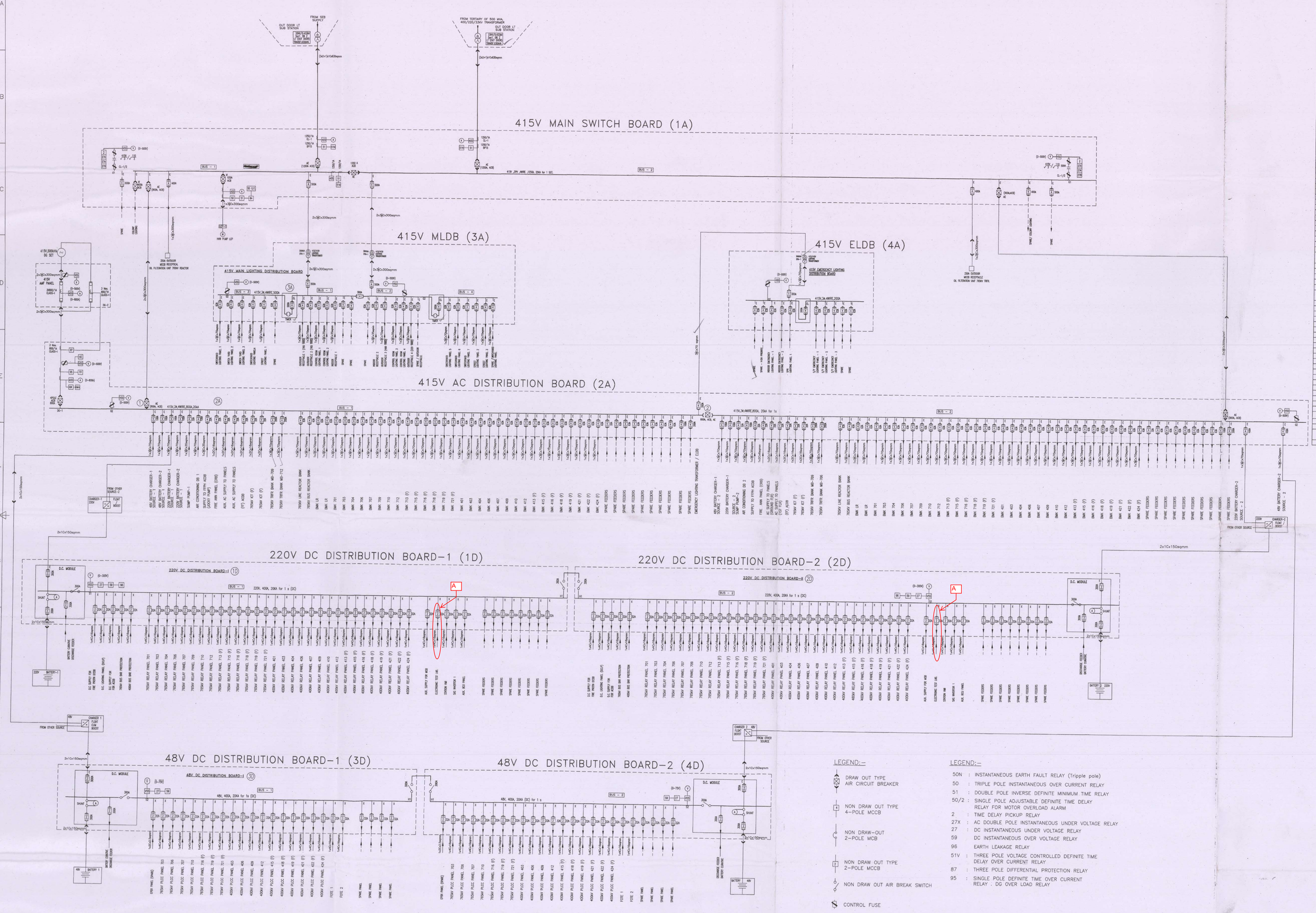
ड्राईंग क्र./DRAWING NO. TB-3-395-510-001
पुनः/REV. 02
पृष्ठ क्र./SHEET No. 01
अगला पृष्ठ /NEXT SHEET 02

COPY RIGHT AND CONFIDENTIAL
THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED.
IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPAY

COMPUTER DRG. PATH NAME :
REF. DRG. NO.
SIGN. AND DATE
INVENTORY NO

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG. NO. TB-395-510-034



Minimum indicative requirement of Analog signals , Potential Free contacts & Command signals which should be available at respective equipment for remote indication & control from Auxiliary BCU located in S/s control room

EQUIPMENT	ANALOG SIGNAL FOR REMOTE INDICATION	POTENTIAL FREE CONTACT FOR REMOTE INDICATION	COMMAND SIGNALS FROM REMOTE INDICATION
415V Main Switchboard			
	BUS 1 Voltage R-Y	Main I/C-1 Breaker ON/OFF	I/C-1 Breaker TRIP CMD
	BUS 1 Voltage Y-B	Main I/C-2 Breaker ON/OFF	I/C-1 Breaker CLOSE CMD
	BUS 1 Voltage B-R	Main B/C Breaker ON/OFF	I/C-2 Breaker TRIP CMD
	I/C-1 Current R Phase	O/G HVW Breaker ON/OFF	I/C-2 Breaker CLOSE CMD
	I/C-1 Current Y Phase	O/G TOWNSHIP Breaker ON/OFF	B/C Breaker TRIP CMD
	I/C-1 Current B Phase	O/G ACDB 1 Breaker ON/OFF	B/C Breaker CLOSE CMD
	BUS 2 Voltage R-Y	O/G ACDB 2 Breaker ON/OFF	
	BUS 2 Voltage Y-B		O/G HVW Breaker TRIP CMD
	BUS 2 Voltage B-R	Main Bus 1 LIV	O/G HVW Breaker CLOSE CMD
	I/C-2 Current R Phase	Main Bus 2 LIV	O/G ACDB 1 Breaker TRIP CMD
	I/C-2 Current Y Phase		O/G ACDB 1 Breaker CLOSE CMD
	I/C-2 Current B Phase		O/G ACDB 2 Breaker TRIP CMD
			O/G ACDB 2 Breaker CLOSE CMD
			O/G TOWNSHIP Breaker TRIP CMD
			O/G TOWNSHIP Breaker CLOSE CMD
ACDB			
		I/C-1 Breaker ON/OFF	ACDB I/C-1 BREAKER TRIP
		I/C-2 Breaker ON/OFF	ACDB I/C-1 BREAKER CLOSE
		I/C DG Breaker ON/OFF	ACDB I/C-2 BREAKER TRIP
		B/C Breaker ON/OFF	ACDB I/C-2 BREAKER CLOSE
			ACDB B/C BREAKER TRIP
			ACDB B/C BREAKER CLOSE
			DG SET INCOMMER BREAKER TRIP
			DG SET INCOMMER BREAKER CLOSE
220V & 48V DCDB			
	DCDB-1 Voltage	DCDB-1 D/F ALARM	
	DCDB-2 Voltage	DCDB-2 D/F ALARM	
	Incomer-1 Current from battery set-1		
	Incomer-1 Current from Battery Charger-1		
	Incomer-2 Current from battery set-2		
	Incomer-2 Current from Battery Charger-2		
220V & 48V BATTERY CHARGER			
		CHARGER-1 : AC power failure	
		CHARGER-1: Rectifier/chargers fuse blown	
		CHARGER-1 : Over voltage across the battery when boost charging	
		CHARGER-1 : Abnormal voltage (High/Low)	
		CHARGER-1 : FLOAT MODE	
		CHARGER-1 : BOOST MODE	
		CHARGER-2 : AC power failure	
		CHARGER-2: Rectifier/chargers fuse blown	
		CHARGER-2 : Over voltage across the battery when boost charging	
		CHARGER-2 : Abnormal voltage (High/Low)	
		CHARGER-2 : FLOAT MODE	
		CHARGER-2 : BOOST MODE	
LT Transformer			
		LT transformer-1: Buchoiz Alarm	
		LT transformer-1: Buchoiz Trip	
		LT transformer-1: WTI Alarm	
		LT transformer-1: WTI Trip	
		LT transformer-1: OTI Alarm	
		LT transformer-1: OTI Trip	
		LT transformer-2: Buchoiz Alarm	
		LT transformer-2: Buchoiz Trip	
		LT transformer-2: WTI Alarm	
		LT transformer-2: WTI Trip	
		LT transformer-2: OTI Alarm	
		LT transformer-2: OTI Trip	
Air Conditioning System			
IN CRB	Main Control room temperature	Room Temperature High Alarm	
Ambient	Switchyard Ambient temperature		
Air Conditioning System for Switchyard PANEL ROOM			
	Switchyard Panel Room's Temperature	i) AC Compressor 1 ON/OFF	
		ii) AC Compressor 2 ON/OFF	
		iii) Fire Detection 1 ON/OFF	
		iv) Fire Detection 2 On/OFF	
		v) Switchyard Panel Room Temperature High Alarm	

Minimum indicative requirement of Analog signals , Potential Free contacts & Command signals which should be available at respective equipment for remote indication & control from Auxiliary BCU located in S/s control room

EQUIPMENT	ANALOG SIGNAL FOR REMOTE INDICATION	POTENTIAL FREE CONTACT FOR REMOTE INDICATION
DG SET		
	DG Voltage R-Y	MAINS 1 ON
	DG Voltage Y-B	MAINS 2 ON
	DG Voltage B-R	Alternator ON
	DG Current R	Charger 1 ON
	DG Current Y	Charger 1 OFF
	DG Current B	Charger 2 ON
		Charger 2 OFF
		MAIN 1 LT Supply ON/OFF
		MAIN 2 LT Supply ON/OFF
		Engine Over Heating
		Lack of Fuel
		Low Oil Pressure
		Set Failed to Start 30Sec After Receiving the First Start Timer
		High Cooling Water Temperature
		Low Level in Daily Service Fuel Tank
		Overspeed trip
		Alternator fault
		Breaker ON
		Breaker OFF

NOTES:-

1. NO TWO AC SOURCE SHALL BE PARALLELED AT ANY STAGE.
2. DG SET SHALL BE AUTO START TYPE.
3. MECHANICAL INTERLOCK SHALL BE PROVIDED TO ENSURE BREAKER OF DG SET WILL CLOSE ONLY WHEN SWITCHES 1 & 2 ARE OPEN.
4. FOR COMPLETE DESCRIPTION OF EACH TYPE OF MODULE, PLEASE REFER TECHNICAL SPECIFICATION.
5. CABLE SIZES SHOWN ARE AS PER THE TECHNICAL SPECIFICATION.
6. ALL THE FEEDERS SHOWN IN THE SLD INCLUDING FUTURE/ SPARE (SHOWN DOTTED) ARE INCLUDED IN SCOPE OF SUPPLY.
7. EACH BAY, TRANSFORMER MB SHALL BE FED BY ATLEAST ONE SOURCE FROM ACDB. SECOND SOURCE SHALL BE LOOPED FROM NEAREST BMK & TRANSFORMER MB WHICH SHALL BE FED FROM ANOTHER SOURCE FROM 415V ACDB.
8. TRANSDUCERS/AUX. CONTACTS REQUIRED FOR ANALOGUE AND DIGITAL INPUT SHALL BE AN INTEGRAL PART OF LT AC/DC BOARDS.
9. ONE DC 'X' TYPE MODULE IN EACH 220 V DCDB SHALL BE PROVIDED FOR EACH LINE, TRANSFORMER, BUS REACTOR, TBC, BC & BUS-SECTION BAY FOR PRESENT & FUTURE BAYS AS SHOWN IN SUBSTATION SLD.
10. ONE DC 'X' TYPE MODULE IN EACH 48V DCDB SHALL BE PROVIDED FOR EACH LINE BAY FOR PRESENT & FUTURE BAYS AS SHOWN IN SUBSTATION SLD.
11. MODULE 'X" REFERRED ABOVE, IS APPLICABLE WITH DP MCCB, MAXIMUM 2Nos. OF DP MCCB SHALL BE CONNECTED IN ONE MODULE OF OFFERED PANEL.
12. AE (800A, ACB) MODULE ,-ALL HAVE ONLY ACB WITHOUT SEPARATE PROTECTIVE RELAYS. HOWEVER, AUX. RELAYS/CONTACTORS SHALL BE INCLUDED AS PER SCHEME REQUIREMENT.
13. ALL DIGITAL / ANALOG INPUTS/OUTPUTS REQUIRED FOR SAS SHALL BE CONSIDERED.
14. GLAND PLATE SHALL BE OF NON MAGNETIC WHEREAS SINGLE CORE POWER CABLE ARE USED.
15. BMB TO BMB INTER LOOPING WILL BE DONE BY 1 X 3.5C 70 SQMM CABLE.
16. UNLESS SPECIFIED, SOURCE 1 WILL BE FED FROM BUS 1 AND SOURCE 2 FROM BUS 2.
17. INSTANT OUTAGE OF COLONY LIGHTING IN CASE OF OUTAGE OF SEB FEEDER.
18. RATING OF BUSBAR/FEEDER INDICATED IN THIS DRAWING ARE MIN. REQUIREMENT AND MAY BE INCREASED DURING DETAILED ENGINEERING IF FOUND INADEQUATE WITH RESPECT TO OFFERED LOADS/SYSTEM.

LEGEND:-

- DRAW OUT TYPE AIR CIRCUIT BREAKER
- NON DRAW OUT TYPE 4-POLE MCCB
- NON DRAW-OUT 2-POLE MCB
- NON DRAW OUT TYPE 2-POLE MCCB
- NON DRAW OUT AIR BREAK SWITCH
- CONTROL FUSE
- BATTERY LINKS/FUSES
- TIMER

LEGEND:-

50N	:	INSTANTANEOUS EARTH FAULT RELAY (Tripple pole)
50	:	TRIPLE POLE INSTANTANEOUS OVER CURRENT RELAY
51	:	DOUBLE POLE INVERSE DEFINITE MINIMUM TIME RELAY
50/2	:	SINGLE POLE ADJUSTABLE DEFINITE TIME DELAY RELAY FOR MOTOR OVERLOAD ALARM
2	:	TIME DELAY PICKUP RELAY
27X	:	AC DOUBLE POLE INSTANTANEOUS UNDER VOLTAGE RELAY
27	:	DC INSTANTANEOUS UNDER VOLTAGE RELAY
59		DC INSTANTANEOUS OVER VOLTAGE RELAY
96		EARTH LEAKAGE RELAY
51V	:	THREE POLE VOLTAGE CONTROLLED DEFINITE TIME DELAY OVER CURRENT RELAY
87	:	THREE POLE DIFFERENTIAL PROTECTION RELAY
95	:	SINGLE POLE DEFINITE TIME OVER CURRENT RELAY . DG OVER LOAD RELAY

TB-3-395-510-021	SINGLE LINE DIAGRAM FOR 765/400 kV MEDINIPUR S/S.
REF. DRG. NO.	TITLE

NOA NO. : MJTL/765kV/ERSS-XVIII/SS01/NOA-I/03(I) & NOA-II/03(I) dated 29.09.2017

ADDITIONAL INFORMATION W.O.No: 87003

STATUS OF DRAWING: CONTRACT

DISTRIBUTION OF PRINTS

ग्राहक/परियोजना का नाम / NAME OF CUSTOMER/PROJECT: POWERGRID MEDINIPUR JEERAT TRANSMISSION LIMITED

NAME OF CONSULTANT: POWER GRID CORPORATION OF INDIA LIMITED

SUBSTATION PACKAGE-SS01 FOR ESTABLISHMENT OF 765/400KV S/S AT MEDINIPUR & JEERAT (NEW) ASSOCIATED WITH TRANSMISSION SYSTEM PROJECT "765kV STRENGTHENING IN EASTERN REGION (ERSS-XVIII)"UNDER TARIFF BASED COMPETITIVE BIDDING (TBCB) ROUTE.

भारत हेवी इलेक्ट्रिकल्स लिमिटेड / ट्रांसमिशन परियोजना विभाग / BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION

REV.	DATE	ALTERED / CHECKED / APPROVED	
01	16.03.18	PK / MM / DKM	

ZONE: DRG. REVISED AS PER POWERGRID COMMENTS DTD 25.01.18

BHPT TBEM 422

अनुपात / SCALE: NTS

कार्ड कोड / CARD CODE

शीर्षक/TITLE: SINGLE LINE DIAGRAM FOR LT AC & DC SYSTEM AT MEDINIPUR

	नाम / NAME	हस्ता / SIGN.	दि. / DATE
तैयार / DRAWN	PK		08.12.17
जाँचा / CHECKED	MM	- sd -	
अनुमोदित / APPROVED	DKM	- sd -	

ड्रॉ.सं./DRAWING NO. TB-395-510-034 — रेव./REV. 01

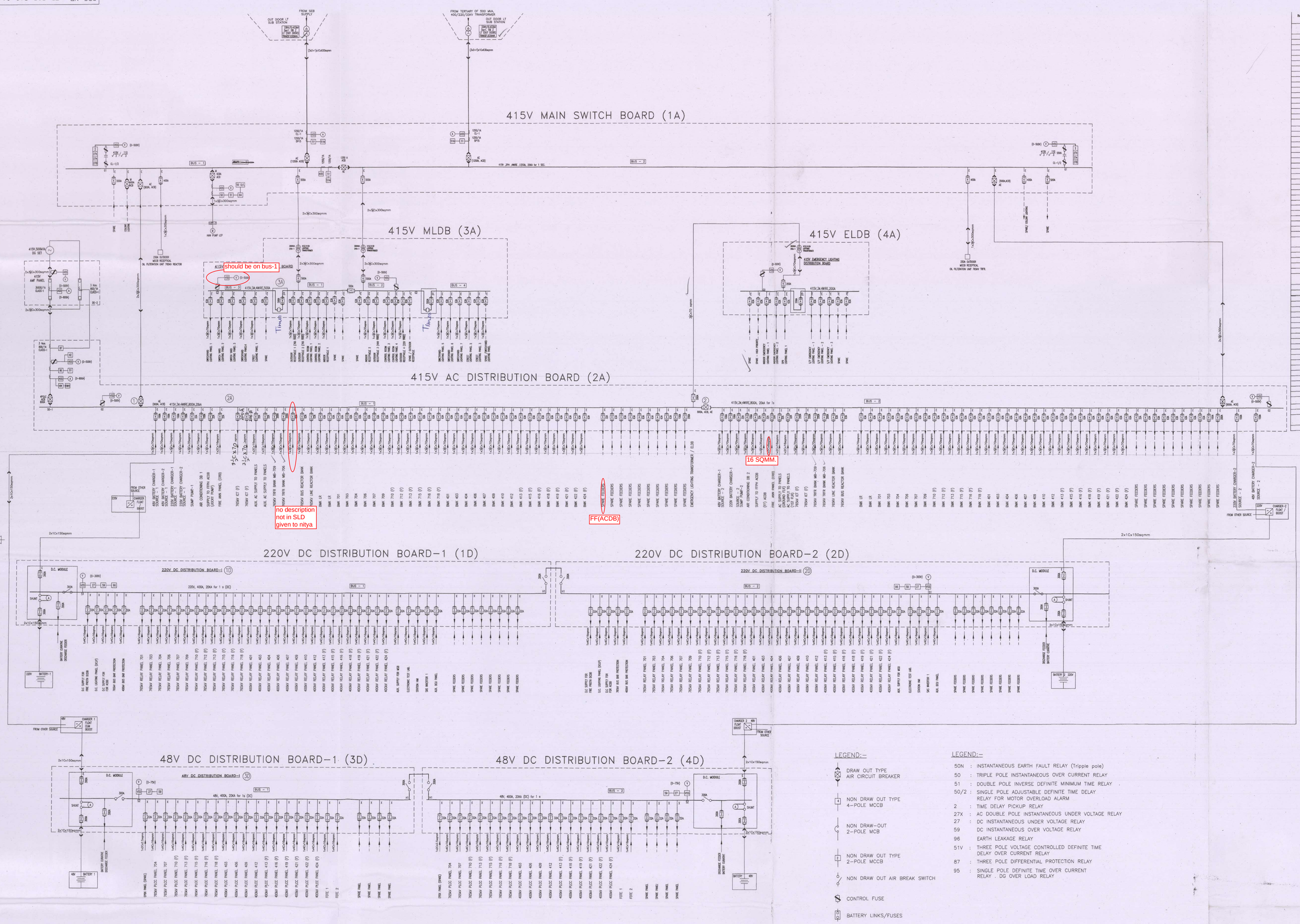
शीट सं./SHEET No. 01 अगली शीट/NEXT SHEET --

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPAY

COMPUTER FILE NAME | REF. DRG. NO. | SIGN. AND DATE | INVENTORY NO.

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG. NO. TB-395-510-014



Minimum indicative requirement of Analog signals , Potential Free contacts & Command signals which should be available at respective equipment for remote indication & control from Auxiliary BCU located in S/s control room

EQUIPMENT	ANALOG SIGNAL FOR REMOTE INDICATION	POTENTIAL FREE CONTACT FOR REMOTE INDICATION	COMMAND SIGNALS FROM REMOTE
415V Main Switchboard			
	BUS 1 Voltage R-Y	Main I/C-1 Breaker ON/OFF	I/C-1 Breaker TRIP CMD
	BUS 1 Voltage Y-B	Main I/C-2 Breaker ON/OFF	I/C-1 Breaker CLOSE CMD
	BUS 1 Voltage B-R	Main B/C Breaker ON/OFF	I/C-2 Breaker TRIP CMD
	I/C-1 Current R Phase	O/G HVW Breaker ON/OFF	I/C-2 Breaker CLOSE CMD
	I/C-1 Current Y Phase	O/G TOWNSHIP Breaker ON/OFF	B/C Breaker TRIP CMD
	I/C-1 Current B Phase	O/G ACDB 1 Breaker ON/OFF	B/C Breaker CLOSE CMD
	BUS 2 Voltage R-Y	O/G ACDB 2 Breaker ON/OFF	
	BUS 2 Voltage Y-B		O/G HVW Breaker TRIP CMD
	BUS 2 Voltage B-R	Main bus 1 UV	O/G HVW Breaker CLOSE CMD
	I/C-2 Current R Phase	Main bus 2 UV	O/G ACDB 1 Breaker TRIP CMD
	I/C-2 Current Y Phase		O/G ACDB 1 Breaker CLOSE CMD
	I/C-2 Current B Phase		O/G ACDB 2 Breaker TRIP CMD
			O/G ACDB 2 Breaker CLOSE CMD
			O/G TOWNSHIP Breaker TRIP CMD
			O/G TOWNSHIP Breaker CLOSE CMD
ACDB			
		I/C-1 Breaker ON/OFF	ACDB I/C-1 BREAKER TRIP
		I/C-2 Breaker ON/OFF	ACDB I/C-1 BREAKER CLOSE
		I/C OG Breaker ON/OFF	ACDB I/C-2 BREAKER TRIP
		B/C Breaker ON/OFF	ACDB I/C-2 BREAKER CLOSE
			ACDB B/C BREAKER TRIP
			ACDB B/C BREAKER CLOSE
			DG SET INCOMER BREAKER TRIP
			DG SET INCOMER BREAKER CLOSE
220V & 48V DCDB			
	DCDB-1 Voltage	DCDB-1 I/F ALARM	
	DCDB-2 Voltage	DCDB-2 I/F ALARM	
	Incomer-1 Current from Battery set-1		
	Incomer-1 Current from Battery Charger-1		
	Incomer-2 Current from Battery set-2		
	Incomer-2 Current from Battery Charger-2		
220V & 48V BATTERY CHARGER			
		CHARGER-1 : AC power failure	
		CHARGER-1 : Rectifier/chargers fuse blown	
		CHARGER-1 : Over voltage across the battery when boost charging	
		CHARGER-1 : Abnormal voltage (High/Low)	
		CHARGER-1 : FLOAT MODE	
		CHARGER-1 : BOOST MODE	
		CHARGER-2 : AC power failure	
		CHARGER-2 : Rectifier/chargers fuse blown	
		CHARGER-2 : Over voltage across the battery when boost charging	
		CHARGER-2 : Abnormal voltage (High/Low)	
		CHARGER-2 : FLOAT MODE	
		CHARGER-2 : BOOST MODE	
LT Transformer			
		LT transformer-1: Buchotz Alarm	
		LT transformer-1: Buchotz Trip	
		LT transformer-1: WTI Alarm	
		LT transformer-1: WTI Trip	
		LT transformer-1: OTI Alarm	
		LT transformer-1: OTI Trip	
		LT transformer-2: Buchotz Alarm	
		LT transformer-2: Buchotz Trip	
		LT transformer-2: WTI Alarm	
		LT transformer-2: WTI Trip	
		LT transformer-2: OTI Alarm	
		LT transformer-2: OTI Trip	
Air Conditioning System			
IN CXB	Main Control room temperature	Room Temperature High Alarm	
Ambient	Switchyard Ambient temperature		
Air Conditioning System for Switchyard PANEL ROOM			
	Switchyard Panel Room/s Temperature	i) AC Compressor 1 ON/OFF	
		ii) AC Compressor 2 ON/OFF	
		iii) Fire Detection 1 ON/OFF	
		iv) Fire Detection 2 On/OFF	
		v) Swinhyard Panel Room Temperature High Alarm	

Minimum indicative requirement of Analog signals , Potential Free contacts & Command signals which should be available at respective equipment for remote indication & control from Auxiliary BCU located in S/s control room

EQUIPMENT	ANALOG SIGNAL FOR REMOTE INDICATION	POTENTIAL FREE CONTACT FOR REMOTE INDICATION
DG SET		
	DG Voltage R-Y	MAINS 1 ON
	DG Voltage Y-B	MAINS 2 ON
	DG Voltage R-B	Alternator ON
	DG Current R	Charger 1 ON
	DG Current Y	Charger 1 OFF
	DG Current B	Charger 2 ON
		Charger 2 OFF
		MAIN 1 LT Supply ON/OFF
		MAIN 2 LT Supply ON/OFF
		Engine Over Heating
		Lack of Fuel
		Low Oil Pressure
		Gen Failed to Start 30 Sec After Receiving the First Start Timer
		High Cooling Water Tempreture
		Low Level in Daily Service Fuel Tank
		overspeed trip
		Alternator fault
		Breaker ON
		Breaker OFF

NOTES:-

1. NO TWO AC SOURCE SHALL BE PARALLELED AT ANY STAGE
2. DG SET SHALL BE AUTO START TYPE
3. MECHANICAL INTERLOCK SHALL BE PROVIDED TO ENSURE BREAKER OF DG SET WILL CLOSE ONLY WHEN SWITCHES 1 & 2 ARE OPEN
4. FOR COMPLETE DESCRIPTION OF EACH TYPE OF MODULE PL. REFER TECHNICAL SPECIFICATION.
5. CABLE SIZES SHOWN ARE AS PER THE TECHNICAL SPECIFICATION.
6. ALL THE FEEDERS SHOWN IN THE SLD INCLUDING FUTURE/ SPARE (SHOWN DOTTED) ARE INCLUDED SCOPE OF SUPPLY.
7. EACH BAY TRANSFORMER MB SHALL BE FED BY ATLEAST ONE SOURCE FROM ACDB. SECOND SOURCE SHALL BE LOOPED FROM NEAREST BMK & TRANSFORMER MB WHICH SHALL BE FED FROM ANOTHER SOURCE FROM 415V ACDB
8. TRANSDUCERS/AUX. CONTACTS REQUIRED FOR ANALOGUE AND DIGITAL INPUT SHALL BE AN INTEGRAL PART OF LT AC/DC BOARDS.
9. ONE DC 'X' TYPE MODULE IN EACH 220.V DCDB SHALL BE PROVIDED FOR EACH LINE, TRANSFORMER, BUS REACTOR, TBC, BC & BUS-SECTION BAY FOR PRESENT & FUTURE BAYS AS SHOWN IN SUBSTATION SLD.
10. ONE DC 'X' TYPE MODULE IN EACH 48V DCDB SHALL BE PROVIDED FOR EACH LINE BAY FOR PRESENT & FUTURE BAYS AS SHOWN IN SUBSTATION SLD.
11. MODULE 'X' REFERRED ABOVE, IS APPLICABLE WITH DP MCCB, MAXIMUM 2Nos. OF DP MCCB SHALL BE CONSIDED IN ONE MODULE OF OFFERED PANEL.
12. AE (BOOA, ACB) MODULE SHALL HAVE ONLY ACB WITHOUT SEPARATE PROTECTIVE RELAYS. HOWEVER, AUX. RELAYS/CONTACTORS SHALL BE INCLUDED AS PER SCHEME REQUIREMENT.
13. ALL DIGITAL / ANALOG INPUTS/OUTPUTS REQUIRED FOR SAS SHALL BE CONSIDERED.
14. GLAND PLATE SHALL BE OF NON MEGNATIC WHEREAS SINGLE CORE POWER CABLE ARE USED.
15. 8MB TO BMB INTERLOOPING WILL BE DONE BY 1 X 3.5C,70 SQMM CABLE.
16. UNLESS SPECIFIED, SOURCE 1 WILL BE FED FROM BUS 1 AND SOURCE 2 FROM BUS 2.
17. INSTANT OUTAGE OF COLONY LIGHTING IN CASE OF OUTAGE OF SEB FEEDER.
18. RATING OF BUSBAR/FEEDER INDICATED IN THIS DRAWING ARE MIN. REQUIREMENT AND MAY BE INCREASED DRAWING DETAILED ENGINEERING IT FOUND INADEQUATE WITH RESPECT TO OFFERED LOADS/SYSTEM.

LEGEND:-

- DRAW OUT TYPE AIR CIRCUIT BREAKER
- NON DRAW OUT TYPE 4-POLE MCCB
- NON DRAW-OUT 2-POLE MCB
- NON DRAW OUT TYPE 2-POLE MCCB
- NON DRAW OUT AIR BREAK SWITCH
- CONTROL FUSE
- BATTERY LINKS/FUSES

LEGEND:-

50N	:	INSTANTANEOUS EARTH FAULT RELAY (Trippie pole)
50	:	TRIPLE POLE INSTANTANEOUS OVER CURRENT RELAY
51	:	DOUBLE POLE INVERSE DEFINITE MINIMUM TIME RELAY
50/2	:	SINGLE POLE ADJUSTABLE DEFINITE TIME DELAY RELAY FOR MOTOR OVERLOAD ALARM
2	:	TIME DELAY PICKUP RELAY
27X	:	AC DOUBLE POLE INSTANTANEOUS UNDER VOLTAGE RELAY
27	:	DC INSTANTANEOUS UNDER VOLTAGE RELAY
59		DC INSTANTANEOUS OVER VOLTAGE RELAY
96		EARTH LEAKAGE RELAY
51V	:	THREE POLE VOLTAGE CONTROLLED DEFINITE TIME DELAY OVER CURRENT RELAY
87	:	THREE POLE DIFFERENTIAL PROTECTION RELAY
95	:	SINGLE POLE DEFINITE TIME OVER CURRENT RELAY . DG OVER LOAD RELAY

TB-3-395-510-001	SINGLE LINE DIAGRAM FOR 765/400kV JEERAT S/S.
REF. DRG. NO.	TITLE
NOA NO. : MJTL/765kV/ERSS-XVIII/SS01/NOA-I/03(I) & NOA-II/03(II) dated 29.09.2017	
ADDITIONAL INFORMATION W.O.No. 87003	प्राहक/परियोजना का नाम NAME OF CUSTOMER/PROJECT: POWERGRID MEDINIPUR JEERAT TRANSMISSION LIMITED NAME OF CONSULTANT: POWER GRID CORPORATION OF INDIA LIMITED SUBSTATION PACKAGE-SS01 FOR ESTABLISHMENT OF 765/400KV S/S AT MEDINIPUR & JEERAT (NEW) ASSOCIATED WITH TRANSMISSION SYSTEM PROJECT "765kV STRENGTHENING IN EASTERN REGION (ERSS-XVIII)"UNDER TARIFF BASED COMPETITIVE BIDDING (TBCB) ROUTE.
STATUS OF DRAWING: CONTRACT	
DISTRIBUTION OF PRINTS	भारत हेवी इलेक्ट्रिकल्स लिमिटेड सूचनाविज्ञान परियोजना विभाग BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION

	नाम /NAME	हस्ता /SIGN.	दि/DATE
बनाया DRAWN	PK		06.12.17
जाँचा CHECKED	MM		
स्वीकृत APPROVED	DKM		

REV.	DATE	ALTERED / CHECKED / APPROVED
01	16.03.18	PK / MM / DKM
ZONE	DRG. REVISED AS PER POWERGRID COMMENTS DTD. 25.01.18.	

विभाग/DIVISION	TBEM
प्रकल्प/PROJECT	422
शीर्षक/TITLE	SINGLE LINE DIAGRAM FOR LT AC & DC SYSTEM AT JEERAT
अनुपात / SCALE	NTS
कार्ड कोड CARD CODE	
ड्रॉइंग नं./DRAWING NO.	TB-395-510-014
पत्रक सं./SHEET No. 01	आगामी पत्रक/NEXT SHEET --
पुनरी./REV.	01

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPAY

COMPUTER FILE NAME | SIGN. AND DATE | REF. DRG. NO. | INVENTORY NO.

SECTION - 2

2.1 SPECIFIC TECHNICAL REQUIREMENTS:

Modular multi-diameter cable sealing system consisting of frames, blocks and accessories shall be installed where the underground and over ground cables enter or leave concrete bay kiosks/switchyard panel room & control rooms in the substations. Cable sealing system shall consist of multi-diameter type peel-able or adjustable blocks of different sizes to suit the various cables. It should be simple, easy and quick to assemble & re-assemble the cable sealing system.

Solid blocks shall not be used on frame. Frames & stay-plate material shall be of galvanized steel and for compression, single piece wedge with galvanized steel bolts shall be used. 30% spare blocks on the frame shall be provided for expansion in future. Cable sealing system should have been tested for fire/water/smoke tightness.

SECTION-3

PROJECT DETAILS & GENERAL SPECIFICATION

SITE INFORMATION

	Particular	Details	
a)	Owner	POWERGRID	
b)	Customer	POWERGRID	
c)	Project Title	765/400kV Switchyard at Medinipur & Jeerat	
d)	Location	Medinipur West Bengal	Jeerat (new) West Bengal
e)	Transport Facilities	Nearest rail head - Medinipur	Nearest rail head - Kolkata
	SITE CONDITIONS		
a)	Max. ambient air temp.	50°C	
b)	Min. ambient air temp.	0°C	
c)	Max. design ambient emp.	50°C	
d)	Design reference temp.	50°C	
e)	Average Humidity	Max. 100%	
f)	Special corrosion conditions	No	
g)	Solar Radiation		
h)	Atmospheric UV radiation	High	
i)	Altitude above sea level	Less than 1000 meter	
j)	Pollution Severity	High Pollution level	
k)	Seismic Zone	As per the seismic zone defined in the relevant BIS / **IEC-62271-300** but not less than 0.3g horrizontal	
	WIND DATA		
	Wind velocity	50m/s	

	Average No. of thunderstorm days per annum	As per IS
	Main Electrical Parameters:	
	Fault Levels:	**765kV: 50kA for 1 sec** **400kV: 63kA for 1 sec** **66kV : 25kA for 3 sec**
	Creepage Distance	**31mm/kV** for string insulator hardware and **25mm/kV** for Equipment

1.0 GENERAL

This Chapter covers Technical Requirements and requirements of auxiliary items.

a) Equipment furnished shall be complete in every respect with all mountings, fittings, fixtures and standard accessories normally provided with such equipment and/or needed for erection, completion and safe operation of the equipment as required by applicable codes unless included in the list of exclusions.

b) Material and components not specifically stated in this specification but which are necessary for satisfactory operation of the equipment and accessories specified in this specification shall be deemed to be included unless specifically excluded and shall be supplied at no extra cost.

c) Whenever a material or article is specified or described by the name of a particular brand, manufacturer or vendor, the specific name mentioned shall be understood as establishing type, function and quality and not as limiting competition.

d) In case any Deviation Schedule, Bid Proposal Sheet, Schedule of Data Requirements (DRS), test reports or any other document/information are not furnished along-with the bid, the bid is liable to be rejected. Unless brought out clearly, the Bid will be deemed to conform to the specification scrupulously. All deviations from the specification shall be clearly brought out in the respective deviation schedule.

f) The Bidder shall clearly indicate in the bid, the specific standards in accordance with which the works will be carried out.

g) The equipment must be new, of highest grade, the best quality of their kind, to best engineering practice and latest state of art, and in accordance with purpose for which they are intended, ensure satisfactory performance throughout service life.

h) All similar parts of the equipment shall be made to gauge and shall be interchangeable with and shall be made of same materials and workmanship as the corresponding parts of the equipment. Where feasible, common components, units

shall be employed in different pieces of equipment in order to optimize the spare part stock-up and utilization.

i) The requirement regarding external RIV as specified for equipment shall include the terminal fittings and the equipment shall have been tested preferably with fittings, if any.

2.0 SERVICES TO BE PERFORMED BY THE EQUIPMENT BEING FURNISHED

a) The equipment furnished under this specification shall perform all its functions and operate satisfactorily without showing undue strain, restrike etc.

b) The equipment shall be able to withstand forces due to wind load, short circuit, system over voltages, fluctuations, frequency variations etc., all forces considered together.

3.0 STANDARDS

a) The equipment to be furnished under this specification shall conform to latest issue with all amendments of standard specified under respective Chapters of this Specification. The Bidder shall note that standards mentioned in the specification are not mutually exclusive or complete in themselves, but intended to compliment each other. The bidder shall also note that list of standards presented in this specification is not complete. Whenever necessary the list of standards shall be considered in conjunction with specific IS/IEC.When the specific requirements stipulated in the specifications exceed or differ than those required by the applicable standards, the stipulation of the specification shall take precedence.

b) Other internationally accepted standards which ensure equivalent or better performance than that specified in the standards referred shall also be accepted.

c) In case governing standards for the equipment is different from IS or IEC, the salient points of difference shall be clearly brought out in additional information schedule along with English language version of standard or relevant extract of the same. The equipment conforming to standards other than IS/IEC shall be subject to POWERGRID's approval.

4.0 ENGINEERING DATA AND DRAWINGS

4.1 The list of drawings/documents which are to be submitted to the Purchaser shall be discussed and finalised by the Purchaser at the time of award. The supplier shall necessarily submit all the drawings/ documents unless anything is waived.

4.2 The Contractor shall submit 4 (four) sets of drawings/ design documents /data / detailed bill of quantity and 1 (one) set of test reports for the approval of the Purchaser. The contractor shall also submit the softcopy of the above documents in addition to hardcopy.

4.3 Drawings

4.3.1 All drawings submitted by the Contractor shall be in sufficient detail to indicate the type, size, arrangement, material description, Bill of Materials, weight of each component, break-up for packing and shipment, dimensions, internal & the

external connections, fixing arrangement required and any other information specifically requested in the specifications.

4.3.2 Drawings submitted by the Contractor shall be clearly marked with the name of the Purchaser, the unit designation, the specifications title, the specification number and the name of the Project. POWERGRID has standardized a large number of drawings/documents of various make including type test reports which can be used for all projects having similar requirements and in such cases no project specific approval (except for list of applicable drawings alongwith type test reports) is required. However, distribution copies of standard drawings/documents shall be submitted as per provision of the contract. All titles, noting, markings and writings on the drawing shall be in English. All the dimensions should be in SI units.

4.3.3 The review of these data by the Purchaser will cover only general conformance of the data to the specifications and documents, interfaces with the equipment provided under the specifications, external connections and of the dimensions which might affect substation layout. This review by the Purchaser may not indicate a thorough review of all dimensions, quantities and details of the equipment, materials, any devices or items indicated or the accuracy of the information submitted. This review and/or approval by the Purchaser shall not be considered by the Contractor, as limiting any of his responsibilities and liabilities for mistakes and deviations from the requirements, specified under these specifications and documents.

4.4 All manufacturing and fabrication work in connection with the equipment prior to the approval of the drawings shall be at the Contractor's risk. The Contractor may make any changes in the design which are necessary to make the equipment conform to the provisions and intent of the Contract and such changes will again be subject to approval by the Purchaser. Approval of Contractor's drawing or work by the Purchaser shall not relieve the contractor of any of his responsibilities and liabilities under the Contract.

4.5 All engineering data submitted by the Contractor after final process including review and approval by the Purchaser shall form part of the Contract Document and the entire works performed under these specifications shall be performed in strict conformity, unless otherwise expressly requested by the Purchaser in Writing.

4.7 Approval Procedure

The scheduled dates for the submission of the drawings as well as for, any data/information to be furnished by the Purchaser would be discussed and finalised at the time of award. The following schedule shall be followed generally for approval and for providing final documentation.

i)	Approval/comments/ Purchaser on initial	As per agreed by schedule submission
ii)	Resubmission (whenever required)	Within 3 (three) weeks from date of comments
iii)	Approval or comments	Within 3 (three) weeks of receipt of resubmission.
iv)	Furnishing of distribution	2 weeks from the date

copies (5 hard copies per substation and one scanned copy (pdf format) for Corporate Centre)	of approval
v) Furnishing of distribution copies of test reports	
(a) Type test reports (one scanned softcopy in pdf format per substationplus one for corporate centre & one hardcopy per substation)	2 weeks from the date of final approval
(b) Routine Test Reports (one copy for each substation)	-do-
vi) Furnishing of instruction/ (2 copies per substation and one softcopy (pdf format) for corporate centre & per substation)	As per agreed schedule operation manuals
(vii) As built drawings (two sets of hardcopy per substation & one softcopy (pdf format) for corporate centre& per substation)	On completion of entire works

NOTE:

(1) The supplier may please note that all resubmissions must incorporate all comments given in the earlier submission by BHEL/POWERGRID or adequate justification for not incorporating the same must be submitted failing which the submission of documents is likely to be returned.

(2) All drawings should be submitted in softcopy form, however substation design drawings like SLD, GA, all layouts etc. shall also be submitted in AutoCAD Version. SLD, GA & layout drawings shall be submitted for the entire substation in case of substation extension also.

(3) The instruction Manuals shall contain full details of drawings of all equipment being supplied under this contract, their exploded diagrams with complete instructions for storage, handling, erection, commissioning, testing, operation, trouble shooting, servicing and overhauling procedures.

(4) If after the commissioning and initial operation of the substation, the instruction manuals require any modifications/ additions/changes, the same shall be incorporated and the updated final instruction manuals shall be submitted by the supplier to BHEL/POWERGRID.

(5) The manufacturer shall furnish to the Purchaser catalogues of spare parts.

(6) All As-built drawings/documents shall be certified by site indicating the changes before final submission.

6.0 QUALITY ASSURANCE PROGRAMME

6.1 To ensure that the equipment and services under the scope of this Contract whether manufactured or performed within the supplier's Works or at his Sub-contractor's premises or at the Purchaser's site or at any other place of Work are in accordance with the specifications, the supplier shall adopt suitable quality assurance programme to control such activities at all points necessary. The detailed programme shall be submitted by the contractor after the award for reference. A quality assurance programme of the supplier shall generally cover

the following:

(a) His organization structure for the management and implementation of the proposed quality assurance programme:

(b) Documentation control system;

(c) Qualification data for bidder's key personnel;

(d) The procedure for purchases of materials, parts components and selection of sub-Contractor's services including vendor analysis, source inspection, incoming raw material inspection, verification of material purchases etc.

(e) System for shop manufacturing and site erection controls including process controls and fabrication and assembly control;

(f) Control of non-conforming items and system for corrective actions;

(g) Inspection and test procedure both for manufacture and field activities.

(h) Control of calibration and testing of measuring instruments and field activities;

(i) System for indication and appraisal of inspection status;

(j) System for quality audits;

(k) System for authorising release of manufactured product to the Purcahser.

(l) System for maintenance of records;

(m) System for handling storage and delivery; and

(n) A quality plan detailing out the specific quality control measures and procedures adopted for controlling the quality characteristics relevant to each item of equipment furnished and/or services rendered.

POWERGRID/BHEL or his duly authorised representative reserves the right to carry out quality audit and quality surveillance of the system and procedure of the supplier/his vendor's quality management and control activities.

6.2 Quality Assurance Documents

The supplier would be required to submit all the Quality Assurance Documents as stipulated in the Quality Plan at the time of POWERGRID/BHEL inspection of equipment/material

7.0 TYPE TESTING, INSPECTION, TESTING & INSPECTION CERTIFICATE

7.1 All equipment being supplied shall conform to type tests as per technical specification and shall be subject to routine tests in accordance with requirements stipulated under respective sections.

7.2 The reports for all type tests as per technical specification shall be furnished by the supplier alongwith equipment / material drawings. However, type test reports of similar equipments/ material already accepted in POWERGRID shall be applicable for all project with similar requirement. The type tests conducted earlier should have either been conducted in accredited laboratory (accredited based on ISO / IEC Guide 25 / 17025 or EN 45001 by the national accreditation body of the country where laboratory is located) or witnessed by POWERGRID or representative authorized by POWERGRID or Utility or

representative of accredited test lab or reputed consultant.

The test reports submitted shall be of the tests conducted within last 10 (ten) years prior to the date of bid opening i.e. **23.11.16**. In case the test reports are of the test conducted earlier than 10 (ten) years prior to the date of bid opening, the contractor shall repeat these test(s) at no extra cost to BHEL.

However, in case of instrument transformers, the following type tests should have been conducted within 5 (five) years prior to the date of bid opening.

i) Lightning Impulse Test

ii) Switching ImpulseTest

iii) Multiple Chopped Impulse Test (For CT)

iv) Chopped Impulse Test (For CVT)

In case the test reports are of these tests (for instrument transformers) as mentioned above are conducted earlier than 5 (five) years prior to the date of bid opening i.e. **23.11.11**, the contractor shall repeat these test(s) at no extra cost to the purchaser.

Further, in the event of any discrepancy in the test reports i.e. any test report not acceptable due to any design/manufacturing changes (including substitution of components) or due to non-compliance with the requirement stipulated in the Technical Specification or any/all type tests not carried out, same shall be carried out without any additional cost implication to the Purchaser.
The supplier shall intimate the BHEL/POWERGRID the detailed program about the tests atleast two (2) weeks in advance in case of domestic supplies & six (6) weeks in advance in case of foreign supplies.

Further, in case type tests are required to be conducted/repeated and the deputation of Inspector/Purchaser's representative is required, then all the expenses shall be borne by the supplier.

7.3 The Purchaser intends to repeat the type tests on Power Transformer and Shunt Reactor except Dynamic short circuit tests on transformers, for which test charges shall be payable as per provision of contract. The price of conducting type tests shall be included in Bid price and break up of these shall be given in the relevant schedule of Bid Proposal Sheets. These Type test charges would be considered in bid evaluation. In case Bidder does not indicate charges for any of the type tests or does not mention the name of any test in the price schedules, it will be presumed that the particular test has been offered free of charge. Further, in case any Bidder indicates that he shall not carry out a particular test, his offer shall be considered incomplete and shall be liable to be rejected. BHEL/POWERGRID reserves the right to witness any or all the type tests. The BHEL/POWERGRID also reserves the right to waive the repeating of type tests partly or fully and in case of waival, test charges for the same shall not be payable.

The Purchaser shall bear all expenses for deputation of purchaser's representative(s) for witnessing the type tests under this clause except in the case of re-deputation if any, necessitated due to no fault of the purchaser.

For outdoor receptacles, trefoil clamps, diesel engine, alternator, motors, cable glands, lighting fixtures, ACSR/AAC conductor, IPS aluminum tube and

junction boxes, type test reports are not required to be submitted for the makes indicated at Annexure-E /POWERGRID approved list of subvendors. For the new makes(other than those indicated at Annexure-E / POWERGRID approved list of subvendors), type test reports as per relevant standard shall be submitted for POWERGRID's approval.

7.4 The Purchaser, his duly authorised representative and/or outside inspection agency acting on behalf of the Purchaser shall have at all reasonable times free access to the Contractor's/sub-vendors premises or Works and shall have the power at all reasonable times to inspect and examine the materials and workmanship of the Works during its manufacture or erection if part of the Works is being manufactured or assembled at other premises or works, the Contractor shall obtain for the Engineer and for his duly authorised representative permission to inspect as if the works were manufactured or assembled on the Contractor's own premises or works. Inspection may be made at any stage of manufacture, dispatch or at site at the option of the Purchaser and the equipment if found unsatisfactory due to bad workmanship or quality, material is liable to be rejected.

7.5 The supplier shall give the Purchaser /Inspector fifteen (15) days written notice for on-shore and six (6) weeks notice for off-shore material being ready for joint testing including contractor and POWERGRID. Such tests shall be to the Contractor's account except for the expenses of the Inspector. The Purchaser/inspector, unless witnessing of the tests is virtually waived, will attend such tests within fifteen (15) days of the date of which the equipment is notified as being ready for test/inspection, failing which the Contractor may proceed alone with the test which shall be deemed to have been made in the Inspector's presence and he shall forthwith forward to the Inspector duly certified copies of tests in triplicate.

7.6 The Purchaser or Inspector shall, within fifteen (15) days from the date of inspection as defined herein give notice in writing to the Contractor, of any objection to any drawings and all or any equipment and workmanship which in his opinion is not in accordance with the Contract. The Contractor shall give due consideration to such objections and shall either make the modifications that may be necessary to meet the said objections or shall confirm in writing to the Purchaser /Inspector giving reasons therein, that no modifications are necessary to comply with the Contract.

7.7 When the factory tests have been completed at the Contractor's or Sub-Contractor's works, the Purchaser/inspector shall issue a certificate to this effect within fifteen (15) days after completion of tests but if the tests are not witnessed by the Purchaser /Inspector, the certificate shall be issued within fifteen (15) days of receipt of the Contractor's Test certificate by the Engineer/Inspector. Failure of the Purchaser /Inspector to issue such a certificate shall not prevent the Contractor from proceeding with the Works. The completion of these tests or the issue of the certificate shall not bind the Purchaser to accept the equipment should, it, on further tests after erection, be found not to comply with the Contract. The equipment shall be dispatched to site only after approval of test reports and issuance of CIP by the Purchaser.

7.8 In all cases where the Contract provides for tests whether at the premises or at the works of the Contractor or of any Sub-Contractor, the Contractor except where otherwise specified shall provide free of charge such items as labour,

materials, electricity, fuel, water, stores, apparatus and instruments as may be reasonably demanded by the Purchaser /Inspector or his authorised representative to carry out effectively such tests of the equipment in accordance with the Contract and shall give facilities to the Purchaser /Inspector or to his authorised representative to accomplish testing.

7.9 The inspection by Purchaser and issue of Inspection Certificate thereon shall in no way limit the liabilities and responsibilities of the Contractor in respect of the agreed quality assurance programme forming a part of the Contract.

7.10 The Purchaser will have the right of having at his own expenses any other test(s)of reasonable nature carried out at Contractor's premises or at site or in any other place in addition of aforesaid type and routine tests, to satisfy that the material comply with the specification.

7.11The Purchaser reserves the right for getting any field tests not specified in respective sections of the technical specification conducted on the completely assembled equipment at site. The testing equipments for these tests shall be provided by the Purchaser.

8.0 PACKAGING & PROTECTION

8.1 All the equipments shall be suitably protected, coated, covered or boxed and crated to prevent damage or deterioration during transit, handling and storage at Site till the time of erection. On request of the Purchaser, the Contractor shall also submit packing details/associated drawing for any equipment/material under his scope of supply, to facilitate the Purchaser to repack any equipment/material at a later date, in case the need arises. While packing all the materials, the limitation from the point of view of availability of Railway wagon sizes in India should be taken into account. The Contractor shall be responsible for any loss or damage during transportation, handling and storage due to improper packing. Any demurrage, wharfage and other such charges claimed by the transporters, railways etc. shall be to the account of the Contractor. Purchaser takes no responsibility of the availability of the wagons.

8.2 All coated surfaces shall be protected against abrasion, impact, discolouration and any other damages. All exposed threaded portions shall be suitably protected with either a metallic or a non-metallic protecting device. All ends of all valves and pipings and conduit equipment connections shall be properly sealed with suitable devices to protect them from damage.

9.0 FINISHING OF METAL SURFACES

9.1 All metal surfaces shall be subjected to treatment for anti-corrosion protection. All ferrous surfaces for external use unless otherwise stated elsewhere in the specification or specifically agreed, shall be hot-dip galvanized after fabrication. High tensile steel nuts & bolts and spring washers shall be electro galvanized to service condition 4.All steel conductors including those used for earthing/grounding (above ground level) shall also be galvanized according to IS:2629.

9.2 HOT DIP GALVANISING

9.2.1 The minimum wt. of the zinc coating shall be 610 gm/sq.m and minimum

average thickness of coating shall be 86 microns for all items having thickness 6mm and above. For items lower than 6mm thickness requirement of coating thickness shall be as per relevant ASTM. For surface which shall be embedded in concrete, the zinc coating shall be 610 gm/sq. m minimum.

9.2.2 The galvanized surfaces shall consist of a continuous and uniform thick coating of zinc, firmly adhering to the surface of steel. The finished surface shall be clean and smooth and shall be free from defects like discoloured patches, bare spots, unevenness of coating, spelter which is loosely attached to the steel globules, spiky deposits, blistered surface, flaking or peeling off, etc. The presence of any of these defects noticed on visual or microscopic inspection shall render the material liable to rejection.

9.2.3 After galvanizing. no drilling or welding shall be performed on the galvanized parts of the equipment excepting that nuts may be threaded after galvanizing. Sodium dichromate treatment shall be provided to avoid formation of white rust after hot dip galvanization.

9.2.4 The galvanized steel shall be subjected to six one minute dips in copper sulphate solution as per IS-2633.

9.2.5 Sharp edges with radii less than 2.5 mm shall be able to withstand four immersions of the Standard Preece test. All other coatings shall withstand six immersions. The following galvanizing tests should essentially be performed as per relevant Indian Standards.

- Coating thickness
- Uniformity of zinc
- Adhesion test
- Mass of zinc coating

9.2.6 Galvanised material must be transported properly to ensure that galvanised surfaces are not damaged during transit. Application of zinc rich paint at site shall not be allowed.

ANNEXURE - A
SCHEDULE OF TECHNICAL DEVIATIONS

Bidder shall list below all technical deviation clause wise w.r.t. tender specifications:

S.No.	Page No.	Clause No.	Deviation	Reason / ustification

Any deviation not specifically brought out in this section shall not be admissible for any commercial implication at later stage. Except to the technical deviations listed in this schedule, bidder s offer shall be considered in full compliance to the tender specifications irrespective of any such deviation indicated / taken elsewhere in the submitted offer.

Date: Tenderer s Stamp Signature

1. gorav@bhel.in / muneet@bhel.in
2. archanak@bhel.in / akchowdhary@bhel.in
3. _____ -
4. , ,
5. Project Status: Domestic. GST applicable.
6. Integrity Pact ï Not Applicable.
7. Permissible Technical Deviations: No permissible Technical Deviation has been envisaged.
8. Clause No. ï 7 - If no option is specified, by default option ï B shall be considered for confirmation.
9. **The link for Online Supplier registration Portal is https://supplier.bhel.in/.**

Clause No. 33 for Reverse Auction of NIT shall be as follows:

"BHEL reserves the right to go for Reverse Auction (RA) (Guidelines as available on www.bhel.com) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. Bidders to give their acceptance with the offer for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides to go for RA.

Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit 'Process compliance form' (to the designated service provider) as well as 'Online sealed bid' in the Reverse Auction. Non-submission of 'Process compliance form' or 'Online sealed bid' by the agreed bidder(s) will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com).

The bidders have to necessarily submit online sealed bid less than or equal to their envelope sealed price bid already submitted to BHEL along with the offer.

The envelope sealed price bid of successful L1 bidder in RA, if conducted, shall also be opened after RA and the order will be placed on lower of the two bids (RA closing price & envelope sealed price) thus obtained. The bidder having submitted this offer specifically agrees to this condition and undertakes to execute the contract on thus awarded rates.

If it is found that L1 bidder has quoted higher in online sealed bid in comparison to envelope sealed bid for any item(s), the bidder will be issued a warning letter to this effect. However, if the same bidder again defaults on this count in any subsequent tender in the unit, it will be considered as fraud and will

invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com)."

As a reminder to the bidders, system will flash following message (in RED Color) during the course of ôonline sealed bidô

"Bidders to submit online sealed bid less than or equal to their envelope sealed bid already submitted to BHEL"

Pre-Qualification Criteria- –

Commercial: Vendor should be approved from POWERGRID as on date of original Techno – Commercial bid opening.

–

–

13. **Clause No. – 17 of GTC: - Tender Evaluation - Comparative statement shall be prepared and evaluated on total cost basis at destination /site on overall quantity basis for both the projects. However, POs shall be placed separately.**
14. **To promote Make in India as per govt. guideline following clause has been added:**

It is mandatory for bidder to submit the enclosed format duly filled, signed and stamped by their authorized person.

Following confirmation to be provided by vendor:

"We confirm that we have quoted as per specified price format provided along with this tender".

Name:

Signature:

Stamp:

Item Name :	**CABLE TRANSIT SYSTEM**
Enquiry No. :	**79G2000125**
Project :	**PGCIL MEDINIPUR AND JEERAT**
Type of project	**TRANSMISSION**
Applicable percentage of Local Content	**50%**

Format for Affidavit of Self certification regarding Minimum Local Content in line with PPP-MII order, 2017 if applicable, to be provided on a non-judicial stamp paper of Rs. 100/-.

Date: / /2019

I _____S/o, D/o, W/o, _____Resident of_____ hereby solemnly affirm and declare as under:

That I will agree to abide by the terms and conditions of the Public Procurement (Preference to Make in India) Order, 2017 (*hereinafter PPP-MII order*) of Government of India issued vide Notification No:P-45021/2/2017 -BE-II dated 15/06/2017, its revision dated 28/05/2018 and any subsequent modifications/Amendments, if any and

That the information furnished hereinafter is correct to the best of my knowledge and belief and I undertake to produce relevant records before the procuring entity/BHEL or any other Government authority for the purpose of assessing the local content of goods/services/works supplied by me for ……. *(Enter the name of the Equipment/Item for Project).*

That the local content for all inputs which constitute the said goods/services/works has been verified by me and I am responsible for the correctness of the claims made therein.

That the goods/services/works supplied by me for ……. *(Enter the name of the Equipment/Item for Project)* meets the 'Minimum Local Content 'as defined in the PPP-MII order.

That the value addition for the purpose of meeting the 'Minimum Local Content 'has been made by me at …… (*Enter the details of the location(s) at which value addition is made).*

That in the event of the local content of the goods/services/works mentioned herein is found to be incorrect and not meeting the prescribed Minimum Local Content criteria, based on the assessment of procuring agency (ies)/BHEL/Government Authorities for the purpose of assessing the local content, action shall be taken against me in line with the PPP-MII order and provisions of the Integrity pact/ Bidding Documents.

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

X
Samrat Jain
Assistant Manager (CS-GI)

i Name and details of the Local Supplier
(Registered Office, Manufacturing unit location, nature of legal entity)

ii. Date on which this certificate is issued

iii. Goods/services/works for which the certificate is produced

iv. Procuring entity to whom the certificate is furnished

v. Percentage of local content claimed and whether it meets the Minimum Local Content prescribed

vi. Name and contact details of the unit of the Local Supplier (s)

vii. Sale Price of the product

viii Ex-Factory Price of the product

ix. Freight, insurance and handling

x. Total Bill of Material

xi List and total cost value of input used to manufacture the Goods/to provide services/in construction of works

xii. List and total cost of input which are domestically sourced. Value addition certificates from suppliers, if the input is not in-house to be attached

xiii. List and cost of inputs which are imported, directly or indirectly

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

Authorized signatory (To be duly authorized by the Board of Directors)
<Insert Name, Designation and Contact No.>

X
Samrat Jain
Assistant Manager (CS-GI)

SCHEDULE OF COMMERCIAL DEVIATION

TENDER ENQUIRY NO. - 79G2000125 dated 23/08/2019

The following are the devitions/ variations exception from the General Terms and Conditions:

SL.NO.	CLAUSE NO. OF GENERAL TERMS AND CONDITIONS	STATEMENT OF DEVIATION

In case, this schedule is not submitted, it will be presumed that the equipment /material to be supplied under this contract is deemed to be in compliance with the Gerneal Terms and Conditions.

If there is NIL deviation,even then the format to be filled as NIL DEVIATION.

Note : Continuation Sheets of like size and format may be used as per the Bidder's Requirement and shall be annexed to this schedule.

All deviations must be mentioned in this format only. Deviation(s) to terms mentioned else where will not be considered.

Signature of the authorised representative of

Place: …….

Date : …….

Bidder's name :…….

Designation:……..

Company Seal:…….

SCHEDULE OF TECHNICAL DEVIATION

TENDER ENQUIRY NO. - 79G2000125 dated 23/08/2019

The following are the devitions/ variations exception from the Technical Specifications:

SL.NO.	CLAUSE NO. OF GENERAL TERMS AND CONDITIONS	STATEMENT OF DEVIATION

In case, this schedule is not submitted, it will be presumed that the equipment /material to be supplied under this contract is deemed to be in compliance with the Technical Specifications,

If there is NIL deviation,even then the format to be filled as NIL DEVIATION.

Note : Continuation Sheets of like size and format may be used as per the Bidder's Requirement and shall be annexed to this schedule.

All deviations must be mentioned in this format only. Deviation(s) to terms mentioned else where will not be considered.

Signature of the authorised representative of

Place: é é é é é é é

Date : é é é é é é é .

Bidder's name :é é é é é é é é é é é é é é é é

Designation:é é é é é é é é é é é é é é é é ..

Company Seal:é é é é é é é é é é é é é é é

SCHEDULE OF PRICE / UNPRICE

(BIDDER TO STRICTLY ENSURE SUBMITTING THE PRICE BIDS IN THIS FORMAT)

VENDOR NAME / OFFER REF:

MENTION THE WORKS FROM WHICH MATERIAL SHALL BE SUPPLIED -

ENQUIRY No. - 79G2000125 dated 23/08/2019

	S.No.	Description of Item	HSN Code	Unit	Quantity	Unit Price Ex-works (Rs.)	Total Ex-Works (Rs.)	GST @__on Ex Works	Unit Freight	Total Freight	GST @__ on Freight	Unit Insurance	Total Insurance	GST @__ on Insurance	TOTAL (FOR Destination) PRICE (Rs.)
	1	SUPPLY- CABLE TRANSIT SYSTEM : MODULES CONSISTING OF PEELABLE / ADJUSTABLE BLOCKS		SQM TR	5.8										
	2	SUPPLY- CABLE TRANSIT SYSTEM : FRAME FOR FIRE FIGHTING PUMP HOUSE (FFPH)		LOT	1										
	3	SUPPLY- CABLE TRANSIT SYSTEM : FRAME FOR CONTROL ROOM BUILDING		LOT	3										
	4	SUPPLY- CABLE TRANSIT SYSTEM : FRAME FOR AUXILIARY BUILDING		LOT	3										
	5	SUPPLY- CABLE TRANSIT SYSTEM : FRAME FOR 765KV SWITCHYARD PANEL ROOM (SPR)		LOT	8										
	6	SUPPLY- CABLE TRANSIT SYSTEM : FRAME FOR 400KV SWITCHYARD PANEL ROOM (SPR)		LOT	8										
		TOTAL PRICE FOR SUPPLY (in figures)													
		TOTAL PRICE FOR SUPPLY (in words)													
		FOR SERVICES				Unit Price	Total Price	Rate of GST							
	1	SERVICES- CABLE TRANSIT SYSTEM : INSTALLATION OF CABLE TRANSIT SYSTEM		Lot	1										
		TOTAL PRICE FOR SERVICES (in figures)													
		TOTAL PRICE FOR SERVICES (in words)													
		Total cost to BHEL for both supply & Services (in figures)													
		Total cost to BHEL for both supply & Services (in words)													

BREAK UP FOR BID PRICE SCHEDULE TO BE SUBMITTED AS PER TECHNICAL SPECIFICATION

1. It is certified that M/s _____ have quoted as per the specified price format of the tender, otherwise offer shall be liable for rejection.
2. PLEASE NOTE THAT UNPRICED COPY OF PRICE BID (i.e. WITH ALL PRICE BLANKED) SHALL BE FURNISHED ALONGWITH TECHNO-COMMERCIAL BID.
3. Vendor to mention the word "QUOTED" against each item in UNPRICED SCHEDULE.

SEAL & SIGNATURE OF TENDERER

SCHEDULE OF PRICE / UNPRICE

(BIDDER TO STRICTLY ENSURE SUBMITTING THE PRICE BIDS IN THIS FORMAT)

VENDOR NAME / OFFER REF:

MENTION THE WORKS FROM WHICH MATERIAL SHALL BE SUPPLIED -

ENQUIRY No. - 79G2000125 dated 23/08/2019

	S.No.	Description of Item	HSN Code	Unit	Quantity	Unit Price Ex-works (Rs.)	Total Ex-Works (Rs.)	GST @__on Ex Works	Unit Freight	Total Freight	GST @__ on Freight	Unit Insurance	Total Insurance	GST @__ on Insurance	TOTAL (FOR Destination) PRICE (Rs.)
	1	SUPPLY- CABLE TRANSIT SYSTEM : MODULES CONSISTING OF PEELABLE / ADJUSTABLE BLOCKS		SQM TR	5.5										
	2	SUPPLY- CABLE TRANSIT SYSTEM : FRAME FOR FIRE FIGHTING PUMP HOUSE (FFPH)		LOT	1										
	3	SUPPLY- CABLE TRANSIT SYSTEM : FRAME FOR CONTROL ROOM BUILDING		LOT	3										
	4	SUPPLY- CABLE TRANSIT SYSTEM : FRAME FOR AUXILIARY BUILDING		LOT	3										
	5	SUPPLY- CABLE TRANSIT SYSTEM : FRAME FOR 765KV SWITCHYARD PANEL ROOM (SPR)		LOT	6										
	6	SUPPLY- CABLE TRANSIT SYSTEM : FRAME FOR 400KV SWITCHYARD PANEL ROOM (SPR)		LOT	6										
		TOTAL PRICE FOR SUPPLY (in figures)													
		TOTAL PRICE FOR SUPPLY (in words)													
		FOR SERVICES				Unit Price	Total Price	Rate of GST							
	1	SERVICES- CABLE TRANSIT SYSTEM : INSTALLATION OF CABLE TRANSIT SYSTEM		Lot	1										
		TOTAL PRICE FOR SERVICES (in figures)													
		TOTAL PRICE FOR SERVICES (in words)													
		Total cost to BHEL for both supply & Services (in figures)													
		Total cost to BHEL for both supply & Services (in words)													

BREAK UP FOR BID PRICE SCHEDULE TO BE SUBMITTED AS PER TECHNICAL SPECIFICATION

1. It is certified that M/s _____ have quoted as per the specified price format of the tender, otherwise offer shall be liable for rejection.
2. PLEASE NOTE THAT UNPRICED COPY OF PRICE BID (i.e. WITH ALL PRICE BLANKED) SHALL BE FURNISHED ALONGWITH TECHNO-COMMERCIAL BID.
3. Vendor to mention the word "QUOTED" against each item in UNPRICED SCHEDULE.

SEAL & SIGNATURE OF TENDERER