



ಭಾರತ್ ಹವಿ ಎಲೆಕ್ಟ್ರಿಕಲ್ಸ್ ಲಿಮಿಟೆಡ್  
भारत हेवी इलेक्ट्रिकल्स लिमिटेड

## **Bharat Heavy Electricals Limited**

(A Government of India Undertaking)

**ELECTRONICS DIVISION**

**P.B No. 2606, Mysore Road, Bangalore - 560 026**

Phone: 080 – 26998693 / 26998445, Fax: 080 – 26989217 / 26989222, email id: [extservices@bheledn.co.in](mailto:extservices@bheledn.co.in)

Dear Sirs,

**Sub : Tender enquiry for sub-contract work of R&M - Erection & Commissioning support for DVR (Regulation Cubicle) panel at NPCIL-Rawatbhata Atomic Power Station, Unit-4 (237.7 MW).**

**Tender Enquiry Number : CE/ES/2017-18/09/NPCIL-RAPS-U#4/DVR/RK**  
**Tender date : 21.09.2017**  
**Tender due Date and Time : 11.10.2017 13:00 Hrs.**

Sealed tenders in single part are invited for taking up the subject contract work of Erection and Commissioning support of DVR (Regulation Cubicle-Suite of 2 panel). The following details may be carefully studied and considered in responding to the enquiry.

1. No extension of time will be given for submission of offer under any circumstances.
2. Offer cover shall be super scribed with the “**Tender Enquiry number, due date and time**”.
3. Offer can be sent by post/courier addressed to the **Addl. General Manager/ External Services Department, BHEL-EDN, P.B.No.2606, Mysore Road, Bangalore – 560 026** so as to reach us before the due date and time.
4. Offers will be opened at Tender opening room situated near Reception, BHEL-EDN, Bangalore on **11.10.2017 at 13:30 hours** in the presence of bidder who wish to be present.
5. The tender is for ONE no. of DVR (Regulation) panel. (Refer page 8 of 12)
6. The validity of offer shall be for 90 days from the date of opening.
7. The prices quoted shall be FIRM. No escalation in price/s will be allowed.
8. GST, if applicable, will be paid extra on submission of GST registration certificate / details.
9. The tender is likely to be finalized in a very short time.
10. The bidder is advised to visit the project site to familiarize themselves with the project site conditions.
11. The total estimated value of work is Rs. 1, 80,000 (Rupees One Lakh Eighty Thousand) excluding of GST.
12. The estimated time for completion of work is 20 days or in line with NPCIL-RAPS schedule for unit shut down and re-synchronising of the unit whichever is earlier.



13. Advance payment and interim payment will **not** be paid to the Contractor.
14. For any clarification on this tender, Sr. Engineer / External Services may please be contacted on phone no. 080-26998387 / 26998445 / 9741988667 / 7816877773, Fax no. 080-26989222 / 26989217, email id: [extservices@bheledn.co.in](mailto:extservices@bheledn.co.in) OR [riteshkumar@bheledn.co.in](mailto:riteshkumar@bheledn.co.in) or [sunilkumarv@bheledn.co.in](mailto:sunilkumarv@bheledn.co.in)

Enquiry comprising of following documents are issued herewith:

- a) Section 1: Special Instructions
- b) Section 2: Scope of Work
- c) Section 3: Schedule of price (offer)
- d) Section 4: Special conditions of contract.
- e) Section 5: No deviation certificate.
- f) Section 6: List of Drawing.

Kindly acknowledge receipt of this tender enquiry. In case bidder does not want to quote against this enquiry, a written communication may please be sent to the undersigned before the tender opening date and time.

BHEL reserves the right to cancel or reject the offer either partly or in full without assigning any reasons thereof.

Thanking you,

Yours Faithfully,  
For & On behalf of BHEL-EDN

(RITESH KUMAR)  
SR. ENGINEER / EXTERNAL SERVICES

**SECTION 1**  
**SPECIAL INSTRUCTIONS**

1. The offer shall be submitted in a single part in a sealed envelope prominently **super scribing** the “**Tender Enquiry Number and due date**” as mentioned in the covering letter.
2. The bidder is requested to carefully and thoroughly read the instructions/ documents sent to them. For any further clarifications BHEL EDN may be contacted.
3. The bidder is advised to visit project site to familiarize themselves with the site conditions before preparing the offer.
4. **EARNEST MONEY DEPOSIT (EMD):**
  - a. EMD of **₹3,600.00** (RUPEES THREE THOUSAND SIX HUNDRED ONLY) in the form of **crossed DEMAND DRAFT** drawn in favour of “**BHEL-Electronics Division, Bangalore**” payable at Bangalore shall be sent along with the bid. EMD in any other form will not be accepted.
  - b. EMD shall not carry any interest.
  - c. EMD by the tenderer will be forfeited if after opening the tender, the tenderer revokes his tender within the validity period or increases the rates w.r.t earlier quoted rates.
  - d. EMD by tenderer will be forfeited if the tenderer fail to deposit the required security deposit or does not commence the work within the period as per LOI / contract.
  - e. EMD given by all unsuccessful tenderers shall be refunded normally within thirty days of acceptance of award of work by the successful tenderer & tenderer should have submitted required formats (NEFT form certified by Bank Manager in original) for EFT mode of payment along with a crossed cancelled Cheque.
5. Security deposit @ 5% of the contract value (including GST) shall be paid by the successful bidder. The successful bidder has option to pay a minimum of 50% of the SD amount by pay order or demand draft in favour of BHEL, payable at Bangalore before start of work and balance 50% can be recovered while releasing the payment for work carried out.
6. The security deposit shall not carry any interest.
7. The Contractor will have to submit a certificate to BHEL declaring that the Contractor has complied with all the statutory provisions including and pertaining to Provident fund during the execution period of the contract.
8. Security Deposit amount will be returned after 90 days from the date of successful completion of work as per the contract after duly certified by BHEL Site Engineer and on receipt of compliance certificate (as per Sl. No. 7 above).
9. Workmanship guarantee is applicable for a period of 90 days from the date of successful completion of work. Any rectification work to be carried out during the guarantee period shall be carried out at free of cost.



10. The Contractor shall mobilize his men, materials, tools & tackles to site immediately from the date of intimation from BHEL or release of LOI / WO.
11. In addition to the local laws and regulations the bidder shall also comply with the Minimum Wages Act. The Payment of Wages Act and the rules made there under in respect of labour currently employed on or connected with the contract shall be followed.
12. A declaration indicating that there is no deviation from the conditions mentioned in tender documents should be given in the format as per section 6.
13. Bidder shall return one set of this tender document with each page duly signed & stamped by them to BHEL along with their offer.
14. The work will be started from last week of October 2017 (tentatively) and to be completed as per the BHEL's / NPCIL-RAPS requirement / Shutdown schedule.
15. Payment term: 100% payment (less 50% of SD amount, as applicable if the total SD amount is not received) will be released within 30 days from the date of receipt of bill at BHEL-EDN, Bangalore on completion of work and certification by BHEL site Engineer or BHEL-Customer. Bill shall be forwarded to BHEL-EDN, Bangalore for process and release of payment will be from BHEL EDN Bangalore. .
16. Mode of payment: Payment will be made by EFT and the charges shall be borne by the Contractor. The Contractor will be required to submit NEFT mandate form duly certified by bank for EFT mode of payment along with a crossed cancelled Cheque.
17. No claim certificate to be submitted along with the invoice for payment
18. GST, if applicable, shall be paid extra. A copy of GST registration certificate shall be enclosed with the offer.
19. Income tax plus surcharge as applicable will be deducted from the gross amount of each bill. Please indicate the IT PAN and a copy of PAN Card be submitted with the offer

**SECTION 2**

**ERECTION & COMMISSIONING SUPPORT FOR DVR (REGULATION CUBICLE ONLY) PANEL AT NPCIL-RAWATBHATA ATOMIC POWER STATION, UNIT-2 (237.7 MW).**

**A) SCOPE OF WORK.**

S.No	DESCRIPTION OF JOB
1	DISMANTLING OF EXISTING REGULATION CUBICLE - SUITE OF 2 PANELS (INCLUDING DISCONNECTION OF EXISTING POWER AND CONTROL CABLES), SHIFTING TO CUSTOMER DESIGNATED PLACE / STORE.
2.	REMOVAL OF PULSE FINAL STAGE RACKS IN THYRISTOR CUBICLES, MOUNTING OF NEW PULSE TRANSFORMERS. INTERNAL WIRING MODIFICATIONS IN FF, FB AND THYRISTOR PANEL.
3.	SHIFTING OF NEW DVR-REGULATION CUBICLE (SUITE OF 2 PANELS) FROM STORAGE PLACE TO THE PLACE OF ERECTION, INSTALLATION OF CUBICLES. MINOR CIVIL WORK AS REQUIRED FOR ERECTION (PREPARATION OF FOUNDATION) FOR MOUNTING OF NEW PANELS / GROUTING OF FOUNDATION BOLTS OR WELDING TO BASE FRAME.
4.	LAYING OF PRE-FABRICATED CABLE WITH CIRCULAR POLE CONNECTORS, PULSE CABLES BETWEEN REGULATION, FIELD SUPPRESSION, AND THYRISTOR (EXISTING) PANELS. OTHER NECESSARY CABLES LAYING, RE-ROUTING OF CABLES IN BETWEEN THE PANELS IF REQUIRED.
5.	DRILLING OF HOLES IN THE GLAND PLATE, GLANDING OF CABLES AND PUTTING METALLIC CABLE TAGS. INTERCONNECTION OF ALL CABLES (POWER, TRIAXIAL, PRE-FABRICATED AND CONTROL CABLES), LAYING OF NEW CABLES (IF REQUIRED). TERMINATION WORK & SUPPLY OF CONSUMABLES LIKE FERRULES (PRINTED/HARD), LUGS, GLANDS (DOUBLE COMPRESSION) FOR TERMINATIONS. EXCITATION PANELS EARTHING ETC.
6.	MODIFICATION IN CONTROL DESK, DRILLING HOLES, MOUNTING OF PUSH BUTTONS, CONTROL SWITCHES, ANNUNCIATOR, LAMPS, METERS ETC ON CONTROL ROOM / DESK
7.	CONTINGENCY FOR JOB NOT SPECIFIED (EARTH PIT, BREAKING OF WALLS, CRANE HIRE CHARGES ETC.) BUT RELEVANT TO WORK IN ORDER TO COMPLETE THE JOB
8.	PROVIDING MAN POWER DURING PRE-COMMISSIONING AND COMMISSIONING CHECKS/TILL THE COMPLETION OF WORK. BASIC TOOLS AND TACKLES REQUIRED DURING THE TESTING SUCH AS MULTIMETER, SOLDERING IRON, SCREW DRIVER SET, POWER SUPPLY BOARD ETC. REQUIRED FOR SMOOTH CONDUCT OF TESTING OF EQUIPMENT.

## B) OTHER WORKS:

- Assistance for verification of materials at site.
- Minor civil works for erection of panels including base frame fabrication/ modification as required. Fixing of foundation bolts and welding of base frame as required.
- Cable dressing / tagging etc.,
- Panel earthing.
- Removal of related debris and cleaning of area
- Any other minor work for satisfactory completion of contract

## C) MAN POWER:

Supervisor, Electricians/Technicians and Helpers are to be provided to assist BHEL site engineer during testing, modifications and commissioning of DAVR System.

## D) SUPPLY OF MATERIALS:

Consumables for cable laying & termination such as ferrules (Printed), lugs (Snap – on type 1.5 & 2.5 Sq.mm size, Ring type (M4) size) small ring – Size 1.5 & 2.5 Sq.mm size, tubular, Pin type etc.) cable ties, tags, clamps, Cable glands (2 to 5 Nos.) – Size as required etc. as per the requirement to be procured and used by the Contractor at no extra cost to BHEL.

**E) All tools & tackles** required for carrying out the erection and commissioning work to be arranged by the Contractor including the following instruments / tools:

- i) Megger 0-1KV – 1no.
- ii) Digital Multimeter – 2 nos.
- iii) 3 phase Variac 5A - , 1 no.
- iv) 3 Phase Variac 15A – 1 no.
- v) Rheostat 5A – 3 nos.
- vi) Tong tester 0-5A – 1no.
- vii) Ferrule Printing machine with printing tube (10 mtrs) – 1 set
- viii) Hole saw cutter for mounting Push buttons & Lamps in control desk.

Security of all the materials during erection of the equipment till the commissioning is in the scope of Contractor. Any damage due to improper handling / misplacement / loss of material during the job execution will be recovered from the Contractor in full.

Any other associated minor works required for the satisfactory completion of erection and commissioning of the system is in the scope of the Contractor even if it is not exclusively mentioned in the scope of work.

Being shutdown job, this work has to be completed within 15-20 days as said in point 13 (page 2 of 12) and shall be started during last week of October 2017 (tentatively).

The Contractor should be able to depute required manpower as desired by BHEL Site Engineer intimation.

**SECTION – 3**

SCHEDULE OF PRICE

QUOTED AMOUNT FOR DISMANTLING OF EXISTING REGULATION CUBICLE AND ERECTION & COMMISSIONING SUPPORT OF NEW DVR REGULATION PANEL (REGULATION 1 & 2) AT NPCIL – RAPS, Unit-4 (237.7MW).

S.No	DESCRIPTION OF JOB	Quoted Amount (Rs.)
1	DISMANTLING OF EXISTING REGULATION CUBICLE - SUITE OF 2 PANELS (INCLUDING DISCONNECTION OF EXISTING POWER AND CONTROL CABLES), SHIFTING TO CUSTOMER DESIGNATED PLACE / STORE.	
2.	REMOVAL OF PULSE FINAL STAGE RACKS IN THYRISTOR CUBICLES, MOUNTING OF NEW PULSE TRANSFORMERS. INTERNAL WIRING MODIFICATIONS IN FF, FB AND THYRISTOR PANEL.	
3.	SHIFTING OF NEW DVR-REGULATION CUBICLE (SUITE OF 2 PANELS) FROM STORAGE PLACE TO THE PLACE OF ERECTION, INSTALLATION OF CUBICLES. MINOR CIVIL WORK AS REQUIRED FOR ERECTION (PREPARATION OF FOUNDATION) FOR MOUNTING OF NEW PANELS / GROUTING OF FOUNDATION BOLTS OR WELDING TO BASE FRAME.	
4.	LAYING OF PRE-FABRICATED CABLE WITH CIRCULAR POLE CONNECTORS, PULSE CABLES BETWEEN REGULATION, FIELD SUPPRESSION, AND THYRISTOR (EXISTING) PANELS. OTHER NECESSARY CABLES LAYING, RE-ROUTING OF CABLES IN BETWEEN THE PANELS IF REQUIRED.	
5.	DRILLING OF HOLES IN THE GLAND PLATE, GLANDING OF CABLES AND PUTTING METALLIC CABLE TAGS. INTERCONNECTION OF ALL CABLES (POWER, TRIAXIAL, PRE-FABRICATED AND CONTROL CABLES), LAYING OF NEW CABLES (IF REQUIRED). TERMINATION WORK & SUPPLY OF CONSUMABLES LIKE FERRULES (PRINTED/HARD), LUGS, GLANDS (DOUBLE COMPRESSION) FOR TERMINATIONS. EXCITATION PANELS EARTHING ETC.	
6.	MODIFICATION IN CONTROL DESK, DRILLING HOLES, MOUNTING OF PUSH BUTTONS, CONTROL SWITCHES, ANNUNCIATOR, LAMPS, METERS ETC ON CONTROL ROOM / DESK	
7.	CONTINGENCY FOR JOB NOT SPECIFIED (EARTH PIT, BREAKING OF WALLS, CRANE HIRE CHARGES ETC.) BUT RELEVANT TO WORK IN ORDER TO COMPLETE THE JOB	
8.	PROVIDING MAN POWER DURING PRE-COMMISSIONING AND COMMISSIONING CHECKS/TILL THE COMPLETION OF WORK. BASIC TOOLS AND TACKLES REQUIRED DURING THE TESTING SUCH AS MULTIMETER, SOLDERING IRON, SCREW DRIVER SET, POWER SUPPLY BOARD ETC. REQUIRED FOR SMOOTH CONDUCT OF TESTING OF EQUIPMENT.	
	<b>TOTAL (Rs.):</b>	



I) TOTAL AMOUNT IN WORDS:

GST Number: \_\_\_\_\_

GST @ \_\_\_\_\_ (%) PERCENTAGE

GST AMOUNT: Rs. \_\_\_\_\_

TOTAL AMOUNT IN FIGURES (INCLUDING GST) IS: Rs. \_\_\_\_\_

TOTAL AMOUNT IN WORDS (INCLUDING GST) IS: Rs. \_\_\_\_\_

\_\_\_\_\_

(SIGNATURE WITH SEAL OF THE CONTRACTOR)

## **SECTION 4**

### **SPECIAL CONDITIONS OF CONTRACT**

The work is to be executed at NPCIL-Rawatbhata Atomic Power Station, Rajasthan for Unit-4 (237.7 MW).

1. The Contractors shall get themselves familiar with the site and nature of job in advance where the works is to be executed before quoting their rates.
2. Apart from GST any other govt. taxes as applicable from time to time shall be borne by the Contractor.
3. The Contractor shall arrange to obtain valid gate passes for his men and equipment's from the concerned authorities.
4. No man / material / equipment not covered by valid gate pass shall be permitted within the power station area and no material / equipment shall be permitted to be taken out of the nuclear power station unless authorized by concerned authority. The Contractor shall be held fully responsible for any delays / losses / damages that may result consequent on any lapses that may occur on the part of his employees in this regard.
5. Carrying / striking of matches, lighters or smoking or other acts which may cause fire hazards in the restricted area of power station such as Hydrogen plants, Hydrogen storage area, fuel oil plant / storage areas etc. is strictly prohibited.
6. In the prescribed areas of nuclear power station no hot work such as welding, gas cutting etc., which may cause fire hazards shall be carried out unless valid gas safety / fire permit is obtained from the BHEL site Engineer and necessary precautions are taken to avoid any risk of fire hazards.
7. The Contractor shall compulsorily provide Personal Protective Equipment's (PPE's) to his employees as per the NPCIL safety standards/ guidelines & in the event of not providing the same by date specified by Customer or as mentioned in contract, it will be provided by BHEL/NPCIL-RAPS at Contractor's risk and cost of the same will be recovered from the bill/s.
8. All necessary personal safety equipment as considered adequate by the BHEL site Engineer or the safety officer of NPCIL-RAPS should be made available at Contractor's cost for use by the persons employed at the site and be maintained in a condition suitable for immediate use. The Contractor should also give sufficient safety training and instructions to his workmen and ensure proper use of safety equipment by those concerned.
9. The Contractor shall obtain permission from appropriate authority / license if required under any applicable law regulations for engaging labours for execution of the work and observe all terms and conditions of the said authorization / license.
10. The Contractor shall comply with the provision of all applicable labour legislation / Acts pertaining to payment of wages and shall pay his workers wages not less than minimum as applicable in NPCIL-RAPS premises.

11. The Contractor has to make his own arrangement for T&P safety appliances and consumables required for the above job.
12. The work shall be executed as per the direction and to the satisfaction of BHEL site Engineer. Decision of BHEL site Engineer will be firm and binding on all matters.
13. Any person below the age of 18 years shall not be deployed for the work.
14. The Contractor shall be required to pay full wages to the workers as per prevailing rules.
15. If the Contractor fails to deploy required numbers of labors as per the terms of contract, then recovery @ double the minimum wages of unskilled labour shall be effected for number of labours less than the specified requirement, if not specially mentioned otherwise.
16. The Contractor has to comply fully with the safety requirement of the NPCIL-RAPS premises.
17. The Contractor shall possess Independent PF code and ESI code. Contractor has to observe all formalities as per PF & ESI act or Workmen Compensation Insurance, as applicable.
18. The Contractor shall be liable to comply with provisions under the various labour legislations. Besides other obligations under the labour legislations he is required to ensure payment of minimum wages as per Minimum Wages Act, grant of leaves, as per the notification of Chief labour commissioner, Provident fund under the Provident Fund Act, compensation under the workmen compensation Act, Retrenchment compensation etc. The Contractor shall indemnify BHEL as well as NPCIL RAPS against all claims, damages and compensations on account of his failure to comply with statutory provisions.
19. The Contractor shall not subcontract, transfer or assign any part or full work of this award without prior written permission from BHEL.
20. In case of any conflict amongst the various drawings and other tender documents, the decision of the BHEL site Engineer shall be final and binding.
21. If any dispute or difference of any kind whatsoever shall arise between BHEL-EDN and the Contractor arising out of the contract or with respect to its interpretation, whether during or after its completion or whether before or after its termination, abandonment or breach of the contract, it shall be referred to the sole arbitration of the Unit head of BHEL-EDN or any Officer duly authorized by him in this behalf and the decision of the Arbitrator shall be final and binding on the parties.
22. It would be the responsibility of the Contractor to give weekly off and other holidays to their employees as applicable at the place of working (NPCIL-RAPS).
23. As per NPCIL-RAPS statutory requirement, the Contractor and their workers shall follow all safety rules while working so that there should not be any accident, which may cause loss of life and damage to Customer's property. Contractor shall also take insurance cover for workmen compensation for the workers employed by him at his own cost.



24. No complaints from Contractor's workmen with regard to nature of work entrusted or place of work will be entertained.
25. The Contractor or his authorized representative shall be available at plant site daily for receiving necessary instructions from Engineer-In-Charge, BHEL and to carry out the work accordingly.
26. The Contractor should note that the labour under their contract will be working in the vicinity of running equipment's and they should give proper instructions to all the workers under their control to be careful so as to avoid any accidents.
27. The Contractor is required to carry out the work in controlled conditions so as to contain air pollution, water/land contamination within relevant legislative and statutory requirements.

Note: The term 'Company' means BHEL and Customer means NPCIL-RAPS.



**Sub-contract work of R&M – Erection Work & Commissioning support for DAVR  
(Regulation) panel at NPCIL-RAPS Generating Station, Unit-4 (237.7 MW).**

*(PREFERABLY TO BE GIVEN ON SUB CONTRACTORS LETTER HEAD)*

**Section 5**

**CERTIFICATE FOR NO DEVIATION**

I/We,.....

of M/s.....

hereby certify that there is no deviation from the tender specifications and conditions either technical or commercial and I/We agree to all the terms and conditions mentioned in the tender specification.

Signature of the Contractor  
With seal

Place :

Date :



**SECTION 6**  
**LIST OF DRAWING / DOCUMENT**

1. OGA OF DVR EQUIPMENT  
- DRAWING NO. **3-653-00-11053 REV. 00**

S.No	Panel Description	Dimension (LXBXH) in mm	Weight (approx..) in KG
1	Regulation (Suite of 2)	2351X1200X2295	2200

Note: The OGA is as attached.

DRG. No. 3 653 00 11053

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3

4

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# OVERALL GENERAL ARRANGEMENT FOR MICRO PROCESSOR BASED DIGITAL STATIC EXCITATION EQUIPMENT

PROJECT :- NPCIL-RAPS, UNIT-3&4 (2x237.7 MW)  
 RATING :- 2x237.7 MW  
 CLIENT :- NUCLEAR POWER CORPORATION OF INDIA LIMITED.  
 WBS NO. :- CE/1373-SH3-48-01 &  
 CE/1373-SH4-48-01

*19/6/17*  
*C.P. Sharma, sk*  
*Srinivasan*  
*19/6/2017*  
*SMELB*

PROJECT : NPCIL-RAPS, UNIT-3&4 (2x237.7 MW)

BHARAT HEAVY ELECTRICALS LIMITED.  
ELECTRONICS DIVISION, BANGALORE

OGA FOR STATIC EXCITATION EQUIPMENT  
(IDENTIFICATION SHEET)

No. OF SHEETS	04
SHEET No.	01

REV.	DATE	ALTERED CHECKED APPROVED	REV.	DATE	ALTERED CHECKED APPROVED	NAME	SIGN	DATE
						DRAWN	PRADEEP	17.06.17
						CHECKED	SUSHEEL	17.06.17
						APPROVED	ASW	17.06.17



DEPT. GHCE CODE 408



W.B.S No.

CE/1373-SH3 & SH4-48-01

DRG. No.

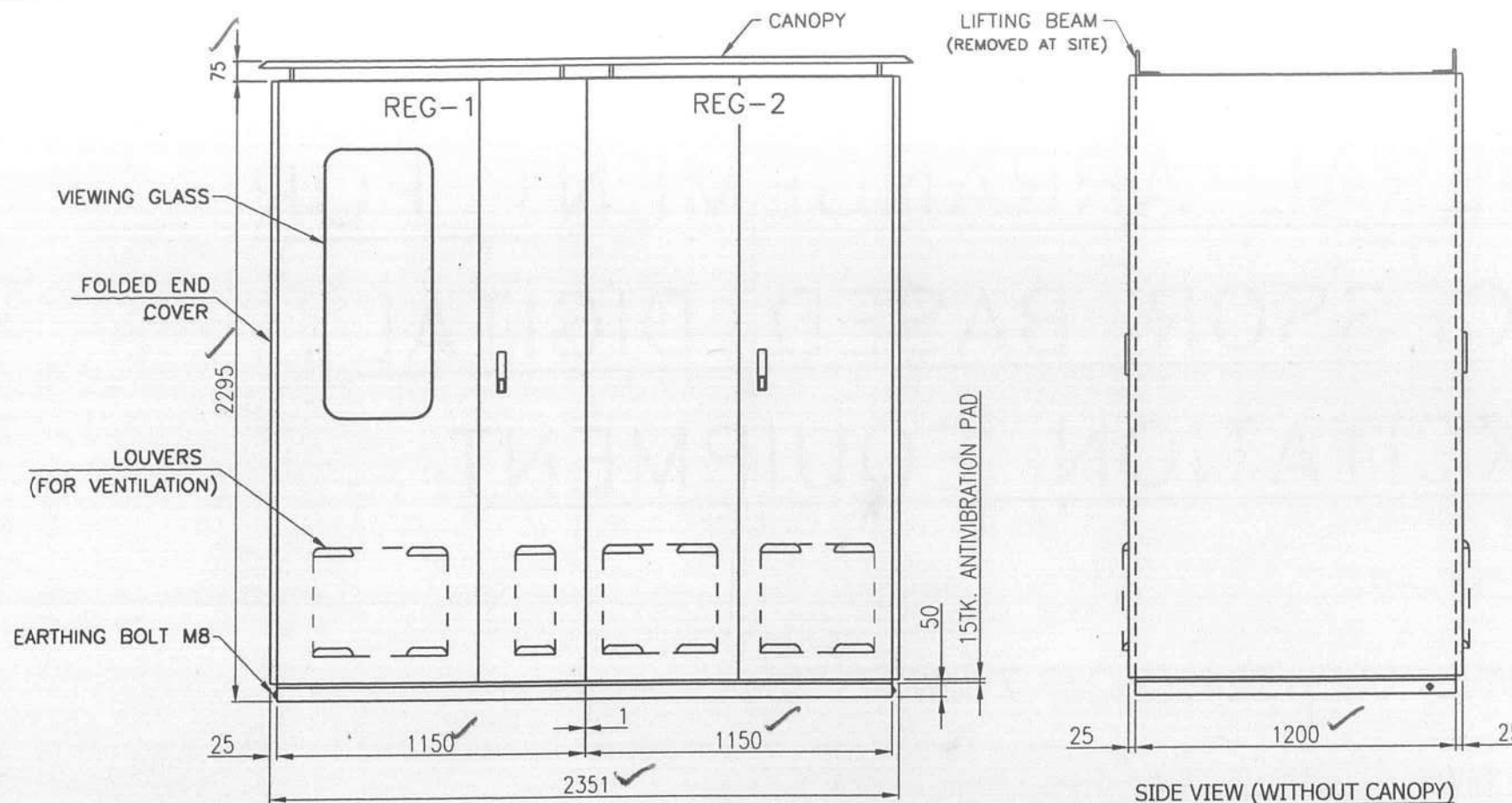
3 653 00 11053

REV

00

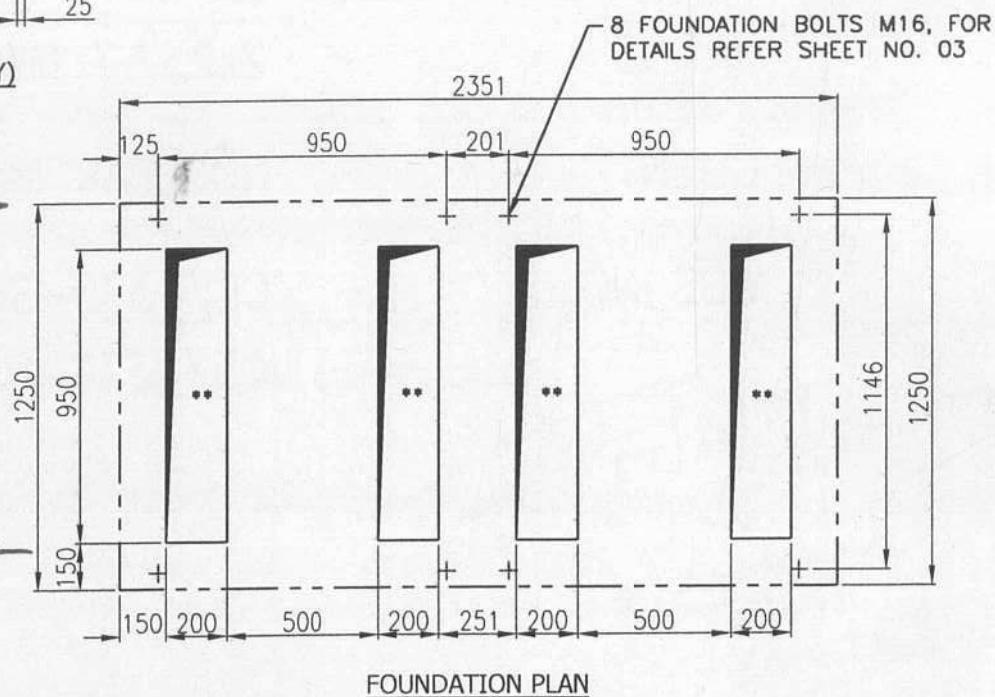
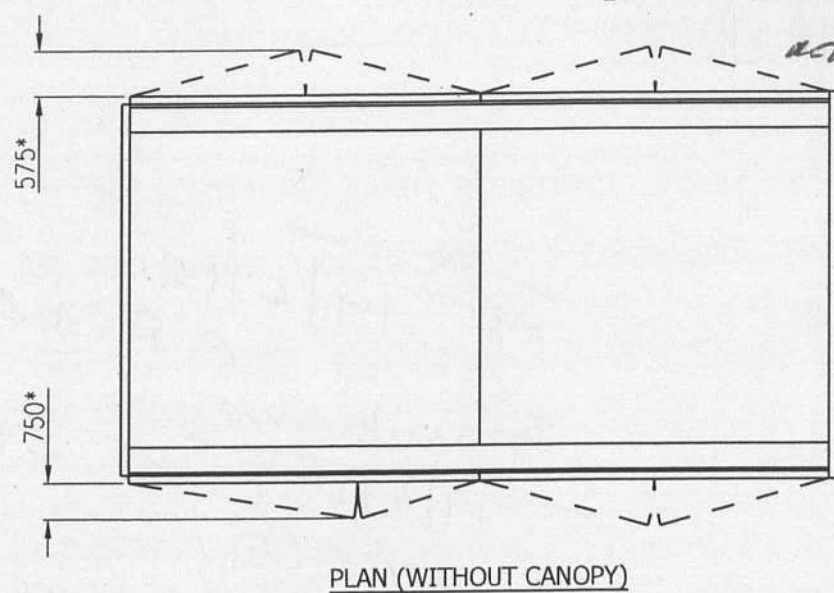
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NOTE :-

1. TOTAL WEIGHT : 2200 Kg APPROX.
  2. TOTAL LOSSES : 3.0 KW APPROX.
  3. COLOUR INTERIOR : BRILLIANT WHITE TO SHADE NO.9-102, SP:1650, POWDER COATED, GLOSSY.
  4. COLOUR EXTERIOR : LIGHT GREY TO SHADE 631 OF IS:5, POWDER COATED, SEMI GLOSSY.
  5. PANEL CONSTRUCTION : C.R.C.A. STEEL SHEET 2mm THICK.
  6. PROTECTION CLASS : IP 31.
  7. HOUSE OF PANEL : CUBICLE TO BE MOUNTED IN A CLEAN AND DUST FREE PLACE.
  8. SHIPPING SECTION : SINGLE.
  9. RECOMMENDED CLEARANCE ON FRONT AND REAR OF THE PANEL IS 1.5 METER.
  10. 'O'VOLT EARTH & SCREEN EARTH POINTS OF AVR SHALL PREFERABLY BE EARTHED TO SEPERATE EARTH POINTS IN THE PLANT.
  11. VENTILATION : NATURAL.
- \* MAXIMUM DOOR SWING.  
\*\* CUTOUT FOR CABLE ENTRY.



*Dimensions of Front view checked and found perfect (compared to old panel).*

*AS  
19/6/17  
C.P. Sharma  
SME*

*Sanjay  
19/6/17  
SME (E)*

REF. DRG. No.  
SIGN. & DATE  
INVENTORY No.

REV.	DATE	ALTERED	REV.	DATE	ALTERED	NAME	SIGN	DATE
		CHECKED			CHECKED			
		APPROVED			APPROVED			
						DRAWN	PRADEEP	17.06.17
						CHECKED	SUSHEEL	17.06.17
						APPROVED	ASW	17.06.17

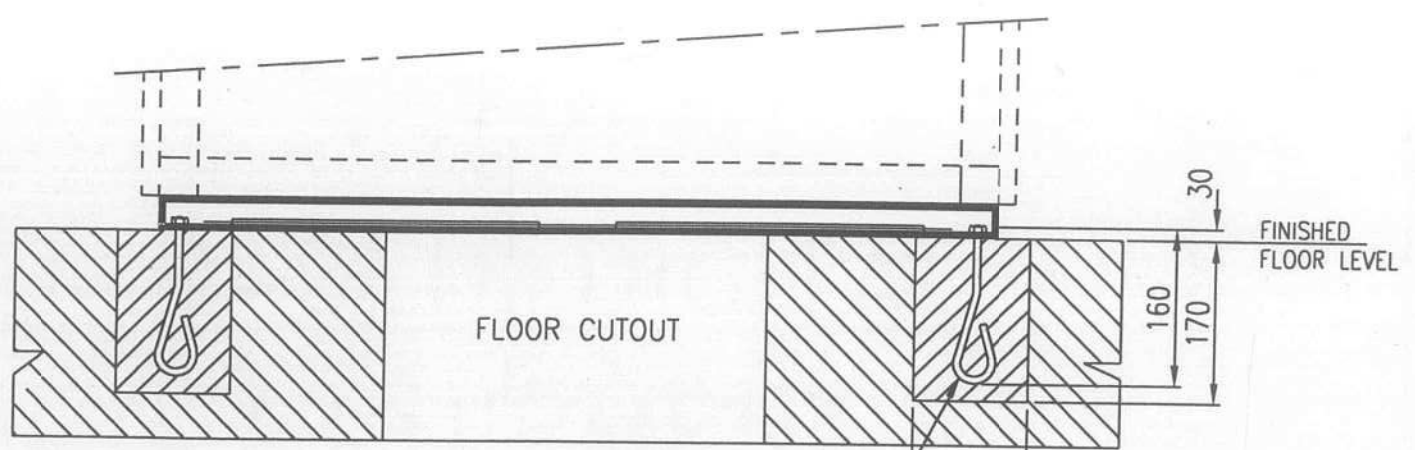
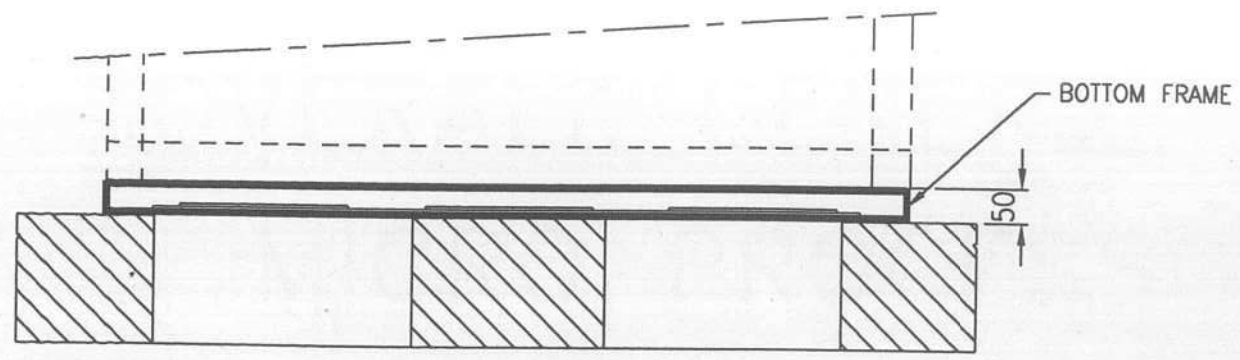
PROJECT : NPCIL-RAPS, UNIT-3&4 (2x237.7 MW)		Bharat Heavy Electricals Limited. Electronics Division, Bangalore	
TITLE: OGA FOR STATIC EXCITATION EQUIPMENT (REGULATION CUBICLES)		No. OF SHEETS	04
W.B.S No. CE/1373-SH3 & SH4-48-01		SHEET No.	02
DRG. No. 3 653 00 11053		REV	00

FIRST ANGLE PROJECTION

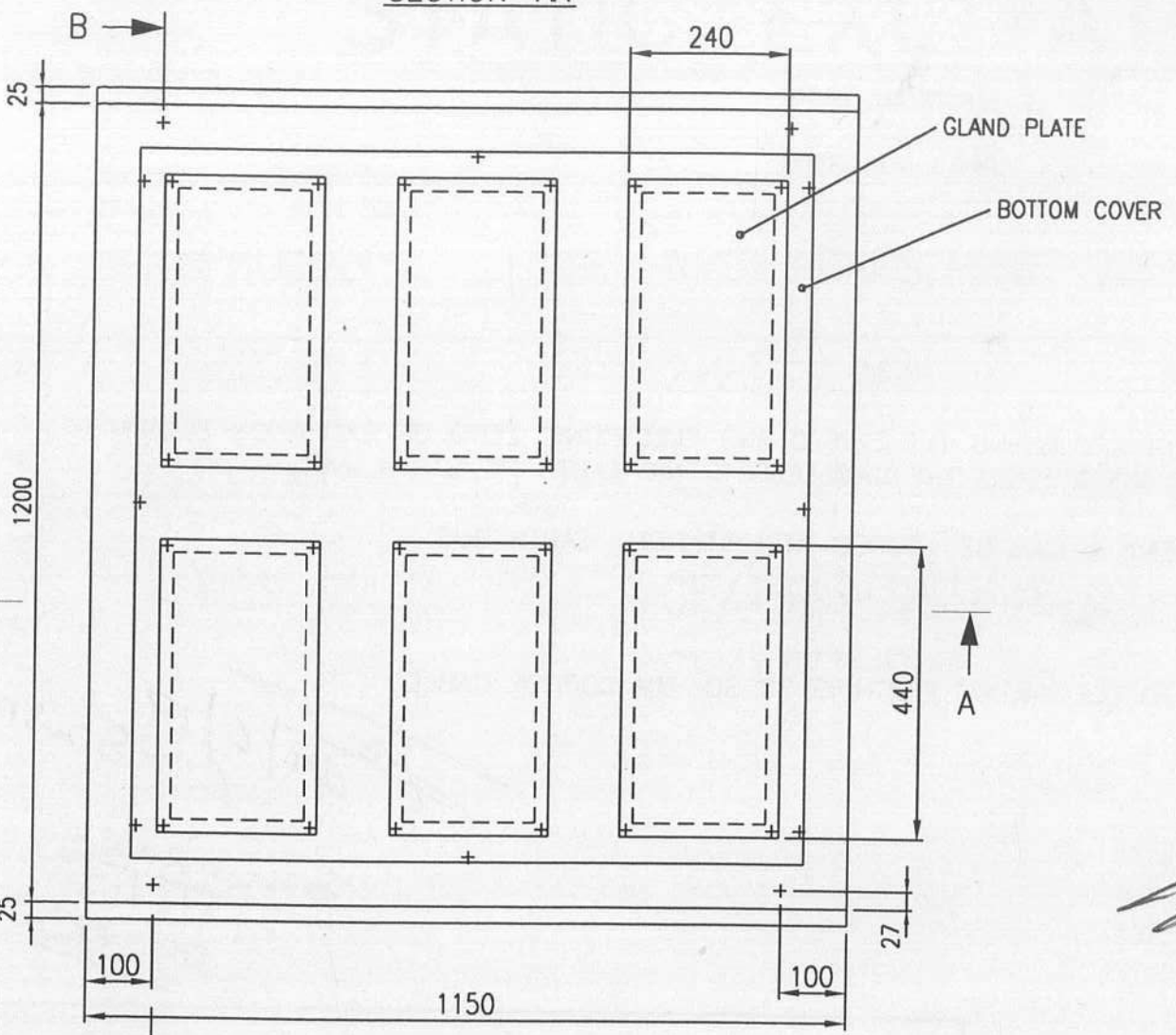
(ALL DIMENSIONS ARE IN mm)

DRG No. 3 653 00 11053

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FOUNDATION BOLTS M16x160  
TYPE A OF IS : 5624 PROJECTING  
30mm ABOVE FINISHED FLOOR  
LEVEL (POCKET SIZE 70x70x170)



NOTE :-

1. GLAND PLATE MAY BE DRILLED AT SITE FOR SUITABLE CABLE GLANDS.
2. BOTTOM FRAME HAS 4 HOLES  $\phi 20$  ONE AT EACH CORNER FOR FOUNDATION BOLTS.
3. UNLESS OTHERWISE STATED THE VIEWS ARE NOT TO SCALE.
4. GLAND PLATE / PLATES ABOVE FLOOR CUTOUT CAN BE REMOVED WITHOUT OPENING THE REMAINING.
5. FOUNDATION BOLTS SUPPLIED LOOSE ALONG WITH THE PANEL.

*17/6/17*  
*C.P. Sharma sk*

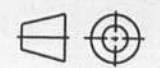
*Srinivasan*  
*17/6/17*  
*smc(e)*

PROJECT : NPCIL-RAPS, UNIT-3&4 (2x237.7 MW)

REV.	DATE	ALTERED	CHECKED	APPROVED	REV.	DATE	ALTERED	CHECKED	APPROVED	NAME	SIGN	DATE
										DRAWN	PRADEEP	17.06.17
										CHECKED	SUSHEEL	17.06.17
										APPROVED	ASW	17.06.17



DEPT. GHCE  
CODE 408



BHARAT HEAVY ELECTRICALS LIMITED.  
ELECTRONICS DIVISION, BANGALORE

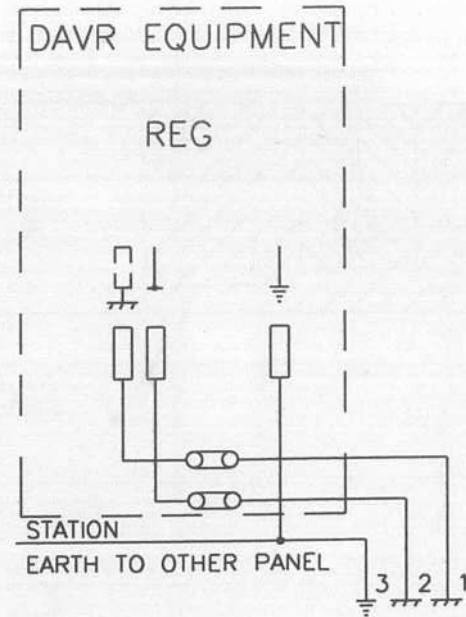
TITLE: OGA FOR STATIC EXCITATION EQUIPMENT  
(FOUNDATION DETAILS)

No. OF SHEETS 04  
SHEET No. 03

W.B.S No. CE/1373-SH3 & SH4-48-01  
DRG. No. 3 653 00 11053  
REV 00

DRG. No. 3 653 00 11053

SHIELD ELECTRONIC ZERO & CUBICLE EARTH SEPERATELY GROUNDED



LEGEND

- SHIELD
- OV
- STATION EARTH
- ELECTRONIC EARTH
- REG : REGULATION

NOTE:- (1) (A) 1 & 2 ARE INDEPENDENT ELECTRONIC EARTHS TO BE PROVIDED FOR GROUNDING THE SHIELD AND ELECTRONIC ZERO OF EXCITATION EQUIPMENT. THESE INDEPENDENT ELECTRONIC EARTH CAN BE TWO INDEPENDENT RISER FROM THE SAME ELECTRONIC EARTH PIT/EARTH MAT.

(B) 3 IS THE STATION EARTH FOR GROUNDING THE EXCITATION EQUIPMENT & CAN BE LOOPED WITH STATION EARTH BUS.

(2) THE ELECTRONIC EARTH RESISTANCE SHOULD BE LESS THAN 0.5 OHMS

(3) RECOMMENDED CABLE SIZE FOR CONNECTION FROM SHIELD/ZERO VOLT TO ELECTRONIC EARTH IS 70 SQ. MM COPPER CABLE.

*19/6/17*  
*C. P. Sharma, SSK*  
*S. Sankaran*  
*19/6/17*  
*SMECE*

PROJECT : NPCIL-RAPS, UNIT-3&4 (2x237.7 MW)

BHARAT HEAVY ELECTRICALS LIMITED.  
ELECTRONICS DIVISION, BANGALORE

TITLE:		No. OF SHEETS	04
OGA FOR STATIC EXCITATION EQUIPMENT		SHEET No.	04
GENERAL METHOD OF GROUNDING OF SEE EQUIPMENT		REV	00
W.B.S No.	CE/1373-SH3 & SH4-48-01	DRG. No.	3 653 00 11053

REV.	DATE	ALTERED	REV.	DATE	ALTERED	NAME	SIGN	DATE
		CHECKED			CHECKED			
		APPROVED			APPROVED			
						DRAWN	PRADEEP	17.06.17
						CHECKED	SUSHEEL	17.06.17
						APPROVED	ASW	17.06.17

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REF. DRG. No.

SIGN. & DATE

INVENTORY No.