

----- EXISTING/FUTURE

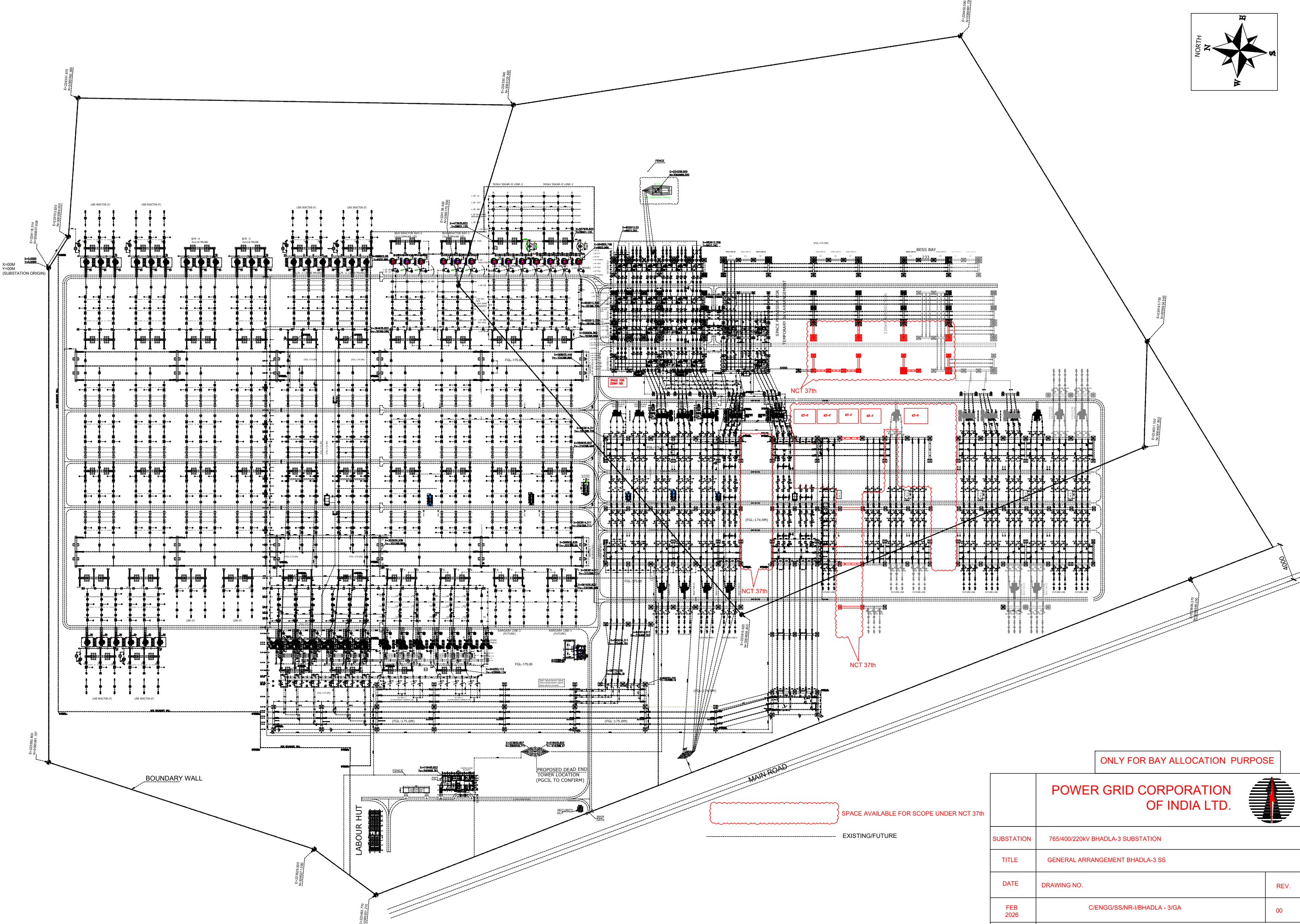
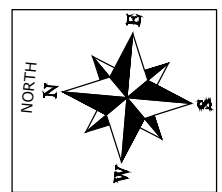
  SPACE AVAILABLE FOR SCOPE UNDER NCT 37th

ONLY FOR BAY ALLOCATION PURPOSE

POWER GRID CORPORATION  
OF INDIA LTD.

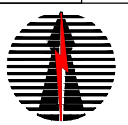


SUBSTATION	765/400/220KV BHADLA-3 SUBSTATION	
TITLE	SINGLE LINE DIAGRAM	
DATE	DRAWING NO.	REV.
FEB 2026	C/ENGG/SS/BHADLA - 3/SLD	00



ONLY FOR BAY ALLOCATION PURPOSE

**POWER GRID CORPORATION OF INDIA LTD.**



SUBSTATION	765/400/220KV BHADLA-3 SUBSTATION	
TITLE	GENERAL ARRANGEMENT BHADLA-3 SS	
DATE	DRAWING NO.	REV.
FEB 2026	C/ENGG/SS/NR-1/BHADLA - 3/GA	00

संदर्भ/Ref : CC-ENGG-TB202442-1002618-SS3450-EMAT-LAYOUT

Date : 04/03/2025

From : Somiran Das  
Senior GM

To : JAKSON LIMITED  
626,Sixth Floor,Tower -A,DLF Tower Delhi  
110076  
110076

Cc : CGM(Project)/Sr.GM(ENGG),Rajasthan  
Projects, Jaipur

Subject : 765KV AIS Substation Extn Package SS60T

LOA Ref : CC/T/W-AIS/DOM/A04/24/07567/NOA-1/24-11235/01 & NOA-2/24-11235/02 Dated 30/09/2024

Please find enclosed following drawings/ documents for necessary action at your end.

Vendor Drg. No. : TB202442-1002618-SS3450-EMAT-LAYOUT  
Orgn. Drg. No. : TB202442-1002618-SS3450-EMAT-LAYOUT  
Revision No. : 00  
Drg. Title : BHADLA-III S/S- EARTHMAT LAYOUT DRGS  
App. Category : CAT-I  
Release Date : 04/03/2025



Scan to verify

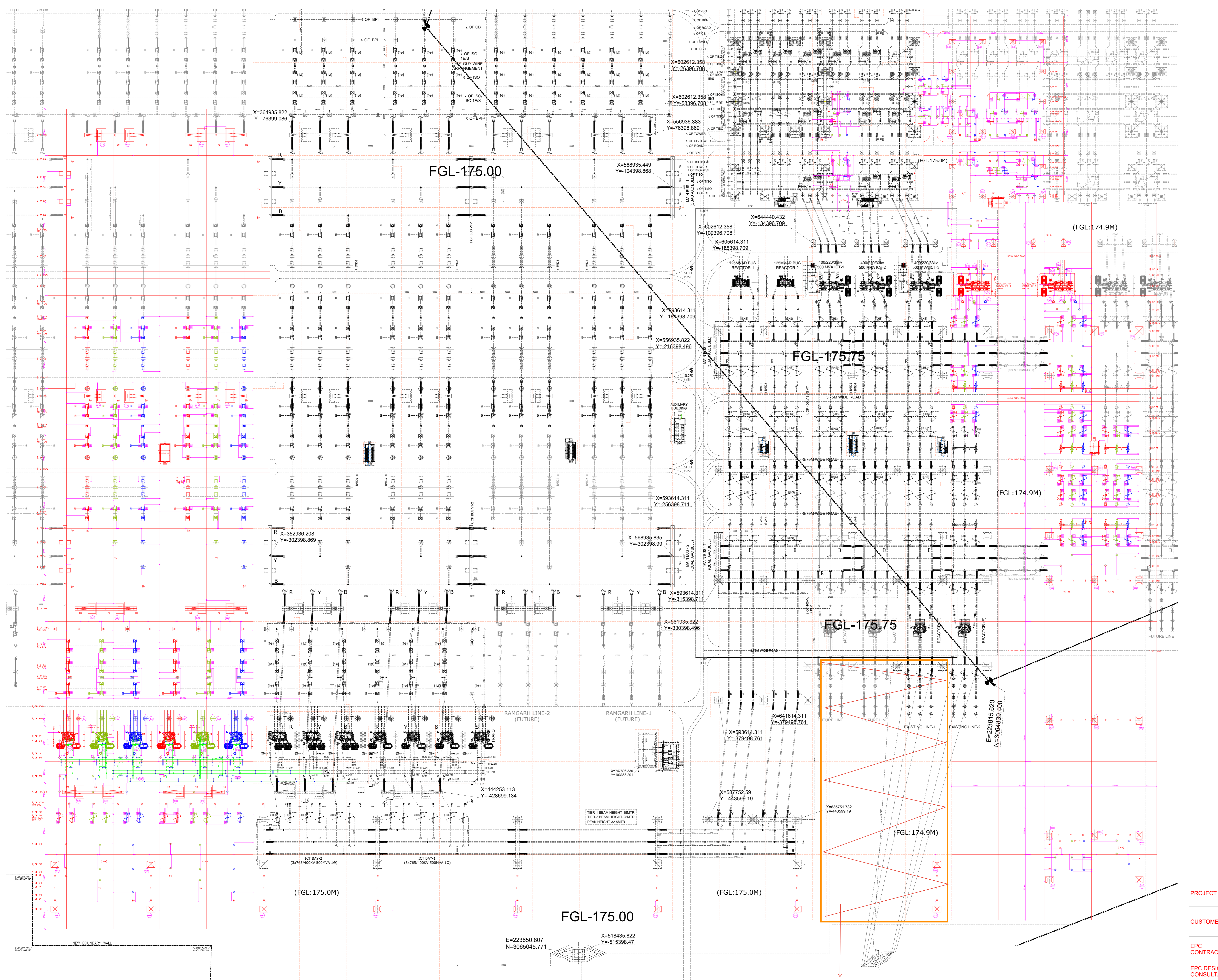
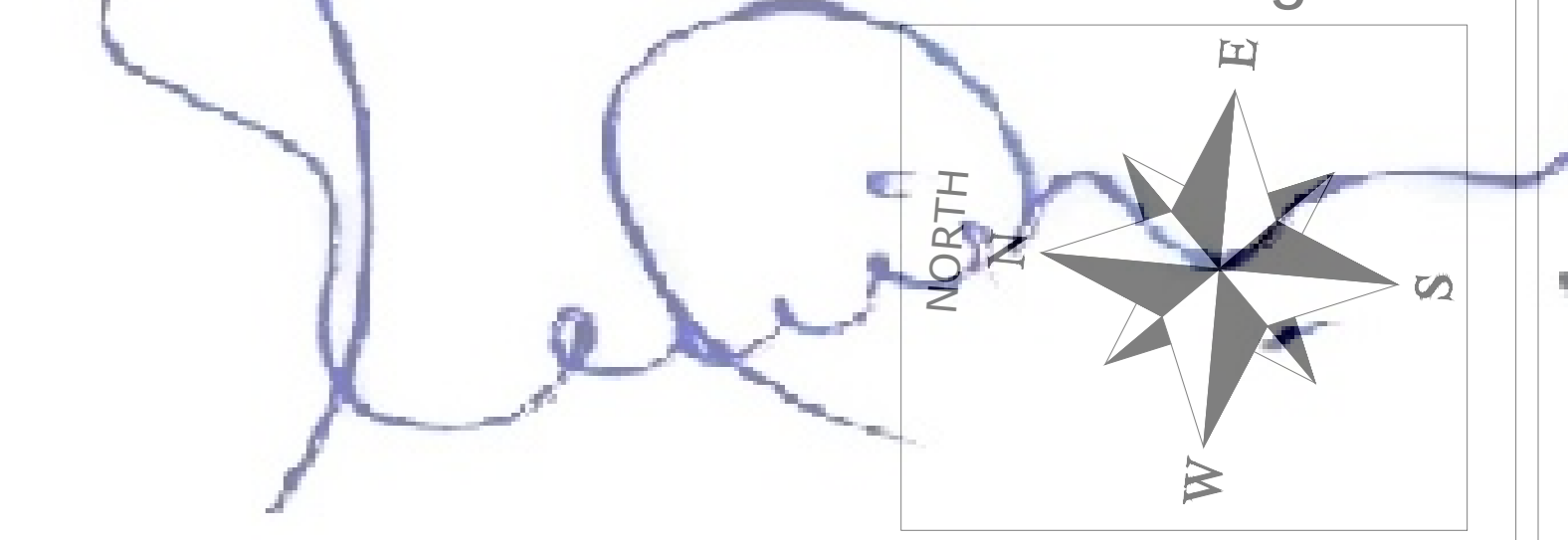
Comments : Reviewed

अनुमोदित श्रेणी/App. Category:

- I. फेब्रिकेशन/निर्माण/टाइप टेस्टिंग हेतु जारी।  
**Approved/released for fabrication/construction.**
  - II. फेब्रिकेशन/निर्माण/टाइप टेस्टिंग हेतु अनुमोदित/जारी बशर्ते दिए गए टिप्पणियाँ एवं आशोधनों की सम्मिलित किया जाये। कृपया रिवाइज्ड दस्तावेज अनुमोदनार्थ प्रस्तुत करें।  
**Approved/released for fabrication/ construction subject to incorporation of comments and modification as noted. Revised drawing required for approval.**
  - III. टिप्पणियाँ सम्मिलित करने के उपरांत दस्तावेज को अनुमोदनार्थ प्रस्तुत करें।  
**To be resubmitted for approval after incorporating the comments.**
  - IV. सूचनार्थ एवं रिकार्ड हेतु।  
**For information and record.**
- CATREL/ निर्माण हेतु जारी।  
REL-CON **Released for construction.**

नोट/Note:

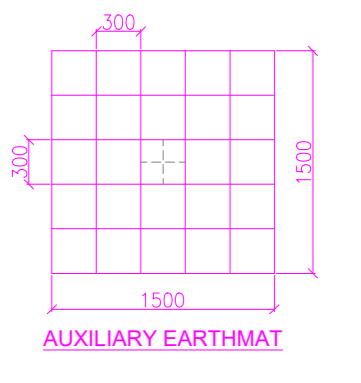
1. Approval/Comments conveyed herein neither relieve the contractor of his contractual obligations and his responsibilities, weights, quantities, design details assemble fits, performance particulars and conformity of the supplies with the Indian Statutory Laws as may be applicable, nor does it limits the purchaser's right under the contract.
2. The approval conveyed vide this letter does not cover the approval of make for sub-vendor items.



EARTHMAT BILL OF QUANTITY (PRESENT SCOPE)					
S.NO	SYMBOL	DESCRIPTION	UNIT	ENG. QUANTITY	LOA QUANTITY
1		40MM DIA MS ROD EXISTING MAIN EARTHMAT	MTR	9800	10000
2		40MM DIA MS ROD MAIN EARTHMAT	MTR	16000	-
3		RISER (BELOW GROUND) 40MM, MS ROD	MTR	16000	-
4		40MM DIA MS ROD AUXILIARY EARTHMAT	NOS	230	-
5	⊕	40MM DIA 3M LONG MS ROD ELECTRODE (RE1 TO RE24) FOR LA	NOS	24	-
6	⊕	40MM DIA 3M LONG MS ROD ELECTRODE (RE25 TO RE84) FOR TOWER WITH PEAK	NOS	60	-
7	⊕	40MM DIA 3M LONG GS PIPE ELECTRODE (PE1 TO PE8)	NOS	08	-

- NOTES**
- THE EARTHING GRID SHALL BE MADE WITH 40mm DIA MS ROD.
  - EQUIPMENT SHALL BE CONNECTED TO VERTICAL & HORIZONTAL EARTHING CONDUCTOR OF MAIN EARTHMAT.
  - WHENEVER EARTHING CONDUCTOR CROSSES CABLE TRAYS, UNDER GROUND SERVICES DUCTS, PIPES, TUNNELS, RAILWAY TRACKS ETC. IT SHALL BE LAID ATLEAST 300mm BELOW THEM AND SHALL BE RE-ROUTED IN CASE IT COLLIDES WITH EQUIPMENT/STRUCTURE FOUNDATION.
  - EARTHING CONDUCTORS CROSSING THE ROAD SHALL BE LAID AT 300mm BELOW THE ROAD OR AT GROUND LEVEL TO SUIT SITE CONDITION.
  - ALL EQUIPMENT & STRUCTURES SHALL BE GROUNDED AS PER STANDARD.
  - EARTHING DETAILS AS PER TECHNICAL SPECIFICATION SECTION-SWITCHYARD SECTION (REV-10).
  - FOR RISER DETAILS OF EARTHING, WELDING AND JOINT DETAILS SHALL BE DONE AS PER STANDARD EARTHING DETAILS AS PER TECHNICAL SPECIFICATION SECTION-SWITCHYARD SECTION.
  - THE LOCATION OF EARTHING CONDUCTOR, EARTHPIES AND GROUND RODS ARE INDICATIVE AND CAN BE MODIFIED TO SUIT SITE CONDITION.
  - WHERE EARTHING CONDUCTOR COLLIDES WITH FOUNDATIONS, SAME SHALL BE DIVERTED LOCALLY AS PER SITE CONDITION.
  - IN CASE OF EXISTING MAIN EARTHMAT WHICH ARE ALREADY LAID IN THE PRESENT SCOPE AREA, COMING ON THE WAY OF NEW EQUIPMENT FOUNDATION, SAME TO BE RE-ROUTED AS PER SITE CONDITION.
  - LOCATION OF AUXILIARY MAT SHALL MATCH THE POSITION OF OPERATING HANDLE OF MOW BOX.
  - MINOR MODIFICATIONS AS PER ISOLATOR Dwg. SHALL BE DONE AT SITE.
  - EARTHING OF FENCE SHALL BE DONE AS PER LOCAL STANDARD EQUIPMENT EARTHING PHILOSOPHY.

**REFERENCE DWG NO.**  
 JM-FGCL-BAD-400-510-LAY-002: ELECTRICAL LAYOUT PLAN & SECTION FOR 765/40/220KV BHADLA-3 S/S  
 KED-SA-410-BM-B1-ESE-310-0RD-100: EARTHMAT LAYOUT FOR 765/40/220KV BHADLA-3 S/S



PROJECT	765KV AIS SUBSTATION EXTN PACKAGE SS-60T AUGMENTATION OF 765/400/220KV BHADLA-III SUBSTATION UNDER ADDITIONAL TRANSMISSION SYSTEM FOR EVACUATION OF POWER FROM BHADLA-III PS AS PART OF RAJASTHAN REZ PHASE-III SCHEME (20 GW) THROUGH TBCB ROUTE
CUSTOMER	POWER GRID CORPORATION OF INDIA LTD. (A Government of India Enterprise)
EPC CONTRACTOR	JAKSON LIMITED
EPC DESIGN CONSULTANT	M/S THORES ENGINEERING SOLUTION

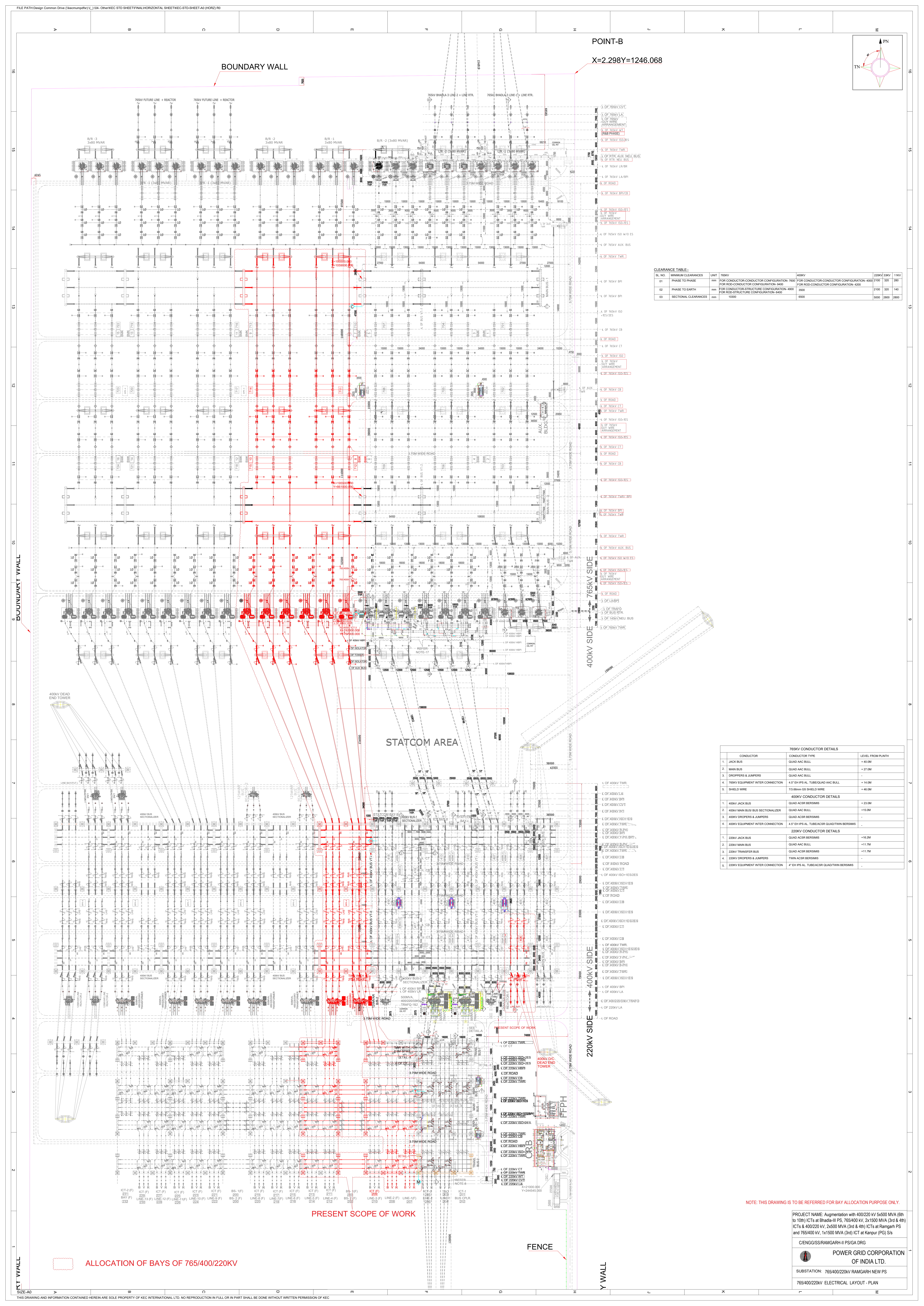
TITLE	OUTDOOR EARTHMAT LAYOUT EXTENSION OF 765/400/220KV BHADLA-3 SUBSTATION	SCALE	1:675
JL DWG. NO.	JAK-PGCL-BAD-400-510-EMT-004	SIZE	A0
DATE	11.02.2025	SHEET	01 OF 01
REV	00	DATE	11.02.2025

REV	DESCRIPTION	DRAWN	DESIGN	CHECKED	APPROVED	DATE
00	RELEASED FOR APPROVAL	-	-	-	-	11.02.2025

NOTE: THE DRAWINGS OF THIS DRAWING SET IS THE PROPERTY OF JAKSON LIMITED. COPYING OR REUSE OF THIS DRAWING WITHOUT PERMISSION IS PROHIBITED.

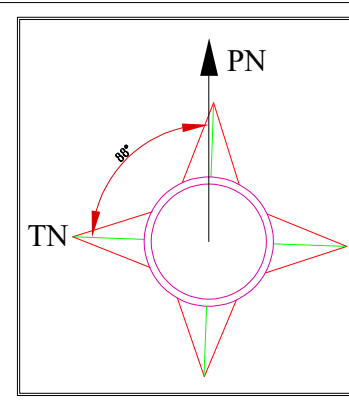


<p><b>PROJECT NAME:</b> Augmentation with 400/220 KV 5600 MVA (6th to 10th) CTs at Bhadla-II PS, 765/400 KV 2x1500 MVA (3rd &amp; 4th) CTs &amp; 400/220 KV 2x600 MVA (3rd &amp; 4th) CTs at Ramganj PS and 765/400 KV 1x1500 MVA (3rd) CT at Kempani (F&amp;G) PS</p> <p><b>DRAWING NO.:</b> CEMGSS/RAMGARH/PS/SSD</p> <p><b>SUBS PATION:</b> 765/400/220KV RAMGARH NE/PS</p> <p><b>POWER GRID CORPORATION OF INDIA LTD.</b></p>		<p><b>PROJECT NAME:</b> Augmentation with 400/220 KV 5600 MVA (6th to 10th) CTs at Bhadla-II PS, 765/400 KV 2x1500 MVA (3rd &amp; 4th) CTs &amp; 400/220 KV 2x600 MVA (3rd &amp; 4th) CTs at Ramganj PS and 765/400 KV 1x1500 MVA (3rd) CT at Kempani (F&amp;G) PS</p> <p><b>DRAWING NO.:</b> CEMGSS/RAMGARH/PS/SSD</p> <p><b>SUBS PATION:</b> 765/400/220KV RAMGARH NE/PS</p> <p><b>POWER GRID CORPORATION OF INDIA LTD.</b></p>
<p><b>NOTES:</b></p> <p>1. THIS DRAWING IS TO BE USED FOR THE PRESENT SCOPE OF WORK ONLY.</p> <p>2. ALL THE COMPONENTS ARE TO BE PROVIDED WITH THE NECESSARY PROTECTIVE RELAYS AND INTERLOCKING.</p> <p>3. THE ELECTRICAL CONNECTIONS ARE TO BE MADE AS PER THE REQUIREMENTS OF THE PROJECT.</p> <p>4. THE DRAWING IS TO BE USED FOR THE PRESENT SCOPE OF WORK ONLY.</p>		<p><b>NOTES:</b></p> <p>1. THIS DRAWING IS TO BE USED FOR THE PRESENT SCOPE OF WORK ONLY.</p> <p>2. ALL THE COMPONENTS ARE TO BE PROVIDED WITH THE NECESSARY PROTECTIVE RELAYS AND INTERLOCKING.</p> <p>3. THE ELECTRICAL CONNECTIONS ARE TO BE MADE AS PER THE REQUIREMENTS OF THE PROJECT.</p> <p>4. THE DRAWING IS TO BE USED FOR THE PRESENT SCOPE OF WORK ONLY.</p>
<p><b>EQUIPMENT IDENTIFICATION SYSTEM:</b></p> <p><b>Z10 BUS BAR</b></p> <p>1. 400/220KV BUS COUPLER</p> <p>2. 400/220KV BUS SECTION</p> <p>3. 400/220KV CT (FUTURE)</p> <p>4. 400/220KV CT (FUTURE)</p> <p>5. 400/220KV CT (FUTURE)</p> <p>6. 400/220KV CT (FUTURE)</p> <p>7. 400/220KV CT (FUTURE)</p> <p>8. 400/220KV CT (FUTURE)</p> <p>9. 400/220KV CT (FUTURE)</p> <p>10. 400/220KV CT (FUTURE)</p> <p>11. 400/220KV CT (FUTURE)</p> <p>12. 400/220KV CT (FUTURE)</p>		<p><b>EQUIPMENT IDENTIFICATION SYSTEM:</b></p> <p><b>Z10 BUS BAR</b></p> <p>1. 400/220KV BUS COUPLER</p> <p>2. 400/220KV BUS SECTION</p> <p>3. 400/220KV CT (FUTURE)</p> <p>4. 400/220KV CT (FUTURE)</p> <p>5. 400/220KV CT (FUTURE)</p> <p>6. 400/220KV CT (FUTURE)</p> <p>7. 400/220KV CT (FUTURE)</p> <p>8. 400/220KV CT (FUTURE)</p> <p>9. 400/220KV CT (FUTURE)</p> <p>10. 400/220KV CT (FUTURE)</p> <p>11. 400/220KV CT (FUTURE)</p> <p>12. 400/220KV CT (FUTURE)</p>
<p><b>THE TECHNICAL PARAMETERS FOR WHICH THE SYSTEM IS DESIGNED ARE:</b></p> <p>1. SYSTEM VOLTAGE: 400KV</p> <p>2. SYSTEM FREQUENCY: 50HZ</p> <p>3. SYSTEM CAPACITY: 5600 MVA</p> <p>4. SYSTEM LENGTH: 100KM</p> <p>5. SYSTEM TYPE: TRANSMISSION LINE</p> <p>6. SYSTEM CONFIGURATION: SINGLE CIRCUIT</p> <p>7. SYSTEM PROTECTION: OVERCURRENT, DIFFERENTIAL</p> <p>8. SYSTEM CONTROL: AUTOMATIC</p> <p>9. SYSTEM MONITORING: TELEPROTECTION</p>		<p><b>THE TECHNICAL PARAMETERS FOR WHICH THE SYSTEM IS DESIGNED ARE:</b></p> <p>1. SYSTEM VOLTAGE: 400KV</p> <p>2. SYSTEM FREQUENCY: 50HZ</p> <p>3. SYSTEM CAPACITY: 5600 MVA</p> <p>4. SYSTEM LENGTH: 100KM</p> <p>5. SYSTEM TYPE: TRANSMISSION LINE</p> <p>6. SYSTEM CONFIGURATION: SINGLE CIRCUIT</p> <p>7. SYSTEM PROTECTION: OVERCURRENT, DIFFERENTIAL</p> <p>8. SYSTEM CONTROL: AUTOMATIC</p> <p>9. SYSTEM MONITORING: TELEPROTECTION</p>



POINT-B  
X=2.298Y=1246.068

BOUNDARY WALL



CLEARANCE TABLE-

SL. NO.	MINIMUM CLEARANCES	UNIT	765KV FOR CONDUCTOR CONFIGURATION-7650 FOR ROD CONFIGURATION-9400	400KV FOR CONDUCTOR CONFIGURATION-4000 FOR ROD CONFIGURATION-4200	220KV 33KV 11KV
01	PHASE TO PHASE	mm	3000	3000	2100 300 280
02	PHASE TO EARTH	mm	3000	3000	2100 300 140
03	SECTIONAL CLEARANCES	mm	10000	6000	5000 2800 2800

765KV CONDUCTOR DETAILS

CONDUCTOR	CONDUCTOR TYPE	LEVEL FROM PLINTH
1. JACK BUS	QUAD AAC BULL	+40.0M
2. MAIN BUS	QUAD AAC BULL	+27.0M
3. DROPPERS & JUMPERS	QUAD AAC BULL	-
4. 765KV EQUIPMENT INTER CONNECTION	4.5" EH IPS AL TUBE/QUAD AAC BULL	+14.0M
5. SHIELD WIRE	7/3.68mm GS SHIELD WIRE	+48.0M

400KV CONDUCTOR DETAILS

1. 400KV JACK BUS	QUAD ACSR BERSIMS	+23.0M
2. 400KV MAIN BUS/ BUS SECTIONALIZER	QUAD AAC BULL	+15.0M
3. 400KV DROPPERS & JUMPERS	QUAD ACSR BERSIMS	-
4. 400KV EQUIPMENT INTER CONNECTION	4.5" EH IPS AL TUBE/ACSR QUAD/TWIN BERSIMS	-

220KV CONDUCTOR DETAILS

1. 220KV JACK BUS	QUAD ACSR BERSIMS	+16.2M
2. 220KV MAIN BUS	QUAD AAC BULL	+11.7M
3. 220KV TRANSFER BUS	QUAD ACSR BERSIMS	+11.7M
4. 220KV DROPPERS & JUMPERS	TWIN ACSR BERSIMS	-
5. 220KV EQUIPMENT INTER CONNECTION	4" EH IPS AL TUBE/ACSR QUAD/TWIN BERSIMS	-

NOTE: THIS DRAWING IS TO BE REFERRED FOR BAY ALLOCATION PURPOSE ONLY.

PROJECT NAME: Augmentation with 400/220 kv 5x500 MVA (6th to 10th) ICTs at Bhadra-III PS, 765/400 kv, 2x1500 MVA (3rd & 4th) ICTs & 400/220 kv, 2x500 MVA (3rd & 4th) ICTs at Ramgarh PS and 765/400 kv, 1x1500 MVA (3rd) ICT at Kanpur (PG) S/s

CIENGSS/RAMGARH-II PS/GA DRG

POWER GRID CORPORATION OF INDIA LTD.

SUBSTATION: 765/400/220KV RAMGARH NEW PS  
765/400/220KV ELECTRICAL LAYOUT - PLAN

संदर्भ/Ref : CC-ENGG-TB202351-1002201-SS3470-EMAT-LAYOUT

Date : 25/09/2024

**From :** Atul Mathur  
DGM

**To :** M/s KEC International Limited  
1st Floor, RPG House, 463, Dr. Annie Besant  
Road  
Worli  
Mumbai-400030, Maharashtra

**Cc :** 0

**Subject :** Substation Package SS01 for establishment of a) 765/400/220kV Ramgarh PS New S/S including 400kV class Transformers & Bus Reactor b) Extn. of 765kV Bhadla-3 S/S associated with "Transmission system for evacuation of power from REZ in Rajasthan (20 GW) under Phase III-Part C1

**LOA Ref :** TBCB/765kV/Raj-part-C1/SS01/G3/NOA-1 & 2/23-107669/01 & 02 Dated 12/10/2023

Please find enclosed following drawings/ documents for necessary action at your end.

**Vendor Drg. No. :** KEC-SA-409-RMGH-C1-ESE-306-DRG-002  
**Orgn. Drg. No. :** TB202351-1002201-SS3470-EMAT-LAYOUT  
**Revision No. :** 02  
**Drg. Title :** RAMGARH PS NEW S/S- EARTHMAT LAYOUT DRGS  
**App. Category :** CAT-I  
**Release Date :** 25/09/2024



Scan to verify

**Comments :** Generally in order.

अनुमोदित श्रेणी/App. Category:



- I. फेब्रिकेशन/निर्माण/टाइप टेस्टिंग हेतु जारी।  
**Approved/released for fabrication/construction.**
  - II. फेब्रिकेशन/निर्माण/टाइप टेस्टिंग हेतु अनुमोदित/जारी बशर्ते दिए गए टिप्पणियाँ एवं आशोधनों की सम्मिलित किया जाये। कृपया रिवाइज्ड दस्तावेज अनुमोदनार्थ प्रस्तुत करें।  
**Approved/released for fabrication/ construction subject to incorporation of comments and modification as noted. Revised drawing required for approval.**
  - III. टिप्पणियाँ सम्मिलित करने के उपरांत दस्तावेज को अनुमोदनार्थ प्रस्तुत करें।  
**To be resubmitted for approval after incorporating the comments.**
  - IV. सूचनार्थ एवं रिकार्ड हेतु।  
**For information and record.**
- CATREL/ निर्माण हेतु जारी।  
REL-CON **Released for construction.**

नोट/Note:

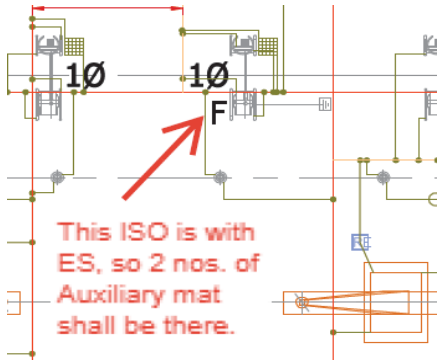

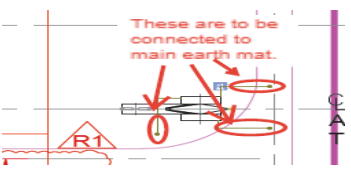
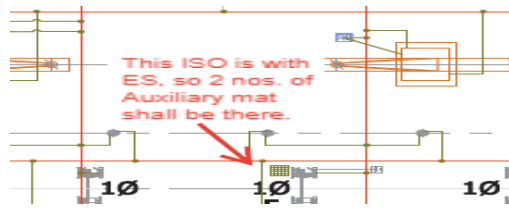
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2. The approval conveyed vide this letter does not cover the approval of make for sub-vendor items.





*Handwritten signature/initials*

PROJECT NAME	SUBSTATION PACKAGE SS01 FOR ESTABLISHMENT OF A. 765/400/220 KV RAMGARH PS NEW S/S INCLUDING 400KV CLASS TRANSFORMER & BUS REACTOR. B. EXTN. OF 765KV BHADLA-3 S/S ASSOCIATED WITH " TRANSMISSION SYSTEM FOR EVACUATION OF POWER FROM REZ IN RAJASTHAN (20GW) UNDER PHASE III-PART C1"
SUBSTATION	765/400/220KV RAMGARH NEW PS
OWNER	POWER GRID RAMGARH-2 TRANSMISSION LTD.
CONSULTANT	 POWER GRID CORPORATION OF INDIA LIMITED.
MAIN CONTRACTOR NAME	 KEC INTERNATIONAL LTD.
NOA NO. & DATE	NOA-I: SUPPLY : TBCB/765kv /RAJ-PART-C1/SS01/G3/NOA-1/23-107669/01 DATED:12/10/2023
	NOA-II: SERVICES :TBCB/765kv/RAJ-PART-C1/SS01/G3/NOA- 2/23-107669/02 DATED:12/10/2023
DOC NAME	DRAWING\DOCUMENT RESPONSE SHEET

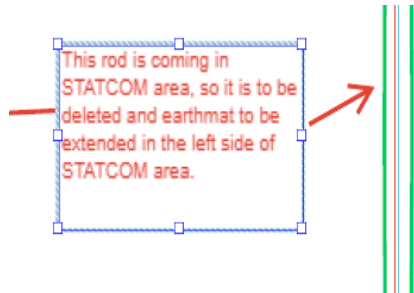
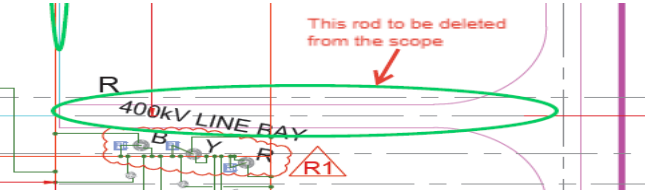
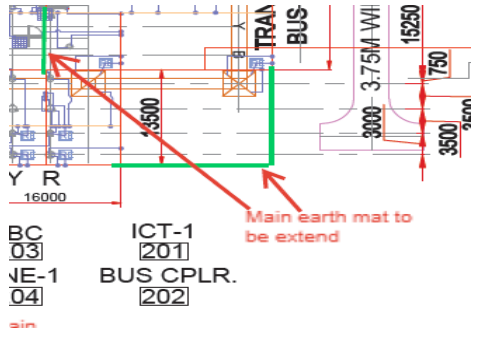
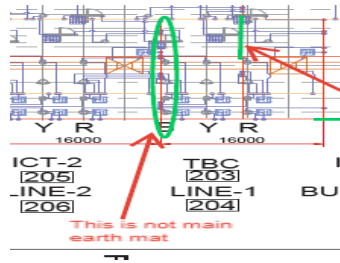
DRAWING\DOCUMENT RESPONSE SHEET.

SL. NO.	DRAWING \ DOC NUMBER	REVISION NUMBER	TITLE OF DRAWING\DOC.	PGCIL COMMENTS. (Rev. R1)	KEC RESPONSE.(Rev. R1)	REMARKS, IF ANY.
1	KEC-SA-409-RMGH-C1-ESE-306-DRG-002	R1	765/400/220KV OVERALL EARTHING LAYOUT		Noted and Closed Further we have shown typical earthing details for each type of Isolator.	
2	KEC-SA-409-RMGH-C1-ESE-306-DRG-002	R1	765/400/220KV OVERALL EARTHING LAYOUT		Noted and Closed	
3	KEC-SA-409-RMGH-C1-ESE-306-DRG-002	R1	765/400/220KV OVERALL EARTHING LAYOUT		Noted and Shown in revised layout.	
4	KEC-SA-409-RMGH-C1-ESE-306-DRG-002	R1	765/400/220KV OVERALL EARTHING LAYOUT		Noted and Closed Further we have shown typical earthing details for each type of Isolator.	

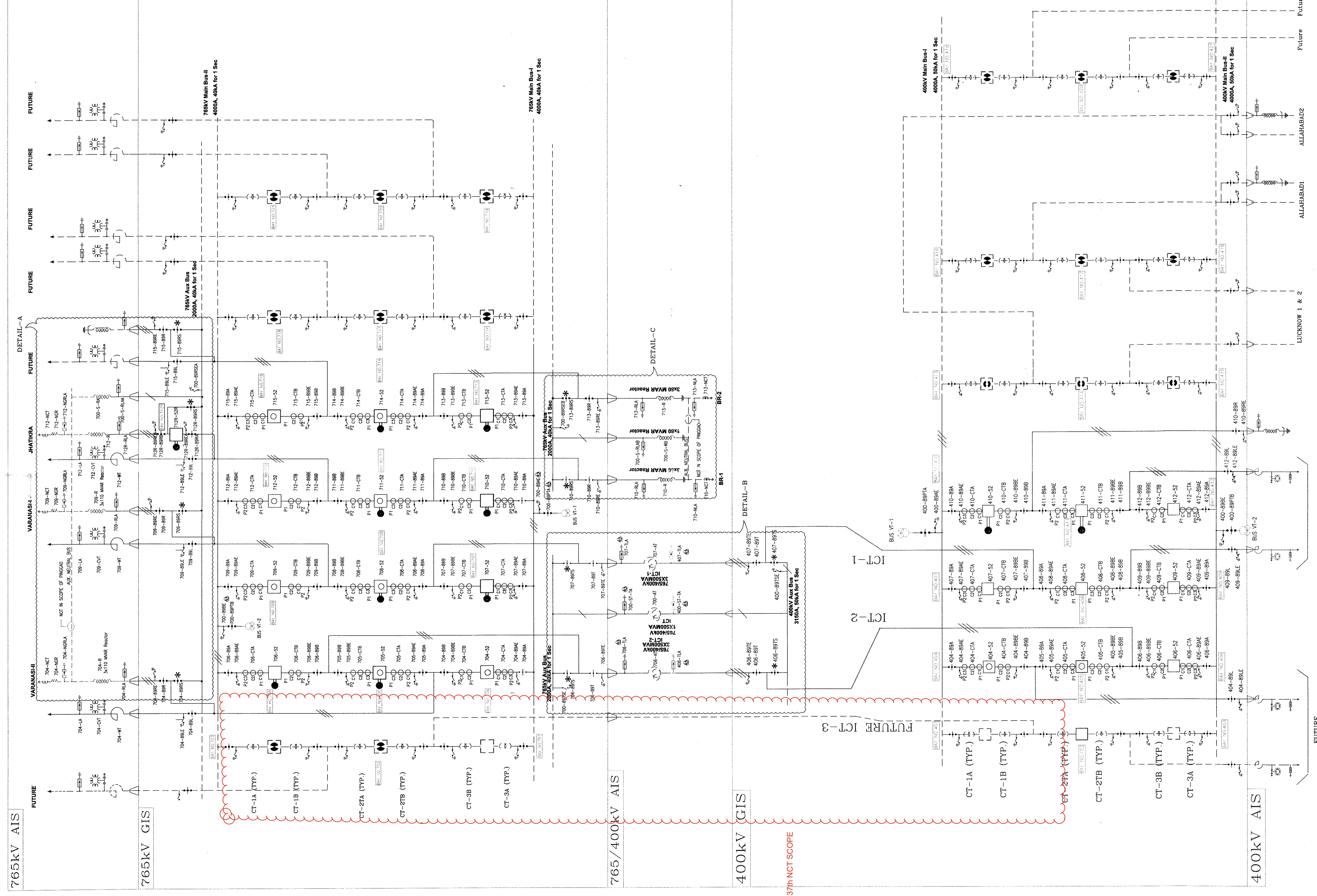
*Handwritten signature/initials*

PROJECT NAME	SUBSTATION PACKAGE SS01 FOR ESTABLISHMENT OF A. 765/400/220 KV RAMGARH PS NEW S/S INCLUDING 400KV CLASS TRANSFORMER & BUS REACTOR. B. EXTN. OF 765KV BHADLA-3 S/S ASSOCIATED WITH " TRANSMISSION SYSTEM FOR EVACUATION OF POWER FROM REZ IN RAJASTHAN (20GW) UNDER PHASE III-PART C1"
SUBSTATION	765/400/220KV RAMGARH NEW PS
OWNER	POWER GRID RAMGARH-2 TRANSMISSION LTD.
CONSULTANT	 POWER GRID CORPORATION OF INDIA LIMITED.
MAIN CONTRACTOR NAME	 KEC INTERNATIONAL LTD.
NOA NO. & DATE	NOA-I: SUPPLY : TBCB/765KV /RAJ-PART-C1/SS01/G3/NOA-1/23-107669/01 DATED:12/10/2023
	NOA-II: SERVICES :TBCB/765KV/RAJ-PART-C1/SS01/G3/NOA- 2/23-107669/02 DATED:12/10/2023
DOC NAME	DRAWING\DOCUMENT RESPONSE SHEET

DRAWING\DOCUMENT RESPONSE SHEET.

SL. NO.	DRAWING \ DOC NUMBER	REVISION NUMBER	TITLE OF DRAWING\DOC.	PGCIL COMMENTS. (Rev. R1)	KEC RESPONSE.(Rev. R1)	REMARKS, IF ANY.
5	KEC-SA-409-RMGH-C1-ESE-306-DRG-002	R1	765/400/220KV OVERALL EARTHING LAYOUT		Noted and Shown in revised layout.	
6	KEC-SA-409-RMGH-C1-ESE-306-DRG-002	R1	765/400/220KV OVERALL EARTHING LAYOUT		Noted and Closed	
7	KEC-SA-409-RMGH-C1-ESE-306-DRG-002	R1	765/400/220KV OVERALL EARTHING LAYOUT		Main eartmat has been extended and shown in revised layout.	
8	KEC-SA-409-RMGH-C1-ESE-306-DRG-002	R1	765/400/220KV OVERALL EARTHING LAYOUT		Noted. Colour has been changed in revised layout.	

Note: Shall be referred only for Bay allocation purpose.



**TABLE-A: DATA OF CT DETAILS**

Sl. No.	CT No.	CT Ratio	CT Class	CT Accuracy	CT Location
1	765-CT-1A	765/5	0.2	0.5	765kV Bus
2	765-CT-1B	765/5	0.2	0.5	765kV Bus
3	765-CT-1C	765/5	0.2	0.5	765kV Bus
4	765-CT-1D	765/5	0.2	0.5	765kV Bus
5	765-CT-1E	765/5	0.2	0.5	765kV Bus
6	765-CT-1F	765/5	0.2	0.5	765kV Bus
7	765-CT-1G	765/5	0.2	0.5	765kV Bus
8	765-CT-1H	765/5	0.2	0.5	765kV Bus
9	765-CT-1I	765/5	0.2	0.5	765kV Bus
10	765-CT-1J	765/5	0.2	0.5	765kV Bus
11	765-CT-1K	765/5	0.2	0.5	765kV Bus
12	765-CT-1L	765/5	0.2	0.5	765kV Bus
13	765-CT-1M	765/5	0.2	0.5	765kV Bus
14	765-CT-1N	765/5	0.2	0.5	765kV Bus
15	765-CT-1O	765/5	0.2	0.5	765kV Bus
16	765-CT-1P	765/5	0.2	0.5	765kV Bus
17	765-CT-1Q	765/5	0.2	0.5	765kV Bus
18	765-CT-1R	765/5	0.2	0.5	765kV Bus
19	765-CT-1S	765/5	0.2	0.5	765kV Bus
20	765-CT-1T	765/5	0.2	0.5	765kV Bus
21	765-CT-1U	765/5	0.2	0.5	765kV Bus
22	765-CT-1V	765/5	0.2	0.5	765kV Bus
23	765-CT-1W	765/5	0.2	0.5	765kV Bus
24	765-CT-1X	765/5	0.2	0.5	765kV Bus
25	765-CT-1Y	765/5	0.2	0.5	765kV Bus
26	765-CT-1Z	765/5	0.2	0.5	765kV Bus
27	765-CT-1AA	765/5	0.2	0.5	765kV Bus
28	765-CT-1AB	765/5	0.2	0.5	765kV Bus
29	765-CT-1AC	765/5	0.2	0.5	765kV Bus
30	765-CT-1AD	765/5	0.2	0.5	765kV Bus
31	765-CT-1AE	765/5	0.2	0.5	765kV Bus
32	765-CT-1AF	765/5	0.2	0.5	765kV Bus
33	765-CT-1AG	765/5	0.2	0.5	765kV Bus
34	765-CT-1AH	765/5	0.2	0.5	765kV Bus
35	765-CT-1AI	765/5	0.2	0.5	765kV Bus
36	765-CT-1AJ	765/5	0.2	0.5	765kV Bus
37	765-CT-1AK	765/5	0.2	0.5	765kV Bus
38	765-CT-1AL	765/5	0.2	0.5	765kV Bus
39	765-CT-1AM	765/5	0.2	0.5	765kV Bus
40	765-CT-1AN	765/5	0.2	0.5	765kV Bus
41	765-CT-1AO	765/5	0.2	0.5	765kV Bus
42	765-CT-1AP	765/5	0.2	0.5	765kV Bus
43	765-CT-1AQ	765/5	0.2	0.5	765kV Bus
44	765-CT-1AR	765/5	0.2	0.5	765kV Bus
45	765-CT-1AS	765/5	0.2	0.5	765kV Bus
46	765-CT-1AT	765/5	0.2	0.5	765kV Bus
47	765-CT-1AU	765/5	0.2	0.5	765kV Bus
48	765-CT-1AV	765/5	0.2	0.5	765kV Bus
49	765-CT-1AW	765/5	0.2	0.5	765kV Bus
50	765-CT-1AX	765/5	0.2	0.5	765kV Bus
51	765-CT-1AY	765/5	0.2	0.5	765kV Bus
52	765-CT-1AZ	765/5	0.2	0.5	765kV Bus
53	765-CT-1BA	765/5	0.2	0.5	765kV Bus
54	765-CT-1BB	765/5	0.2	0.5	765kV Bus
55	765-CT-1BC	765/5	0.2	0.5	765kV Bus
56	765-CT-1BD	765/5	0.2	0.5	765kV Bus
57	765-CT-1BE	765/5	0.2	0.5	765kV Bus
58	765-CT-1BF	765/5	0.2	0.5	765kV Bus
59	765-CT-1BG	765/5	0.2	0.5	765kV Bus
60	765-CT-1BH	765/5	0.2	0.5	765kV Bus
61	765-CT-1BI	765/5	0.2	0.5	765kV Bus
62	765-CT-1BJ	765/5	0.2	0.5	765kV Bus
63	765-CT-1BK	765/5	0.2	0.5	765kV Bus
64	765-CT-1BL	765/5	0.2	0.5	765kV Bus
65	765-CT-1BM	765/5	0.2	0.5	765kV Bus
66	765-CT-1BN	765/5	0.2	0.5	765kV Bus
67	765-CT-1BO	765/5	0.2	0.5	765kV Bus
68	765-CT-1BP	765/5	0.2	0.5	765kV Bus
69	765-CT-1BQ	765/5	0.2	0.5	765kV Bus
70	765-CT-1BR	765/5	0.2	0.5	765kV Bus
71	765-CT-1BS	765/5	0.2	0.5	765kV Bus
72	765-CT-1BT	765/5	0.2	0.5	765kV Bus
73	765-CT-1BU	765/5	0.2	0.5	765kV Bus
74	765-CT-1BV	765/5	0.2	0.5	765kV Bus
75	765-CT-1BW	765/5	0.2	0.5	765kV Bus
76	765-CT-1BX	765/5	0.2	0.5	765kV Bus
77	765-CT-1BY	765/5	0.2	0.5	765kV Bus
78	765-CT-1BZ	765/5	0.2	0.5	765kV Bus
79	765-CT-1CA	765/5	0.2	0.5	765kV Bus
80	765-CT-1CB	765/5	0.2	0.5	765kV Bus
81	765-CT-1CC	765/5	0.2	0.5	765kV Bus
82	765-CT-1CD	765/5	0.2	0.5	765kV Bus
83	765-CT-1CE	765/5	0.2	0.5	765kV Bus
84	765-CT-1CD	765/5	0.2	0.5	765kV Bus
85	765-CT-1CE	765/5	0.2	0.5	765kV Bus
86	765-CT-1CD	765/5	0.2	0.5	765kV Bus
87	765-CT-1CE	765/5	0.2	0.5	765kV Bus
88	765-CT-1CD	765/5	0.2	0.5	765kV Bus
89	765-CT-1CE	765/5	0.2	0.5	765kV Bus
90	765-CT-1CD	765/5	0.2	0.5	765kV Bus
91	765-CT-1CE	765/5	0.2	0.5	765kV Bus
92	765-CT-1CD	765/5	0.2	0.5	765kV Bus
93	765-CT-1CE	765/5	0.2	0.5	765kV Bus
94	765-CT-1CD	765/5	0.2	0.5	765kV Bus
95	765-CT-1CE	765/5	0.2	0.5	765kV Bus
96	765-CT-1CD	765/5	0.2	0.5	765kV Bus
97	765-CT-1CE	765/5	0.2	0.5	765kV Bus
98	765-CT-1CD	765/5	0.2	0.5	765kV Bus
99	765-CT-1CE	765/5	0.2	0.5	765kV Bus
100	765-CT-1CD	765/5	0.2	0.5	765kV Bus

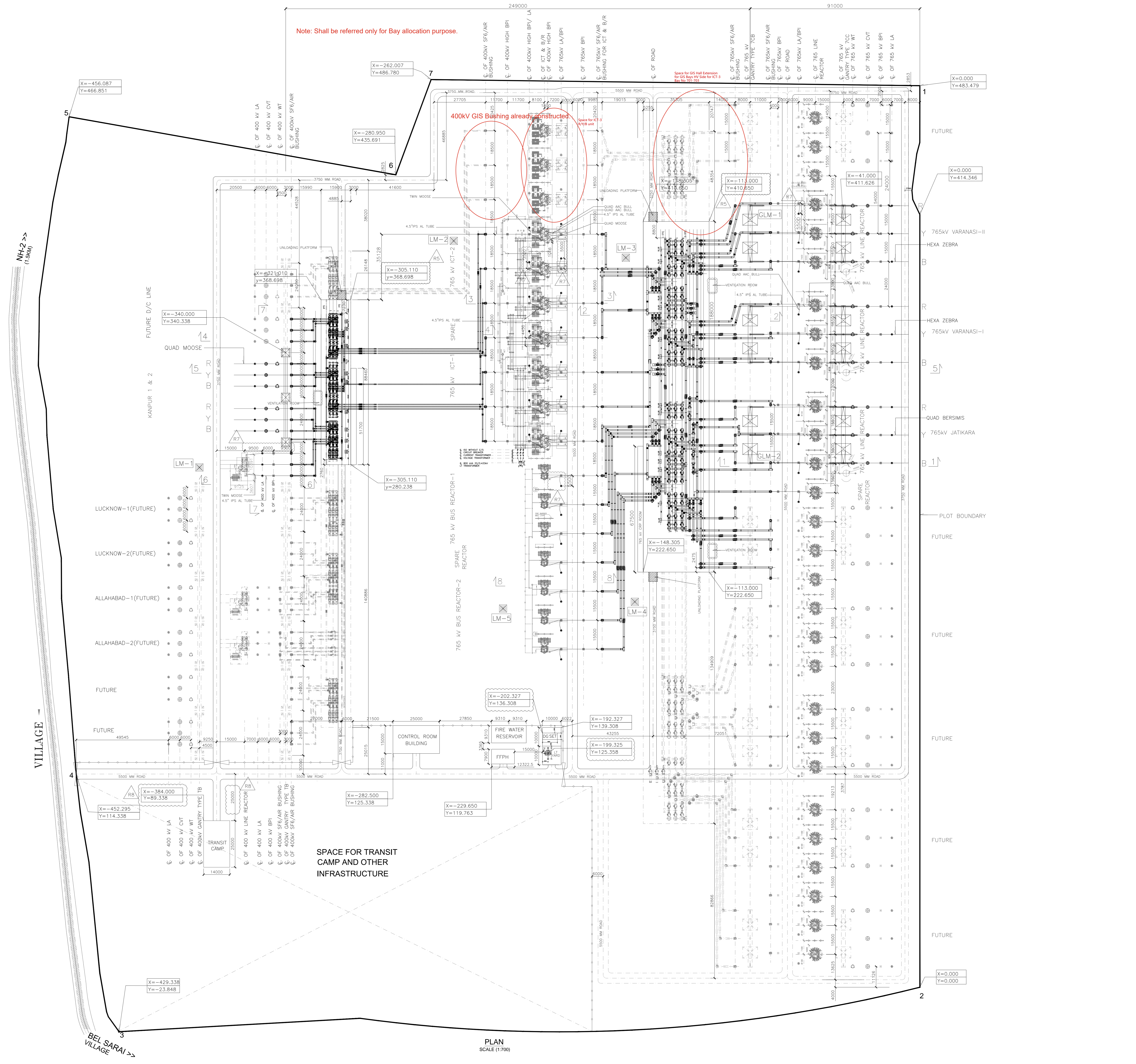
**TABLE-B: DATA OF PT DETAILS**

Sl. No.	PT No.	PT Ratio	PT Class	PT Location
1	765-PT-1	765/110	0.2	765kV Bus
2	765-PT-2	765/110	0.2	765kV Bus
3	765-PT-3	765/110	0.2	765kV Bus
4	765-PT-4	765/110	0.2	765kV Bus
5	765-PT-5	765/110	0.2	765kV Bus
6	765-PT-6	765/110	0.2	765kV Bus
7	765-PT-7	765/110	0.2	765kV Bus
8	765-PT-8	765/110	0.2	765kV Bus
9	765-PT-9	765/110	0.2	765kV Bus
10	765-PT-10	765/110	0.2	765kV Bus
11	765-PT-11	765/110	0.2	765kV Bus
12	765-PT-12	765/110	0.2	765kV Bus
13	765-PT-13	765/110	0.2	765kV Bus
14	765-PT-14	765/110	0.2	765kV Bus
15	765-PT-15	765/110	0.2	765kV Bus
16	765-PT-16	765/110	0.2	765kV Bus
17	765-PT-17	765/110	0.2	765kV Bus
18	765-PT-18	765/110	0.2	765kV Bus
19	765-PT-19	765/110	0.2	765kV Bus
20	765-PT-20	765/110	0.2	765kV Bus
21	765-PT-21	765/110	0.2	765kV Bus
22	765-PT-22	765/110	0.2	765kV Bus
23	765-PT-23	765/110	0.2	765kV Bus
24	765-PT-24	765/110	0.2	765kV Bus
25	765-PT-25	765/110	0.2	765kV Bus
26	765-PT-26	765/110	0.2	765kV Bus
27	765-PT-27	765/110	0.2	765kV Bus
28	765-PT-28	765/110	0.2	765kV Bus
29	765-PT-29	765/110	0.2	765kV Bus
30	765-PT-30	765/110	0.2	765kV Bus
31	765-PT-31	765/110	0.2	765kV Bus
32	765-PT-32	765/110	0.2	765kV Bus
33	765-PT-33	765/110	0.2	765kV Bus
34	765-PT-34	765/110	0.2	765kV Bus
35	765-PT-35	765/110	0.2	765kV Bus
36	765-PT-36	765/110	0.2	765kV Bus
37	765-PT-37	765/110	0.2	765kV Bus
38	765-PT-38	765/110	0.2	765kV Bus
39	765-PT-39	765/110	0.2	765kV Bus
40	765-PT-40	765/110	0.2	765kV Bus
41	765-PT-41	765/110	0.2	765kV Bus
42	765-PT-42	765/110	0.2	765kV Bus
43	765-PT-43	765/110	0.2	765kV Bus
44	765-PT-44	765/110	0.2	765kV Bus
45	765-PT-45	765/110	0.2	765kV Bus
46	765-PT-46	765/110	0.2	765kV Bus
47	765-PT-47	765/110	0.2	765kV Bus
48	765-PT-48	765/110	0.2	765kV Bus
49	765-PT-49	765/110	0.2	765kV Bus
50	765-PT-50	765/110	0.2	765kV Bus
51	765-PT-51	765/110	0.2	765kV Bus
52	765-PT-52	765/110	0.2	765kV Bus
53	765-PT-53	765/110	0.2	765kV Bus
54	765-PT-54	765/110	0.2	765kV Bus
55	765-PT-55	765/110	0.2	765kV Bus
56	765-PT-56	765/110	0.2	765kV Bus
57	765-PT-57	765/110	0.2	765kV Bus
58	765-PT-58	765/110	0.2	765kV Bus
59	765-PT-59	765/110	0.2	765kV Bus
60	765-PT-60	765/110	0.2	765kV Bus
61	765-PT-61	765/110	0.2	765kV Bus
62	765-PT-62	765/110	0.2	765kV Bus
63	765-PT-63	765/110	0.2	765kV Bus
64	765-PT-64	765/110	0.2	765kV Bus
65	765-PT-65	765/110	0.2	765kV Bus
66	765-PT-66	765/110	0.2	765kV Bus
67	765-PT-67	765/110	0.2	765kV Bus
68	765-PT-68	765/110	0.2	765kV Bus
69	765-PT-69	765/110	0.2	765kV Bus
70	765-PT-70	765/110	0.2	765kV Bus
71	765-PT-71	765/110	0.2	765kV Bus
72	765-PT-72	765/110	0.2	765kV Bus
73	765-PT-73	765/110	0.2	765kV Bus
74	765-PT-74	765/110	0.2	765kV Bus
75	765-PT-75	765/110	0.2	765kV Bus
76	765-PT-76	765/110	0.2	765kV Bus
77	765-PT-77	765/110	0.2	765kV Bus
78	765-PT-78	765/110	0.2	765kV Bus
79	765-PT-79	765/110	0.2	765kV Bus
80	765-PT-80	765/110	0.2	765kV Bus
81	765-PT-81	765/110	0.2	765kV Bus
82	765-PT-82	765/110	0.2	765kV Bus
83	765-PT-83	765/110	0.2	765kV Bus
84	765-PT-84	765/110	0.2	765kV Bus
85	765-PT-85	765/110	0.2	765kV Bus
86	765-PT-86	765/110	0.2	765kV Bus
87	765-PT-87	765/110	0.2	765kV Bus
88	765-PT-88	765/110	0.2	765kV Bus
89	765-PT-89	765/110	0.2	765kV Bus
90	765-PT-90	765/110	0.2	765kV Bus
91	765-PT-91	765/110	0.2	765kV Bus
92	765-PT-92	765/110	0.2	765kV Bus
93	765-PT-93	765/110	0.2	765kV Bus
94	765-PT-94	765/110	0.2	765kV Bus
95	765-PT-95	765/110	0.2	765kV Bus
96	765-PT-96	765/110	0.2	765kV Bus
97	765-PT-97	765/110	0.2	765kV Bus
98	765-PT-98	765/110	0.2	765kV Bus
99	765-PT-99	765/110	0.2	765kV Bus
100	765-PT-100	765/110	0.2	765kV Bus

**TABLE-C: DATA OF BUSBAR DETAILS**

Sl. No.	Busbar No.	Busbar Type	Busbar Location
1	765-BUS-1	76	





- LEGENDS:**
- ⊕ LIGHTNING ARRESTOR
  - ⊕ CAPACITIVE VOLTAGE TRANSFORMER
  - ⊕ WAVE TRAP
  - ⊕ BUS POST INSULATOR
  - ⊕ SF6 TO AIR TERMINATION BUSHING
  - LR LINE REACTOR
  - BR BUS REACTOR
  - ICT INTERCONNECTING TRANSFORMER
  - LA LIGHTNING ARRESTOR
  - WT WAVE TRAP
  - CVT CAPACITIVE VOLTAGE TRANSFORMER
  - ⊕ LIGHTNING MAST
- PRESENT SCOPE  
- - - FUTURE SCOPE

- NOTES:**
- 1 ALL THE DIMENSIONS ARE IN MM.
  - 2 OUTDOOR EQUIPMENT DIMENSIONS ARE INDICATIVE ONLY.
  - 3 TRANSFORMER & REACTOR AREA IS KEPT UNDER HOLD CONDITION.
  - 4 LAYOUT PERTAINING TO LT TRANSFORMER & TERTIARY AREA ARE KEPT UNDER HOLD AND THE SAME SHALL BE UPDATED BASED ON APPROVED MANUFACTURE DRAWING.
  - 5 LOCATION AND SIZE OF 765kV AND 400kV GIS HALL VENTILATION ROOM ARE INDICATIVE ONLY. FINAL LOCATION AND SIZE WILL BE AS PER APPROVED VENTILATION SYSTEM DESIGN.
  - 6 LOCATION OF TRANSIT CAMP IS TENTATIVE AND SHALL BE DECIDED BY PGCL SITE.
  - 7 IN THIS LAYOUT GIS HALL INNER DIMENSIONS ARE SHOWN. FOR DETAIL DIMENSION PLEASE REFER RESPECTIVE ARCH. DRAWING.

- PINGGAO REFERENCE DRAWING:**
- 1 SINGLE LINE DIAGRAM 765kV/400kV KANPUR GIS SUBSTATION PG/PGCL/KNP/Sid-drg-001 R3
  - 2 765kV GIS PLAN LAYOUT DRAWING FOR 765/400 kV KANPUR (NEW) GIS SUBSTATION: PG/PGCL/KNP/765/PLAN/GIS-drg/001-R3
  - 3 400kV GIS PLAN LAYOUT DRAWING FOR 765/400 kV KANPUR (NEW) GIS SUBSTATION: PG/PGCL/KNP/400/PLAN/GIS-drg/001-R2

IN CASE OF REVISION OF THESE DRAWINGS, THE SAME CHANGE WILL BE INCORPORATED IN THE GA DRAWING.

**ELECTRICAL PARAMETER**

SR. NO.	DESCRIPTION OF PARAMETERS	765kV SYSTEM	400kV SYSTEM
1	SYSTEM OPERATING VOLTAGE	765kV	400kV
2	MAXIMUM OPERATING VOLTAGE OF THE SYSTEM (RMS)	800kV	420kV
3	RATED FREQUENCY	50HZ	50HZ
4	NO. OF PHASE	3	3
5	RATED INSULATION LEVELS		
i)	FULL WAVE IMPULSE WITHSTAND VOLTAGE (1.2/50 MICROSEC)	2100kVp	1550kVp
ii)	SWITCHING IMPULSE WITHSTAND VOLTAGE (250/2500 MICROSEC)	1550kVp	1050kVp
iii)	ONE MINUTE POWER FREQUENCY WAVE WITHSTAND VOLTAGE (RMS)	830kV	630kV
6	CORONA EXTINCTION VOLTAGE	508kV	320kV
7	MAX. RADIO INTERFERENCE VOLTAGE FOR FREQUENCY BETWEEN 0.5 MHz AND 2 MHz AT 508kV RMS FOR 765kV, 266kV RMS FOR 400kV SYSTEM	2500 MICRO-VOLTS	1000 MICRO-VOLTS
8	MINIMUM CREEPAGE DISTANCE (25MM/KV)	20000MM	10500MM
9	MINIMUM CLEARANCES		
i)	PHASE TO PHASE	7600MM (FOR CONDUCTOR CONFIGURATION) 9400MM (FOR ROD-CONDUCTOR CONFIGURATION)	4000MM (FOR CONDUCTOR CONFIGURATION) 4200MM (FOR ROD-CONDUCTOR CONFIGURATION)
ii)	PHASE TO EARTH	4900MM (FOR CONDUCTOR STRUCTURE) 6400MM (FOR ROD-STRUCTURE)	3500 MM
iii)	SECTIONAL CLEARANCE	10300 MM	6500 MM
10	RATED SHORT CIRCUIT CURRENT FOR 1sec. DURATION	40KA FOR 1 SEC. 50KA FOR 1 SEC.	
11	SYSTEM NEUTRAL EARTHING	EFFECTIVELY EARTHED	EFFECTIVELY EARTHED

SR.	REVISION	DATE	BY	CHKD.	DATE
R7	REVISED IN LINE WITH APPROVED 765kV LINE & BUS REACTOR AREA AND 400kV REACTOR AREA AS PER PGCL COMMENT	30-07-2014	DSP		
R6	REVISED IN LINE WITH APPROVED ICT AREA PLAN	09-08-2014	DSP		
R5	REVISED IN LINE WITH APPROVED GIS LAYOUT DRAWING	03-04-2014	DSP		
R4	REVISED AS PER POWERGRID COMMENT	05-10-2014	DSP		
R3	REVISED AS PER POWERGRID COMMENT	27-12-2013	DSP		
R2	REVISED AS PER POWERGRID COMMENT	12-12-2013	DSP		
R1	REVISED AS PER POWERGRID COMMENT	18-10-2013	DSP		
R0	FOR APPROVAL	14-09-2013	DSP		

CLIENT: **POWER GRID CORPORATION OF INDIA LIMITED**  
(A GOVERNMENT OF INDIA ENTERPRISE)

PROJECT: **SUBSTATION PACKAGE - GIS-3**  
765/400 kV KANPUR (NEW) GIS SUBSTATION UNDER TRANSMISSION SYSTEM ASSOCIATED WITH PHASE-I GENERATION PROJECT IN JHARKHAND & WB (PART-B)  
SPECIFICATION No.: CC / 161 - NR1 / GIS - 1403 / 3 / G8

MAIN CONTRACTOR: **PINGGAO GROUP CO. LTD.**

CONSULTANT: **TATA CONSULTING ENGINEERS LIMITED, MUMBAI**

ARCHITECT: **TATA PROJECTS LIMITED**  
TOWER-8, GROUND FLOOR, GREEN BOULEVARD, PLOT NO. B-9/A  
SECTOR-62, NOIDA

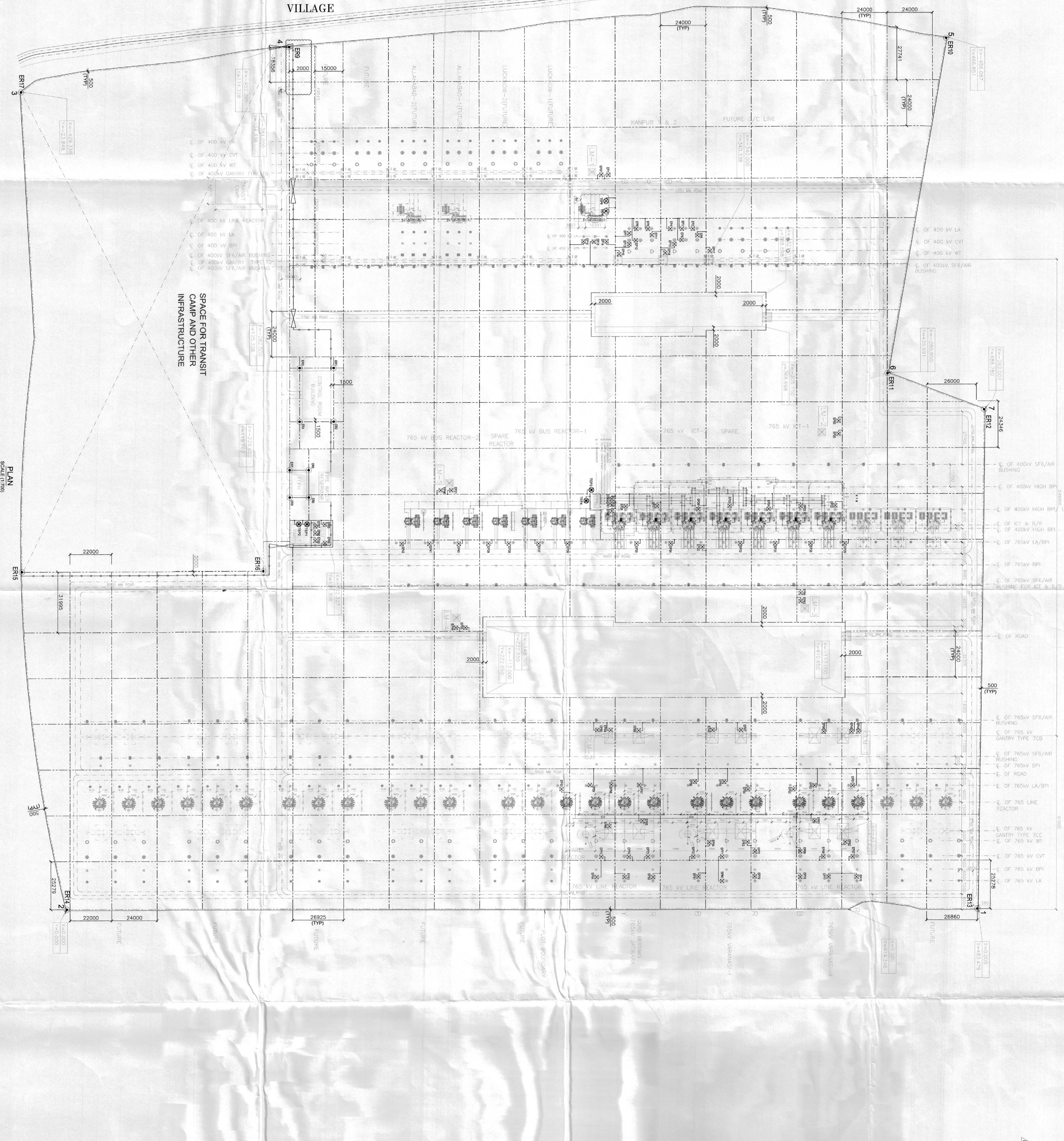
TITLE: **OVERALL GENERAL ARRANGEMENT LAYOUT FOR 765/400kV KANPUR GIS SUBSTATION**

SCALE: 1 : 700	APPROVED:	DATE: 30-07-2014
DIV: ENGINEERING		
DRN: RSJ	MANUJ PATNAIK Project Director	SHEET 1 OF 2
CHKD: --	TCE-7320A-740-GA-3011	ISSUE: R7



VILLAGE

NH-2  
(1.5KM)



PLAN  
SCALE (1/700)

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

**NOTES:**

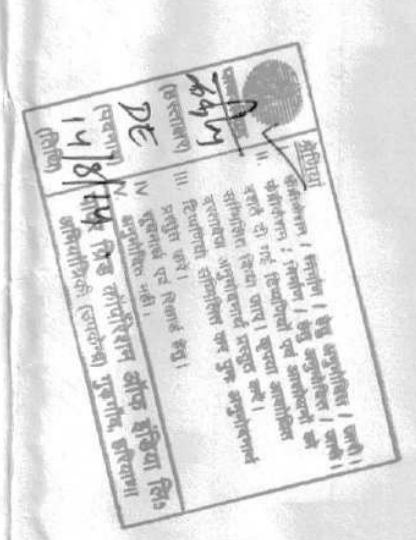
1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE SPECIFIED.
2. MAIN EARTHING CONDUCTOR SHALL BE Laid 600mm BELOW THE FINISHED GRADE.
3. UNDESIRABLE GROUNDING OF 25 X 25 M.M. IS CONSIDERED FOR EARTHING AND WIREMESH AS PER THE SITE CONDITIONS.
4. EARTHING CONDUCTOR CROSSING THE ROAD CASE THROUGH PRESS & DRAWING Etc. THE SAME SHALL BE Laid BELOW 300mm OF RESPECTIVE CROSSING.
5. EARTHING LEADS FROM EQUIPMENT STRUCTURES SHALL BE CONNECTED TO EARTHING CONDUCTOR AT MAIN EARTHING POINTS SHALL BE 800 TO 1000 mm.
6. ABOVE AND BELOW GROUND LEVEL CONNECTIONS SHALL BE WELDED TO THE LOCATION OF EQUIPMENT EARTHING LEADS AND EARTH ELECTRODES ARE SHOWN IN THE DRAWING.
7. EARTHING CONDUCTOR SHALL BE BURIED 2 M OUTSIDE SWITCHYARD FENCE. ALL GATES AND ALTERNATE FENCE POSTS SHALL BE EARTHED.
8. FOR EARTHING OF EQUIPMENT SUPPORT STRUCTURES & TOWERS RISERS EARTHING CONDUCTOR SHALL BE BURIED 2 M OUTSIDE SWITCHYARD FENCE. ALL GATES SHALL BE FOLLOWED.
9. RAIL TRACKS WITHIN SWITCHYARD SHALL BE EARTHED AT 2M INTERVAL AND ALSO AT 100 M INTERVAL.
10. EARTHING CONDUCTOR EMBEDDED IN CONCRETE SHALL HAVE APP. 50MM CONCRETE COVER.
11. JOINTS SHALL BE ALLOWED TO COOL DOWN GRADUALLY TO AMBIENT TEMPERATURE BEFORE PUTTING ANY LOAD ON IT. ARTIFICIAL COOLING SHALL NOT BE ALLOWED.
12. BONDING OF EARTH ROD SHALL BE DONE PREFERABLY BY GAS HEATING.
13. COVER EARTHING CONDUCTOR LARGER DIA CONDUCTOR SHALL BE DONE WITH LON HYDROGEN.
14. THE EARTHING PIPE LINE AND ANY OTHER PIPE LINE SYSTEM THROUGH THE YARD SHALL BE GROUND WITH EARTH MAT. THE TOP AND ALL ALONG THE CASE & TRAY AND SHALL BE WELDED TO EARTHING THE BONES. EARTHING THIS MAT SHALL BE PAINTED AT BOTH ENDS AT INTERVAL OF 3M. THIS MAT SHALL BE FINALLY PAINTED WITH TWO COATS RED OXIDE AND POST OFFICE EMERALD PAINT.
15. EARTHING CONDUCTOR SHALL BE BURIED IN A MINIMUM DISTANCE OF 1500 MM FROM OUTER BOUNDARY OF SWITCHYARD.
16. EARTHING CONDUCTOR SHALL BE BURIED IN A MINIMUM DISTANCE OF 1500 MM FROM OUTER BOUNDARY OF SWITCHYARD.
17. EARTHING CONDUCTOR SHALL BE BURIED IN A MINIMUM DISTANCE OF 1500 MM FROM OUTER BOUNDARY OF SWITCHYARD.
18. *Earthling design is subject to approval.*

**BILL OF QUANTITIES:**

Sl. No.	DESCRIPTION	UNITS	QUANTITY
1	40 DIA. U.S. ROD - MAIN EARTHING CONDUCTOR	Mtrs.	16000
2	40 DIA. U.S. ROD - RISER	Mtrs.	3000
3	75 X 12.5 S FLAT - EARTHING CONDUCTOR	Mtrs.	5000
4	80 X 8 G.S. FLAT - EARTHING CONDUCTOR	Mtrs.	2000
5	50 X 8 S FLAT - EARTHING CONDUCTOR	Mtrs.	2000
6	40 DIA. 3000MM LONG 1/3 ROD ELECTRODE WITH	Nos.	90
7	40 DIA. 3000MM LONG 1/3 ROD ELECTRODE WITHOUT	Nos.	200
8	EARTH PIT (3000MM LONG - 3.5 PILE ELECTRODE WITH TREATED	Nos.	11
9	EARTH PIT	Nos.	6

**LEGEND:**

- : MAIN EARTH MAT / GRID (40 DIA. U.S. ROD)
- ⊗ : EARTH ROD (NUMBER)
- ⊕ : EARTH PIT (NUMBER)
- ⊙ : TREATED EARTH PIT (NUMBER)
- : 40mm DIA. 3000mm LONG U.S. ROD ELECTRODE WITHOUT EARTH PIT
- ⊙ : 40mm DIA. 3000mm LONG U.S. ROD ELECTRODE WITH EARTH PIT
- ⊙ : TREATED EARTH PIT WITH 40mm DIA. 3000mm LONG G.S. PILE ELECTRODE



**POWER GRID CORPORATION OF INDIA LIMITED**  
(A GOVERNMENT OF INDIA ENTERPRISE)

**PROJECT:** 765KV KANPUR (NEW) GIS SUBSTATION UNDER TRANSMISSION SYSTEM ASSOCIATION SPECIFICATION No. GC-CSE/161-NRI/GIS-1400/3 (2014)

**CLIENT:** PINGGAO GROUP CO. LTD.

**CONSULTANT:** TATA CONSULTING ENGINEERS LIMITED, MUMBAI

**PROJECT ENGINEER:** TATA PROJECTS LIMITED, TOWER-8, GROUND FLOOR, GREEN BOULEVARD, PLOT NO. B-9A, SECTOR-62, NOIDA

**TITLE:** OVERALL SUBSTATION EARTH MAT LAYOUT FOR 765KV KANPUR GIS SUBSTATION

SCALE: 1:700

DATE: 31-07-2014

DESIGNED BY: RSD

CHECKED BY: RSD

DATE: 31-07-2014

PROJECT NO: TCE/720A-18-GI-3029

SHEET NO: 1

TOTAL SHEETS: 2