BOQ_ANNEXURE_2

PROJECT SPECIFIC DRAWING & DOCUMENT LIST

Sl. No.	DRAWING / DOCUMENT NUMBER	DRAWING / DOCUMENT TITLE
1	TB-1-424-510-001-REV 07	BIKANER III NEW S/S- SINGLE LINE DIAGRAM
2	TB-0-424-316-001-REV 08	BIKANER III NEW S/S- ELECTRICAL LAYOUT PLAN & SECTIONAL ELEVATION OF BIKANER (III) S/S
3	TB-0-424-316-003-REV 01	BIKANER III NEW S/S- STRUCTURE LAYOUT PLAN & SECTION
4	TB-0-424-316-004-REV 01	BIKANER III NEW S/S- DSLP LAYOUT
5	TB-0-424-316-008-REV 01, TB-424-316-008-BOQ -REV 01	BIKANER III NEW S/S- ERECTION KEY DIAGRAM LAYOUT PLAN & SECTION & BOQ
6	TB-0-424-316-007-REV 03	BIKANER III NEW S/S-CABLE TRENCH LAYOUT
7	TB-0-424-316-005-REV 03	BIKANER III NEW S/S- EARTHMAT LAYOUT DRGS
8	TB-2-424-316-009-REV 01	BIKANER III NEW S/S- CONTROL ROOM BUILDING CABLE TRENCH LAYOUT
9	C/ENGG/NRI/BIKANER-III/SS01/IND CAB TRENCH/01-REV 01	RCC DETAILS OF GRADE SLAB AND INDOOR CABLE TRENCHES FOR AUXILIARY BUILDING
10	USL/PGCIL/BHEL/2024-2025/1241A	BIKANER III NEW S/S- LT SWITCHGEAR - DRGS
11	Annexure-Aluminium_Welding	PROCEDURE FOR WELDING OF ALUMINIUM BUSES
12	TB-XXX-618-002a	TECHNICAL SPECIFICATION FOR EQUIPMENT FIXING HARDRWARE
13	Annexure-TRF	N2 FILLING/ VACCUMING/ PURGING AND HEATING (IF REQUIRED) AS PER BHEL BHOPAL PROCEDURE FOR TRANSFORMERS/ REACTORS
14	TB-XXX-316-041-REV 02	TECHNICAL SPECIFICATION-PVC PIPES & BENDS
15	TB-XXX-316-040-REV 02	TECHNICAL SPECIFICATION-GI PIPES & BENDS

Note:

1. Above drawings are given for reference purpose. Latest revision of above drawings will be shared with successful bidder, which is to be followed, during contract execution stage.
2. Any other drawing/document related to BOQ line item will be shared with successful bidder during detailed engineering stage.

BOQ_ANNEXURE_3

STANDARD DRAWING & DOCUMENT LIST

Sl.No	DRAWING / DOCUMENT NUMBER	DRAWING / DOCUMENT TITLE
1	SECTION-PROJECT-REV.00	SECTION-PROJECT. (REV.00): SUBSTATION PACKAGE SS01 A) CONSTRUCTION OF 765/400/220KV BIKANER-III (NEW) PS B) EXTENSION OF 765 KV NEEMRANA-II S/S C) EXTENSION OF 400KV BIKANER-III S/S UNDER TRANSMISSION SYSTEM FOR EVACUATION OF POWER FROM REZ IN RAJASTHAN (7.7 GW) UNDER PHASE IV-PART I,
2	C/ENGG/SPEC/GTR (Rev.15)	SECTION-GENERAL TECHNICAL REQUIREMENTS (REV.15)
3	C / ENGG / SPEC / ERC REV. NO: 10	SECTION-SE (SWITCHYARD ERECTION (REV.10))
4	D-2-01-03-01-04	PRE COMMISSIONING PROCEDURE & FORMAT FOR SWITCHYARD ERECTION
5	Annexure-III	SPECIFIC REQUIREMENT_REV 07 WITH ANNEXURES
6	PG-C-ENGG-SPEC-SWGR-CB-REV.11	SECTION- SWITCHGEAR- CB (REV 11)
7	PG-C-ENGG-SPEC-SWGR-ISO-REV.R11B	SECTION- SWITCHGEAR- ISO (REV 11B)
8	PG-C-ENGG-SPEC-SWGR-INT-REV.R11	SECTION- SWITCHGEAR-INST (INSTRUMENT TRANSFORMER) (REV 11)
9	C/ENGG/SPEC/SWGR/SA/R12	SECTION- SWITCHGEAR- SURGE ARRESTER (REV 12)
10	PG-C-ENGG-SPEC-CAB-REV.06	SECTION-POWER AND CONTROL CABLES (REV.06)
11	C/ENGG/MODEL-SPEC/RT Rev. 11	TECHNICAL SPECIFICATION, UPTO 400KV SHUNT REACTOR
12	C/ENGG/SPEC/LT-TRF Rev. No. 5	TECHNICAL SPECIFICATION, SECTION: LT TRANSFORMER
13	C/ENGG/SPEC/STR (REV 06)	SECTION: STRUCTURE

Note:

1 Any other drawing/document related to BOQ line item will be shared with successful bidder during detailed engineering stage.

BOQ_ANNEXURE_2

PROJECT SPECIFIC DRAWING & DOCUMENT LIST

Sl. No.	DRAWING / DOCUMENT NUMBER	DRAWING / DOCUMENT TITLE
1	TB-1-424-510-101-REV 01	Bikaner II- SINGLE LINE DIAGRAM
2	TB-0-424-316-102-REV 02	Bikaner II- ELECTRICAL LAYOUT PLAN & SECTION
3	TB-0-424-316-104-REV 00/ TB202359-1002269-SI3480-DSLP-LAYOUT	Bikaner II- DSLP LAYOUT
4	TB-2-424-316-105-REV 00	Bikaner II- ERECTION KEY DIAGRAM LAYOUT PLAN & SECTION
5	TB-0-424-316-104-REV 00/ TB202359-1002269-SI3480-CABTR-LAYOUT-REV 00	Bikaner II-CABLE TRENCH LAYOUT
6	TB-0-424-316-103-REV 01	Bikaner II- EARTHMAT LAYOUT DRGS
7	Annexure-Aluminium_Welding	PROCEDURE FOR WELDING OF ALUMINIUM BUSES
8	TB-XXX-618-002a	TECHNICAL SPECIFICATION FOR EQUIPMENT FIXING HARDRWARE
9	TB-XXX-316-041-REV 02	TECHNICAL SPECIFICATION-PVC PIPES & BENDS
10	TB-XXX-316-040-REV 02	TECHNICAL SPECIFICATION-GI PIPES & BENDS

Note:

1 Above drawings are given for reference purpose. Latest revision of above drawings will be shared with successful bidder, which is to be followed, during contract execution stage.

2 Any other drawing/document related to BOQ line item will be shared with successful bidder during detailed engineering stage.

BOQ_ANNEXURE_3

STANDARD DRAWING & DOCUMENT LIST

Sl.No	DRAWING / DOCUMENT NUMBER	DRAWING / DOCUMENT TITLE
1	SECTION-PROJECT-REV.00	SECTION-PROJECT. (REV.00): SUBSTATION PACKAGE SS01 A) CONSTRUCTION OF 765/400/220KV BIKANER-III (NEW) PS B) EXTENSION OF 765 KV NEEMRANA-II S/S C) EXTENSION OF 400KV BIKANER-III S/S UNDER TRANSMISSION SYSTEM FOR EVACUATION OF POWER FROM REZ IN RAJASTHAN (7.7 GW) UNDER PHASE IV-PART I,
2	C/ENGG/SPEC/GTR (Rev.15)	SECTION-GENERAL TECHNICAL REQUIREMENTS (REV.15)
3	C / ENGG / SPEC / ERC REV. NO: 10	SECTION-SE (SWITCHYARD ERECTION (REV.10))
4	D-2-01-03-01-04	PRE COMMISSIONING PROCEDURE & FORMAT FOR SWITCHYARD ERECTION
5	Annexure-III	SPECIFIC REQUIREMENT_REV 07 WITH ANNEXURES
6	PG-C-ENGG-SPEC-SWGR-CB-REV.11	SECTION- SWITCHGEAR- CB (REV 11)
7	PG-C-ENGG-SPEC-SWGR-ISO-REV.R11B	SECTION- SWITCHGEAR- ISO (REV 11B)
8	PG-C-ENGG-SPEC-SWGR-INT-REV.R11	SECTION- SWITCHGEAR-INST (INSTRUMENT TRANSFORMER) (REV 11)
9	C/ENGG/SPEC/SWGR/SA/R12	SECTION- SWITCHGEAR- SURGE ARRESTER (REV 12)
10	PG-C-ENGG-SPEC-CAB-REV.06	SECTION-POWER AND CONTROL CABLES (REV.06)
11	C/ENGG/SPEC/STR (REV 06)	SECTION: STRUCTURE

Note:

1 Any other drawing/document related to BOQ line item will be shared with successful bidder during detailed engineering stage.

पावरग्रिड
POWERGRID

पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
(भारत सरकार का उपक्रम)
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

संदर्भ/Ref : CC-ENGG-TB202359-1002269-BS3480-SS-SLD

Date : 28/12/2024

From : Somiran Das
Senior GM

To : Bharat Heavy Electricals Limited
Plot No.-7, Sector-142 Noida 201305
201305

Cc :

Subject : Substation Package SS-01 for (i) Establishment of 765/400/220kV Bikaner-III (New) Pooling Station including 400kV class Bus Reactor at Bikaner-III S/s; (ii) Extension of 765kV Neemrana-II S/s for termination of 765 kV D/c line Neemrana-II–Bikaner-III T/L and (iii) Extension of 400kV Bikaner-II S/s for termination of 400kV Bikaner-II Bikaner-III T/L under "Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-1) (Bikaner Complex): PART-A"

LOA Ref : CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 Dated 23/02/2024

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

Vendor Drg. No.	:	TB-1-424-510-001
Orgn. Drg. No.	:	TB202359-1002269-BS3480-SS-SLD
Revision No.	:	07
Drg. Title	:	BIKANER III NEW S/S- SINGLE LINE DIAGRAM
App. Category	:	CAT-I
Release Date	:	28/12/2024

Scan to verfiy

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 रिवाइजड 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/ REL-CON निर्माण हेतु जारी।
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.

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG. NO. TB-1-424-510-001

INDEX

DESCRIPTION	SHEET
SINGLE LINE DIAGRAM FOR 765KV BIKANER (III) S/S	1
ARRANGEMENT OF AUX BUS FOR ICT 765/400KV BIKANER (III) S/S	2
SINGLE LINE DIAGRAM FOR 400KV BIKANER (III) S/S	3
SINGLE LINE DIAGRAM FOR 220KV BIKANER (III) S/S	4
ARRANGEMENT OF 765kV, 110MVAR LINE/BUS REACTOR AND AUX. BUS	5

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IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY

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

REV.	DATE		
06	24.12.2024	ALTERED	SY
		CHECKED	SS
		APPROVED	SKS

ZONE: REVISED IN LINE WITH POWERGRID COMMENTS VIDE MAIL DATED 05.12.2024 & 23.12.2024

REV.	DATE		
05	29.07.2024	ALTERED	SY
		CHECKED	SS
		APPROVED	SKS

ZONE: REVISED IN LINE WITH POWERGRID COMMENTS ON LAYOUT DRAWING DATED 24/07/2024

REV.	DATE		
04	18.07.2024	ALTERED	SY
		CHECKED	SS
		APPROVED	SKS

ZONE: REVISED IN LINE WITH POWERGRID COMMENTS VIDE MAIL DATED 18/07/2024

REV.	DATE		
03	22.05.2024	ALTERED	SY
		CHECKED	SS
		APPROVED	SKS

ZONE: REVISED IN LINE WITH POWERGRID COMMENTS DTD-15/05/2024

REV.	DATE		
02	09.05.2024	ALTERED	SY
		CHECKED	SS
		APPROVED	SKS

ZONE: REVISED IN LINE WITH POWERGRID COMMENTS DTD - 29/04/2024 AND 07/05/2024

REV.	DATE		
01	15.04.24	ALTERED	SY
		CHECKED	SS
		APPROVED	SKS

ZONE: REVISED AS PER POWERGRID COMMENT DTD-01.04.24

REV.	DATE		
07	27.12.2024	ALTERED	SY
		CHECKED	SS
		APPROVED	SKS

ZONE: REVISED AS PER POWERGRID COMMENT DATED 25.12.24 & 26.12.2024

NOA NO. : CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01

ADDITIONAL INFORMATION W.O.No.

STATUS OF DRAWING

DISTRIBUTION OF PRINTS

NAME OF CUSTOMER: BIKANER III NEEMRANA TRANSMISSION LIMITED
NAME OF CUNSULTANT: POWERGRID CORPORATION OF INDIA LIMITED
NAME OF PROJECT: Establishment of 6x1500 MVA, 765/400 kV & 5x500 MVA 400/220 kV Bikaner-III Pooling Station (Including 400kV, 2x125MVAR, reactor at Bikaner-III)

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

	नाम /NAME	हस्ता./SIGN.	दि./DATE
बनाया DRAWN	SY	-SGD-	22.12.23
चेक CHECKED	NK	-SGD-	22.12.23
स्वीकृत APPROVED	SKS	-SGD-	22.12.23

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

POWERGRID DRAWING NO. TB202359-1002269-BS3480-SS-SLD

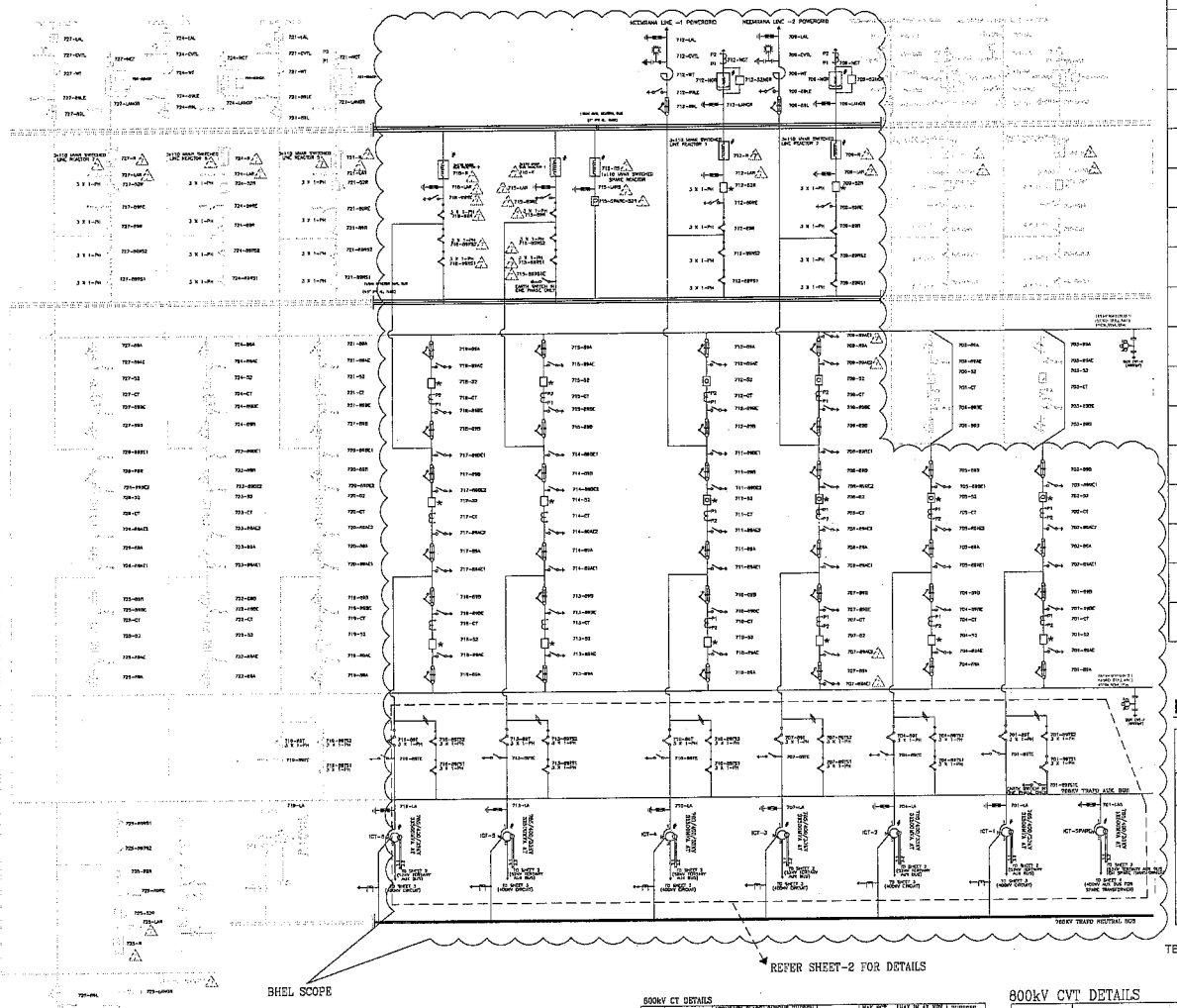
शीर्षक/TITLE: SINGLE LINE DIAGRAM BIKANER(III) S/S

ड्राईंग क्र./DRAWING NO. TB-1-424-510-001 | पुनः/REV. 07

पृष्ठ क्र./SHEET No. 00 | अगला पृष्ठ/NEXT SHEET 01

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG. NO. TB-1-424-510-001



BILL OF QTY. FOR 765kV MAIN EQUIPMENTS:

SL.NO.	DESCRIPTION	RATING	S. C. RATING	SLD QTY. (NO.)	NOA QTY. (NO.)	SYMBOL	SCOPE OF SUPPLY	LEGEND	MAKE
1	500 MVA, (1-PH) AUTOTRANSFORMER	765/400/33KV	50 KA FOR 1 S.	19	19		POWERGRID	T	BHEL
2.a.	110MVAR LINE REACTOR (1-PH)	765KV	50 KA FOR 1 S.	6	6		POWERGRID	R	GE
2.b	110MVAR BUS REACTOR (1-PH)	765KV	50 KA FOR 1 S.	7	7		POWERGRID	R	GE
3	NGR(600 Ohm) FOR REACTOR	765KV	N.A	2	2		POWERGRID	NGR	GE
4	SF6 CIRCUIT BREAKER WITH CR, WITH CSD (3-PH)	3150A	50 KA FOR 1 S.	4	4		BHEL	52	TBD
5	SF6 CIRCUIT BREAKER WITH CR,WITHOUT CSD (3-PH)	3150A	50 KA FOR 1 S.	2	2		BHEL	52	TBD
6	SF6 CIRCUIT BREAKER WITHOUT CR,WITH CSD (3-PH)	3150A	50 KA FOR 1 S.	12	12		BHEL	52	TBD
7	SF6 CIRCUIT BREAKER WITHOUT CR,WITH CSD (1-PH) PROVISION	3150A	50 KA FOR 1 S.	1	1		BHEL	52	TBD
8	ISOLATOR WITH ONE E/S (3 PH) VERTICAL KNEE TYPE	3150A	50 KA FOR 1 S.	22	20		BHEL	89/89E	TBD
9	ISOLATOR WITH TWO E/S (3 PH) VERTICAL KNEE TYPE	3150A	50 KA FOR 1 S.	12	14		BHEL	89/89E1 /89E2	TBD
10	ISOLATOR WITH ONE E/S (1 PH) VERTICAL KNEE TYPE	3150A	50 KA FOR 1 S.	32	32		BHEL	89/89E1	TBD
11	ISOLATOR WITHOUT E/S (1 PH.) VERTICAL KNEE TYPE	3150A	50 KA FOR 1 S.	58	58		BHEL	89	TBD
12	CURRENT TRANSFORMER (1 PH.) WITH 120% EXTENDED CURRENT RATING.	3000A	50 KA FOR 1 S.	48	48		BHEL	CT	TBD
13	CVT (1 PH.)	8800pF	NA	12	12		BHEL	CVT	BHEL
14	SURGE ARRESTER (1 PH.)	624 kV	NA	38	38		BHEL	LA	TBD
15	WAVE TRAP (1 PH.) PEDESTAL TYPE.	1mH, 3150A	50 KA FOR 1 S.	04	04		BHEL	WT	TBD

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

SL.NO.	DESCRIPTION	RATING	SLD QTY. (NO.)	NOA QTY. (NO.)	SYMBOL	SCOPE OF SUPPLY	LEGEND
1	SURGE ARRESTER (1 PH.)	132 kV, 10 KA 5 KJ/KV	2	2		POWERGRID	LANGR
2	CT. (1 PH.) FOR TRANSFORMER NEUTRAL	33KV	6	6		BHEL	NCT
3	CT. (1 PH.) FOR REACTOR NEUTRAL	33KV	2	2		BHEL	NCT
4	145kV CIRCUIT BREAKER (1-PH) FOR NGR BY-PASSING ARRANGEMENT	145kV, 1250A,31.5KA	2	2		BHEL	LANGR

TBD: TO BE DECIDED

800kV CT DETAILS

CODE	CURRENT RATIO	ACCURACY CLASS	OUTPUT BURDEN (VA)	MIN KPV (V)	MAX RCT (OHM)	MAX IM AT KPV (MA)	PURPOSE
1	3000/ 1600/ 800/A	PE	-	[illegible]	15+15+3.5	Must be lower than or equal to 30mA Max	NO DIFF. MAIN-
2	3000/ 1600/ 800/A	PE	-	[illegible]	15+15+3.5	Must be lower than or equal to 30mA Max	NO DIFF. MAIN-
3	3000/ 2000/ 800/A	0.2S 0.2S 0.2S	30 30 30	-	-	-	METERING
4	3000/ 2000/ 400/A	0.2S 0.2S 0.2S	30 30 30	-	-	-	METERING
5	3000/ 1600/ 800/A	PE	-	[illegible]	15+15+3.5	Must be lower than or equal to 30mA Max	AC PROTECTION/ INTER TRIP
6	3000/ 1600/ 800/A	PE	-	[illegible]	15+15+3.5	Must be lower than or equal to 30mA Max	AC PROTECTION/ INTER TRIP

800kV CVT DETAILS

RATIO	800kV/√3 / 110V/√3 / 110V/√3 / 110V/√3
SEC-I	CLASS-0.5/3P, 50VA
SEC-II	CLASS-0.5/3P, 50VA
SEC-III	CLASS-0.2, 50VA

NOTES:-
1. SYSTEM 765kV, 50kA FOR 1 SEC., 50Hz, 3Ph, SOLIDLY EARTHED
2. PRESENT ———
   FUTURE - - - - -
3. PHASE LOCATION OF WAVE TRAPS TO BE DECIDED DURING DETAILED ENGINEERING
4. 765kV EQUIPMENTS FOR ICT AND REACTOR SWITCHING ARE ALSO INCLUDED IN THE BOQ OF QTY. FOR 765kV MAIN EQUIPMENTS.

REV.	DATE	ALTERED BY	CHECKED BY	APPROVED BY	ZONE
07	27.12.2024	SS	SS	SKS	REVISED AS PER POWERGRID COMMENT DATED 25.12.24 & 26.12.2024
06	24.12.2024	SS	SS	SKS	REVISED IN LINE WITH POWERGRID COMMENTS VIDE MAIL DATED 05.12.2024 & 23.12.2024
05	29.07.2024	SS	SS	SKS	NO CHANGE IN THIS SHEET
04	19.07.2024	SS	SS	SKS	NO CHANGE IN THIS SHEET
03	22.05.24	SS	SS	SKS	REVISED IN LINE WITH POWERGRID COMMENTS DTD-29/04/2024 AND 07/05/2024
02	03.05.24	SS	SS	SKS	REVISED IN LINE WITH POWERGRID COMMENTS DTD-15/05/2024
01	15.04.24	SS	HK	SKS	REVISED AS PER POWERGRID COMMENT DTD-01.04.24

NOA NO. : CC/T/W-AIS/DOMA/10/23/01866/NOA-1/24-10264/01

ADDITIONAL INFORMATION W.O.No.	NAME OF CUSTOMER: BIKANER III NEEMRANA TRANSMISSION LIMITED
	NAME OF CONSULTANT: POWERGRID CORPORATION OF INDIA LIMITED
STATUS OF DRAWING	NAME OF PROJECT: Establishment of 6x1500 MVA, 765/400 kV & 5x500 MVA 400/220 kV Bikaner-III Pooling Station (including 400kV, 2x125MVAR, reactor at Bikaner-III)
DISTRIBUTION OF PRINTS	

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

	NAME	SIGN.	DATE
प्रस्तुत DRAWN	NS	-SGD-	21.12.23
जांचे CHECKED	NK	-SGD-	21.12.23
स्वीकृत APPROVED	SKS	-SGD-	21.12.23

POWERGRID DRAWING NO. TB202359-1002269-BS3480-SS-SLD

CARD CODE

उत्पादन / SCALE

शीर्षक/TITLE: SINGLE LINE DIAGRAM FOR 765kV BIKANER(III) S/S

डिज़ाइन नं./DRAWING NO. TB-1-424-510-001 | संशो./REV. 07

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

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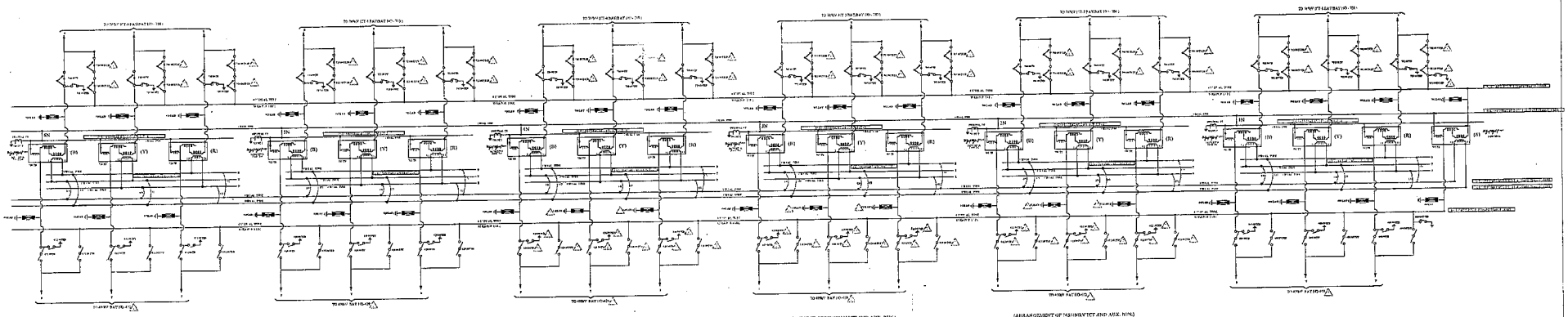
COMPUTER DRG. PATH NAME :
REF. DRG. NO.
SIGN. AND DATE
INVENTORY NO

DRG. NO. TB-1-424-510-001



MANUAL JUMPERING NEED TO BE DONE BETWEEN TERTIARY BUS AND AUX.TERTIARY BUS TO CONNECT THE SPARE TRANSFORMER IN PLACE OF FAULTY TRANSFORMER. WITH RESPECT TO PHASE (EITHER R-Y, Y-B, B-R) ONLY TWO CONNECTIONS TO BE MADE AT ANY TIME.

SL NO	AUTO TRANSFORMER -6 ANY PHASE OUT OF SERVICE			AUTO TRANSFORMER -5 ANY PHASE OUT OF SERVICE			AUTO TRANSFORMER -4 ANY PHASE OUT OF SERVICE			AUTO TRANSFORMER -3 ANY PHASE OUT OF SERVICE			AUTO TRANSFORMER -2 ANY PHASE OUT OF SERVICE			AUTO TRANSFORMER -1 ANY PHASE OUT OF SERVICE			CONNECTIONS TO BE MADE
	R-PHASE	Y-PHASE	B-PHASE	R-PHASE	Y-PHASE	B-PHASE	R-PHASE	Y-PHASE	B-PHASE	R-PHASE	Y-PHASE	B-PHASE	R-PHASE	Y-PHASE	B-PHASE	R-PHASE	Y-PHASE	B-PHASE	
1																		✓	1N
2																	✓		2N
3															✓				3N
4														✓					4N
5													✓						5N
6												✓							6N
7											✓								7N
8										✓									8N
9									✓										9N
10								✓											10N
11							✓												11N
12						✓													12N
13					✓														13N
14				✓															14N
15			✓																15N
16		✓																	16N
17	✓																		17N
18																			18N
19																			19N
20																			20N
21																			21N
22																			22N
23																			23N
24																			24N
25																			25N
26																			26N
27																			27N
28																			28N
29																			29N
30																			30N
31																			31N
32																			32N
33																			33N
34																			34N
35																			35N
36																			36N

MANUAL JUMPERING NEED TO BE DONE BETWEEN NEUTRAL BUS AND AUX.NEUTRAL BUS. WHILE TAKING OUT ANY 1-PH AUTO TRANSFORMER FOR MAINTENANCE. ONLY ONE CONNECTION TO BE MADE AT A TIME.

SL NO	AUTO TRANSFORMER -6 ANY PHASE OUT OF SERVICE	AUTO TRANSFORMER -5 ANY PHASE OUT OF SERVICE	AUTO TRANSFORMER -4 ANY PHASE OUT OF SERVICE	AUTO TRANSFORMER -3 ANY PHASE OUT OF SERVICE	AUTO TRANSFORMER -2 ANY PHASE OUT OF SERVICE	AUTO TRANSFORMER -1 ANY PHASE OUT OF SERVICE	CONNECTIONS TO BE MADE
1						✓	1N
2					✓		2N
3				✓			3N
4			✓				4N
5		✓					5N
6	✓						6N

NOTE: EQUIPMENTS SHOWN IN THIS SWITCHING SCHEME IS INCLUDED IN THE BILL OF QTY. OF RESPECTIVE 765KV AND 400KV SLD.

NOA NO. : CC/TM-AIS/DOM/A10/23/01956/NOA-1/24-102843/01

ADDITIONAL INFORMATION W.O.No.

STATUS OF DRAWING

DISTRIBUTION OF PRINTS

NAME OF CUSTOMER: BIKANER III NEEMRANA TRANSMISSION LIMITED
NAME OF CONSULTANT: POWERGRID CORPORATION OF INDIA LIMITED
NAME OF PROJECT: Establishment of 6x1500 MVA, 765/400 kV & 5x500 MVA 400/220 kV Bikaner-III Pooling Station (including 400kV, 2x125MVAR, reactor at Bikaner-III)

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

	नाम /NAME	हस्ता./SGN.	दि./DATE
बनाया DRAWN	SY	-SGD-	22.12.23
जांचा CHECKED	NK	-SGD-	22.12.23
स्वीकृत APPROVED	SKS	-SGD-	22.12.23

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
			07	27.12.2024	SY / SS / SKS	06	24.12.24	SY / SS / SKS	05	29.07.24	SY / SS / SKS	04	19.07.2024	SY / SS / SKS	03	22.05.24	SY / SS / SKS
ZONE			ZONE	REVISED AS PER POWERGRID COMMENT DATED 25.12.24 & 26.12.2024		ZONE	NO CHANGE IN THIS SHEET		ZONE	NO CHANGE IN THIS SHEET		ZONE	NO CHANGE IN THIS SHEET		ZONE	NO CHANGE IN THIS SHEET	

REV.	DATE	ALTERED / CHECKED / APPROVED	REV.	DATE	ALTERED / CHECKED / APPROVED
			02	08.05.24	SY / SS / SKS
ZONE			ZONE	REVISED IN LINE WITH POWERGRID DTD-29/04/2024 AND 07/05/2024	
01	15.04.24	SY / NK / SKS			
ZONE	REVISED AS PER POWERGRID COMMENT DTD- 01.04.24				

विभाग DEPT. / कोड CODE / मात्रक / SCALE / कार्ड कोड CARD CODE

POWERGRID DRAWING NO. TB202359-1002269-BS3480-SS-SLD

शीर्षक/TITLE: ARRANGEMENT OF AUX. BUS FOR ICT 765/400kV BIKANER(III)S/S

ड्राईंग सं./DRAWING NO. TB-1-424-510-001 | उत्पा./REV. 07

पृष्ठ सं./SHEET No. 02 | अगला पृष्ठ/NEXT SHEET 03

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

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG. NO. TB-1424-510-001

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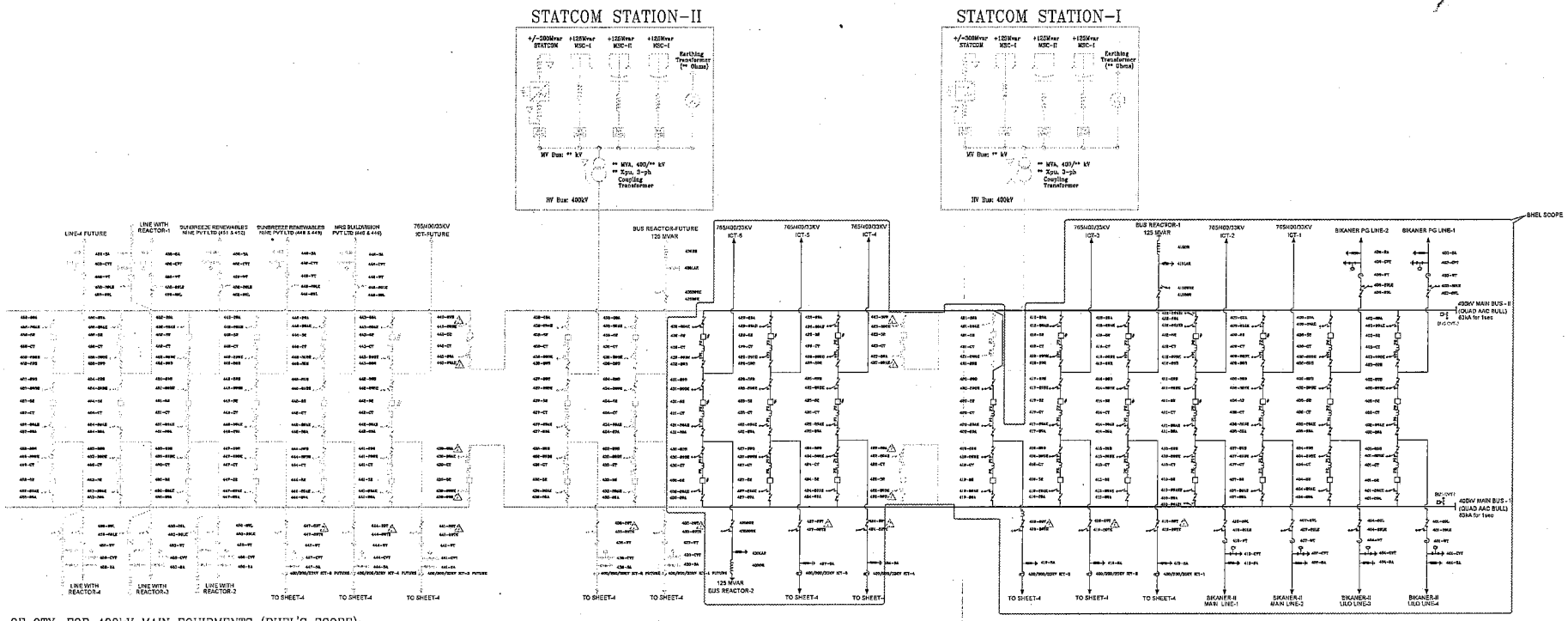
COMPUTER DRG. PATH NAME :
REF. DRG. NO.
SIGN. AND DATE
INVENTORY NO



BILL OF QTY. FOR 400kV MAIN EQUIPMENTS (BHEL'S SCOPE):

SL.NO.	DESCRIPTION	RATING	S. C. RATING	SLD QTY. (NO.)	NOA QTY. (NO.)	SYMBOL	LEGEND	MAKE
21	125MVAR BUS REACTOR (3-PH)	420 kV	63 KA FOR 1 S.	2	2		BR	BHEL
22	SF6 CIRCUIT BREAKER WITHOUT CR WITH CSD (3-PH)	3150A	63 KA FOR 1 S.	15	15		52	MAKE TO BE INDICATED IN FINAL AS BUILT DRAWING
23	SF6 CIRCUIT BREAKER WITHOUT CR,WITHOUT CSD (3-PH)	3150A	63 KA FOR 1 S.	14	13		52	
24	ISOLATOR WITH ONE E/S (3 PH) DOUBLE BREAK TYPE	3150A	63 KA FOR 1 S.	69	69		89/89E	
25	ISOLATOR WITH TWO E/S (3 PH) DOUBLE BREAK TYPE	3150A	63 KA FOR 1 S.	2	2		89/89E1 /89E2	
26	ISOLATOR WITH ONE E/S (1 PH) DOUBLE BREAK TYPE	3150A	63 KA FOR 1 S.	19	19		89/89E	
27	ISOLATOR WITHOUT E/S (1 PH) DOUBLE BREAK TYPE	3150A	63 KA FOR 1 S.	17	17		89	
28	CURRENT TRANSFORMER (1 PH.) WITH 120% EXTENDED CURRENT RATING.	3000A	63 KA FOR 1 S.	87	87		CT	BHEL
29	CVT (1 PH.)	4400pF		24	24		CVT	BHEL
30	LINE TRAP (1 PH.)	0.5mH 3150A	63 KA FOR 1 S.	12	12		WT	TBD
31	SURGE ARRESTER (1 PH.)	336 kV		58	58		LA	
31	500MVA, 400/220/33KV ICT	400KV		5	5		ICT	T&R

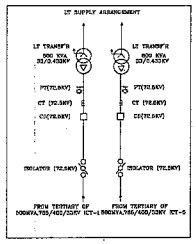
NOTES:–
1. SYSTEM 400kV, 50kA FOR 1 SEC., 50Hz, 3Ph, SOLIDLY EARTHED
2. PRESENT
   FUTURE
3. PHASE LOCATION OF WAVE TRAPS TO BE DECIDED DURING DETAILED ENGINEERING
4. 400kV EQUIPMENTS FOR 765/400/33kV ICT SWITCHING ARE ALSO INCLUDED IN THE BOQ OF QTY. FOR 400kV MAIN EQUIPMENTS.

400kV CT DETAILS

CORE	CURRENT RATIO	ACCURACY CLASS	OUTPUT BURDEN (VA)	MIN KPV (V)	MAX RCT (OHMS)	MAX IM AT KPV (MA)	PURPOSE
1	3000/ 2000/ 500/1	PX	–	3000-2000-500	15-10-2.5	30mA on 3000/1 Tap 30mA on 2000/1 Tap 150mA on 500/1 Tap	BUS DIFF. MAIN-1
2	3000/ 2000/ 500/1	PX	–	3000-2000-500	15-10-2.5	30mA on 3000/1 Tap 30mA on 2000/1 Tap 150mA on 500/1 Tap	BUS DIFF. MAIN-2
3	3000/ 2000/ 500/1	0.2S 0.2S 0.2S	20 20 20	–	–		METERING
4	3000/ 2000/ 500/1	0.2S 0.2S 0.2S	20 20 20	–	–		METERING
5	3000/ 2000/ 500/1	PX	–	3000-2000-500	15-10-2.5	30mA on 3000/1 Tap 30mA on 2000/1 Tap 150mA on 500/1 Tap	LBB PROTN.MAIN-2/ BWD BCKUP
6	3000/ 2000/ 500/1	PX	–	3000-2000-500	15-10-2.5	30mA on 3000/1 Tap 30mA on 2000/1 Tap 150mA on 500/1 Tap	LBB PROTN.MAIN-1/ BWD BKP.

400kV CVT DETAILS

RATIO	400kV / √3 / 110V / √3 / 110V / √3
SEC-I	CLASS-0.5/3P, 50VA
SEC-II	CLASS-0.5/3P, 50VA
SEC-III	CLASS-0.2/3P, 50VA
	CAPACITANCE-4400pF (+10%, -5%)



BILL OF QTY. FOR LT SUPPLY (BHEL'S SCOPE)

SL.NO.	RATING	DESCRIPTION	SYMBOL	SLD QTY. (NO.)	NOA QTY. (NO.)
1	72.5	72.5KV, 1250A, 25KA FOR 1 SEC, 3PH CIRCUIT BREAKER		2	2
2		72.5KV, 630A, 25KA FOR 1 SEC, 3PH DOUBLE BREAK ISOLATOR W/O ES		2	2
3		72.5KV CURRENT TRANSFORMER, 50A Rh=120% 25KA FOR 1 SEC.		6	6
4		72.5KV VOLTAGE TRANSFORMER		6	6
5		500kVA, 33kV/0.433kV 3PH LT TRANSFORMER		2	2

REV.	DATE	ALTERED	SY	REV.	DATE	ALTERED	SY	REV.	DATE	ALTERED	SY	REV.	DATE	ALTERED	SY	REV.	DATE	ALTERED	SY	REV.	DATE	ALTERED	SY
		CHECKED				CHECKED				CHECKED				CHECKED				CHECKED				CHECKED	
		APPROVED				APPROVED				APPROVED				APPROVED				APPROVED				APPROVED	
06	24.12.2024	REVISED IN LINE WITH POWERGRID COMMENTS VIDE MAIL DATED 05.12.2024 & 23.12.2024		05	29.07.2024	NO CHANGE IN THIS SHEET		04	19.07.2024	REVISED IN LINE WITH POWERGRID COMMENTS VIDE MAIL DATED 16/07/2024		03	22.05.24	NO CHANGE IN THIS SHEET		02	09.05.24	REVISED IN LINE WITH POWERGRID COMMENTS DTD-26/04/2024 AND 9/05/2024		01	10.04.24	REVISED AS PER POWERGRID COMMENT DTD- 01.04.24	

NOA NO. : CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01

ADDITIONAL INFORMATION W.O.No.

STATUS OF DRAWING

DISTRIBUTION OF PRINTS

NAME OF CUSTOMER: BIKANER III NEEMRANA TRANSMISSION LIMITED
NAME OF CONSULTANT: POWERGRID CORPORATION OF INDIA LIMITED
NAME OF PROJECT: Establishment of 6x1500 MVA, 765/400 kV & 5x500 MVA 400/220 kV Bikaner-III Pooling Station (including 400kV, 2x125MVAR, reactor at Bikaner-III)

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

	नाम / NAME	हस्ता / SIGN.	दि./DATE
तैयार DRAWN	SY	-SGD-	01.12.23
जाँच CHECKED	NK	-SGD-	01.12.23
स्वीकृत APPROVED	SKS	-SGD-	01.12.23

उद्धरण / SCALE | रद्द लेख CAND CODE | POWERGRID DRAWING NO. TB202359-1002269-BS3480-SS-SLD

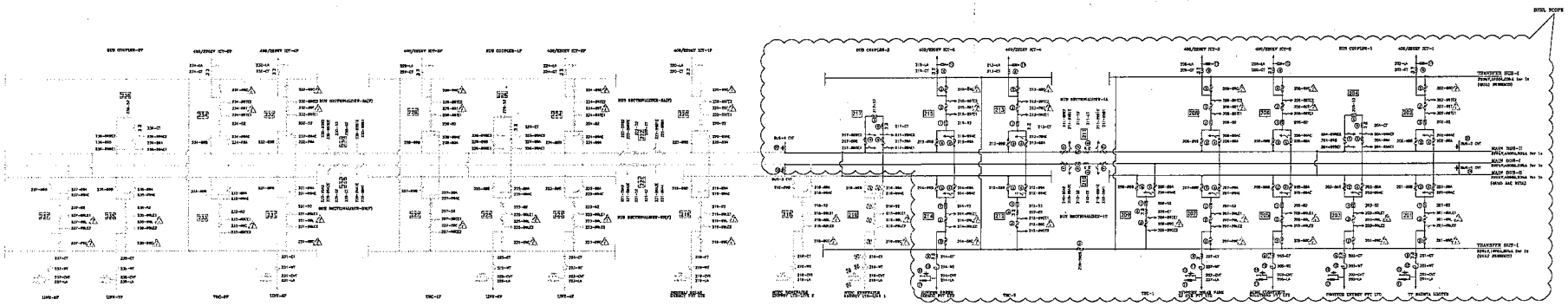
शीर्षक/TITLE: SINGLE LINE DIAGRAM FOR 400 kV BIKANER(III) S/S

ड्रा. सं./DRAWING NO. TB-1-424-510-001 | संशो./REV. 07

पृष्ठ सं./SHEET No. 05 | कुल पृष्ठ/NOT SHEET 04

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG. NO. TB-1-424-510-001



BILL OF QUANTITY FOR 220kV EQUIPMENTS (BHEL SCOPE)

SCHEDULE OF EQUIPMENT (OUTDOOR)

ITEM CODE	DESCRIPTION	SYMBOL	SLD QTY. (NOS.)	NOA QTY. (NOS.)	LEGEND	MAKE
1	245KV, 1600A, 50kA/1s CIRCUIT BREAKER (3-Ph)		12	13	52	MAKE TO BE INDICATED IN FINAL AS-BUILT DRAWINGS
2	245KV, 3150A, 50kA/1s CIRCUIT BREAKER (3-Ph) (BUS COUPLER & BUS SECTIONALISER BAYS)		04	04	52	
3	245KV, 1600A, 50kA/1s HDB ISOLATOR WITH 2E/S (3-Ph)		10#	+2 13	89/89E1 /89E2	
4	245KV, 1600A, 50kA/1s HDB ISOLATOR WITH 1E/S (3-Ph)		12	13	89/89E1	
5	245KV, 1600A, 50kA/1s HDB TANDEM ISOLATOR WITHOUT E/S (3-Ph)		23	25	89	
6	245KV, 3150A, 50kA/1s HDB ISOLATOR WITH 2E/S (3-Ph) (BUS COUPLER BAYS)		04	04	89/89E1 /89E2	
7*	245KV, 3150A, 50kA/1s HDB ISOLATOR WITH 1E/S (3-Ph) (BUS SECTIONALISER BAYS)		04	04	89/89E1	
8	245KV, 1600A (120%), 50kA/1s CURRENT TRANSFORMER (1-Ph)		36	39	CT	
9	245KV, 2500A (120%), 50kA/1s CURRENT TRANSFORMER (1-Ph) (BUS COUPLER & BUS SECTIONALISER BAYS)		12	12	CT	
10	245KV CAPACITIVE VOLTAGE TRANSFORMER (4400 pF) (1-Ph)		27	30	CVT	
11	216KV SURGE ARRESTER (1-Ph)		30	33	LA	
12	220KV, 1600A, 0.5mH, 50kA/1s LINE TRAP (1-Ph)		05	06	WT	

#- 10 NOS OF ISOLATORS ARE NOT CONNECTED DIRECTLY TO ANY BUS. HENCE FOR THESE 10 NOS OF ISOLATORS BUS TRANSFER CURRENT SWITCHING DUTY IS NOT REQUIRED.

220kV, 1600A, 50kA/1s CT DETAILS

CORE	RATIO	MAX. EXCITING (mA) CURRENT AT Vk	KNEE POINT VOLTAGE (Vk)	ACCURACY	OUTPUT BURDEN	RCT
1	1600-800/1A	25 ON 1600/1 TAP 50 ON 800/1 TAP	1600/800V	PX		8/4
2	1600-800/1A	25 ON 1600/1 TAP 50 ON 800/1 TAP	1600/800V	PX		8/4
3	1600-800/1A	-	-	0.2S	20VA	-
4	1600-800/1A	25 ON 1600/1 TAP 50 ON 800/1 TAP	1600/800V	PX		8/4
5	1600-800/1A	25 ON 1600/1 TAP 50 ON 800/1 TAP	1600/800V	PX		8/4

220kV, 2500A, 50kA/1s CT DETAILS

CORE	RATIO	MAX. EXCITING (mA) CURRENT AT Vk	KNEE POINT VOLTAGE (Vk)	ACCURACY	OUTPUT BURDEN	RCT
1	2500-1250/1A	25 ON 2500/1 TAP 50 ON 1250/1 TAP	2500/1250V	PX		12.5/6.25
2	2500-1250/1A	25 ON 2500/1 TAP 50 ON 1250/1 TAP	2500/1250V	PX		12.5/6.25
3	2500-1250/1A	-	-	0.2S	20VA	-
4	2500-1250/1A	25 ON 2500/1 TAP 50 ON 1250/1 TAP	2500/1250V	PX		12.5/6.25
5	2500-1250/1A	25 ON 2500/1 TAP 50 ON 1250/1 TAP	2500/1250V	PX		12.5/6.25

NOTES:-

1. SYSTEM
   220kV, 50kA FOR 1 SEC., 50Hz, 3Ph, SOLIDLY EARTHED
2. PRESENT ———
   FUTURE - - - - -
3. PHASE LOCATION OF WAVE TRAPS TO BE DECIDED DURING DETAILED ENGINEERING

REV.		ALTERED / CHECKED / APPROVED	REV.		ALTERED / CHECKED / APPROVED	REV.		ALTERED / CHECKED / APPROVED	REV.		ALTERED / CHECKED / APPROVED	REV.		ALTERED / CHECKED / APPROVED	REV.		ALTERED / CHECKED / APPROVED	REV.		ALTERED / CHECKED / APPROVED
			07	27.12.2024	SY / SS / SKS															
ZONE			ZONE		REVISED AS PER POWERGRID COMMENT DATED 25.12.24 & 26.12.2024															
06	24.12.2024	SY / SS / SKS	05	29.07.2024	SY / SS / SKS	04	19.07.2024	SY / SS / SKS	03	22.05.2024	SY / SS / SKS	02	09.05.2024	SY / SS / SKS	01	15.04.2024	SY / NK / SKS			
ZONE	REVISED IN LINE WITH POWERGRID COMMENTS VIDE MAIL DATED 05.12.2024 & 23.12.2024		ZONE	REVISED IN LINE WITH POWERGRID COMMENTS ON LAYOUT DRAWING VIDE LETTER CC-01/SG-TB202359-1002269-SD3480-ELECT-LAYOUT DATED 24/07/2024		ZONE	REVISED IN LINE WITH POWERGRID COMMENTS VIDE MAIL DATED 16/07/2024		ZONE	REVISED IN LINE WITH POWERGRID COMMENTS DTD-15/05/2024		ZONE	REVISED IN LINE WITH POWERGRID COMMENTS DTD-29/04/2024 AND 07/05/2024		ZONE	REVISED AS PER POWERGRID COMMENT DTD-01.04.2024				

NOA NO. : CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01

ADDITIONAL INFORMATION W.O.No.

STATUS OF DRAWING

DISTRIBUTION OF PRINTS

NAME OF CUSTOMER: BIKANER III NEEMRANA TRANSMISSION LIMITED
NAME OF CUNSULTANT: POWERGRID CORPORATION OF INDIA LIMITED
NAME OF PROJECT: Establishment of 6x1500 MVA, 765/400 kV & 5x500 MVA 400/220 kV Bikaner-III Pooling Station (including 400kV, 2x125MVAR, reactor at Bikaner-III)

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

	नाम /NAME	हस्ता./SIGN.	दि./DATE
बनाया DRAWN	SY	-SGD-	22.12.23
जाँचा CHECKED	NK	-SGD-	22.12.23
स्वीकृत APPROVED	SKS	-SGD-	22.12.23

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

POWERGRID DRAWING NO. TB202359-1002269-BS3480-SS-SLD

शीर्षक/TITLE: SINGLE LINE DIAGRAM FOR 220 kV BIKANER(III) S/S

ड्रॉइंग सं./DRAWING NO. TB-1-424-510-001 | पुन:/REV. 07

पृष्ठ सं./SHEET No. 04 | अगला पृष्ठ/NEXT SHEET 05

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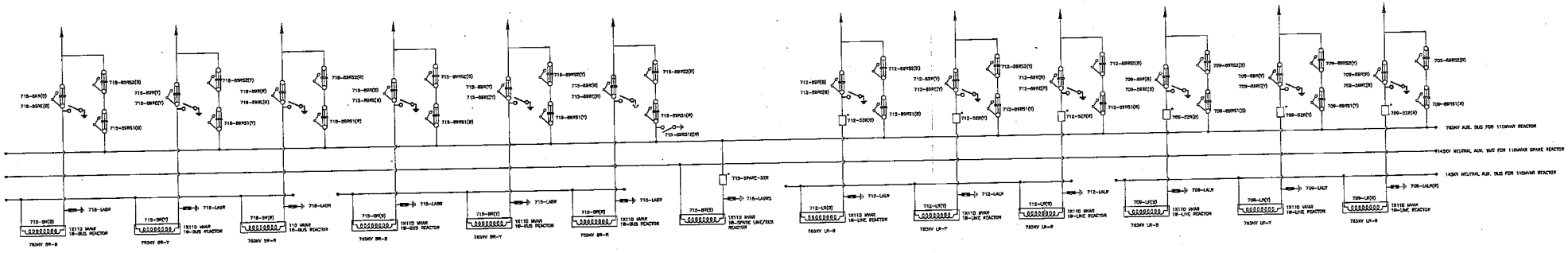
COMPUTER DRG. PATH NAME :
REF. DRG. NO.
SIGN. AND DATE
INVENTORY NO

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG. NO. TB-1-424-510-001



(ARRANGEMENT OF 765kV, 110MVAR LINE/BUS REACTOR AND AUX. BUS)

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COMPUTER GRG. PATH NAME :

REF. DRG. NO.

SIGN. AND DATE

INVENTORY NO

NOA NO. : CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01

ADDITIONAL INFORMATION
W.O.No.

STATUS OF DRAWING

DISTRIBUTION OF PRINTS

ग्राहक/परियोजना का नाम
NAME OF CUSTOMER/PROJECT

BIKANER III NEEMRANA TRANSMISSION LIMITED
POWERGRID CORPORATION OF INDIA LIMITED
Establishment of 6x1500 MVA, 765/400 kV & 5x500 MVA 400/220 kV Bikaner-III Pooling Station (including 400kV, 2x125MVAR, reactor at Bikaner-III)

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

	नाम /NAME	हस्ता./SIGN.	दि./DATE
डराया DRAWN	SY	-SGD-	24.12.24
जाँचा CHECKED	SS	-SGD-	24.12.24
स्वीकृत APPROVED	SKS	-SGD-	24.12.24

REV.	DATE	ALTERED / CHECKED / APPROVED
07	27.12.2024	ALTERED SY / CHECKED SS / APPROVED SKS

ZONE: NO CHANGE IN THIS SHEET

विभाग DEPT.
कोड CODE
उलुपात / SCALE
कार्ड कोड CARD CODE

POWERGRID DRAWING NO.
TB202359-1002269-BS3480-SS-SLD

शीर्षक/TITLE
ARRANGEMENT OF 765kV, 110MVAR LINE/BUS REACTOR AND AUX. BUS

ड्राईंग क्र./DRAWING NO.
TB-1-424-510-001

पुनः/REV. 07

पृष्ठ क्र./SHEET No. 05 अगला पृष्ठ/NEXT SHEET —

REV.	DATE	ALTERED / CHECKED / APPROVED	ZONE

पावरग्रिड
POWERGRID

पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

संदर्भ/Ref : CC-ENGG-TB202359-1002269-BS3480-ELECT-LAYOUT

Date : 27/12/2024

From : Somiran Das
Senior GM

To : Bharat Heavy Electricals Limited
Plot No.-7, Sector-142 Noida 201305
201305

Cc :

Subject : Substation Package SS-01 for (i) Establishment of 765/400/220kV Bikaner-III (New) Pooling Station including 400kV class Bus Reactor at Bikaner-III S/s; (ii) Extension of 765kV Neemrana-II S/s for termination of 765 kV D/c line Neemrana-II–Bikaner-III T/L and (iii) Extension of 400kV Bikaner-II S/s for termination of 400kV Bikaner-II Bikaner-III T/L under "Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-1) (Bikaner Complex): PART-A"

LOA Ref : CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 Dated 23/02/2024

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

Vendor Drg. No.	:	TB-0-424-316-001
Orgn. Drg. No.	:	TB202359-1002269-BS3480-ELECT-LAYOUT
Revision No.	:	08
Drg. Title	:	BIKANER III NEW S/S- ELECTRICAL LAYOUT PLAN & SECTION
App. Category	:	CAT-I
Release Date	:	27/12/2024

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 रिवाइजड 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/ REL-CON निर्माण हेतु जारी।
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.

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

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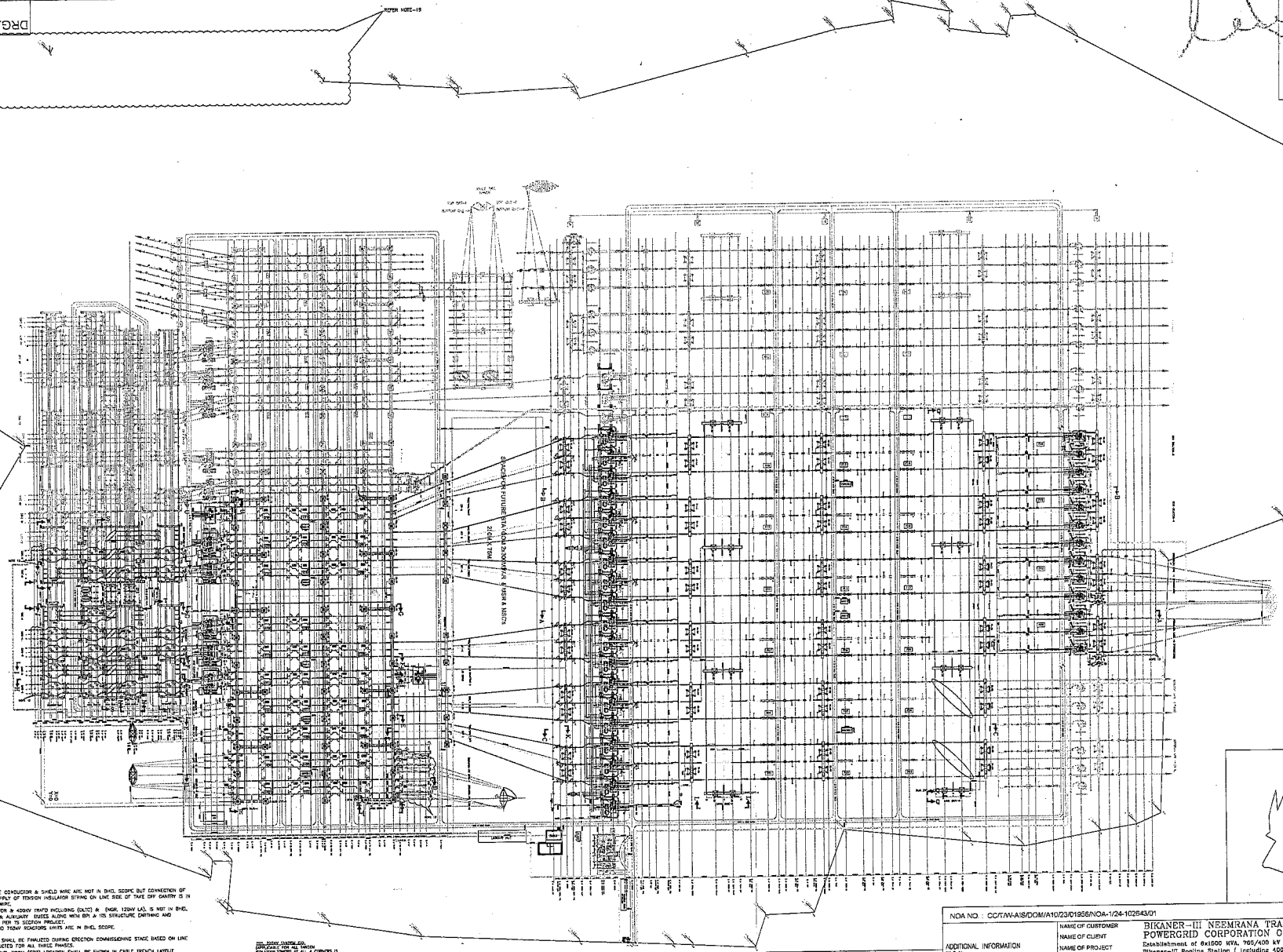
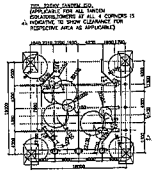
IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPAY

DRG. NO. TB-0-424-316-001



NOTES:

1. DEAD END TOWER ERECTION AND GUYDING STRENGTH OF LINE CONDUCTOR & SHIELD WIRE ARE NOT IN BHEL SCOPE BUT CONNECTION OF EQUIPMENT TOWARDS LINE SIDE SHALL BE DONE BY BHEL. SUPPLY OF TENSION INSULATOR STRING ON LINE SIDE OF TAKE OFF GANTRY IS IN BHEL SCOPE OF WORK INCLUDING TENSION CLAMP FOR EARTHWIRE.
2. SUPPLY ERECTION, TESTING, COMMISSIONING OF 765kV REACTOR & 400kV TRAFO INCLUDING (OLTC) & (NGR, 120W LA), IS NOT IN BHEL SCOPE. HOWEVER, FORMATION OF HV, LV, TERTIARY, NEUTRAL & AUXILIARY BUSES ALONG WITH BPI & ITS STRUCTURE EARTHING AND ASSOCIATED CIVIL WORKS IS COVERED IN SCOPE OF WORK AS PER TS SECTION PROJECT.
3. FIRE RESISTANT WALL BETWEEN 765kV TRANSFORMER UNITS AND 765kV REACTORS UNITS ARE IN BHEL SCOPE.
4. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
5. LOCATION OF WI SHOWN IS INDICATIVE ONLY. EXACT LOCATION SHALL BE FINALIZED DURING ERECTION COMMISSIONING STAGE BASED ON LINE PARAMETERS. FOUNDATION FOR WAVE TRAP SHALL BE CONSIDERED FOR ALL THREE PHASES.
6. DETAILS OF RMU, CUE, CVT JUNCTION BOX & SWITCHYARD PANEL ROOM (SPR) LOCATION SHALL BE SHOWN IN CABLE TRENCH LAYOUT DRAWING.
7. PLINTH HEIGHT OF FOUNDATION WILL BE MIN. 300MM FROM FINISHED GROUND LEVEL (F.G.L.).
8. REFER DETAIL DRAWING FOR 765/400kV TRANSFORMER ARRANGEMENT LAYOUT: TB-0-424-318-006-R2, 765kV REACTOR ARRANGEMENT LAYOUT: TB-0-424-318-005-R2.
9. LA PRESSURE RELIEF VALVE SHALL NOT BE TOWARDS TRANSFORMER SIDE/ANY EQUIPMENT KEPT NEAR LIGHTNING ARRESTER
10. FOR BETTER VISIBILITY OF DRAWING PLOT BOUNDARY IS SHOWN ONLY UPTO FUTURE SUBSTATION AREA FOR COMPLETE PLOT BOUNDARY REFER GGA DRAWING.
11. ALL THE ROAD SHOWN IN THE LAYOUT ARE OF 3.75M WIDTH.
12. LINE SIDE EQUIPMENT LOCATION TO BE FINALISED AFTER CONFIRMATION OF DEADEND TOWER LOCATION.



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	REV.	DATE	ALTERED / CHECKED / APPROVED
08	08.11.24	SY / SS / SKS	05	31.07.24	SY / SS / SKS	04	22.07.24	SY / SS / SKS	03	05.07.24	SY / SS / SKS	02	14.06.24	SY / SS / SKS	01	30.05.24	SY / SS / AS / SKS	00	17.12.24	SY / SS / SKS
ZONE	REVISED AS PER POWERGRID COMMENTS		ZONE	REVISED AS PER POWERGRID COMMENTS		ZONE	REVISED AS PER POWERGRID COMMENTS		ZONE	REVISED AS PER PGCIL COMMENTS		ZONE	REVISED AS PER PGCIL COMMENTS		ZONE	REVISED AS PER PGCIL COMMENTS		ZONE	REVISED AS MARKED		ZONE	REVISED AS MARKED	

NOA NO. : CC/T/W-A/S/DOM/A10/23/01956/NOA-1/24-102643/01

ADDITIONAL INFORMATION
W.O.No.

STATUS OF DRAWING

DISTRIBUTION OF PRINTS

NAME OF CUSTOMER: BIKANER-III NEEMRANA TRANSMISSION LIMITED
NAME OF CLIENT: POWERGRID CORPORATION OF INDIA LIMITED
NAME OF PROJECT: Establishment of 6x1500 MVA, 765/400 kV & 5x500 MVA 400/220 kV Bikaner-III Pooling Station (including 400kV, 2x125MVAR, reactor at Bikaner-III)

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION BUSINESS GROUP

	नाम /NAME	हस्ता./SIGN.	दि./DATE
बनाया DRAWN	SY	-SGD-	03.04.24
जाँचा CHECKED	NK	-SGD-	03.04.24
स्वीकृत APPROVED	SKS	-SGD-	03.04.24

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

POWERGRID DRAWING NO. TB202359-1002269-BS8480-ELECT-LAYOUT

शीर्षक/TITLE: ELECTRICAL LAYOUT PLAN & SECTIONAL ELEVATION OF BIKANER (III) S/S

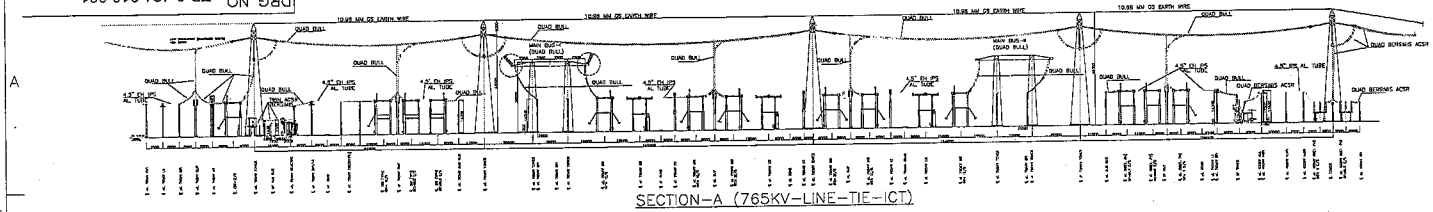
ड्राईंग सं./DRAWING NO. TB-0-424-316-001 | पुनरी/REV. 08

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

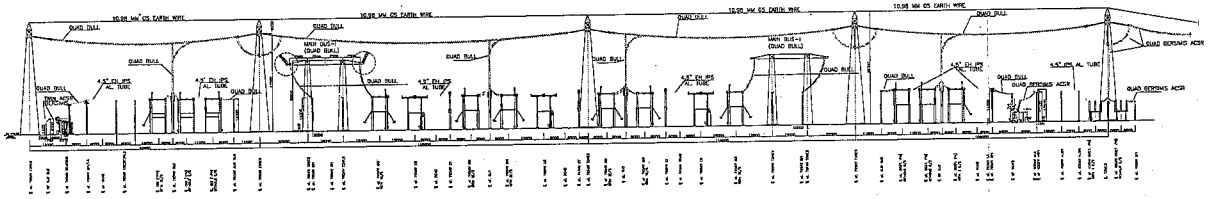
COMPUTER DRG. PATH NAME : | REF. DRG. NO. | SIGN. AND DATE | INVENTORY NO

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

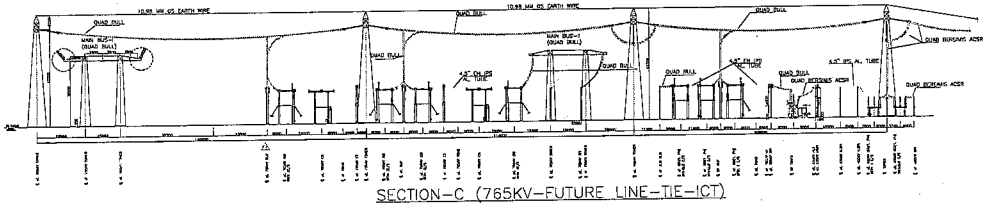
DRG. NO. TB-0-424-316-001



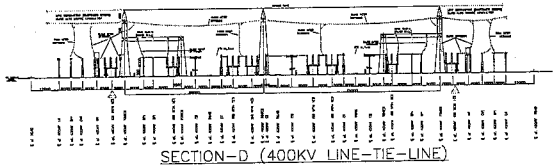
SECTION-A (765KV-LINE-TIE-ICT)



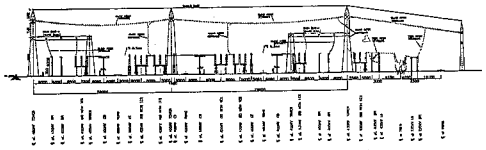
SECTION-B (765KV-REACTOR-TIE-ICT)



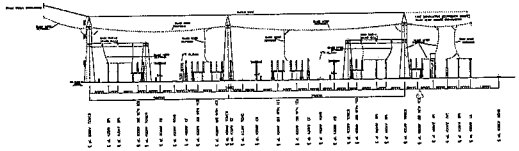
SECTION-C (765KV-FUTURE LINE-TIE-ICT)



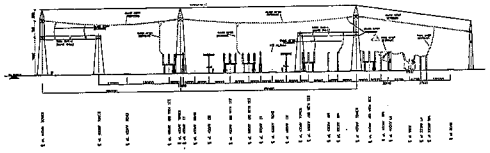
SECTION-D (400KV LINE-TIE-LINE)



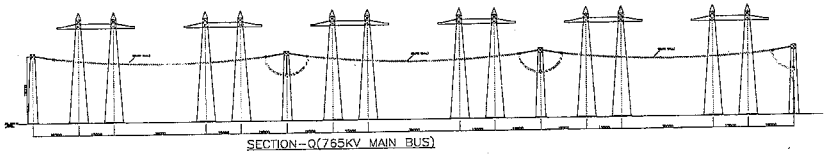
SECTION-F (400KV BAY-TIE-ICT)



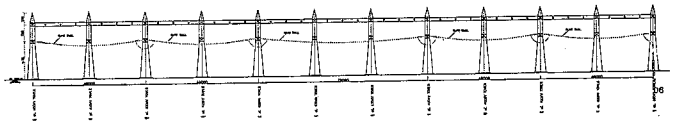
SECTION-E (765/400KV ICT BAY-TIE-400KV LINE)



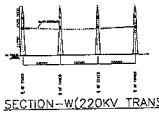
SECTION-G (400KV-FUTURE STATCOM-TIE-ICT)



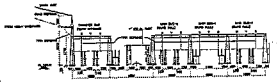
SECTION-Q(765KV MAIN BUS)



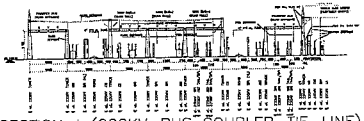
SECTION-R(400KV MAIN BUS)



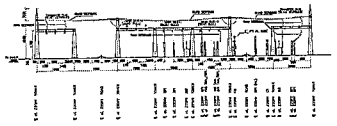
SECTION-W(220KV TRANSFER BUS)



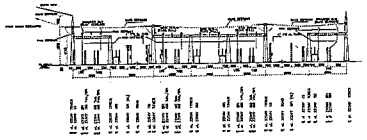
SECTION-H (220KV ICT-TIE-LINE)



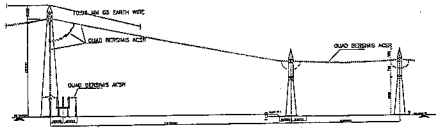
SECTION-I (220KV-BUS COUPLER-TIE-LINE)



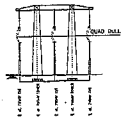
SECTION-J (220KV-TBC)



SECTION-V (220KV ICT-TIE-TBC-2)

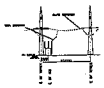


SECTION-K (765KV-400KV INTERCONNECTION)

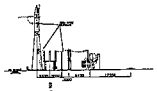


SECTION-L (765KV BUS CVT SECTION)

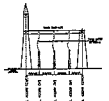
SECTION-O(220KV BUS SECTIONALIZER)



SECTION-P

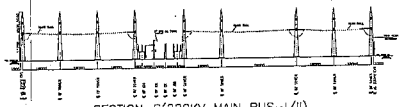


SECTION-U (400KV REACTOR)

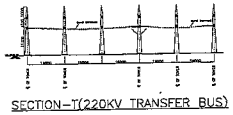


SEC-M (400KV BUS CVT SECTION)

SEC-N (220KV BUS CVT SECTION)



SECTION-S(220KV MAIN BUS-I/II)



SECTION-T(220KV TRANSFER BUS)

REV.	DATE	ALTERED BY / CHECKED / APPROVED	REV.	DATE	ALTERED BY / CHECKED / APPROVED	REV.	DATE	ALTERED BY / CHECKED / APPROVED	REV.	DATE	ALTERED BY / CHECKED / APPROVED	REV.	DATE	ALTERED BY / CHECKED / APPROVED
08	02.11.24	SY / SS / SKS	06	31.07.24	SY / SS / SKS	04	22.07.24	SY / SS / SKS	03	05.07.24	SY / SS / SKS	02	14.05.24	SY / SS / SKS
ZONE	REVISED AS PER POWERGRID COMMENTS		ZONE	REVISED AS PER POWERGRID COMMENTS		ZONE	REVISED AS PER POWERGRID COMMENTS		ZONE	REVISED AS PER PGCIL COMMENTS		ZONE	REVISED AS PER PGCIL COMMENTS	

REV.	DATE	ALTERED BY / CHECKED / APPROVED	REV.	DATE	ALTERED BY / CHECKED / APPROVED
09	17.12.24	SY / SS / SKS	07	11.12.24	SY / SS / SKS
ZONE	REVISED AS MARKED △		ZONE	REVISED AS MARKED △	

REV.	DATE	ALTERED BY / CHECKED / APPROVED
01	30.05.24	SY / AS / SKS
ZONE	REVISED AS PER PGCIL COMMENTS	

NDA NO.: CC/TW-AIS/DOM/A10/23/1956/NOA-1/24-102643/01

ADDITIONAL INFORMATION W.O.No.

STATUS OF DRAWING

DISTRIBUTION OF PRINTS

NAME OF CUSTOMER: BIKANER-III NEEMRANA TRANSMISSION LIMITED

NAME OF CLIENT: POWERGRID CORPORATION OF INDIA LIMITED

NAME OF PROJECT: Establishment of 6x1500 MVA, 765/400 kV & 5x500 MVA 400/220 kV Bikaner-III Pooling Station (including 400kV, 2x125MVAR, reactor at Bikaner-III)

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION BUSINESS GROUP

कार्यान्वित / DRAWN	SY	-SD-	03.04.24
जाँचा / CHECKED	SK	-SD-	03.04.24
स्वीकृत / APPROVED	SKS	-SD-	03.04.24

डिज़ाइन विभाग / DESIGN DEPT.: PTS

कोड / CODE:

अनुपात / SCALE:

कार्ड कोड / CARD CODE:

POWERGRID DRAWING NO. TB202359-1002269-BS3480-ELECT-LAYOUT

शीर्षक / TITLE: ELECTRICAL LAYOUT PLAN & SECTIONAL ELEVATION OF BIKANER (III) S/S

ड्राइंग सं./DRAWING NO. TB-0-424-316-001

पुनरीक्षण / REV. 08

पृष्ठ सं./SHEET No. 02 अगला पृष्ठ/NEXT SHEET 03

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COMPUTER DRG. PATH NAME :

REF. DRG. NO.

SIGN. AND DATE

INVENTORY NO

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG. NO. TB-0-424-316-001

BILL OF QTY. FOR 765kV MAIN EQUIPMENTS:

SL.NO.	DESCRIPTION	RATING	S. C. RATING	SLD QTY. (NO.)	NOA QTY. (NO.)	SYMBOL	SCOPE OF SUPPLY
1	500 MVA, (1-PH) AUTOTRANSFORMER	765/400/33KV	50 KA FOR 1 S.	19	19		POWERGRID
2	110MVAR LINE REACTOR (1-PH)	765KV	50 KA FOR 1 S.	6	6		POWERGRID
3	110MVAR BUS REACTOR (1-PH)	765KV	50 KA FOR 1 S.	7	7		POWERGRID
4	SF6 CIRCUIT BREAKER WITH CR, WITH CSD (3-PH)	3150A	50 KA FOR 1 S.	4	4		BHEL
5	SF6 CIRCUIT BREAKER WITH CR,WITHOUT CSD (3-PH)	3150A	50 KA FOR 1 S.	2	2		BHEL
6	SF6 CIRCUIT BREAKER WITHOUT CR,WITH CSD (3-PH)	3150A	50 KA FOR 1 S.	12	12		BHEL
7	SF6 CIRCUIT BREAKER WITHOUT CR,WITH CSD (1-PH) PROVISION	3150A	50 KA FOR 1 S.	1	1		BHEL
8	ISOLATOR WITH ONE E/S (3 PH) VERTICAL KNEE TYPE	3150A	50 KA FOR 1 S.	22	20		BHEL
9	ISOLATOR WITH TWO E/S (3 PH) VERTICAL KNEE TYPE	3150A	50 KA FOR 1 S.	12	14		BHEL
10	ISOLATOR WITH ONE E/S (1 PH) VERTICAL KNEE TYPE	3150A	50 KA FOR 1 S.	32	32		BHEL
11	ISOLATOR WITHOUT E/S (1 PH.) VERTICAL KNEE TYPE	3150A	50 KA FOR 1 S.	58	58		BHEL
12	CURRENT TRANSFORMER (1 PH.) WITH 120% EXTENDED CURRENT RATING.	3000A	50 KA FOR 1 S.	48	48		BHEL
13	CVT (1 PH.)	8800pF	NA	12	12		BHEL
14	SURGE ARRESTER (1 PH.)	624 kV	NA	38	38		BHEL
15	WAVE TRAP (1 PH.) PEDESTAL TYPE.	1mH, 3150A	50 KA FOR 1 S.	04	04		BHEL
16	BUS POST INSULATOR (1 PH.) – 8KN	NA	NA	78	86		BHEL
17	GUY INSULATOR (1PH)	NA	NA	66	—		BHEL

BILL OF QUANTITY FOR 220kV EQUIPMENTS (BHEL SCOPE)

SCHEDULE OF EQUIPMENT (OUTDOOR)

ITEM CODE	DESCRIPTION	SYMBOL	SLD QTY. (NOS.)	NOA QTY. (NOS.)
1	245KV, 1600A, 50kA/1s CIRCUIT BREAKER (3-Ph)		12	13
2	245KV, 3150A, 50kA/1s CIRCUIT BREAKER (3-Ph)		04	04
3	245KV, 1600A, 50kA/1s HDB ISOLATOR WITH 2E/S (3-Ph)		12	13
4	245KV, 1600A, 50kA/1s HDB ISOLATOR WITH 1E/S (3-Ph)		12	13
5	245KV, 1600A, 50kA/1s HDB TANDEM ISOLATOR WITHOUT E/S (3-Ph)		23	25
6	245KV, 3150A, 50kA/1s HDB ISOLATOR WITH 2E/S (3-Ph)		04	04
7	245KV, 3150A, 50kA/1s HDB ISOLATOR WITH 1E/S (3-Ph)		04	04
8	245KV, 1600A (120%), 50kA/1s CURRENT TRANSFORMER (1-Ph)		36	38
9	245KV, 2500A (120%), 50kA/1s CURRENT TRANSFORMER (1-Ph)		12	12
10	245KV CAPACITIVE VOLTAGE TRANSFORMER (4400 pF) (1-Ph)		27	30
11	216KV SURGE ARRESTER (1-Ph)		30	33
12	220KV, 1600A, 0.5mH, 50kA/1s LINE TRAP (1-Ph)		05	06
12	245KV BUS POST INSULATOR (1-Ph)– 8KN		133	140

BILL OF QTY. FOR 400kV MAIN EQUIPMENTS (BHEL'S SCOPE):

SL.NO.	DESCRIPTION	RATING	S. C. RATING	SLD QTY. (NO.)	NOA QTY. (NO.)	SYMBOL	SCOPE OF SUPPLY
1	400/220KV, 500MVA ICT (3-PH)	420 kV	63 KA FOR 1 S.	05	05		POWERGRID
2	125MVAR BUS REACTOR (3-PH)	420 kV	63 KA FOR 1 S.	2	2		BHEL
3	SF6 CIRCUIT BREAKER WITHOUT CR WITH CSD (3-PH)	3150A	63 KA FOR 1 S.	15	16		BHEL
4	SF6 CIRCUIT BREAKER WITHOUT CR,WITHOUT CSD (3-PH)	3150A	63 KA FOR 1 S.	14	13		BHEL
5	ISOLATOR WITH ONE E/S (3 PH) DOUBLE BREAK TYPE	3150A	63 KA FOR 1 S.	69	69		BHEL
6	ISOLATOR WITH TWO E/S (3 PH) DOUBLE BREAK TYPE	3150A	63 KA FOR 1 S.	2	2		BHEL
7	ISOLATOR WITH ONE E/S (1 PH) DOUBLE BREAK TYPE	3150A	63 KA FOR 1 S.	19	19		BHEL
8	ISOLATOR WITHOUT E/S (1 PH) DOUBLE BREAK TYPE	3150A	63 KA FOR 1 S.	17	17		BHEL
9	CURRENT TRANSFORMER (1 PH.) WITH 120% EXTENDED CURRENT RATING.	3000A	63 KA FOR 1 S.	87	87		BHEL
10	CVT (1 PH.)	4400pF	NA	24	24		BHEL
11	LINE TRAP (1 PH.)	0.5mH 3150A	63 KA FOR 1 S.	12	12		BHEL
12	SURGE ARRESTER (1 PH.)	336 kV	NA	58	58		BHEL
13	BUS POST INSULATOR (1 PH.) – 8KN	420 kV	NA	131	169		BHEL
14	GUY INSULATOR (1PH)	420 kV	NA	18	—		BHEL

BILL OF QTY. OF BUS POST INSULATORS FOR 765KV SPARE ICT AND REACTOR CONNECTION ARRANGEMENT

SL.NO.	DESCRIPTION	SLD QTY.	NOA QTY.	SYMBOL	SCOPE OF SUPPLY
1	765KV 8KN BUS POST INSULATOR FOR 765KV SPARE ICT CONNECTION ARRAGEMENT	32	06 LOT		BHEL
2	765KV 8KN BUS POST INSULATOR FOR 765KV SPARE REACTOR CONNECTION ARRANGEMENT	21	04 LOT		BHEL
3	400KV 8KN BUS POST INSULATOR FOR 765KV SPARE ICT CONNECTION ARRAGEMENT	31	06 LOT		BHEL
4	145KV 6KN BUS POST INSULATOR FOR 765KV SPARE REACTOR CONNECTION ARRANGEMENT AND REACTOR NEUTRAL FORMATION	47	04 LOT		BHEL
5	52KV 6KN BUS POST INSULATOR FOR 765KV SPARE ICT DELTA CONNECTION ARRANGEMENT AND ICT DELTA FORMATION	294	06 LOT		BHEL
6	36KV 6KN BUS POST INSULATOR FOR 765KV SPARE ICT NEUTRAL CONNECTION ARRANGEMENT AND ICT NEUTRAL FORMATION	138	06 LOT		BHEL

* 765KV CB WITH CSD
# 400KV CB WITH CSD

CLEARANCE TABLE AS PER POWERGRID SPI

Sl.No.	DESCRIPTION	765kV SYSTEM	400kV SYSTEM	220kV SYSTEM	66kV SYSTEM
1	PHASE TO PHASE FOR CONDUCTOR–CONDUCTOR CONFIGURATION FOR ROD–CONDUCTOR CONFIGURATION	7600mm 9400mm	4000mm 4200mm	2100mm 2100mm	750mm 750mm
2	PHASE TO EARTH FOR CONDUCTOR–CONDUCTOR STRUCTURE FOR ROD–CONDUCTOR CONFIGURATION	4800mm 6400mm	3500mm 3500mm	2100mm 2100mm	630mm 630mm
3	SECTIONAL CLEARANCE	10300mm	6500mm	5000mm	3100mm
4	VERTICAL DISTANCE BETWEEN LOWEST PART OF INSULATOR TO PLINTH	2550mm	2550mm	2550mm	2550mm

CONDUCTOR & STRINGING DETAILS –765kV

SL.NO.	DESCRIPTION	LEVEL FROM PLINTH	SUB-CONDUCTOR	TENSION INSULATOR STRING/PHASE
1.	MAIN BUS-I & II	(AT 30M HEIGHT)	QUAD ACC BULL CONDUCTOR WITH 450MM SUB-CONDUCTOR SPACING	DOUBLE TENSION 210 kN COMPOSITE LONG ROD INSULATOR
2.	JACKBUS	(AT 42M HEIGHT)	QUAD ACC BULL CONDUCTOR WITH 450MM SUB-CONDUCTOR SPACING	DOUBLE TENSION 210 kN COMPOSITE LONG ROD INSULATOR
3.	DROPPERS/JUMPERING	–	QUAD ACC BULL CONDUCTOR WITH 450MM SUB-CONDUCTOR SPACING	SINGLE SUSPENSION 210 kN COMPOSITE LONG ROD INSULATOR
4.	EQUIPMENT INTERCONNECTION	(AT 14M HEIGHT)	4.5" IPS AL. TUBE (120mm OD)/QUAD ACC BULL CONDUCTOR WITH 450MM SPACING	
5.	EARTHWIRE	(AT 48M HEIGHT)	7/3.66mm GI WIRE (10.98mm DIA)	
6.	INTERCONNECTION BETWEEN 765/400kV TRAFO TO 400kV SUB-STATION		QUAD BERSIMIS ACSR CONDUCTOR WITH 450MM SUB-CONDUCTOR SPACING/4.5" IPS AL. TUBE	
7.	EQUIPMENT INTERCONNECTION NEAR 765/400kV ICT AREA FOR HIGH BPI&HIGH SA	(AT 12M HEIGHT)	QUAD BULL/BERSIMIS ACSR CONDUCTOR WITH 450MM SUB-CONDUCTOR SPACING/4.5" IPS AL. TUBE	

CONDUCTOR & STRINGING DETAILS –400kV

SL.NO.	DESCRIPTION	LEVEL FROM PLINTH	SUB-CONDUCTOR	TENSION INSULATOR STRING/PHASE
1.	MAIN BUS-I & II	(AT 18M HEIGHT)	QUAD ACC BULL CONDUCTOR WITH 450MM SUB-CONDUCTOR SPACING	DOUBLE TENSION 120 kN COMPOSITE LONG ROD INSULATOR
2.	JACKBUS	(AT 23.5M HEIGHT)	QUAD BERSIMIS ACSR CONDUCTOR WITH 450MM SUB-CONDUCTOR SPACING	DOUBLE TENSION 120 kN COMPOSITE LONG ROD INSULATOR
3.	DROPPERS/JUMPERING	–	QUAD BERSIMIS ACSR CONDUCTOR WITH 450MM SUB-CONDUCTOR SPACING	SINGLE SUSPENSION 120 kN COMPOSITE LONG ROD INSULATOR
4.	EQUIPMENT INTERCONNECTION	(AT 8M HEIGHT)	4.5" IPS AL. TUBE /QUAD ACSR BERSIMIS CONDUCTOR WITH 450MM SPACING	
5.	EARTHWIRE	(AT 28.5M HEIGHT)	7/3.66mm GI WIRE (10.98mm DIA)	
6.	INTERCONNECTION BETWEEN 400/220kV TRAFO TO 220kV SUB-STATION		TWIN BERSIMIS ACSR CONDUCTOR WITH 450MM SUB-CONDUCTOR SPACING	
7.	BUS CVT, CVT & SA IN LINE BAYS	–	TWIN BERSIMIS ACSR CONDUCTOR WITH 450MM SUB-CONDUCTOR SPACING	

CONDUCTOR & STRINGING DETAILS –220kV

SL.NO.	DESCRIPTION	LEVEL FROM PLINTH	SUB-CONDUCTOR	TENSION INSULATOR STRING/PHASE
1.	MAIN BUS-I & II	(AT 11.7M HEIGHT)	QUAD ACC BULL CONDUCTOR WITH 250MM SUB-CONDUCTOR SPACING	DOUBLE TENSION 120 kN COMPOSITE LONG ROD INSULATOR
2.	TRANSFER BUS	(AT 11.7M HEIGHT)	QUAD ACSR BERSIMIS CONDUCTOR WITH 250MM SUB-CONDUCTOR SPACING	DOUBLE TENSION 120 kN COMPOSITE LONG ROD INSULATOR
3.	JACKBUS	(AT 16.2M HEIGHT)	QUAD/TWIN BERSIMIS ACSR CONDUCTOR WITH 250MM SUB-CONDUCTOR SPACING	DOUBLE TENSION 120 kN COMPOSITE LONG ROD INSULATOR
4.	DROPPERS/JUMPERING	–	QUAD/TWIN BERSIMIS ACSR CONDUCTOR WITH 250MM SUB-CONDUCTOR SPACING	SINGLE SUSPENSION 120 kN COMPOSITE LONG ROD INSULATOR
5.	EQUIPMENT INTERCONNECTION	(AT 5.5M HEIGHT)	4.5" IPS AL. TUBE /TWIN ACSR BERSIMIS CONDUCTOR WITH 250MM SPACING	
6.	BUS CVT, CVT & SA IN LINE BAYS	–	TWIN BERSIMIS ACSR CONDUCTOR WITH 250MM SUB-CONDUCTOR SPACING	

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

SL.NO.	DESCRIPTION	RATING	SLD QTY. (NO.)	NOA QTY. (NO.)	SYMBOL	SCOPE OF SUPPLY
1	SURGE ARRESTER (1 PH.)	132 kV, 10 KA 5 KJ/KV	2	2		POWERGRID
2	CT. (1 PH.) FOR TRANSFORMER NEUTRAL	33KV	6	6		BHEL
3	CT. (1 PH.) FOR REACTOR NEUTRAL	33KV	2	2		BHEL
4	145kV CIRCUIT BREAKER (1-PH) FOR NGR BY-PASSING ARRANGEMENT	145kV, 1250A,31.5KA	2	2		BHEL
5	145kV BUS POST INSULATOR (1-PH) – 6 KN	145kV, 6 KN	4	4		BHEL
6	NEUTRAL GROUNDING REACTOR	145kV, 600 Ohm	2	2		POWERGRID

REV.	DATE	ALTERED BY / CHECKED BY / APPROVED BY	REVISED AS MARKED
08	17.12.24	SY / SS / SKS	REVISED AS MARKED
07	11.12.24	SY / SS / SKS	REVISED AS MARKED
06	02.11.24	SY / SS / SKS	REVISED AS PER POWERGRID COMMENTS
05	31.07.24	SY / SS / SKS	REVISED AS PER POWERGRID COMMENTS
04	22.07.24	SY / SS / SKS	REVISED AS PER POWERGRID COMMENTS
03	05.07.24	SY / SS / SKS	REVISED AS PER PGCIL COMMENTS
02	14.05.24	SY / SS / SKS	REVISED AS PER PGCIL COMMENTS
01	30.03.24	SY / SS / SKS	REVISED AS PER PGCIL COMMENTS

NOA NO. : CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01

ADDITIONAL INFORMATION W.O.No.

STATUS OF DRAWING

DISTRIBUTION OF PRINTS

NAME OF CUSTOMER: BIKANER-III NEEMRANA TRANSMISSION LIMITED

NAME OF CLIENT: POWERGRID CORPORATION OF INDIA LIMITED

NAME OF PROJECT: Establishment of 6x500 MVA, 765/400 kV & 5x500 MVA 400/220 kV Bikaner-III Pooling Station (including 400kV, 2x125MVAR, reactor at Bikaner-III)

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TRANSMISSION BUSINESS GROUP

	नाम /NAME	हस्ता./SIGN.	दि./DATE
तैयार DRAWN	SY	-SCD-	03.04.24
जाँच CHECKED	NK	-SCD-	03.04.24
स्वीकृत APPROVED	SKS	-SCD-	03.04.24

उत्पाद / SCALE | कार्ड कोड CARD CODE

POWERGRID DRAWING NO. TB202359-1002269-BS3480-ELECT-LAYOUT

शीर्षक/TITLE: ELECTRICAL LAYOUT PLAN & SECTIONAL ELEVATION OF BIKANER (III) S/S

ड्रॉइंग सं./DRAWING NO. TB-0-424-316-001 | शीट/REV 08

पृष्ठ सं./SHEET No.03 | अगला पृष्ठ/NEXT SHEET --

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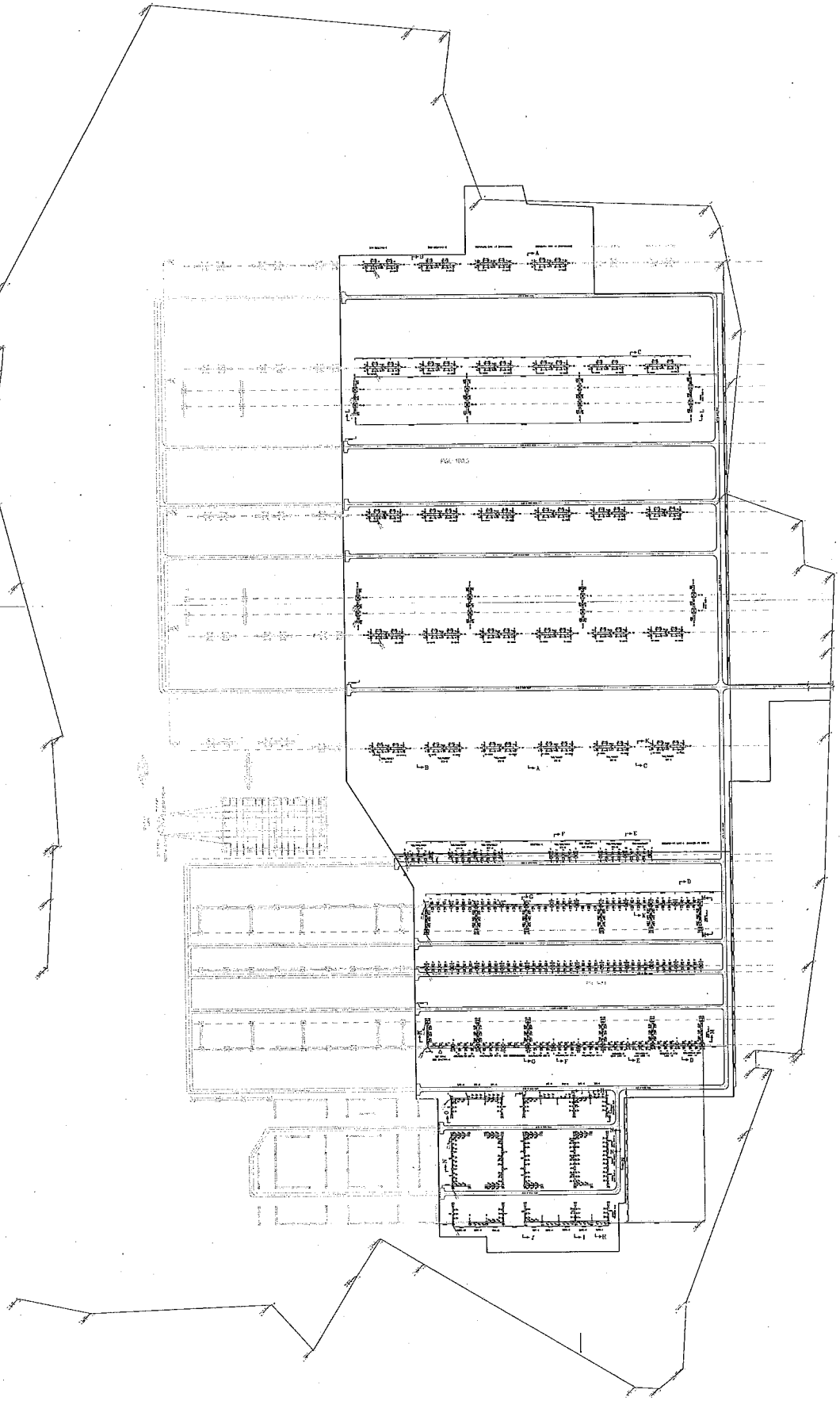
COMPUTER DRG. PATH NAME : | REF. DRG. NO. | SIGN. AND DATE | INVENTORY NO



FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

NOA NO.: CC/TW-A/S/DOM/A1/023/01556/NOA-1/24-1/0264/301					
ADDITIONAL INFORMATION W.R.2 No.	NAME OF CUSTOMER: BIKANER-III NEEMRANA TRANSMISSION LIMITED NAME OF CLIENT: POWERGRID CORPORATION OF INDIA LIMITED Establishment of 6x1500 MVA, 765/400 kV & 5x500 MVA 400/220 kV Pooling Station (including 400kV, 2x125MVAR, reactor at Bikaner-III)				
STATUS OF DRAWING DISTRIBUTION OF PRINTS	भारत हेवी इलेक्ट्रिकल्स लिमिटेड BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION BUSINESS GROUP				
REV. 01	DATE 12.03.24	LIKED CHECKED SY	SS APPROVED SKS		
ZONE					
REVISED AS PER POWERGRID COMMENTS					

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
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स्केल / SCALE

मद कोड CARD CODE

	DRN BY	SY	
	CHD BY	SS	
	APD BY	SKS	
	DATE		

शीर्षक/TITLE
BIKANER III NEW S/G- STRUCTURE LAYOUT
PLAN & SECTION

	DSIGN BY	SY	EERF: -SGD-
	CHD BY	SS	-SGD-
	APD BY	SKS	-SGD-
	DATE		

POWERGRID DRAWING NO.
TB202359-1002269-BS3480-STR-LAYOUT

ड्रॉइंग नं./DRAWING NO.
TB-0-424-316-003

ड्रॉइंग नं./SHEET No. 01 | आकार/ SIZE

DRG. NO. TB-0-424-316-003

765kV TOWER DETAILS													
S.NO.	SPAN (MTR)	TOWER DESIGNATION	NOMINAL HEIGHT OF TOWER (MTR)	QUANTITY OF TOWER (NOS.)	PEAK	PEAK HEIGHT (MTR.)	E.F.FORTIFYING BEAM FOR CONDUCTOR (MTR.)	BEAM LEVEL FOR CONDUCTOR (MTR.)	SUPPORTING BEAM FOR SHIELD WIRE	BEAM LEVEL FOR SHIELD WIRE (MTR.)	PAYLOAD	INITIAL SEAGOW	SUP SPACER TENSION SPAN	REMARKS
1.	365MTR(AVG)	765-CA	30	91	WITHOUT PEAK	-	76-BA (765KV D/C PWR LINE) HO / 765-BB (765 KV S/C PWR LINE) CKT NO. 1	23	-	-	25	27	3.5TT / 6 MTR
2.	365MTR(AVG)	765-CB	41	45	WITH PEAK	6	765-BC (765KV D/C PWR LINE) HO / 765-BD (765 KV S/C PWR LINE) CKT NO. 2	42	765-CC (765KV S/C)	45	25	3.5	11.2TT / 6 MTR
3.	365MTR(AVG)	765-CC	45	16	WITH PEAK	6	765-BE (765KV D/C PWR LINE) HO / 765-BF (765 KV S/C PWR LINE) CKT NO. 1	42	765-CC (765KV S/C)	45	25 (AVG)	3.5	11.2TT / 6 MTR

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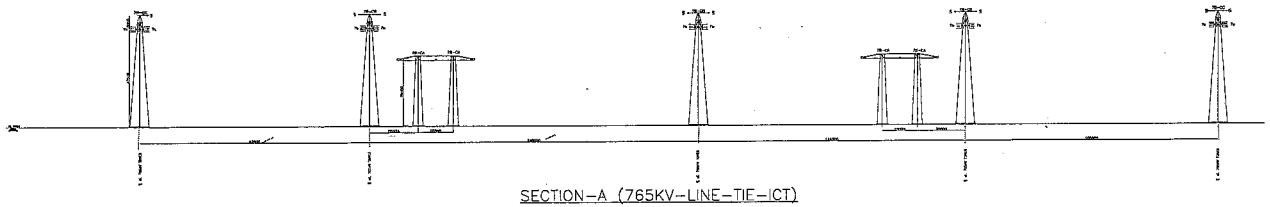
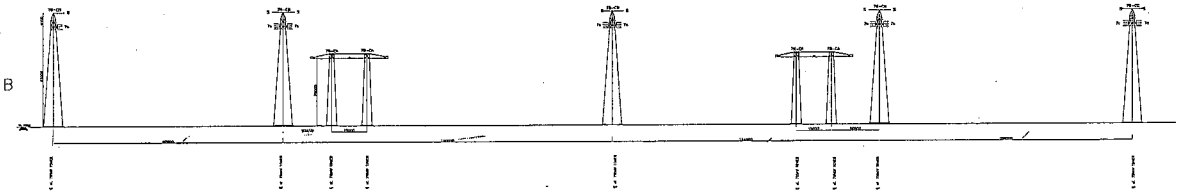
INVENTORY NO	SIGN. AND DATE	REF. DRG. NO.	COMPUTER DRG. PATH NAME :

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

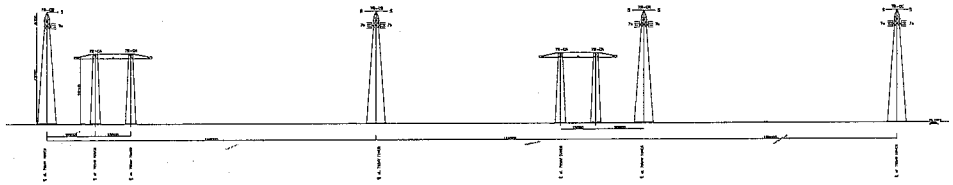
DRG. NO. TB-0-424-316-003



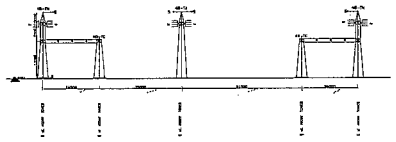
SECTION-A (765KV-LINE-TIE-ICT)



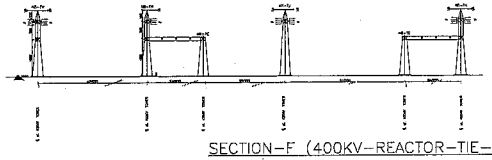
SECTION-B (765KV-REACTOR-TIE-ICT)



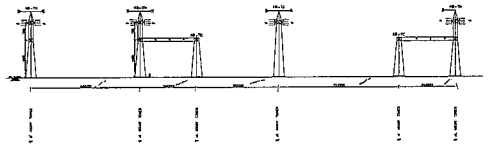
SECTION-C (765KV-FUTURE LINE-TIE-ICT)



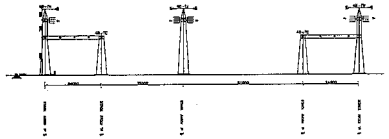
SECTION-D (400KV LINE-TIE-LINE)



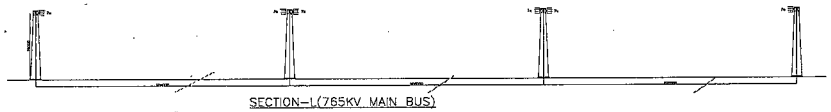
SECTION-F (400KV-REACTOR-TIE-ICT)



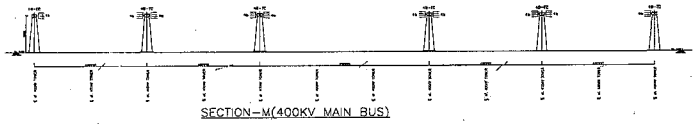
SECTION-E (400KV ICT-TIE-LINE)



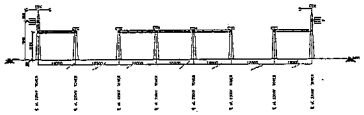
SECTION-G (400KV-FUTURE STATCOM-TIE-ICT)



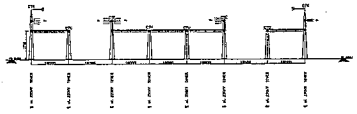
SECTION-L(765KV MAIN BUS)



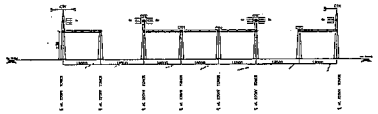
SECTION-M(400KV MAIN BUS)



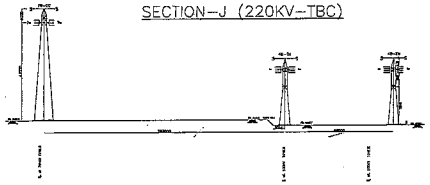
SECTION-H (220KV ICT-TIE-LINE)



SECTION-I (220KV-BUS COUPLER-TIE-LINE)



SECTION-J (220KV-TBC)



SECTION-K (765KV-400KV INTERCONNECTION)

SECTION-N(220KV MAIN BUS-I/II)

SECTION-O(220KV TRANSFER BUS)

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COMPUTER DRG. PATH NAME :

REF. DRG. NO.

SIGN. AND DATE

INVENTORY NO

NOA NO. : CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01

ADDITIONAL INFORMATION
W.O.No.

STATUS OF DRAWING
DISTRIBUTION OF PRINTS

REV.	DATE	ALTERED SY / CHECKED SS / APPROVED SKS
01	12.08.24	

ZONE: REVISED AS PER POWERGRID COMMENTS

NAME OF CUSTOMER: BIKANER-III NEEMRANA TRANSMISSION LIMITED
NAME OF CLIENT: POWERGRID CORPORATION OF INDIA LIMITED
NAME OF PROJECT: Establishment of 6x1500 MVA, 765/400 kV & 5x500 MVA 400/220 kV Pooling Station (Including 400kV, 2x125MVAR, reactor at Bikaner-III)

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BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION BUSINESS GROUP

विभाग / DEPT.
कोड / CODE
उपपत्र / SCALE
कार्ड कोड / CARD CODE

	नाम / NAME	हस्ता. /
तैयार / DRAWN	SY	-SGD-
जाँचा / CHECKED	SS	-SGD-
स्वीकृत / APPROVED	SKS	-SGD-

POWERGRID DRAWING NO.
TB202359-1002259-BS3480-STR-LAYOUT

शीर्षक/TITLE
BIKANER III NEW S/S- STRUCTURE LAYOUT PLAN & SECTION

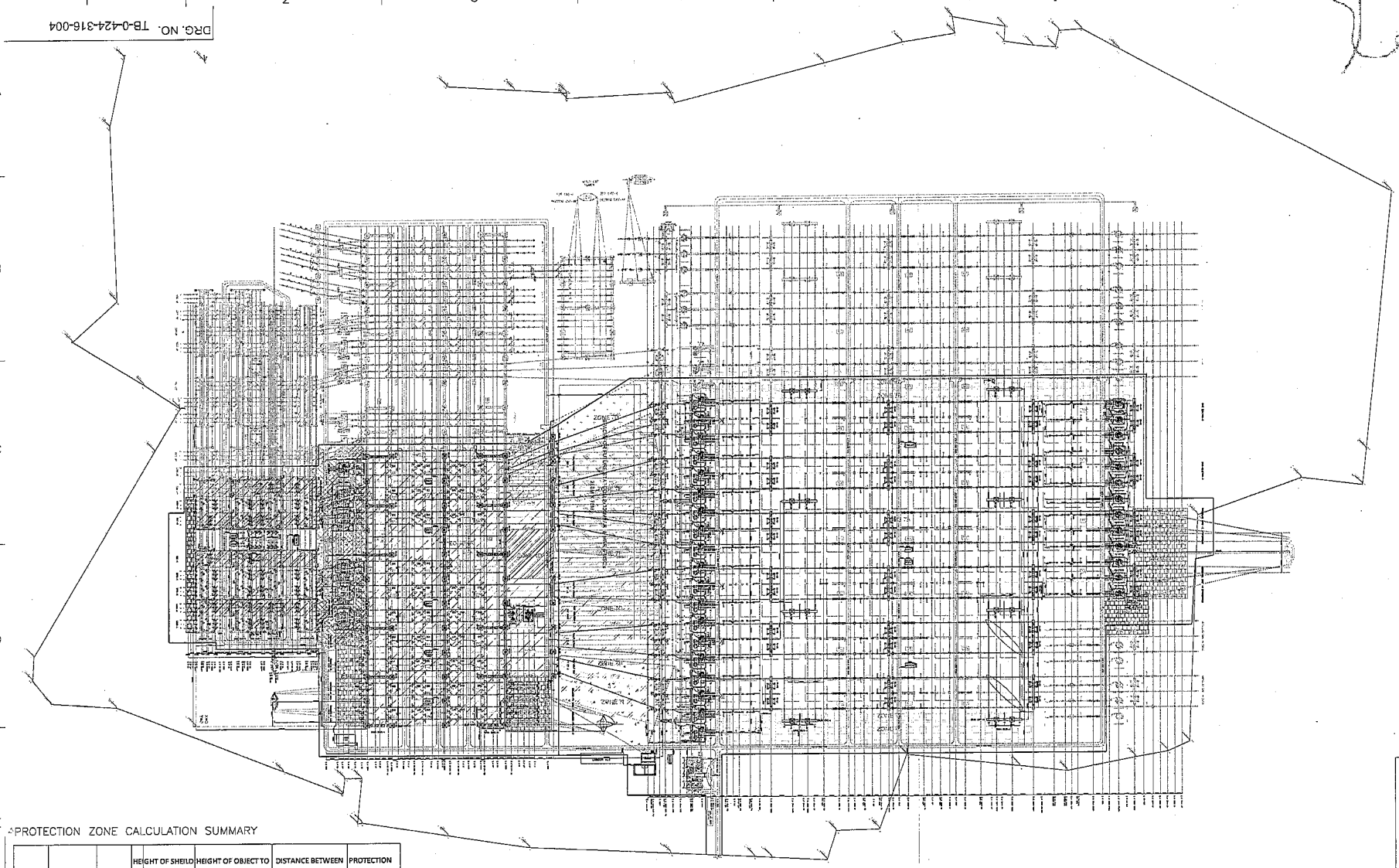
डि.सं./DRAWING NO.
TB-0-424-316-003

शीट सं./SHEET No. 02 आगामी शीट : 01

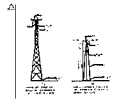
TB202359-1002259-BS3480-STR-LAYOUT01/CA1-1/Page

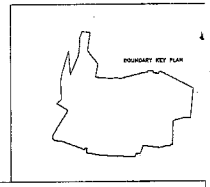
FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG. NO. TB-0-424-316-004



ZONE 7B ZONE 4B
ZONE 7C ZONE 4C
ZONE 7D ZONE 4D
ZONE 7E ZONE 4E
ZONE 7F ZONE 2A
ZONE 7G ZONE 2B
ZONE 7H ZONE 2C
ZONE 7I ZONE L





PROTECTION ZONE CALCULATION SUMMARY

SL.NO	ZONE	CASE	HEIGHT OF SHEILD WIRES (M)	HEIGHT OF OBJECT TO BE PROTECTED (M)	DISTANCE BETWEEN SHEILD WIRES (M)	PROTECTION ACHEIVED
1	7A	CASE 1	48	42	30	YES
2	7B	CASE 3	48	29	30	YES
3	7C	CASE 3	48	14	30	YES
4	7D	CASE 4	48/27.7	8	54/42.5	YES
5	7E		48/27.7	8	54/48	YES
6	7F		48/27.7	8	54/48	YES
7	7G		48/27.7	8	54/48	YES
8	7H		48/27.7	8	54/48	YES
9	7I	CASE 11	48/27.7	8	0	YES
10	4A	CASE 2	28.5	23.5	24	YES
11	4B	CASE 6	28.5/21.2	10	24/16	YES
12	4C	CASE 7	28.5/21.2	6	24/37	YES
13	4D	CASE 8	28.5	6	48	YES
14	4E	CASE 12	28.5	6	0	YES
15	2A	CASE 9	21.2	16.2	16	YES
16	2B	CASE 10	21.2	11.7	16	YES
17	2C	CASE 11	21.2	9	21	YES
18	L	CUSTOMER SCOPE FOR LINE SIDE EQUIPMENT PROTECTION				YES

NOTES:

1. LINE SIDE EQUIPMENT WILL BE PROTECTED BY SHIELD WIRE (NOT IN BHEL SCOPE) LAID FROM DEAD END TOWER TO LINE TOWER, ZONE L IS SHOWN INDICATIVE FOR THIS AREA.
2. DSLP OF CONTROL ROOM BUILDING, AUXILIARY BUILDING & FIRE WALL BE SUBMITTED VIDE SEPARATE DRAWING.

ITEM DESCRIPTION.	Quantity (Meters)
1. SHIELD WIRE-10.0MM	14000

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
ZONE			ZONE			ZONE			ZONE			ZONE		

NOA NO.: CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01

ADDITIONAL INFORMATION W.O.No.

STATUS OF DRAWING

DISTRIBUTION OF PRINTS

NAME OF CUSTOMER / NAME OF CLIENT / NAME OF PROJECT: BIKANER-III NEEMRANA TRANSMISSION LIMITED
POWERGRID CORPORATION OF INDIA LIMITED
Establishment of 6x1500 MVA, 765/400 kV & 5x500 MVA 400/220 kV Bikaner-III Pooling Station (Including 400kV, 2x125MVAR, reactor at Bikaner-III)

भारत हैवी इलेक्ट्रिकल्स लिमिटेड
BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION BUSINESS GROUP

	नाम /NAME	हस्ताक्षर /SIGN.	दि./DATE
तैयार किया DRAWN	SY	-SGD-	23.08.24
जाँच CHECKED	SS	-SGD-	23.08.24
स्वीकृत APPROVED	SKS	-SGD-	23.08.24

REV.	DATE	ALTERED / CHECKED / APPROVED	REMARKS
01	04.01.25	ALTERED SY / CHECKED SS / APPROVED SKS	REVISED AS PER POWERGRID COMMENTS

ड्राफ्ट DFT. / कोड CODE / अनुपात / SCALE / कार्ड कोड CARD CODE

POWERGRID DRAWING NO. TB202359-1002269-BS3480-DSLP-LAYOUT

शीर्षक/TITLE: BIKANER III NEW S/S- DSLP LAYOUT

ड्रॉ. सं./DRAWING NO. TB-0-424-316-004 | पुनरी/REV. 01

पृष्ठ सं./SHEET No.01 | अगला पृष्ठ/NEXT SHEET --

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

संदर्भ/Ref : CC-ENGG-TB202359-1002269-BS3480-EKD-LAYOUT

Date : 27/01/2025

From : Somiran Das
Senior GM

To : Bharat Heavy Electricals Limited
Plot No.-7, Sector-142 Noida 201305
201305

Cc :

Subject : Substation Package SS-01 for (i) Establishment of 765/400/220kV Bikaner-III (New) Pooling Station including 400kV class Bus Reactor at Bikaner-III S/s; (ii) Extension of 765kV Neemrana-II S/s for termination of 765 kV D/c line Neemrana-II–Bikaner-III T/L and (iii) Extension of 400kV Bikaner-II S/s for termination of 400kV Bikaner-II Bikaner-III T/L under "Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-1) (Bikaner Complex): PART-A"

LOA Ref : CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 Dated 23/02/2024

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

Vendor Drg. No.	:	TB-0-424-316-008
Orgn. Drg. No.	:	TB202359-1002269-BS3480-EKD-LAYOUT
Revision No.	:	01
Drg. Title	:	BIKANER III NEW S/S- ERECTION KEY DIAGRAM LAYOUT PLAN & SECTION
App. Category	:	CAT-II
Release Date	:	27/01/2025

Scan to verfiy

Comments : Comments marked

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 रिवाइजड 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.

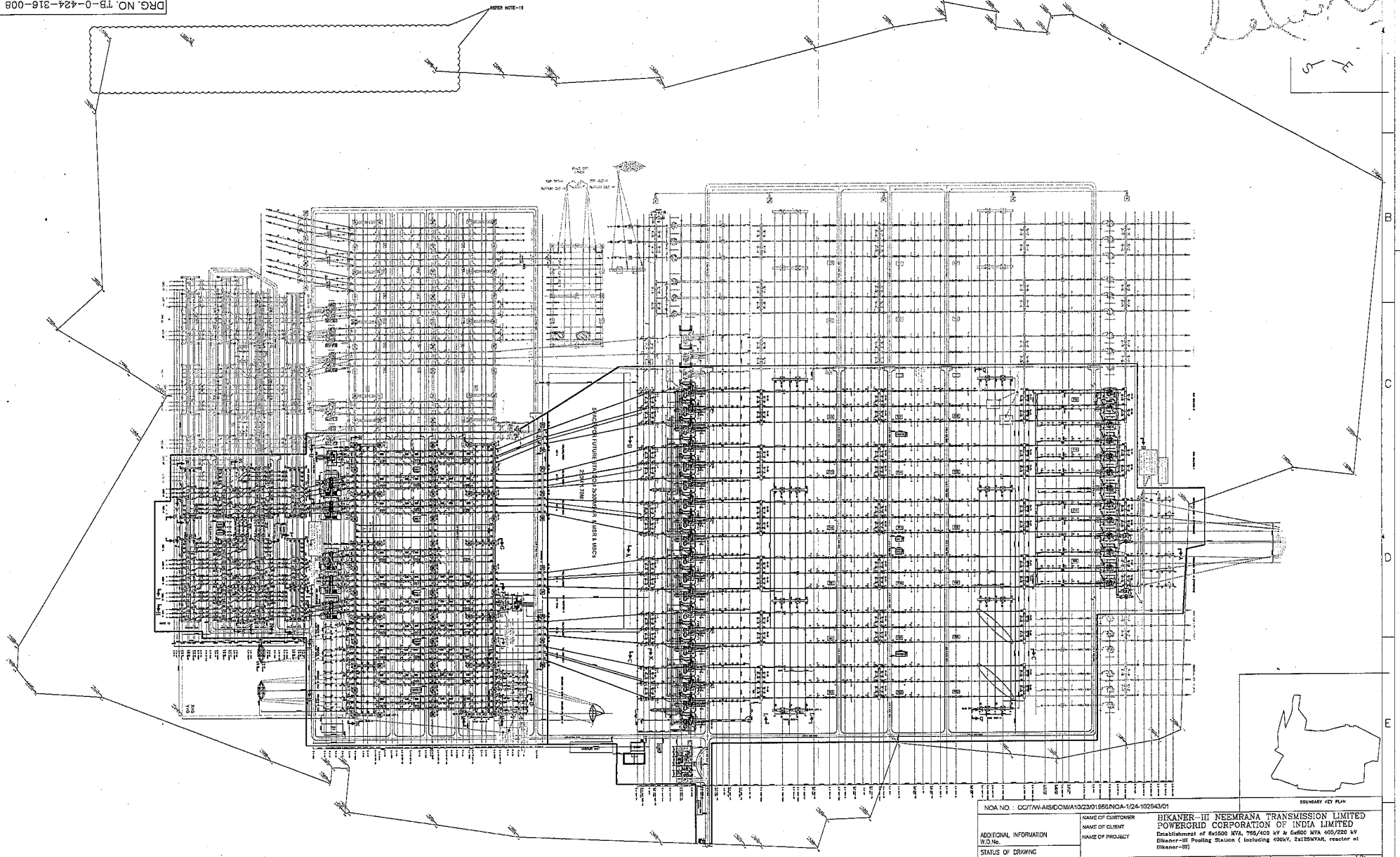
CATREL/ REL-CON निर्माण हेतु जारी।
Released for construction.

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.

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG. NO. TB-0-424-316-008



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COMPUTER DRG. PATH NAME :

REF. DRG. NO.

SIGN. AND DATE

INVENTORY NO

REFER ENCLOSED DOCUMENT TB-424-316-008-BOQ FOR ITEM DESCRIPTION & QUANTITY OF CLAMPS, CONNECTOR & STRINGING HARDWARE

SOUNDARY KEY PLAN

NOA NO. : CC/T/W-AIS/DOM/A10/23/01955/NOA-1/24-102643/01

NAME OF CUSTOMER	BIKANER-III NEEMRANA TRANSMISSION LIMITED
NAME OF CLIENT	POWERGRID CORPORATION OF INDIA LIMITED
NAME OF PROJECT	Establishment of 6x1500 MVA, 765/400 kV & 6x500 MVA 400/220 kV Bikaner-III Pooling Station (including 420kV, 2x125MVAR, reactor at Bikaner-III)
ADDITIONAL INFORMATION W.O.No.	
STATUS OF DRAWING	
DISTRIBUTION OF PRINTS	

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION BUSINESS GROUP

	नाम /NAME	हस्ता./SIGN.	दि./DATE
तैयार DRAWN	SY	-SGD-	02.12.24
जांचा CHECKED	SS	-SGD-	02.12.24
स्वीकृत APPROVED	SKS	-SGD-	02.12.24

REV.	DATE	ALTERED BY / CHECKED BY / APPROVED BY
01	15.01.25	SKS
ZONE	REVISED AS PER POWERGRID COMMENTS DATED 15.12.24	

DD-SFI
DEPT.
कोड CODE

उलुपात / SCALE

कार्ड कोड CARD CODE

POWERGRID DRAWING NO.
TB202359-1002269-BS3480-EKD-LAYOUT

शीर्षक/TITLE
BIKANER III NEW S/S- ERECTION KEY DIAGRAM LAYOUT PLAN & SECTION

ड्राईंग सं./DRAWING NO.
TB-0-424-316-008

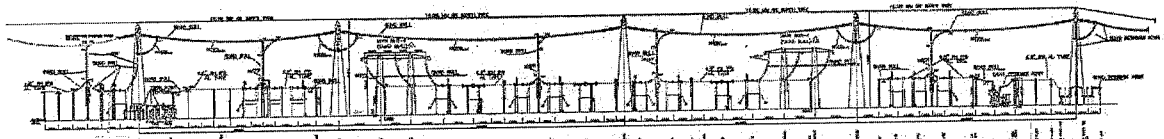
पुनरी/REV.
01

पृष्ठ सं./SHEET No. 01 अगला पृष्ठ/NEXT SHEET 02

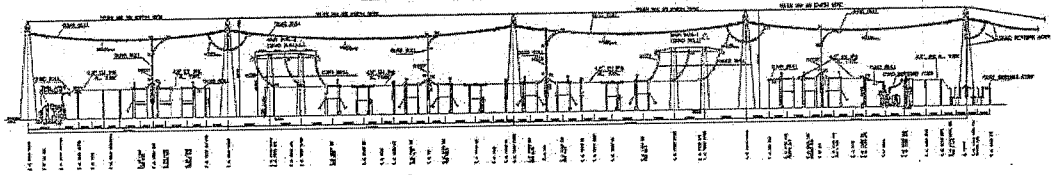
FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

TB202359-1002269-B2C400-EXD-LAYOUT01/CAT-III/Page: 2 of

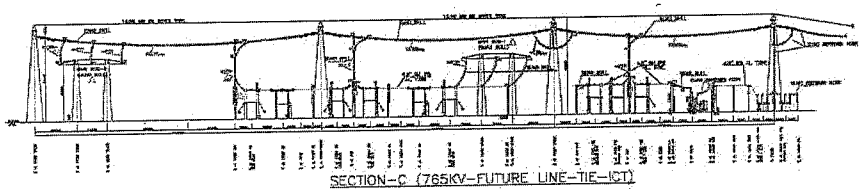
DRG. NO. TB-0-424-316-008



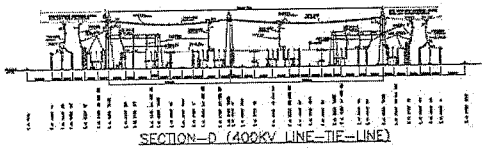
SECTION–A (765KV–LINE–TIE–ICT)



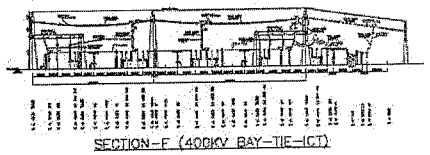
SECTION–B (765KV–REACTOR–TIE–ICT)



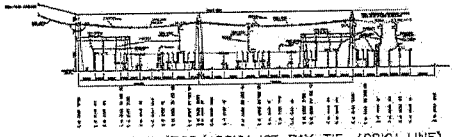
SECTION–C (765KV–FUTURE LINE–TIE–ICT)



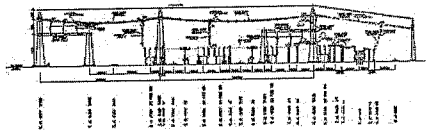
SECTION–D (400KV LINE–TIE–LINE)



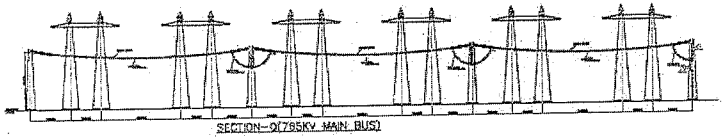
SECTION–F (400KV BAY–TIE–ICT)



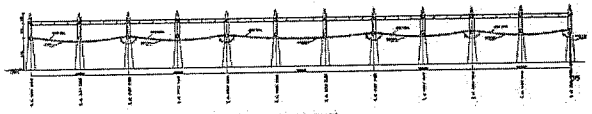
SECTION–E (765/400KV ICT BAY–TIE–400KV LINE)



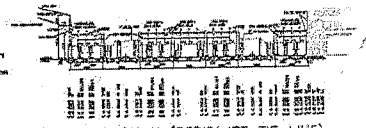
SECTION–G (400KV–FUTURE STATCOM–TIE–ICT)



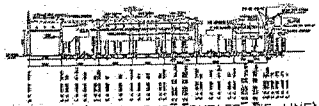
SECTION–Q(765KV MAIN BUS)



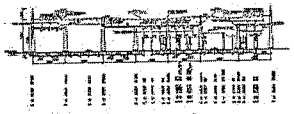
SECTION–R(400KV MAIN BUS)



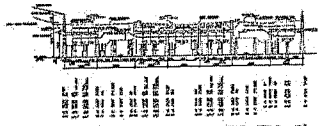
SECTION–H (220KV ICT–TIE–LINE)



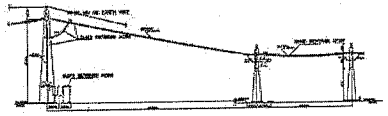
SECTION–I (220KV–BUS COUPLER–TIE–LINE)



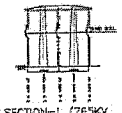
SECTION–J (220KV–TBC)



SECTION–V (220KV ICT–TIE–TBC–2)



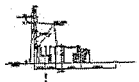
SECTION–K (765KV–400KV INTERCONNECTION)



SECTION–L (765KV BUS CVT SECTION)

SECTION–O(220KV BUS SECTIONALIZER)

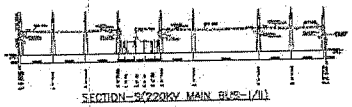
SECTION–P



SECTION–U (400KV REACTOR)

SEC–M (400KV BUS CVT SECTION)

SEC–N (220KV BUS CVT SECTION)



SECTION–S(220KV MAIN BUS–I/II)

SECTION–T(220KV TRANSFER BUS)

SECTION–W(220KV TRANSFER BUS)

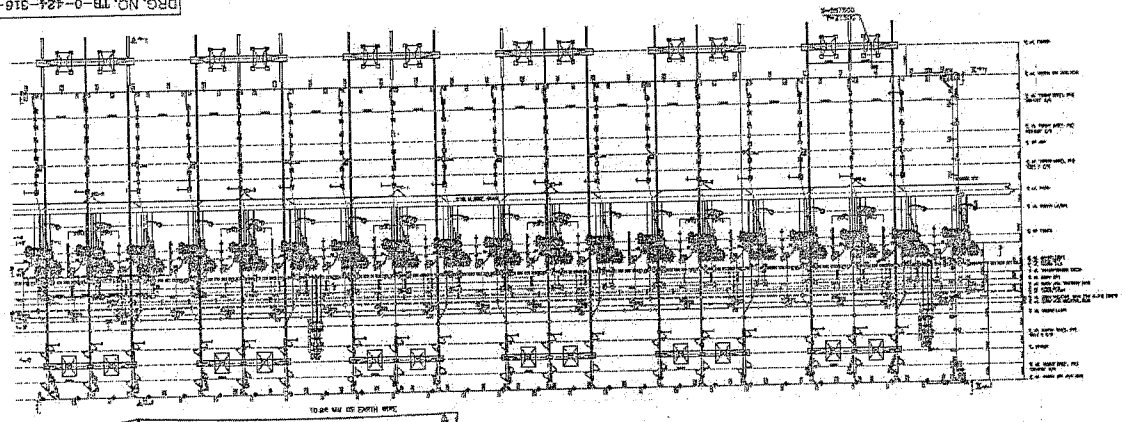
REFER ENCLOSED DOCUMENT TB–424–316–008–BOQ FOR ITEM DESCRIPTION & QUANTITY OF CLAMPS, CONNECTOR & STRINGING HARDWARE

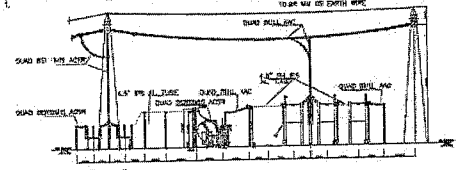
NOTIFICATION NO. / CONTRACT REFERENCE	NAME OF SUB-VENDOR	BIKANER–III NEEMRANA TRANSMISSION LIMITED POWERGRID CORPORATION OF INDIA LIMITED Establishment of Bikaner 3GIS, 765/400 kV & 400/220 kV Bikaner–III Pooling Station (1000MVA ICTs), Rajasthan Phase–II Scheme–III	
ADDITIONAL INFORMATION M.O.No.	NAME OF CLIENT NAME OF PROJECT		
STATUS OF DRAWING			
DISTRIBUTION OF PRINTS	भारत हेवी इलेक्ट्रिकल्स लिमिटेड BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION BUSINESS GROUP		
REV. / DATE / REASON / BY / CHECKED / APPROVED			
01 / 28.02.09 / APPROVED FOR CONSTRUCTION			
NOTE: REFER TO THE POWERGRID CONTRACT DRAWN TITLE			

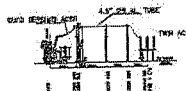
		NOT /NAME	DATE / SIGN
		DRAWN / SIGN	~TCD~ 08.12.04
		CHECKED / SIGN	~SCD~ 08.12.04
		APPROVED / SIGN	~ZCD~ 08.12.04

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG. NO. TB-0-424-316-008



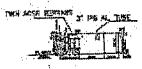




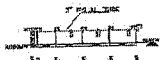
SECTION C-C
400KV BUSBAR CONNECTIONS

SECTION D-D
(TYP. FOR ICT-2,3,4,5)

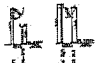
SECTION E-E
TERTIARY BUSBAR CONNECTION
(TYP. FOR ALL PHASES)



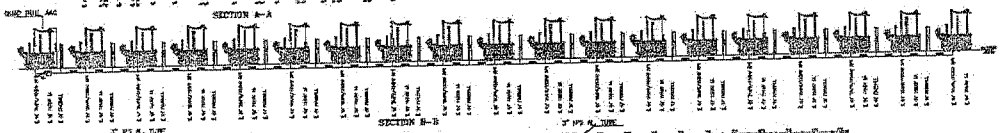
SECTION F-F
NEUTRAL BUSBAR CONNECTIONS



SECTION G-G
NEUTRAL BUS
(TYP. FOR SPR ICTs)

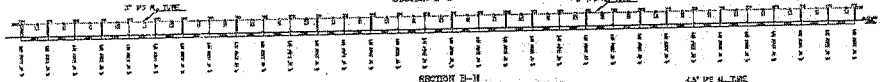


DETAIL-A DETAIL-B

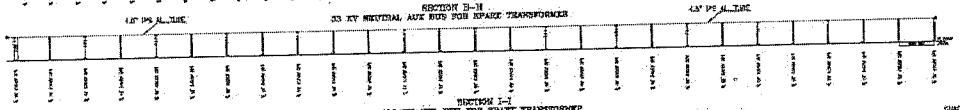


SECTION A-A

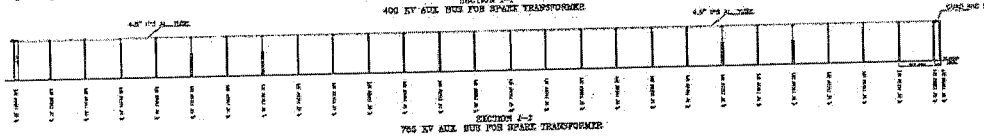
SECTION B-B



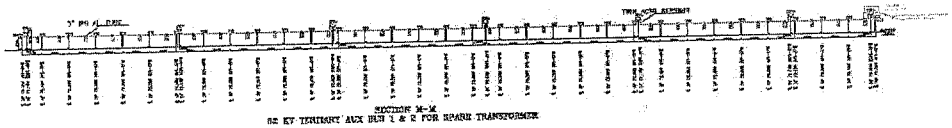
SECTION H-H
33 KV NEUTRAL AUX BUS FOR SPARE TRANSFORMER



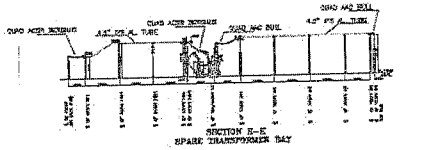
SECTION I-I
400 KV AUX BUS FOR SPARE TRANSFORMER



SECTION J-J
765 KV AUX BUS FOR SPARE TRANSFORMER



SECTION M-M
33 KV TERTIARY AUX BUS 1 & 2 FOR SPARE TRANSFORMER



SECTION N-N
ICT SUPPLY ARRANGEMENT

SECTION L-L
(FOR ICT-1 AND ICT-5)

SECTION O-O

SECTION K-K
SPARE TRANSFORMER BAY

BILL OF QTY. OF BUS POST INSULATORS FOR 765KV SPARE ICT CONNECTION ARRANGEMENT

SL.NO.	DESCRIPTION	REQ QTY.	NOS. QTY.	SYMBOL	SCOPE OF SUPPLY
1	765KV SHG BUS POST INSULATOR FOR 765KV SPARE ICT CONNECTION ARRANGEMENT	32	08 LOT	-	BHEL
2	400KV SHG BUS POST INSULATOR FOR 765KV SPARE ICT CONNECTION ARRANGEMENT	32	08 LOT	-	BHEL
3	33KV SHG BUS POST INSULATOR FOR TERTIARY SPARE ICT CONNECTION ARRANGEMENT AND NEUTRAL BUSBAR AT 400KV SHUNT REACTOR	256	08 LOT	-	BHEL
4	33KV SHG BUS POST INSULATOR FOR 765KV SPARE ICT CONNECTION ARRANGEMENT AND NEUTRAL BUSBAR AT 400KV SHUNT REACTOR	128	08 LOT	-	BHEL

BILL OF QTY. FOR LT SUPPLY

SL.NO.	DESCRIPTION	REQ QTY.	NOS. QTY.	SYMBOL	SCOPE OF SUPPLY
1	72.5KV, 1250A, 25KA FOR 1 SEC, 3PH CIRCUIT BREAKER	02	02	[illegible]	BHEL
2	72.5KV, 40KA, 25KA FOR 1 SEC, 3PH DOUBLE BREAK ISOLATOR W/O ES	02	02	[illegible]	BHEL
3	72.5KV CURRENT TRANSFORMER, 2GA 50mm 1200/5 25KA FOR 1 SEC.	06	06	-	BHEL
4	72.5KV VOLTAGE TRANSFORMER	06	06	-	BHEL
5	72.5KV SHG BUS POST INSULATOR	48	48	-	BHEL
6	800KVA, 33KV/0.433KV 3PH LT TRANSFORMER	02	02	[illegible]	BHEL

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COMPUTER GRG. PATH NAME :
REF. GRG. NO.
SPN. AND DATE
INVENTORY NO

WON NO. : 00TTM-J-BSCOM/NR-ZN2/BSSNGA-1/24-2024-25

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

NAME OF SUBSTATION
NAME OF CLIENT
NAME OF PROJECT

BIKANER-III NEEMRANA TRANSMISSION LIMITED
POWERGRID CORPORATION OF INDIA LIMITED
Establishment of Bikaner 3GIS, 765/400 kV & 765/33 kV 400/220 kV Bikaner-III Pooling Station (1500MVA 400kV, 240MVAR reactor at Bikaner-III)

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION BUSINESS GROUP

	NAME	DATE
DRAWN	[illegible]	[illegible]
CHKD	[illegible]	[illegible]
APPD	[illegible]	[illegible]

REV.	DATE	REASON	CHECKED BY
01	[illegible]	[illegible]	[illegible]

DRAWN	
CHKD	
APPD	
DATE	

SCALE / स्केल
DWG SIZE

POWERGRID DRAWING NO.
TB202359-1002269-BS3430-EKD-LAYOUT

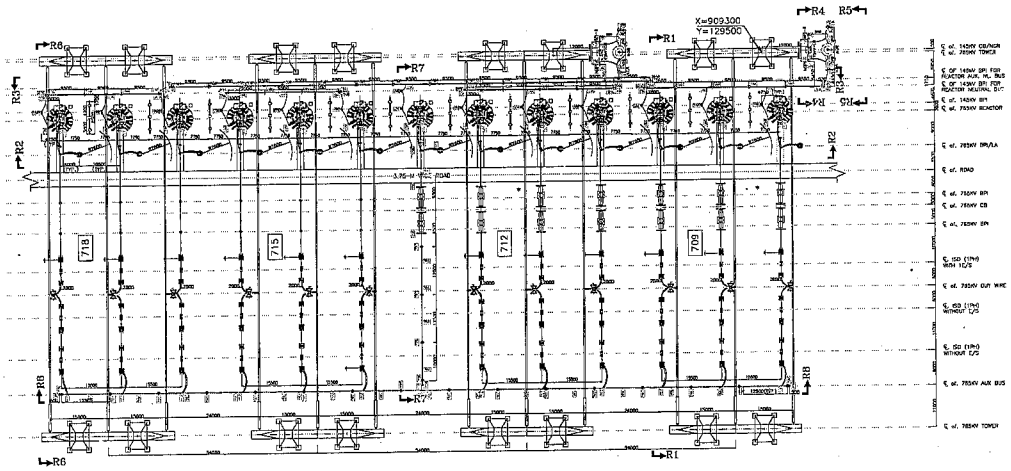
ड्रॉइंग/DRAWING NO.
TB-0-424-316-008
REV. 01

SHEET 04

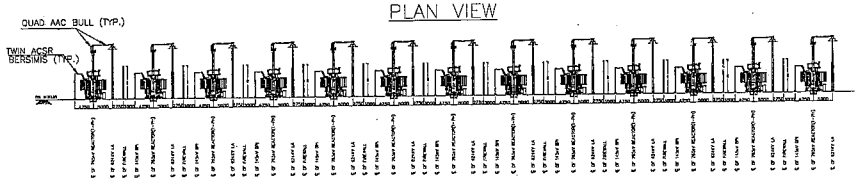
शीर्षक/TITLE
BIKANER III NEW S/S- ERECTION KEY DIAGRAM LAYOUT PLAN & SECTION

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG. NO. TB-0-424-316-008

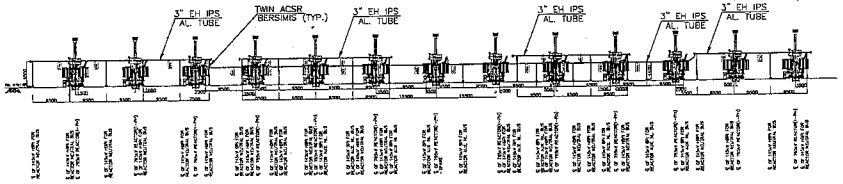


PLAN VIEW



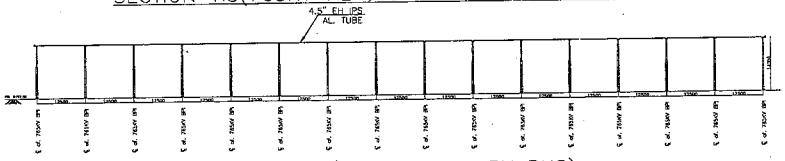
SECTION–R2(765KV REACTOR TO 624KV LA CONNECTION)

SECTION–R5(NGR CONNECTIONS)

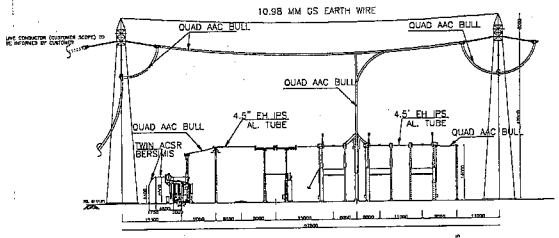


SECTION–R3(765KV REACTOR NEUTRAL & NEUTRAL AUXILIARY BUS)

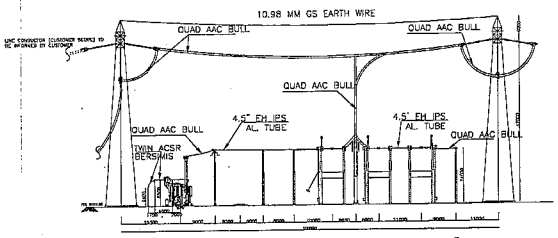
SECTION–R4(CB CONNECTIONS FOR NGR BYPASS)



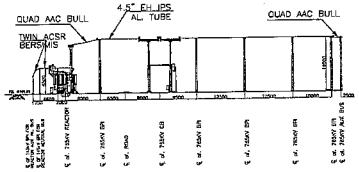
SECTION–R8(765KV AUXILIARY BUS)



SECTION–R1(765KV REACTOR AREA– 709,712)



SECTION–R6(765KV REACTOR AREA–715,718)



SECTION–R7(765KV SPARE REACTOR)

BILL OF QTY. OF BUS POST INSULATORS FOR 765KV SPARE REACTOR CONNECTION ARRANGEMENT

SL.NO.	DESCRIPTION	SLD QTY.	NOA QTY.	SYMBOL	SCOPE OF SUPPLY
1	765KV 8KN BUS POST INSULATOR FOR 765KV SPARE REACTOR CONNECTION ARRANGEMENT	21 NO.	04 LOT	◆	BHEL
2	145KV 6KN BUS POST INSULATOR FOR 765KV SPARE REACTOR CONNECTION ARRANGEMENT AND REACTOR NEUTRAL FORMATION (6500MM HIGH)	33 NO.	04 LOT	●	BHEL
3	145KV 6KN BUS POST INSULATOR FOR 765KV REACTOR AUX NEUTRAL BUS (4400MM HIGH)	14 NO.			

NOA NO. : CC/T/W-AIS/DOM/A10/23/01958/NOA-1/24-102643/01

ADDITIONAL INFORMATION W.O.No.

STATUS OF DRAWING

DISTRIBUTION OF PRINTS

NAME OF CUSTOMER: BIKANER-III NEEMRANA TRANSMISSION LIMITED
NAME OF CLIENT: POWERGRID CORPORATION OF INDIA LIMITED
NAME OF PROJECT: Establishment of 6x1500 MVA, 765/400 kV & 6x500 MVA 400/220 kV Bikaner-III Pooling Station (including 400kV, 2x125MVAR, reactor at Bikaner-III)

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
BHEL
SHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION BUSINESS GROUP

	नाम / NAME	हस्ता / SIGN.	दि./DATE
तैयार / DRAWN	SV	-SD/-	02.12.24
जांचा / CHECKED	SS	-SD/-	02.12.24
अनुमोदित / APPROVED	SKD	-SD/-	02.12.24

REV.	DATE	ALTERED BY / CHECKED BY / APPROVED BY
01	15.01.25	SV / SS / SKD

REVISED AS PER POWERGRID COMMENTS DATED 13.12.24

ZONE

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

POWERGRID DRAWING NO. TB202359-1002269-BS3480-EKD-LAYOUT

शीर्षक / TITLE: BIKANER III NEW S/S- ERECTION KEY DIAGRAM LAYOUT PLAN & SECTION

ड्रॉ. सं. / DRAWING NO. TB-0-424-316-008

संशो. / REV. 01

पृष्ठ सं. / SHEET No. 04 अगला पृष्ठ / NEXT SHEET --

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

BILL OF QUANTITIES FOR CLAMPS AND CONNECTORS-BIKANER-III-765KV

S.NO.	ITEM DESCRIPTION	CLAMP NO.	UNIT	BAY WISE QUANTITY																			TOTAL QUANTITY
				SPARE REACTOR	SPARE ICT	SPARE BAY-1 OF HALF DIA.	SPARE BAY-2 OF HALF DIA.	BUS REACTOR BAY -1	BUS REACTOR BAY -2	TRANSFORMER BAY-1	TRANSFORMER BAY-2	TRANSFORMER BAY-3	TRANSFORMER BAY-4	TRANSFORMER BAY-5	TRANSFORMER BAY-6	LINE REACTORS BAY-1 (WITH NGR BYPASS)	LINE REACTORS BAY-2 (WITH NGR BYPASS)	NEEMRANA LINE BAY-1	NEEMRANA LINE BAY-2	765 KV MAIN BUS 1	765 KV MAIN BUS 2	COMMON	
				BPS NO. 62 (4 LOT)	BPS NO. 63 (6 LOT)	BPS NO. 64 (2 set)		BPS NO. 65 (2 set)		BPS NO. 66 (6 set)						BPS NO. 67 (2 set)		BPS NO. 68 (2 set)		BPS NO. 69 (2 set)			
1	765KV ,3150 A, CIRCUIT BREAKER, EXPANSION TYPE CONNECTOR SUITABLE FOR 4.5" IPS ALUMINIUM TUBE WITH HORIZONTAL APPROACH	701	No.	2	0	3	3	9	9	9	9	9	9	9	9	6	6	9	9	0	0	0	110
2	765KV , 3150A, VERTICAL KNEE ISOLATOR , RIGID TYPE CONNECTOR SUITABLE FOR 4.5" IPS ALUMINIUM TUBE	702	No.	0	0	~~3~~ 6	~~3~~ 6	12 9	12 9	9	9	9	9	9	9	6	6	6	6	0	0	0	108
3	765KV , 3150A, VERTICAL KNEE ISOLATOR, EXPANSION TYPE CONNECTOR SUITABLE FOR 4.5" IPS ALUMINIUM TUBE	703	No.	0	0	0	0	8	8	11	11	11	11	11	11	3	3	5	5	0	0	0	98
4	765KV , 3150A, VERTICAL KNEE ISOLATOR, CONNECTOR SUITABLE FOR QUAD BULL AAC CONDUCTOR (UA)	704	No.	0	0	3	3	16	16	16	16	16	16	16	16	9	9	13	13	0	0	0	178
5	765KV , 3150A, CURRENT TRANSFORMER , RIGID TYPE CONNECTOR SUITABLE FOR 4.5" IPS ALUMINIUM TUBE	705	No.	0	0	0	0	6	6	12	12	12	12	12	12	0	0	6	6	0	0	0	96
6	765KV, BUS POST INSULATOR, RIGID/SLIDING TYPE CONNECTOR SUITABLE FOR 4.5" IPS AL TUBE	706	No.	4	4	0	0	5	5	5	5	5	5	5	5	3	3	5	5	0	0	0	64
7	765KV , 3150A, BUS POST INSULATOR , RIGID-EXPANSION TYPE CONNECTOR SUITABLE FOR 4.5" IPS AL TUBE, TUBE CUT	707	No.	17	28	0	0	7	7	1	1	1	1	1	1	0	0	1	1	0	0	0	67
8	765KV, CVT CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID/SLIDING TYPE	708	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	6
9	765KV , CAPACITOR VOLTAGE TRANSFORMER , SUITABLE FOR QUAD BULL AAC CONDUCTOR (UNIVERSAL TAKEOFF)	709	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	6

BILL OF QUANTITIES FOR CLAMPS AND CONNECTORS-BIKANER-III-765KV

S.NO.	ITEM DESCRIPTION	CLAMP NO.	UNIT	BAY WISE QUANTITY																			TOTAL QUANTITY
				SPARE REACTOR	SPARE ICT	SPARE BAY-1 OF HALF DIA.	SPARE BAY-2 OF HALF DIA.	BUS REACTOR BAY -1	BUS REACTOR BAY -2	TRANSFORMER BAY-1	TRANSFORMER BAY-2	TRANSFORMER BAY-3	TRANSFORMER BAY-4	TRANSFORMER BAY-5	TRANSFORMER BAY-6	LINE REACTORS BAY-1 (WITH NGR BYPASS)	LINE REACTORS BAY-2 (WITH NGR BYPASS)	NEEMRANA LINE BAY-1	NEEMRANA LINE BAY-2	765 KV MAIN BUS 1	765 KV MAIN BUS 2	COMMON	
				BPS NO. 62 (4 LOT)	BPS NO. 63 (6 LOT)	BPS NO. 64 (2 set)		BPS NO. 65 (2 set)		BPS NO. 66 (6 set)						BPS NO. 67 (2 set)		BPS NO. 68 (2 set)		BPS NO. 69 (2 set)			
10	624KV, LIGHTNING ARRESTER , RIGID/SLIDING TYPE CONNECTOR SUITABLE FOR 4.5" IPS AL TUBE	710	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	6
11	624KV, LIGHTNING ARRESTER, CONNECTOR SUITABLE FOR QUAD BULL AAC CONDUCTOR	711*	No.	1	1	0	0	3	3	3	3	3	3	3	3	3	3	0	0	0	0	0	32
12	765KV, 3150A, WAVE TRAP, RIGID TYPE CONNECTOR SUITABLE FOR QUAD BULL AAC CONDUCTOR WITH HORIZONTAL APPROACH	712*	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	8
13	765KV, 500MVA (1 PHASE) ICT HV BUSHING, 3150A, CONNECTOR SUITABLE FOR QUAD BULL AAC CONDUCTOR WITH HORIZONTAL APPROACH	713	No.	0	1	0	0	0	0	3	3	3	3	3	3	0	0	0	0	0	0	0	19
14	765KV, 110MVAR (1 PHASE) LINE/BUS REACTOR HV BUSHING, 3150A, CONNECTOR SUITABLE FOR QUAD BULL AAC CONDUCTOR WITH HORIZONTAL APPROACH	714	No.	1	0	0	0	3	3	0	0	0	0	0	0	3	3	0	0	0	0	0	13
15	765KV , 3150A, TEE CONNECTOR SUITABLE FOR 4.5" AL TUBE RUN AND QUAD BULL AAC TAP (UNIVERSAL TAKEOFF)	715	No.	~~24~~ 4	~~29~~ 4	0	0	~~8~~	~~8~~ 11	~~8~~	~~8~~	~~8~~	~~8~~	~~8~~	~~8~~	6	6	5	5	0	0	0	120
16	765KV, 3150A, TEE CONNECTOR SUITABLE FOR QUAD BULL AAC CONDUCTOR (RUN) AND QUAD BULL AAC CONDUCTOR (TAP)	716	No.	0	0	9	9	12	12	12	12	12	12	12	12	3	3	9	9	6	6	0	150

BILL OF QUANTITIES FOR CLAMPS AND CONNECTORS-BIKANER-III-765KV

S.NO.	ITEM DESCRIPTION	CLAMP NO.	UNIT	BAY WISE QUANTITY																			TOTAL QUANTITY
				SPARE REACTOR	SPARE ICT	SPARE BAY-1 OF HALF DIA.	SPARE BAY-2 OF HALF DIA.	BUS REACTOR BAY -1	BUS REACTOR BAY -2	TRANSFORMER BAY-1	TRANSFORMER BAY-2	TRANSFORMER BAY-3	TRANSFORMER BAY-4	TRANSFORMER BAY-5	TRANSFORMER BAY-6	LINE REACTORS BAY-1 (WITH NGR BYPASS)	LINE REACTORS BAY-2 (WITH NGR BYPASS)	NEEMRANA LINE BAY-1	NEEMRANA LINE BAY-2	765 KV MAIN BUS-1	765 KV MAIN BUS-2	COMMON	
				BPS NO. 62 (4 LOT)	BPS NO. 63 (6 LOT)	BPS NO. 64 (2 set)		BPS NO. 65 (2 set)		BPS NO. 66 (6 set)						BPS NO. 67 (2 set)		BPS NO. 68 (2 set)		BPS NO. 69 (2 set)			
17	PG CLAMP SUITABLE FOR QUAD BULL AAC CUNDOCTOR (RUN) AND QUAD BULL AAC CONDUCTOR (TAP)	717	No.	0	0	6	6	24	24	24	24	24	24	24	24	12	12	21	21	0	0	0	270
18	765KV,TEE CONNECTOR SUITABLE FOR HEXA ZEBRA ACSR CONDUCTOR (RUN) AND QUAD BULL AAC CONDUCTOR (TAP)	718	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	6
19	PG CLAMP SUITABLE FOR HEXA ZEBRA ACSR CONDUCTOR (RUN) AND QUAD BULL AAC CONDUCTOR (TAP)	719	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	6
20	765KV FLEXIBLE SPACERS FOR QUAD BULL AAC CONDUCTOR	720	No.	0	0	57	57	108	108	102	102	102	102	102	102	0	0	114	114	174	174	0	1518
21	765KV RIGID SPACERS FOR QUAD BULL AAC CONDUCTOR	721	No.	0	0	21	21	48	48	48	48	48	48	48	48	24	24	54 42	54 42	16	16	0	588
22	765KV CORONA END BELL FOR 4.5" IPS AL TUBE	7CB	No.	4	4	0	0	5	5	5	5	5	5	5	5	3	3	5	5	0	0	0	64
23	ALUMINIUM WELDING SLEEVES FOR 4.5" IPS AL TUBE	WS1	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	129	129
24	TWO WAY PG CLAMPS FOR 7/9 SWG (10.98MM DIA) GS WIRE	E1	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	132	132
25	TENSION CLAMPS FOR 7/9 SWG(10.98MM DIA) GS WIRE BOLTED TYPE	E2	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	88	88
26	STRUCTURE CLAMPS FOR 7/9 SWG(10.98MM DIA) GS WIRE ON LATTICE TYPE STRUCTURE	E3	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1456	1456
27	PAD TYPE CLAMP FOR CONNECTING 7/9 SWG(10.98MM DIA) GS WIRE ON ONE SIDE AND 75X 12 MM GS STRIP ON OTHER SIDE	E4	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56	56
28	STRUCTURE CLAMPS FOR 75X 12 MM GS STRIPS ON LATTICE TYPE STRUCTURE	E5	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7500	11300

* connector being supplied by OEM

TB-424-316-008-BOQ-REV 01

BILL OF QUANTITIES FOR CLAMPS AND CONNECTORS-BIKANER-III-400KV

S.NO.	ITEM DESCRIPTION	CLAMP NO.	UNIT	BAY WISE QUANTITY																									TOTAL QUANTITY
				765KV SPARE ICT	SPARE BAY-1 OF HALF DIA.	BUS REACTOR BAY -1	BUS REACTOR BAY -2	765/400KV ICT-TRANSFORMER BAY-1	765/400KV ICT-TRANSFORMER BAY-2	765/400KV ICT-TRANSFORMER BAY-3	765/400KV ICT-TRANSFORMER BAY-4	765/400KV ICT-TRANSFORMER BAY-5	765/400KV ICT-TRANSFORMER BAY-6	400/220KV ICT-TRANSFORMER BAY-1	400/220KV ICT-TRANSFORMER BAY-2	400/220KV ICT-TRANSFORMER BAY-3	400/220KV ICT-TRANSFORMER BAY-4	400/220KV ICT-TRANSFORMER BAY-5	BIKANER PG LINE-1	BIKANER PG LINE-2	BIKANER II LILO LINE-3	BIKANER II LILO LINE-4	BIKANER-II LINE -1	BIKANER-II LINE -2	400KV MAIN BUS-1	400KV MAIN BUS-2	400KV MAIN BUS-1	400KV MAIN BUS-2	COMMON	
				BPS NO. 63 (6 LOT)	BPS NO. 75 (1 set)	BPS NO. 76 (2 set)		BPS NO. 77 (11 set)											BPS NO. 78 (6 set)						BPS NO. 79 (4 SET)		Erection Hardware for 400kV I type layout-Bus Work (For Three diameter) as per technical specification: 1 SET (NEW ITEM ADDITION TO BE AMENDED BY PG)			
1	420KV, 63KA FOR 1S, 3150A, CB CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, EXPANSION TYPE	401	No.	0	3	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	0	0	0	0	0	174
2	420KV, 63KA FOR 1S, 3150A, CT CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID TYPE	402	No.	0	6	12	6	12	12	12	12	12	12	6	6	6	6	6	12	12	6	6	6	6	0	0	0	0	0	174
3	420KV, 63KA FOR 1S, 3150A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID TYPE	403	No.	0	0	8	11	11	11	11	11	11	11	11	11	11	11	11	8	8	11	11	11	11	0	0	0	0	0	200
4	420KV, 63KA FOR 1S, 3150A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, EXPANSION TYPE	404	No.	0	3	9	6	9	9	9	9	9	9	6	6	6	6	6	9	9	6	6	6	6	0	0	0	0	0	144
5	400KV, 63KA FOR 1S, 3150A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR QUAD BERSIMIS (HA)	405	No.	0	3	7	7	10	10	10	10	10	10	7	7	7	7	7	7	7	7	7	7	7	0	0	0	0	0	154
6	420KV, 63KA FOR 1S, 3150A, WAVE TRAP CONNECTOR SUITABLE FOR QUAD BERSIMIS	406*	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	4	4	4	4	0	0	0	0	0	24
7	336KV LIGHTNING ARRESTER, RIGID/SLIDING TYPE CONNECTOR SUITABLE FOR 4.5" IPS AL TUBE	407	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3	3	3	3	0	0	0	0	0	18
8	336KV LIGHTNING ARRESTER, RIGID/SLIDING TYPE CONNECTOR SUITABLE FOR TWIN BERSIMIS	408*	No.	1	0	3	3	3	3	3	3	3	3	3	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	40
9	400KV, 63KA FOR 1S, 2000A, CVT CONNECTOR SUITABLE FOR TWIN BERSIMIS (UNIVERSAL TAKEOFF)	409	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3	3	3	3	0	0	0	0	0	18
10	420KV, 63KA FOR 1S, 3150A, BPI CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, SLIDING THROUGH TYPE	410	No.	4	0	2	2	5	5	5	5	5	5	2	2	2	2	2	5	5	5	5	5	5	0	0	0	0	0	78
11	420KV, 63KA FOR 1S, 3150A, BPI RIGID-EXPANSION TYPE CONNECTOR SUITABLE FOR 4.5" IPS AL TUBE, TUBE CUT	411	No.	27	0	0	0	6	6	6	6	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	63
12	400KV, 63KA FOR 1S, 3150A, BPI CONNECTOR SUITABLE FOR TWIN BERSIMIS THROUGH TYPE	412	No.	0	0	3	3	0	0	0	0	0	0	3	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	21

TB-424-216-008-BOQ-REV 01

BILL OF QUANTITIES FOR CLAMPS AND CONNECTORS-BIKANER-III-400KV

S.NO.	ITEM DESCRIPTION	CLAMP NO.	UNIT	BAY WISE QUANTITY																									TOTAL QUANTITY
				765KV SPARE ICT	SPARE BAY-1 OF HALF DIA.	BUS REACTOR BAY -1	BUS REACTOR BAY -2	765/400KV ICT-TRANSFORMER BAY-1	765/400KV ICT-TRANSFORMER BAY-2	765/400KV ICT-TRANSFORMER BAY-3	765/400KV ICT-TRANSFORMER BAY-4	765/400KV ICT-TRANSFORMER BAY-5	765/400KV ICT-TRANSFORMER BAY-6	400/220KV ICT-TRANSFORMER BAY-1	400/220KV ICT-TRANSFORMER BAY-2	400/220KV ICT-TRANSFORMER BAY-3	400/220KV ICT-TRANSFORMER BAY-4	400/220KV ICT-TRANSFORMER BAY-5	BIKANER PG LINE-1	BIKANER PG LINE-2	BIKANER II LILO LINE-3	BIKANER II LILO LINE-4	BIKANER-II LINE -1	BIKANER-II LINE -2	400KV MAIN BUS-1	400KV MAIN BUS-2	400KV MAIN BUS-1	400KV MAIN BUS-2	COMMON	
				BPS NO. 63 (6 LOT)	BPS NO. 75 (1 set)	BPS NO. 76 (2 set)		BPS NO. 77 (11 set)											BPS NO. 78 (6 set)						BPS NO. 79 (4 SET)		Erection Hardware for 400kV I type layout-Bus Work (For Three diameter) as per technical specification: 1 SET (NEW ITEM ADDITION TO BE AMENDED BY PG)			
13	420KV, 63KA FOR 1S, 2000A, 400KV REACTOR BUSHING CONNECTOR SUITABLE FOR TWIN BERSIMIS	413	No.	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
14	420KV, 63KA FOR 1S, 3150A, 400KV ICT BUSHING CONNECTOR FOR 400KV ICT SUITABLE FOR QUAD BERSIMIS	414	No.	0	0	0	0	0	0	0	0	0	0	3	3	3	3	3	0	0	0	0	0	0	0	0	0	0	15
15	420KV, 63KA FOR 1S, 3150A, 400KV ICT BUSHING CONNECTOR FOR 765KV ICT SUITABLE FOR QUAD BERSIMIS	415	No.	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
16	CONNECTORS 400KV, 63KA FOR 1S TEE CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS TO QUAD BERSIMIS CONDUCTOR	416	No.	4 21	0	5	5	5	5	6 5	5	5	5	5	2 5	5	5	5	5	3 5	5	5	5	5	0	0	0	0	116
17	CONNECTORS 400KV, 63KA FOR 1S, TEE CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS TO TWIN BERSIMIS CONDUCTOR	417	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3	3	3	3	0	0	0	0	18
18	400KV, 63KA FOR 1S, TEE CONNECTOR SUITABLE FOR QUAD BERSIMIS TO QUAD BERSIMIS	418	No.	0	6	3	3	21	21	21	21	21	21	3	3	3	3	3	3	3	3 6	6	3	3	0	0	0	0	177
19	400KV, 63KA FOR 1S, TEE CONNECTOR SUITABLE FOR QUAD BERSIMIS TO TWIN BERSIMIS	419	No.	0	0	3	3	0	0	0	0	0	0	3	3	3	3	3	0	0	0	0	0	0	0	0	0	0	21
20	400KV, 63KA FOR 1S, TEE CONNECTOR SUITABLE FOR QUAD BULL TO QUAD BERSIMIS	420	No.	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	0	0	0	0	60
21	400KV, 63KA FOR 1S, TEE CONNECTOR SUITABLE FOR QUAD AL59 MOOSE CONDUCTOR TO QUAD ACSR BERSIMIS CONDUCTOR	421	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3	3	3	3	0	0	0	0	18
22	400KV, 63KA FOR 1S, TEE CONNECTOR SUITABLE FOR QUAD AL59 MOOSE CONDUCTOR TO TWIN ACSR BERSIMIS CONDUCTOR	422	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3	3	3	3	0	0	0	0	18
23	420KV, 63KA FOR 1S, FLEXIBLE SPACER SUITABLE FOR QUAD BERSIMIS	423	No.	0	39	54	54	153	153	153	153	153	153	54	54	54	54	54	42	42	54	54	54	54	0	0	0	0	0	1635
24	420KV, 63KA FOR 1S,RIGID SPACER SUITABLE FOR QUAD BERSIMIS	424	No.	0	15	15	15	36	36	36	36	36	36	15	15	15	15	15	39	39	39	39	39	39	0	0	0	0	0	570

TB-124-215-008-BOQ-REV 01

BILL OF QUANTITIES FOR CLAMPS AND CONNECTORS-BIKANER-III-400KV

S.NO.	ITEM DESCRIPTION	CLAMP NO.	UNIT	BAY WISE QUANTITY																									TOTAL QUANTITY
				765KV SPARE ICT	SPARE BAY-1 OF HALF DIA.	BUS REACTOR BAY -1	BUS REACTOR BAY -2	765/400KV ICT-TRANSFORMER BAY-1	765/400KV ICT-TRANSFORMER BAY-2	765/400KV ICT-TRANSFORMER BAY-3	765/400KV ICT-TRANSFORMER BAY-4	765/400KV ICT-TRANSFORMER BAY-5	765/400KV ICT-TRANSFORMER BAY-6	400/220KV ICT-TRANSFORMER BAY-1	400/220KV ICT-TRANSFORMER BAY-2	400/220KV ICT-TRANSFORMER BAY-3	400/220KV ICT-TRANSFORMER BAY-4	400/220KV ICT-TRANSFORMER BAY-5	BIKANER PG LINE-1	BIKANER PG LINE-2	BIKANER II LILO LINE-3	BIKANER II LILO LINE-4	BIKANER-II LINE -1	BIKANER-II LINE -2	400KV MAIN BUS-1	400KV MAIN BUS-2	400KV MAIN BUS-1	400KV MAIN BUS-2	COMMON	
				BPS NO. 63 (6 LOT)	BPS NO. 75 (1 set)	BPS NO. 76 (2 set)		BPS NO. 77 (11 set)											BPS NO. 78 (6 set)						BPS NO. 79 (4 SET)		Erection Hardware for 400kV I type layout-Bus Work (For Three diameter) as per technical specification: 1 SET (NEW ITEM ADDITION TO BE AMENDED BY PG)			
25	420KV, 63KA FOR 1S, FLEXIBLE SPACER SUITABLE FOR TWIN BERSIMIS	425	No.	0	0	3	3	0	0	0	0	0	0	3	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	21
26	420KV, 63KA FOR 1S, RIGID SPACER SUITABLE FOR TWIN BERSIMIS	426	No.	0	0	18	18	0	0	0	0	0	0	18	18	18	18	18	~~15~~	~~15~~ 12	~~15~~	~~15~~	~~15~~	~~15~~	~~3~~ 3	~~3~~	0	0	0	228
27	CONNECTORS 420KV, 63KA FOR 1S, FLEXIBLE SPACER SUITABLE FOR QUAD BULL	427	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	~~126~~ 120	~~126~~	51	51	0	354
28	PG CLAMP SUITABLE FOR QUAD BERSIMIS ACSR CONDUCTOR (RUN) AND QUAD BERSIMIS ACSR CONDUCTOR (TAP)	428	No.	0	6	6	6	6	6	6	6	6	6	6	6	6	6	6	9	9	9	9	9	9	0	0	0	0	0	138
29	PG CLAMP SUITABLE FOR TWIN BERSIMIS ACSR CONDUCTOR (RUN) AND TWIN BERSIMIS ACSR CONDUCTOR (TAP)	429	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6	6	6	6	6	0	0	0	0	0	36
30	PG CLAMP SUITABLE FOR QUAD QUAD AL59 MOOSE CONDUCTOR (RUN) AND QUAD BERSIMIS ACSR CONDUCTOR (TAP)	430	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3	3	3	3	0	0	0	0	0	18
31	PG CLAMP SUITABLE FOR QUAD QUAD AL59 MOOSE CONDUCTOR (RUN) AND TWIN BERSIMIS ACSR CONDUCTOR (TAP)	431	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3	3	3	3	0	0	0	0	0	18
32	400KV CORONA END BELL FOR 4.5" IPS AL TUBE	4CB	No.	4	0	2	2	5	5	5	5	5	5	2	2	2	2	2	8	8	8	8	8	8	0	0	0	0	0	96
33	ALUMINIUM WELDING SLEEVES FOR 4.5" IPS AL TUBE	WS1	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	168	168
34	TWO WAY PG CLAMPS FOR 7/9 SWG (10.98MM DIA) GS WIRE	E1	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	126	126
35	TENSION CLAMPS FOR 7/9 SWG(10.98MM DIA) GS WIRE BOLTED TYPE	E2	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	84
36	STRUCTURE CLAMPS FOR 7/9 SWG(10.98MM DIA) GS WIRE ON LATTICE TYPE STRUCTURE	E3	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	690	690
37	PAD TYPE CLAMP FOR CONNECTING 7/9 SWG(10.98MM DIA) GS WIRE ON ONE SIDE AND 75X 12 MM GS STRIP ON OTHER SIDE	E4	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46	46
38	STRUCTURE CLAMPS FOR 75X 12 MM GS STRIPS ON LATTICE TYPE STRUCTURE	E5	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3300	6500

how??

* connector being supplied by OEM

BILL OF QUANTITIES FOR CLAMPS AND CONNECTORS-BIKANER-III-220KV

S.NO.	ITEM DESCRIPTION	CLAMP NO.	UNIT	400/220KV ICT-TRANSFORMER BAY-1	400/220KV ICT-TRANSFORMER BAY-2	400/220KV ICT-TRANSFORMER BAY-3	400/220KV ICT-TRANSFORMER BAY-4	400/220KV ICT-TRANSFORMER BAY-5	LINE BAY-1	LINE BAY-2	LINE BAY-3	LINE BAY-4	LINE BAY-5	BUS COUPLER-1	BUS COUPLER-2	TBC-1	TBC-2	220KV MAIN BUS-1	220KV MAIN BUS-2	220KV TRANSFER BUS	BUS SECTIONALISER-1	BUS SECTIONALISER-2	COMMON	TOTAL QUANTITY
				BPS NO. 87 (5 SET)					BPS NO. 86 (5 SET)					BPS NO. 88 (2 SET)		BPS NO. 89 (2 SET)		BPS NO. 84 (6 SET) & 85 (4 SET)			BPS NO. 90 (2 SET)			
1	220KV, 50KA FOR 1S, 1600A, CB CONNECTOR SUITABLE FOR AL TUBE 4 INCH IPS, EXPANSION TYPE	201	No.	6	6	6	6	6	6	6	6	6	6	0	0	6	6	0	0	0	0	0	0	72
	220KV, 50KA FOR 1S, 3150A, CB CONNECTOR SUITABLE FOR AL TUBE 4 INCH IPS, EXPANSION TYPE	202	No.	0	0	0	0	0	0	0	0	0	0	6	6	0	0	0	0	0	6	6	0	24
2	220KV, 50KA FOR 1S, 1600A, CT CONNECTOR SUITABLE FOR AL TUBE 4 INCH IPS, RIGID TYPE	203	No.	3	3	3	3	3	3	3	3	3	3	0	0	6	6	0	0	0	0	0	0	42
3	220KV, 50KA FOR 1S, 1600A, CT CONNECTOR SUITABLE FOR TWIN BERSIMIS	204	No.	3	3	3	3	3	3	3	3	3	3	0	0	0	0	0	0	0	0	0	0	30
4	220KV, 50KA FOR 1S, 2500A, CT CONNECTOR SUITABLE FOR AL TUBE 4 INCH IPS, RIGID TYPE	205	No.	0	0	0	0	0	0	0	0	0	0	6	6	0	0	0	0	0	6	6	0	24
6	220KV, 50KA FOR 1S, 1600A, ISOLATOR (TANDEM) CONNECTOR SUITABLE FOR AL TUBE 4 INCH IPS	206	No.	6	6	6	6	6	6	6	6	6	6	0	0	3	3	0	0	0	0	0	0	66
7	220KV, 50KA FOR 1S, 1600A, ISOLATOR (TANDEM) CONNECTOR SUITABLE FOR TWIN BERSIMIS	207	No.	6	6	6	6	6	6	6	6	6	6	0	0	3	3	0	0	6	0	0	0	72
8	220KV, 50KA FOR 1S, 1600A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR AL TUBE 4 INCH IPS, RIGID TYPE	208	No.	6	6	6	6	6	9	9	9	9	9	0	0	5	7	0	0	0	0	0	0	87
9	220KV, 50KA FOR 1S, 1600A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR AL TUBE 4 INCH IPS, EXPANSION TYPE	209	No.	6	6	6	6	6	3	3	3	3	3	0	0	3	3	0	0	0	0	0	0	51
10	220KV, 50KA FOR 1S, 1600A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR TWIN BERSIMIS	210	No.	0	0	0	0	0	0	0	0	0	0	0	0	4	2	0	0	0	0	0	0	6

TB-224-316-008-BOQ -REV 01

BILL OF QUANTITIES FOR CLAMPS AND CONNECTORS-BIKANER-III-220KV

S.NO.	ITEM DESCRIPTION	CLAMP NO.	UNIT	400/220KV ICT-TRANSFORMER BAY-1	400/220KV ICT-TRANSFORMER BAY-2	400/220KV ICT-TRANSFORMER BAY-3	400/220KV ICT-TRANSFORMER BAY-4	400/220KV ICT-TRANSFORMER BAY-5	LINE BAY-1	LINE BAY-2	LINE BAY-3	LINE BAY-4	LINE BAY-5	BUS COUPLER-1	BUS COUPLER-2	TBC-1	TBC-2	220KV MAIN BUS-1	220KV MAIN BUS-2	220KV TRANSFER BUS	BUS SECTIONALISER-1	BUS SECTIONALISER-2	COMMON	TOTAL QUANTITY
				BPS NO. 87 (5 SET)					BPS NO. 86 (5 SET)					BPS NO. 88 (2 SET)		BPS NO. 89 (2 SET)		BPS NO. 84 (6 SET) & 85 (4 SET)			BPS NO. 90 (2 SET)			
11	220KV, 50KA FOR 1S, 3150A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR AL TUBE 4 INCH IPS, RIGID TYPE	211	No.	0	0	0	0	0	0	0	0	0	0	9	9	0	0	0	0	0	6	6	0	30
12	220KV, 50KA FOR 1S, 3150A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR QUAD BERSIMIS	212	No.	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	6	6	0	18
13	220KV, 50KA FOR 1S, 1600A, WAVE TRAP CONNECTOR SUITABLE FOR TWIN BERSIMIS	213*	No.	0	0	0	0	0	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	10
14	220KV, 50KA FOR 1S, BPI CONNECTOR SUITABLE FOR AL TUBE 4 INCH IPS, RIGID/SLIDING THROUGH TYPE	214	No.	9	9	9	9	9	9	9	9	9	9	6	7	8	7	0	0	0	0	0	0	118
15	220KV, 50KA FOR 1S, BPI CONNECTOR SUITABLE FOR TWIN BERSIMIS (THROUGH)	215	No.	3	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
16	216KV, 50KA FOR 1S, LIGHTNING ARRESTER CONNECTOR SUITABLE FOR TWIN BERSIMIS	216*	No.	3	3	3	3	3	3	3	3	3	3	0	0	0	0	0	0	0	0	0	0	30
17	220KV, 50KA FOR 1S, 2000A, CVT CONNECTOR SUITABLE FOR TWIN BERSIMIS	217	No.	0	0	0	0	0	3	3	3	3	3	0	0	0	0	6	6	0	0	0	0	27
18	220KV, 50KA FOR 1S, 2000A, ICT BUSHING CONNECTOR SUITABLE FOR TWIN BERSIMIS	218	No.	3	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
19	220KV, 50KA FOR 1S, FLEXIBLE SPACER SUITABLE FOR QUAD AAC BULL	219	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	168	336	0	12	12	0	528
20	220KV, 50KA FOR 1S, RIGID SPACER SUITABLE FOR QUAD AAC BULL	220	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6	0	12

BILL OF QUANTITIES FOR CLAMPS AND CONNECTORS-BIKANER-III-220KV

S.NO.	ITEM DESCRIPTION	CLAMP NO.	UNIT	400/220KV ICT-TRANSFORMER BAY-1	400/220KV ICT-TRANSFORMER BAY-2	400/220KV ICT-TRANSFORMER BAY-3	400/220KV ICT-TRANSFORMER BAY-4	400/220KV ICT-TRANSFORMER BAY-5	LINE BAY-1	LINE BAY-2	LINE BAY-3	LINE BAY-4	LINE BAY-5	BUS COUPLER-1	BUS COUPLER-2	TBC-1	TBC-2	220KV MAIN BUS-1	220KV MAIN BUS-2	220KV TRANSFER BUS	BUS SECTIONALISER-1	BUS SECTIONALISER-2	COMMON	TOTAL QUANTITY
				BPS NO. 87 (5 SET)					BPS NO. 86 (5 SET)					BPS NO. 88 (2 SET)		BPS NO. 89 (2 SET)		BPS NO. 84 (6 SET) & 85 (4 SET)			BPS NO. 90 (2 SET)			
21	220KV, 50KA FOR 1S, FLEXIBLE SPACER SUITABLE FOR QUAD ACSR BERSIMIS	221	No.	0	0	0	0	0	0	0	0	0	0	111	111	162	162	0	0	369	0	0	0	915
22	220KV, 50KA FOR 1S, RIGID SPACER SUITABLE FOR QUAD ACSR BERSIMIS	222	No.	0	0	0	0	0	0	0	0	0	0	30	30	0	0	0	0	0	0	0	0	60
23	220KV, 50KA FOR 1S, FLEXIBLE SPACER SUITABLE FOR TWIN ACSR BERSIMIS	223	No.	6	6	6	6	6	6	6	6	6	6	0	0	0	0	12	24	6	0	0	0	102
24	220KV, 50KA FOR 1S, RIGID SPACER SUITABLE FOR TWIN ACSR BERSIMIS	224	No.	30	30	30	30	30	46	37	46	46	46	0	0	31	31	6	12	9	0	0	0	460
25	220KV, 50KA FOR 1S,TEE CONNECTOR SUITABLE FOR QUAD AAC BULL TO QUAD ACSR BERSIMIS	225	No.	0	0	0	0	0	0	0	0	0	0	9	9	0	0	0	0	0	0	0	0	18
26	220KV, 50KA FOR 1S,TEE CONNECTOR SUITABLE FOR QUAD AAC BULL TO TWIN ACSR BERSIMIS	226	No.	4	4	4	4	4	5	3	5	5	5	0	0	6	6	6	12	0	0	0	0	73
27	220KV, 50KA FOR 1S,TEE CONNECTOR SUITABLE FOR QUAD ACSR BERSIMIS TO QUAD ACSR BERSIMIS	227	No.	0	0	0	0	0	0	0	0	0	0	9	9	6	6	0	0	0	0	0	0	30
28	220KV, 50KA FOR 1S,TEE CONNECTOR SUITABLE FOR QUAD ACSR BERSIMIS TO TWIN ACSR BERSIMIS	228	No.	6	6	6	6	6	3	3	3	3	3	0	0	12	12	0	0	9	0	0	0	78
29	220KV, 50KA FOR 1S,TEE CONNECTOR SUITABLE FOR TWIN ACSR BERSIMIS TO TWIN ACSR BERSIMIS	229	No.	0	0	0	0	0	3	3	3	3	3	0	0	0	0	0	0	0	0	0	0	15
30	220KV, 50KA FOR 1S,TEE CONNECTOR SUITABLE FOR SINGLE AL59 MOOSE (TO BE CONFIRMED BY POWERGRID) TO SINGLE ACSR BERSIMIS	230	No.	0	0	0	0	0	6	6	6	6	6	0	0	0	0	0	0	0	0	0	0	30

BILL OF QUANTITIES FOR CLAMPS AND CONNECTORS-BIKANER-III-220KV

S.NO.	ITEM DESCRIPTION	CLAMP NO.	UNIT	400/220KV ICT-TRANSFORMER BAY-1	400/220KV ICT-TRANSFORMER BAY-2	400/220KV ICT-TRANSFORMER BAY-3	400/220KV ICT-TRANSFORMER BAY-4	400/220KV ICT-TRANSFORMER BAY-5	LINE BAY-1	LINE BAY-2	LINE BAY-3	LINE BAY-4	LINE BAY-5	BUS COUPLER-1	BUS COUPLER-2	TBC-1	TBC-2	220KV MAIN BUS-1	220KV MAIN BUS-2	220KV TRANSFER BUS	BUS SECTIONALISER-1	BUS SECTIONALISER-2	COMMON	TOTAL QUANTITY
				BPS NO. 87 (5 SET)					BPS NO. 86 (5 SET)					BPS NO. 88 (2 SET)		BPS NO. 89 (2 SET)		BPS NO. 84 (6 SET) & 85 (4 SET)			BPS NO. 90 (2 SET)			
31	220KV, 50KA FOR 1S, 4000A, TEE CONNECTOR SUITABLE FOR AL TUBE 4 INCH IPS TO QUAD ACSR BERSIMIS	231	No.	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	6
32	220KV, 50KA FOR 1S, 4000A, TEE CONNECTOR SUITABLE FOR AL TUBE 4 INCH IPS TO TWIN ACSR BERSIMIS	232	No.	7	7	7	7	7	8	6	8	8	8	0	0	8	8	0	0	0	0	0	0	89
33	220KV, 50KA FOR 1S,TEE CONNECTOR SUITABLE FOR QUAD AAC BULL TO QUAD AAC BULL	233	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	220KV CORONA END BELL FOR 4" IPS AL TUBE	2CB	No.	0	0	0	0	0	0	0	0	0	0	0	2	2	1	0	0	0	0	0	5	10
35	ALUMINIUM WELDING SLEEVES FOR 4" IPS AL TUBE	WS2	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	133	133
36	TWO WAY PG CLAMPS FOR 7/9 SWG (10.98MM DIA) GS WIRE	E1	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	58	58
37	TENSION CLAMPS FOR 7/9 SWG(10.98MM DIA) GS WIRE BOLTED TYPE	E2	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	38
38	STRUCTURE CLAMPS FOR 7/9 SWG(10.98MM DIA) GS WIRE ON LATTICE TYPE STRUCTURE	E3	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	216	216
39	PAD TYPE CLAMP FOR CONNECTING 7/9 SWG(10.98MM DIA) GS WIRE ON ONE SIDE AND 75X 12 MM GS STRIP ON OTHER SIDE	E4	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	18
40	STRUCTURE CLAMPS FOR 75X 12 MM GS STRIPS ON LATTICE TYPE STRUCTURE	E5	No.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2000	3900

* connector being supplied by OEM

BILL OF QUANTITIES FOR CLAMPS AND CONNECTORS-BIKANER-III-145KV

S.NO.	ITEM DESCRIPTION	CLAMP NO.	UNIT	BAY WISE QUANTITY		TOTAL QUANTITY
				BPS NO. 62 (4 LOT)	BPS NO. 67 (2 SET)	
1	145KV, 25KA FOR 1S, 1250A, CB CONNECTOR SUITABLE FOR TWIN BERSIMIS	101	NO.	0	4	4
2	145KV, 25KA FOR 1S, NGR CONNECTOR SUITABLE FOR TWIN BERSIMIS	102	NO.	0	4	4
3	132KV, 25KA FOR 1S, SURGE ARRESTER CONNECTOR SUITABLE FOR TWIN BERSIMIS THROUGH TYPE	103	NO.	0	2	2
4	145KV, 25KA FOR 1S, BPI CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, RIGID-SLIDING THROUGH TYPE	104	NO.	9	0	9
5	145KV, 25KA FOR 1S, BPI CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, TUBE CUT	105	NO.	23	0	23
6	145KV, 25KA FOR 1S, BPI CONNECTOR SUITABLE FOR TWIN BERSIMIS CONDUCTOR THROUGH	106	NO.	14	4	18
7	TEE CONNECTOR/PG CLAMP SUITABLE FOR TWIN ACSR BERSIMIS CUNDOCTOR (RUN) AND TWIN ACSR BERSIMIS CONDUCTOR (TAP)	107	NO.	0	8	8
8	145KV, 25KA FOR 1S, 1250A, TEE CONNECTOR/PG CONNECTOR SUITABLE FOR 3" IPS AL TUBE TO TWIN BERSIMIS	108	NO.	23	0	23
9	145KV, REACTOR NEUTRAL BUSHING, 1250A, CONNECTOR SUITABLE FOR TWIN BERSIMIS CONDUCTOR WITH HORIZONTAL APPROACH	109	NO.	13	0	13
10	WELDING SLEEVE SUITABLE FOR 3 INCH IPS AL TUBE	WS3	NO.	28	0	28
11	END CAP SUITABLE FOR 3 INCH IPS AL TUBE	3CB	NO.	10	0	10

Kindly include bus post and associated structure quantities under this item.

BILL OF QUANTITIES FOR CLAMPS AND CONNECTORS-BIKANER-III-72.5KV

S.NO.	ITEM DESCRIPTION	CLAMP NO.	UNIT	BAY WISE QUANTITY		TOTAL QUANTITY
				BPS NO. 63 (6 LOT)	BPS NO. 98 (2 SET)	
1	72.5KV, 25KA FOR 1S, 1250A, CB CONNECTOR SUITABLE FOR TWIN BERSIMIS	501	NO.	0	12	12
2	72.5KV, 25KA FOR 1S, CT CONNECTOR SUITABLE FOR TWIN BERSIMIS	502	NO.	0	12	12
3	72.5KV, 25KA FOR 1S, 1250A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR TWIN BERSIMIS	503	NO.	0	12	12
4	66KV, 25KA FOR 1S, PT CONNECTOR SUITABLE FOR TWIN BERSIMIS	504	NO.	0	6	6
5	72.5KV, 25KA FOR 1S, 1250A, BPI CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, SLIDING THROUGH TYPE	505	NO.	146	0	146
6	72.5KV, 25KA FOR 1S, 1250A, BPI RIGID-EXPANSION TYPE CONNECTOR SUITABLE FOR 3" IPS AL TUBE, TUBE CUT	506	NO.	164	0	164
7	72.5KV, 25KA FOR 1S, 1250A, ICT BUSHING CONNECTOR SUITABLE FOR TWIN BERSIMIS (THROUGH TYPE)	507	NO.	38	0	38
8	72.5KV, 25KA FOR 1S, 1250A, TEE CONNECTOR/PG CONNECTOR SUITABLE FOR 3" IPS AL TUBE TO TWIN BERSIMIS	508	NO.	364	0	364
9	72.5KV, 25KA FOR 1S, 1250A, LT TRANSFORMER BUSHING CONNECTOR SUITABLE FOR TWIN BERSIMIS	509	NO.	0	6	6
10	WELDING SLEEVE SUITABLE FOR 3 INCH IPS AL TUBE	WS3	NO.	196	0	196
11	END CAP SUITABLE FOR 3 INCH IPS AL TUBE	3CB	NO.	146	0	146

BILL OF QUANTITIES FOR CLAMPS AND CONNECTORS-BIKANER-III-33KV

S.NO.	ITEM DESCRIPTION	CLAMP NO.	UNIT	QUANTITY
				BPS NO. 63 (6 LOT)
1	33KV, 25KA FOR 1S, BPI CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, RIGID-SLIDING THROUGH TYPE	301	NO.	52
2	33KV, 25KA FOR 1S, BPI CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, RIGID-EXPANSION TYPE CONNECTOR, TUBE CUT	302	NO.	67
3	33KV, 25KA FOR 1S, BPI CONNECTOR SUITABLE FOR TWIN BERSIMIS CONDUCTOR THROUGH	303	NO.	19
4	33KV, 25KA FOR 1S, 2000A, BUSHING CONNECTOR SUITABLE FOR TWIN BERSIMIS	304	NO.	19
5	33KV, 25KA FOR 1S, 1250A, TEE CONNECTOR/PG CONNECTOR SUITABLE FOR 3" IPS Al tube TO TWIN BERSIMIS	305	NO.	69
6	33KV, 25KA FOR 1S, CURRENT TRANSFORMER CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, RIGID TYPE	306	NO.	6
7	33KV, 25KA FOR 1S, CURRENT TRANSFORMER CONNECTOR SUITABLE FOR 75X12 MM FLAT	307	NO.	6
8	WELDING SLEEVE SUITABLE FOR 3 INCH IPS AL TUBE	WS3	NO.	68
9	END CAP SUITABLE FOR 3 INCH IPS AL TUBE	3CB	NO.	46

BPI quantities to be included.

Bill of Quantity - String Insulators Hardware - Bikaner-III Station (765kV)

S.No	Engineering Description	Nomenclature	Sl. No. as per BPS	Description as per BPS	ICT-1 TIE FUTURE	ICT-2 TIE FUTURE	ICT-3 TIE NEEMRANA LINE-2 WITH REACTOR	ICT-4 TIE NEEMRANA LINE-1 WITH REACTOR	ICT-5 TIE BUS REACTOR-1	ICT-6 TIE BUS REACTOR-2	MAIN BUS-I	MAIN BUS-II	Engineered Quantity Total (Nos)	Quantity as per BPS (Nos)	UNIT	REMARKS
Tension Hardware																
A1	765 kV Double Tension Hardware without Turnbuckle suitable for Quad Bull AAC Conductor	7H1	72	765KV TENSION INSULATOR STRING AND ASSOCIATED HARDWARE FITTINGSWITHOUT TURN BUCKLE SUITABLE FOR QUAD CONDUCTOR	9	9	12	12	12	12	9	9	84	84	Nos	
A2	765 kV Double Tension Hardware with Turnbuckle suitable for Quad Bull AAC Conductor	7H2	74	765KV TENSION INSULATOR STRING AND ASSOCIATED HARDWARE FITTINGS WITHTURN BUCKLE SUITABLE FOR QUAD CONDUCTOR	9	9	12	12	12	12	9	9	84	84	Nos	
A3	765 kV Double Tension Hardware with Turnbuckle suitable forHexa zebra Conductor	7H5	73	765KV TENSION INSULATOR STRING AND ASSOCIATED HARDWARE FITTINGS WITHTURN BUCKLE SUITABLE FOR HEXA CONDUCTOR	--	--	3	3	--	--	--	--	6	6	Nos	
A4	765kv guy arrangement hardware with Turnbuckle suitable for Quad Bull AAC Conductor	7H6	--	NOT IN BPS	9	9	15	15	12	12	--	--	72	--	Nos	
Suspension Hardware																
A5	765 kV Single Suspension Hardware with Drop Clamp suitable for Quad Bull AAC Conductor	7H3	70	765KV SUSPENSION INSULATOR STRING AND ASSOCIATED HARDWARE FITTINGS WITH DROP CLAMP SUITABLE FOR QUAD CONDUCTOR	--	--	3	3	--	--	3	3	12	12	Nos	
A6	765 kV Single Suspension Hardware with Through Clamp suitable for Quad Bull AAC Conductor	7H4	71	765KV SUSPENSION INSULATOR STRING AND ASSOCIATED HARDWARE FITTINGS WITH THROUGH CLAMP SUITABLE FOR QUAD CONDUCTOR	3	3	6	6	6	6	6	6	42	42	Nos	
COMPOSITE LONG ROD POLYMER INSULATOR-765KV																
B1	765KV COMPOSITE LONG ROD POLYMER INSULATOR STRING - 31mm/kV, 210kN - For Tension Insulators	--	--	--	--	--	--	--	--	--	--	--	696	--	Nos	
B2	765KV COMPOSITE LONG ROD POLYMER INSULATOR STRING - 31mm/kV, 210kN - For Suspension Insulators	--	--	--	--	--	--	--	--	--	--	--	216	--	Nos	
B3	765KV COMPOSITE LONG ROD POLYMER INSULATOR STRING- 31mm/kV, 210kN - For guy wire arrangement	--	--	--	--	--	--	--	--	--	--	--	288	--	Nos	

These are part of LS item under erection hardware, not payable additionally

Bill of Quantity - String Insulators Hardware - Bikaner-III Station (400kV)

S.No	Engineering Description	Nomenclature	Sl. No. as per BPS	Description as per BPS	BIKANER PG LINE-2-TIE-BIKANER II LILO LINE-4	BIKANER PG LINE-1-TIE-BIKANER II LILO LINE-3	765KV ICT-1-TIE-BIKANER-II LINE -2	765KV ICT-2-TIE-BIKANER-II LINE -1	400KV REACTOR-1-TIE-400KV ICT-1	765KV ICT-3-TIE-400KV ICT-2	FUTURE-TIE-400KV ICT-3	765KV ICT-4-TIE-400KV ICT-4	765KV ICT-5-TIE-400KV ICT-5	765KV ICT-6-TIE-400KV REACTOR-2	FUTURE BUS SECTIONALISER	400KV MAIN BUS 1	400KV MAIN BUS 2	Engineered Quantity Total (Nos)	Quantity as per BPS (Nos)	UNIT	REMARKS
Tension Hardware																					
A1	400 kV Double Tension Hardware without Turnbuckle suitable for Quad ACSR Bersimis Conductor	4H1	80	400KV TENSION INSULATOR STRING AND ASSOCIATED HARDWARE FITTINGSWITHOUT TURN BUCKLE SUITABLE FOR QUAD CONDUCTOR	6	6	12	12	6	12	6	12	12	12	6	--	--	102	126	Nos	Amendment required for 5 no. additional quantity
A2	400 kV Double Tension Hardware without Turnbuckle suitable for Quad AAC Bull Conductor	4H3			--	--	--	--	--	--	--	--	--	--	--	15	15	30		Nos	
A3	400 kV Double Tension Hardware with Turnbuckle suitable for Quad ACSR Bersimis Conductor	4H2	81	400KV TENSION INSULATOR STRING AND ASSOCIATED HARDWARE FITTINGSWITH TURN BUCKLE SUITABLE FOR QUAD CONDUCTOR	6	6	12	12	6	12	6	12	12	12	6	--	--	102	108	Nos	Amendment required for 42 no. additional quantity
A4	400 kV Double Tension Hardware with Turnbuckle suitable for Quad AAC Bull Conductor	4H4			--	--	--	--	--	--	--	--	--	--	--	15	15	30		Nos	
A5	400 kV Double Tension Hardware with Turnbuckle suitable for Quad AL59-Maose	4H5			6	6	3	3	--	--	--	--	--	--	--	--	--	18		Nos	
A6	400 kV guy arrangement hardware with Turnbuckle suitable for ACSR Bersimis Conductor	4H6	--	NOT IN BPS	--	--	3	3	--	3	--	3	3	3	--	--	--	18	--	Nos	This is part of LS item
Suspension Hardware																					
A7	400 kV Single Suspension Hardware with Drop Clamp suitable for Quad ACSR Bersimis Conductor	4H7	82	400KV SUSPENSION INSULATOR STRING AND ASSOCIATED HARDWARE FITTINGSWITH DROP CLAMP SUITABLE FOR QUAD CONDUCTOR .	6	6	6	6	6	6	3	6	6	6	--	3	3	63	63	Nos	
A8	401 kV Single Suspension Hardware with Through Clamp suitable for Quad ACSR Bersimis Conductor	4H8	83	400KV SUSPENSION INSULATOR STRING AND ASSOCIATED HARDWARE FITTINGSWITH THROUGH CLAMP SUITABLE FOR QUAD CONDUCTOR	--	--	3	3	--	3	--	3	3	3	--	--	--	18	42	Nos	
COMPOSITE LONG ROD POLYMER INSULATOR-400KV																					
B1	400KV COMPOSITE LONG ROD POLYMER INSULATOR - 31mm/kV, 120kN - For Tension Insulators	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	564	--	Nos	
B2	400KV COMPOSITE LONG ROD POLYMER INSULATOR - 31mm/kV, 120kN - For suspension Insulators	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	81	--	Nos	
B3	400KV COMPOSITE LONG ROD POLYMER INSULATOR - 31mm/kV, 120kN - For guy wire arrangement	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	36	--	Nos	

Bill of Quantity - String Insulators Hardware - Bikaner-III Station (220kV)

S.No	Engineering Description	Nomenclature	Sl. No. as per BPS	Description as per BPS	220KV SIDE OF ICT 1-TIE-LINE-1	BUS COUPLER-TIE-LINE-2	220KV SIDE OF ICT 2-TIE-LINE-3	220KV SIDE OF ICT 3-TIE-LINE-4	FUTURE-TIE-TBC-1	220KV SIDE OF ICT 4-TIE-TBC-2	220KV SIDE OF ICT 5-TIE-LINE-5	BUS COUPLER-2	220KV MAIN BUS 1	220KV MAIN BUS 2	220KV TRANSFER BUS	Engineered Quantity Total (Nos)	Quantity as per BPS (Nos)	UNIT	REMARKS
Tension Hardware																			
A1	220 kV Double Tension Hardware without Turnbuckle suitable for Quad ACSR Bersimis Conductor	2H1	94	220KV TENSION INSULATOR STRING AND ASSOCIATED HARDWARE FITTINGSWITHOUT TURN BUCKLE SUITABLE FOR QUAD CONDUCTOR	3	6	3	3	9	12	3	6	--	--	21	66	63	Nos	Amendment required for 30 no. additional quantity
A2	220 kV Double Tension Hardware without Turnbuckle suitable for Quad AAC Bull Conductor	2H3		220KV TENSION INSULATOR STRING AND ASSOCIATED HARDWARE FITTINGSWITHOUT TURN BUCKLE SUITABLE FOR QUAD CONDUCTOR	--	--	--	--	--	--	--	--	9	18	--	27		Nos	
A3	220 kV Double Tension Hardware with Turnbuckle suitable for Quad ACSR Bersimis Conductor	2H2	92	220KV TENSION INSULATOR STRING AND ASSOCIATED HARDWARE FITTINGS WITHTURN BUCKLE SUITABLE FOR QUAD CONDUCTOR	3	6	3	3	9	12	3	6			21	66	63	Nos	Amendment required for 30 no. additional quantity
A4	220 kV Double Tension Hardware with Turnbuckle suitable for Quad AAC Bull Conductor	2H4		220KV TENSION INSULATOR STRING AND ASSOCIATED HARDWARE FITTINGS WITHTURN BUCKLE SUITABLE FOR QUAD CONDUCTOR	--	--	--	--	--	--	--	--	9	18	--	27		Nos	
A5	220 kV Double Tension Hardware with Turnbuckle suitable for **Single/twin AL59 Moose Conductor** - Line Side	2H7	91	220KV TENSION INSULATOR STRING AND ASSOCIATED HARDWARE FITTINGS WITHTURN BUCKLE SUITABLE FOR TWIN CONDUCTOR	3	3	3	3	--	--	3	--	--	--	--	15	60	Nos	These quantities shall be finalised after receipt of type of conductor from POWERGRID
Suspension Hardware																			
A6	220 kV Single Suspension Hardware with **Drop** Clamp suitable for Twin ACSR **Bersimis** Conductor	2H5	95	220KV SUSPENSION INSULATOR STRING AND ASSOCIATED HARDWARE FITTINGSWITH DROP CLAMP SUITABLE FOR TWIN CONDUCTOR	5	2	5	5	--	3	5	--	6	6	3	33 40	33	Nos	Amendment required for 2 no. additional quantity
A7	220 kV Single Suspension Hardware with **Drop** Clamp suitable for **Quad AAC Bull** Conductor	2H6	97	220KV SUSPENSION INSULATOR STRING AND ASSOCIATED HARDWARE FITTINGSWITH DROP CLAMP SUITABLE FOR QUAD CONDUCTOR	--	--	--	--	--	--	--	--	6	6	--	12	12	Nos	
COMPOSITE LONG ROD POLYMER INSULATOR-220KV																			
B1	220KV COMPOSITE LONG ROD POLYMER INSULATOR - 31mm/kV, 120kN - For Tension Insulators	--	--	--	--	--	--	--	--	--	--	--	--	--	--	372	--	Nos	
B2	220KV COMPOSITE LONG ROD POLYMER INSULATOR - 31mm/kV, 120kN - For suspension Insulators	--	--	--	--	--	--	--	--	--	--	--	--	--	--	47	--	Nos	

पावरग्रिड POWERGRID

पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

संदर्भ/Ref : CC-ENGG-TB202359-1002269-BS3480-CABTR-LAYOUT

Date : 28/01/2025

From : Somiran Das
Senior GM

To : Bharat Heavy Electricals Limited
Plot No.-7, Sector-142 Noida 201305
201305

Cc :

Subject : Substation Package SS-01 for (i) Establishment of 765/400/220kV Bikaner-III (New) Pooling Station including 400kV class Bus Reactor at Bikaner-III S/s; (ii) Extension of 765kV Neemrana-II S/s for termination of 765 kV D/c line Neemrana-II–Bikaner-III T/L and (iii) Extension of 400kV Bikaner-II S/s for termination of 400kV Bikaner-II Bikaner-III T/L under "Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-1) (Bikaner Complex): PART-A"

LOA Ref : CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 Dated 23/02/2024

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

Vendor Drg. No.	:	TB-0-424-316-007
Orgn. Drg. No.	:	TB202359-1002269-BS3480-CABTR-LAYOUT
Revision No.	:	03
Drg. Title	:	BIKANER III NEW S/S-CABLE TRENCH LAYOUT
App. Category	:	CAT-I
Release Date	:	28/01/2025

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 को सम्मिलित किया जाये। कृपया रिवाइजड 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.

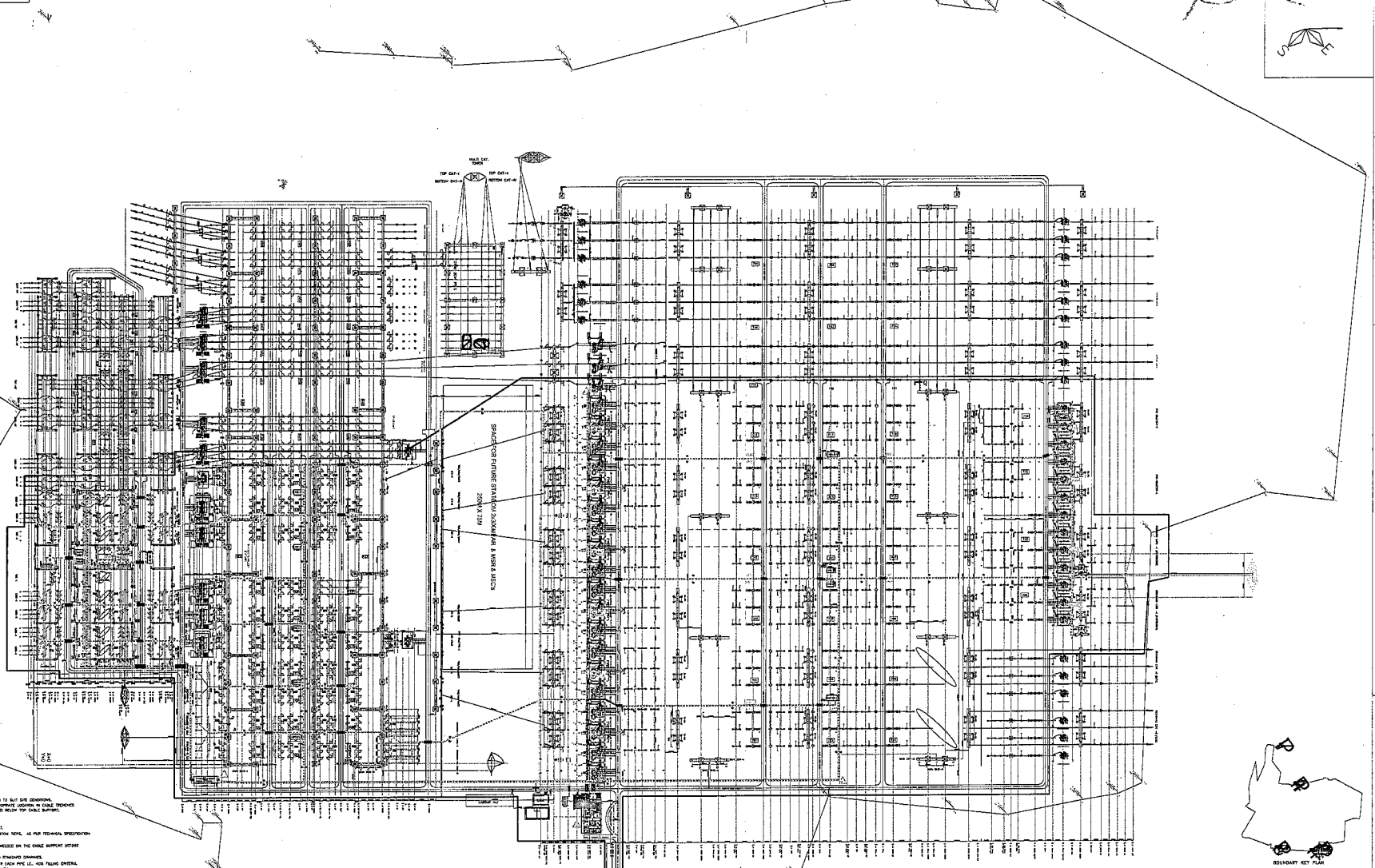
CATREL/ REL-CON निर्माण हेतु जारी।
Released for construction.

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.

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG. NO. TB-0-424-316-007



NOTE:-

1. ALL DIMENSIONS ARE IN mm.
2. THE LOCATION OF CABLE TRENCHES MARKED IN THIS DWG MAY BE SLIGHTLY MODIFIED TO SUIT SITE CONDITIONS.
3. OPENINGS FOR TAKING OUT PIPE PIPES TO EQUIPMENTS SHALL BE PROVIDED AT APPROPRIATE LOCATION IN CABLE TRENCHES SUCH BY. OPENINGS SHALL BE SURVEYED TO DIA. 50/110 mm SHALL BE PROVIDED BELOW TOP CABLE SUPPORT.
4. CABLES SHALL BE LAID IN MULTILAYER ON CABLE SUPPORT (NOLOS)
5. CABLE SUPPORT SHALL BE PROVIDED AT EVERY 600mm INTERVAL.
6. MOBILE MUFF BE PROVIDED AT EVERY 750mm INTERVAL FOR FITTING CABLE SUPPORT.
7. AUXILIARY POWER CABLES SHALL BE LAID IN TOP TIERS AND CONTROL CABLES IN BOTTOM TIERS. AS PER TECHNICAL SPECIFICATION
8. SPARE CABLES FOR LOADING PURPOSE SHALL BE AS PER LOADING LAYOUT.
9. EARTH CONDUCTOR 50x8 MS FLAT SHALL BE RUN ALONG THE TOP TIER AND TO BE WELDED ON THE CABLE SUPPORT DURING INSTALLATION OF CABLES.
10. DETAILS OF CABLE TRENCHES AND ITS ROAD CROSSING SHALL BE AS PER PROVIDING STANDARD DRAWINGS.
11. FOR POWER & CONTROL SEPARATE PIPES SHALL BE USED CONSIDERING 50% USED FOR EACH PIPE I.E. FOR FILLING GENERAL ACCORDINGLY ADDITIONAL PIPES OF REQUIRED) WILL BE PROVIDED AS PER SITE CONDITION.
12. PVC PIPES SHALL BE SECURELY FIXED AT 20TH ENDS, OTHER SHORTED IN CONCRETE OR PROPERLY CLAMPED.
13. AFTER LAYING THE CABLES THE ENDS OF PIPES SHALL BE FULLY SEALED TO PREVENT ENTRIES OF WATER INSIDE THE PIPE.
14. CABLE TRENCHES SHALL BE PROVIDED WITH PROPER DRAINAGE SYSTEM AS PER STANDARD.
15. CABLE RACK AND SUPPORTS SHALL BE FABRICATED AFTER GALVANIZING WITH 2 COATS OF METAL PRIMER (COMPRISING OF RED OXIDE & ZINC CHROMATE IN A STRUCTURE MEDIUM) FOLLOWED BY TWO FINISHING COAT OF ALUMINIUM PAINT.
16. SUITABLE PULL OUT BOX SHALL BE PROVIDED (IF REQUIRED), WHERE CABLE SHALL BE LAID IN PVC PIPE.
17. LONGITUDINAL SLOPE IN CABLE TRENCH SHALL BE AS PER DWG. SMD.
18. FOR ALL CIVIL WORKS EXECUTION PROCEDURE APPROVAL/RELEASED DWGS SHALL BE FOLLOWED.
19. PROVISION FOR DOWNCOMING EARTH PLAT TO EXTERNAL EARTH GRID AT ANY INTERVAL OF 30 METRE SHALL BE PROVIDED.
20. ALL CABLE FROM TRY CABLE TRENCH TO EQUIPMENT AND ALL INTERNAL CABLES (BOTH POWER & CONTROL) FOR ALL EQUIPMENT SHALL BE LAID IN PVC PIPE.
21. FIBRE OPTIC CABLES SHALL RUN THROUGH G.I. PIPES IN BOTTOM TIER OF TRENCH/MIDDLE SIZE 100mm (AS APPLICABLE).
22. THE PURPOSE OF TRENCH LAYOUT DRAWING IS THEN USE AS FOLLOWS. - TO BE USED AS CIVIL INPUT FOR CABLE TRENCHES. FOR CREATION OF CABLE BASED AT SITE. - FOR CABLE LAYING AND PRACTICE AT SITE.
23. ALL OTHER DETAILS PERTAINING TO CIVIL WORKS SHALL BE REFLECTED IN THE PROPERTING CIVIL DRAWINGS.
24. ---------INDICATES CABLES LAID IN THE PIPES OF 50/110mm OUTER DIA AT BOTTOM OF 200mm (MIN.) CABLE FROM EQUIPMENT TO CABLE TRENCH SHALL RUN IN PVC PIPES.
25. OOOOOOOO INDICATE PVC CLOUCHY.
26. TRENCH DWG NO. ARE MARKED FROM DWG-1 TO DWG-12, HOWEVER THEY ARE MARKED DWG-1 TO DWG-19
27. 220kV DWG NO MARKED DWG-01 TO DWG-15
28. TRENCH CROSSING DETAIL ARE INDICATIVE OF THE REQUIREMENT OF NO. OF PIPES. CONSTRUCTION DETAILS SHALL BE ACCORDING TO CIVIL DRAWING.
29. TRENCH CROSSING THROUGH BOUNDRY OF TRANSFORMER/REACTOR IS SHOWN THROUGH CULVERT, NECESSARY DETAILS SHALL BE SHOWN IN CIVIL DRAWING.
30. ---------INDICATES TRENCH WIDTH, ALWAYS CABLE TO BE LAID AS PER E / DWG / MAT / A MS, MS, TL, B-DWG NO.
30.a 42250 MM 'A' BASED IN NORMAL SOIL, 2+1000mm 'B' TRENCH CROSSING & ROAD CROSSING AREA
30.b 41,42,43,& 45,52 IN NORMAL CHANNEL CHAMFER (0.2) OF CABLE TO BE LAID IN BURIED TRENCH. ACTUAL O.D. SHALL BE USED AT SITE WHILE CABLE LAYING.
30.c CLEARANCE BETWEEN POWER CABLE TO CONTROL CABLE SHALL BE 200mm AS PER IS 1255 : 1983.
31. MODULAR CONTROL CABLE TRENCH SHALL BE USED FOR CONNECTION OF EQUIPMENT CLOSER TO LEAVE SWITCHYARD PANEL ROOM & CONTROL ROOM AS PER DWG NO. 1-DWG-14
32. THE CABLE RACK/TRAY WHICH SHALL PROJECT FOR 300 FROM STRUCTURE AND SHALL BE SPACED AT AN ADDITIONAL OF 50 METERS FOR AT EARTH CONNECTION, A SPECIFICATION THEY SHALL BE LOCATED ON BOTH SIDES OF TRENCH. THE TRENCH PROPERLY IN THE PROPERLY LAYING/RUNNING VOLTAGE CABLE OF CABLES SHALL BE SEPARATED ON THE TRENCH CABLE TRAYS/RACK SHALL BE ORGANIZED IN 4 CONCRETE BLOCK.

S.NO.	TRENCH SECTION	TRENCH LENGTH	LEGEND
1.	1–1	0.04 km (APPROX)	==========
2.	2–2	1.90 km (APPROX)	**********
3.	2A–2A	1.51 km (APPROX)	==========
4.	3–3	2.03 km (APPROX)	**********
5.	4–4	0.07 km (APPROX)	==========

Tentative location of CMB marked in Y phase of Each ICT/Reactor near to cable trench, however, exact location of same may be finalized at site based on actual site conditions

Power & Control Cable should not be laid in same PVC Pipe, same may be ensured at Site

REV.	DATE	ALTERED BY / CHECKED / APPROVED
03	17.01.2025	CHECKED SS / APPROVED SKS
02	27.12.2024	CHECKED SS / APPROVED SKS
01	25.11.24	CHECKED SS / APPROVED SKS

ZONE: REVISED AS PER CUSTOMER COMMENTS DATED-10.01.2025

ZONE: REVISED AS PER CUSTOMER COMMENTS DATED-31.12.2024

ZONE: REVISED AS PER CUSTOMER COMMENTS DATED-11.10.24

NOA NO. : CC/T/W-AIS/DOM/A10/23/01958/NOA-1/24-102643/01

ADDITIONAL INFORMATION
W.O.No.

STATUS OF DRAWING

DISTRIBUTION OF PRINTS

NAME OF CUSTOMER: BIKANER-III NEEMRANA TRANSMISSION LIMITED
NAME OF CLIENT: POWERGRID CORPORATION OF INDIA LIMITED
NAME OF PROJECT: Establishment of 4x1500 MVA, 765/400 kV & 6x500 MVA 400/220 kV Bikaner-III Pooling Station (including 400kV, 2x125MVAR, reactor at Bikaner-III)

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION BUSINESS GROUP

	नाम / NAME	हस्ता./SIGN.	दि./DATE
तैयार किया DRAWN	RY	-SGD-	05.10.24
चेक्ड CHECKED	SS	-SGD-	05.10.24
अनुमोदित APPROVED	SKS	-SGD-	05.10.24

डि०-सं० DWG. NO. TB202359-1002269-BS8480-CABTR-LAYOUT

अनुपात / SCALE

कार्ड कोड CARD CODE

शीर्षक/TITLE: BIKANER III NEW S/S-CABLE TRENCH LAYOUT

ड्रा०सं./DRAWING NO. TB-0-424-316-007

पुनः/REV. 03

पृष्ठ सं./SHEET No. 01 अगला पृष्ठ/NEXT SHEET 02

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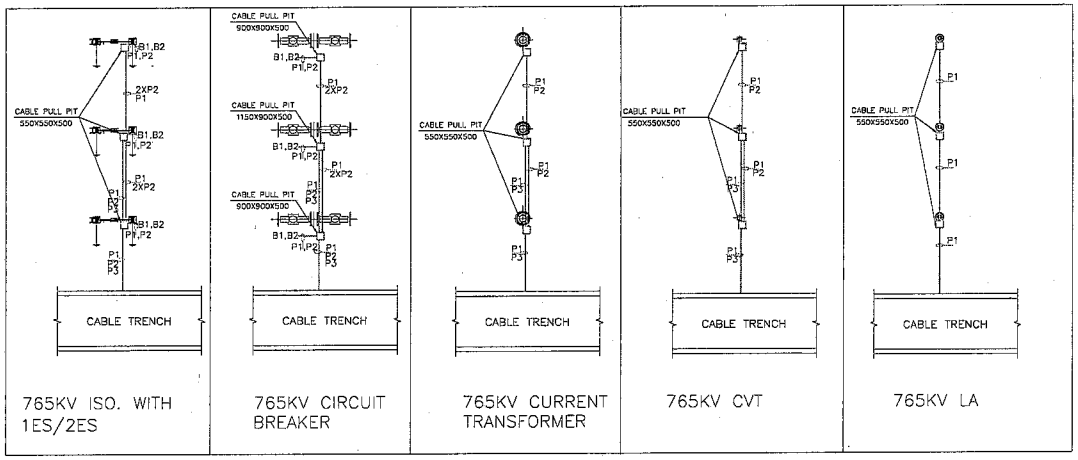
COMPUTER DRG. PATH NAME :
REF. DRG. NO.
SIGN. AND DATE
INVENTORY NO.

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG. NO. TB-0-424-316-007

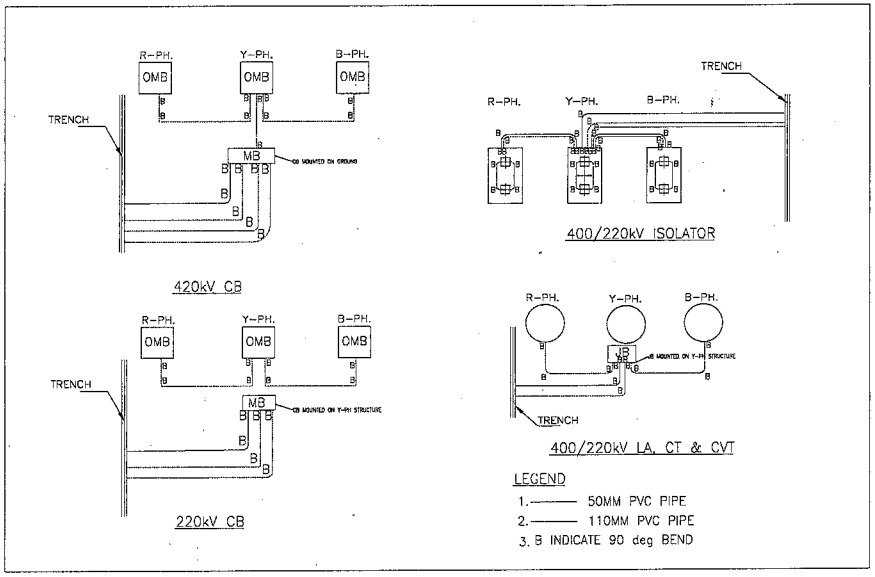
765KV EQUIPMENTS TYPICAL CABLE TRENCH DETAILS



LEGENDS

- PVC PIPE ROUTING
- 2/3x ø PVC PIPE FOR REACTOR AND ICT MOM BOX.
- PULL CHAMBER
- ROAD/PIT CROSSING THROUGH CABLE CULVERT
- P1 1X50 MM ø PVC PIPE FOR POWER CABLE
- P2 1X110 MM ø PVC PIPE FOR CONTROL CABLE
- P3 1X200 MM ø PVC PIPE FOR CONTROL CABLE
- BAY MARSHALLING KIOSK

PVC PIPE DETAILS OF 400/220KV EQUIPMENTS



NOA NO. : CC/T/W-AIS/DOM/A10/23/01856/NOA-1/24-102643/01

ADDITIONAL INFORMATION W.O.No.	NAME OF CUSTOMER: BIKANER-III NEEMRANA TRANSMISSION LIMITED
STATUS OF DRAWING	NAME OF CLIENT: POWERGRID CORPORATION OF INDIA LIMITED
DISTRIBUTION OF PRINTS	NAME OF PROJECT: Establishment of 6x500 MVA, 765/400 kV & 6x500 MVA 400/220 kV Bikaner-III Pooling Station (Including 420kV, 2x125MVAR, reactor at Bikaner-III)

भारत हेवी इलेक्ट्रिकल्स लिमिटेड BHEL BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION BUSINESS GROUP

	नाम /NAME	हस्ता./SIGN.	दि./DATE
तैयार DRAWN	SY	-sd-	05.10.24
जाँच CHECKED	SS	-sd-	05.10.24
अनुमोदित APPROVED	SKS	-sd-	05.10.24

REV.	DATE	ALTERED BY	CHECKED BY	APPROVED BY	ZONE
03	17.01.2025	SY	SS	SKS	REVISED AS PER CUSTOMER COMMENTS DATED-10.01.2025
02	27.12.2024	SY	SS	SKS	REVISED AS PER CUSTOMER COMMENTS DATED-01.12.2024
01	25.11.24	SY	SS	SKS	REVISED AS PER CUSTOMER COMMENTS DATED-11.10.24

डिज़ाइन DSN / ड्रॉ. CODE / उपपत्र / SCALE / कार्ड कोड CARD CODE / POWERGRID DRAWING NO. TB202359-1002269-BS3480-CABTR-LAYOUT

शीर्षक/TITLE: BIKANER III NEW S/S-CABLE TRENCH LAYOUT

ड्रा.सं./DRAWING NO. TB-0-424-316-007 | पुनः/REV. 03

पृष्ठ सं./SHEET No. 02 | अगला पृष्ठ/NEXT SHEET ----

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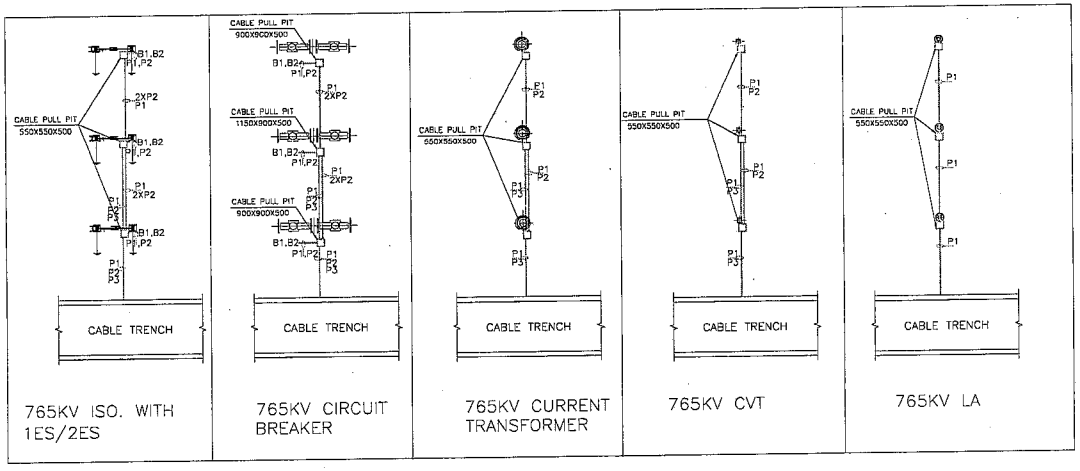
COMPUTER DRG. PATH NAME : | REF. DRG. NO. | SIGN AND DATE | INVENTORY NO

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG. NO. TB-0-424-316-007

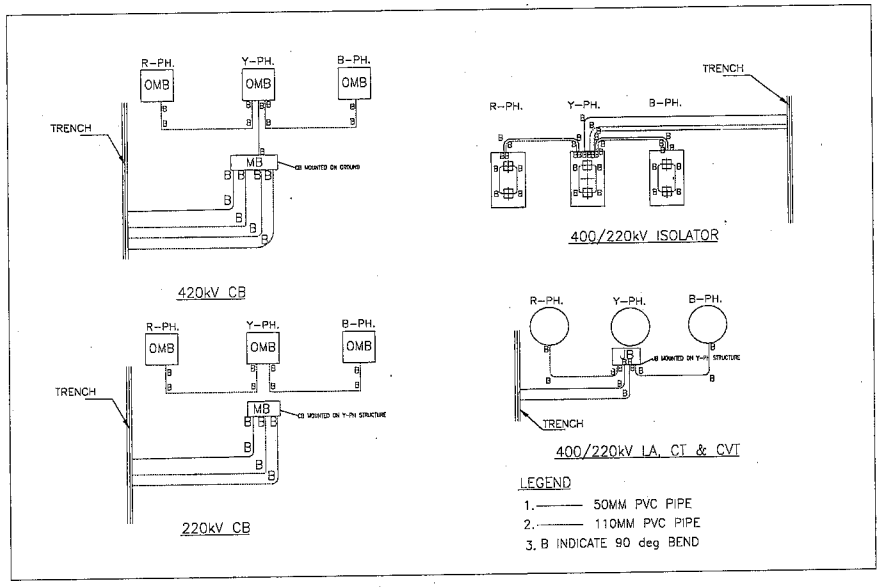
765KV EQUIPMENTS TYPICAL CABLE TRENCH DETAILS



LEGENDS

- PVC PIPE ROUTING
- 2/3x ø PVC PIPE FOR REACTOR AND ICT MOM BOX.
- PULL CHAMBER
- ROAD/PIT CROSSING THROUGH CABLE CULVERT
- P1 1X50 MM ø PVC PIPE FOR POWER CABLE
- P2 1X110 MM ø PVC PIPE FOR CONTROL CABLE
- P3 1X200 MM ø PVC PIPE FOR CONTROL CABLE
- BAY MARSHALLING KIOSK

PVC PIPE DETAILS OF 400/220KV EQUIPMENTS



NOA NO. : CC/TM/-AIS/DOM/A10/23/01956/NOA-1/24-102643/01

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

NAME OF CUSTOMER: BIKANER-III NEEMRANA TRANSMISSION LIMITED
NAME OF CLIENT: POWERGRID CORPORATION OF INDIA LIMITED
NAME OF PROJECT: Establishment of 6x1600 MVA, 765/400 kV & 6x500 MVA 400/220 kV Bikaner-III Pooling Station (Including 400kV, 2x125MVAR, reactor at Bikaner-III)

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BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION BUSINESS GROUP

	NAME	SIGN.	DATE
DRAWN	BY	-SGD-	05.10.24
CHECKED	SS	-SGD-	05.10.24
APPROVED	SKS	-SGD-	05.10.24

REV.	DATE	ALTERED	BY
03	17.01.2025	CHECKED	SS
		APPROVED	SKS
ZONE	REVISED AS PER CUSTOMER COMMENTS DATED-10.01.2025		

REV.	DATE	ALTERED	BY
02	27.12.2024	CHECKED	SS
		APPROVED	SKS
ZONE	REVISED AS PER CUSTOMER COMMENTS DATED-01.12.2024		

REV.	DATE	ALTERED	BY
01	25.11.24	CHECKED	SS
		APPROVED	SKS
ZONE	REVISED AS PER CUSTOMER COMMENTS DATED-11.10.24		

दिनांक DATE
नोट CODE
शीर्षक/TITLE: BIKANER III NEW S/S-CABLE TRENCH LAYOUT
उपपात / SCALE
कार्ड कोड CARD CODE
POWERGRID DRAWING NO. TB202359-1002269-BS3490-CABTR-LAYOUT
ड्रॉ.सं./DRAWING NO. TB-0-424-316-007
ड्रॉ/REV. 03
पृष्ठ सं./SHEET No.02
अगला पृष्ठ/NEXT SHEET --

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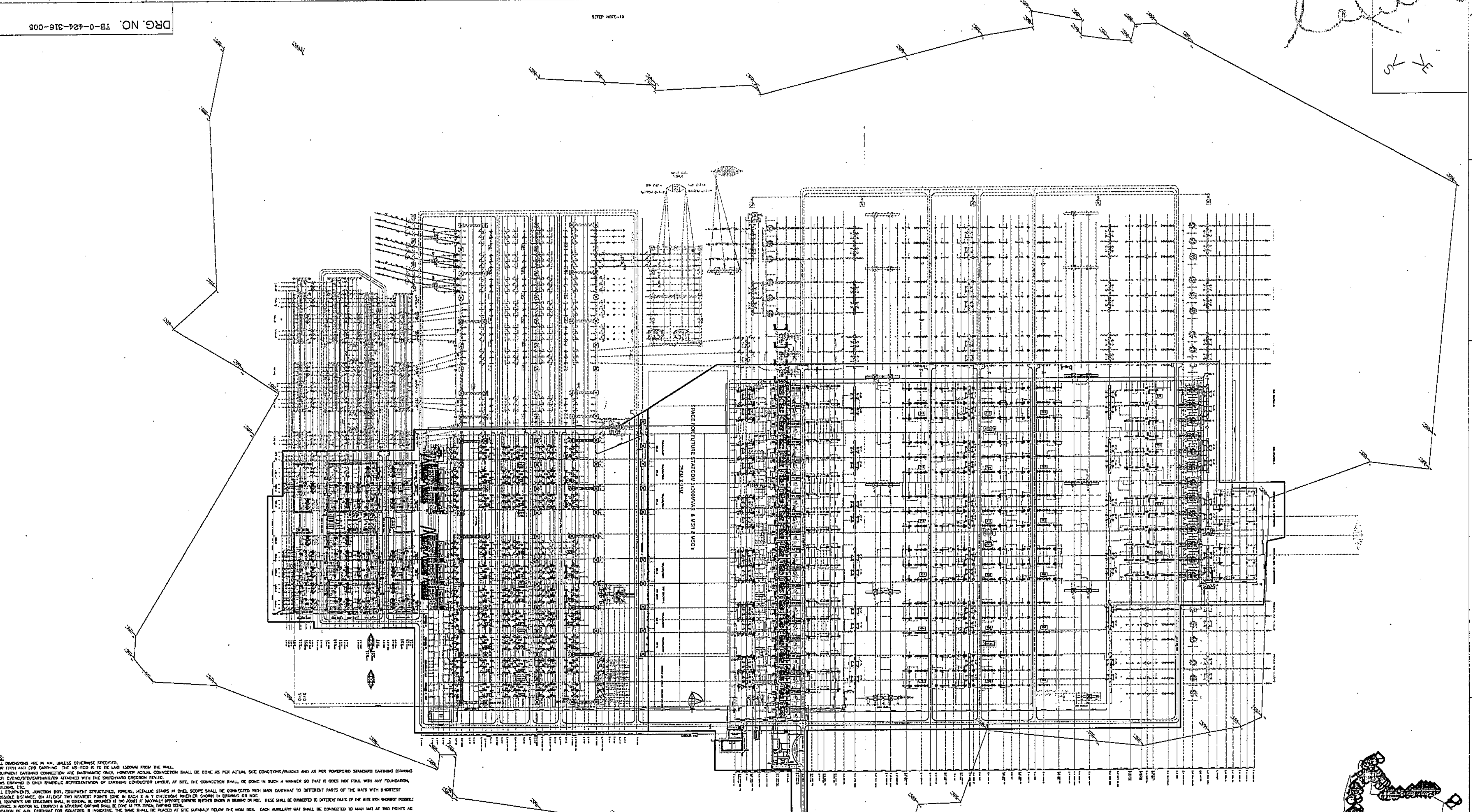
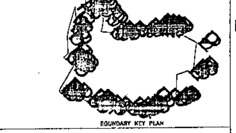
COMPUTER DRG. PATH NAME :
REF. DRG. NO.
SIGN. AND DATE
INVENTORY NO

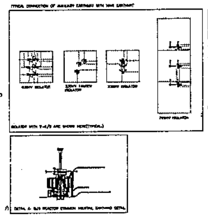
FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG. NO. TB-0-424-316-005





NOTES:
1. ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE SPECIFIED.
2. FOR ITPH AND CRO EARTHING THE MS-ROD IS TO BE LAID 1500MM FROM THE WALL.
3. EQUIPMENT EARTHING CONNECTION ARE DIAGRAMATIC ONLY, HOWEVER ACTUAL CONNECTION SHALL BE DONE AS PER ACTUAL SITE CONDITIONS/IS:3043 AND AS PER POWERGRID STANDARD EARTHING DRAWING REF: C/ENG/STD/EARTHING/09 ATTACHED WITH THE SWITCHYARD ERECTION REV.10.
4. THIS DRAWING IS ONLY SYMBOLIC REPRESENTATION OF EARTHING CONDUCTOR LAYOUT. AT SITE, THE CONNECTION SHALL BE DONE IN SUCH A MANNER SO THAT IT DOES NOT FOUL WITH ANY FOUNDATION, BUILDING, ETC.
5. ALL EQUIPMENTS, JUNCTION BOX, EQUIPMENT STRUCTURES, TOWERS, METALLIC STAIRS IN BHEL SCOPE SHALL BE CONNECTED WITH MAIN EARTHMAT TO DIFFERENT PARTS OF THE MATS WITH SHORTEST POSSIBLE DISTANCE, ON ATLEAST TWO NEAREST POINTS (ONE IN EACH X & Y DIRECTION) WHETHER SHOWN IN DRAWING OR NOT.
6. ALL EQUIPMENTS AND STRUCTURES SHALL, IN GENERAL, BE GROUNDED AT TWO POINTS AT DIAGONALLY OPPOSITE CORNERS WHETHER SHOWN IN DRAWING OR NOT. THESE SHALL BE CONNECTED TO DIFFERENT PARTS OF THE MATS WITH SHORTEST POSSIBLE DISTANCE. IN ADDITION ALL EQUIPMENT & STRUCTURE EARTHING SHALL BE DONE AS PER TYPICAL EARTHING DETAIL.
7. LOCATION OF AUX. EARTHMAT FOR ISOLATORS IS INDICATIVE, THE SAME SHALL BE PLACED AT SITE SUITABLY BELOW THE MOM BOX. EACH AUXILLARY MAT SHALL BE CONNECTED TO MAIN MAT AT TWO POINTS AS PER POWERGRID STANDARD DRAWING REF: C/ENG/STD/EARTHING/09.
8. EARTHING CONDUCTORS IN OUTDOOR AREAS SHALL BE BURIED AT LEAST 600 MM BELOW FINISHED GROUND LEVEL UNLESS STATED OTHERWISE.
9. WHEREVER EARTHING CONDUCTOR CROSSES CABLE TRENCHES, UNDERGROUND SERVICE DUCTS, PIPES, TUNNELS, RAILWAY TRACKS ETC., IT SHALL BE LAID MINIMUM 300 MM BELOW THEM AND SHALL BE CIRCUMVENTED IN CASE IT FOULS WITH EQUIPMENT/STRUCTURE FOUNDATIONS.
10. TAP-CONNECTIONS FROM THE EARTHING GRID TO THE EQUIPMENT/STRUCTURE TO BE EARTHED SHALL BE TERMINATED ON THE EARTHING TERMINALS OF THE EQUIPMENT/STRUCTURE AS PER STANDARD EARTHING DETAILS - DRG NO. C/ENG/STD/EARTHINGS/09 ATTACHED WITH THE SWITCHYARD ERECTION REV.10.
11. EARTHING CONDUCTORS OR LEADS ALONG THEIR RUN ON CABLE TRENCH, LADDER, WALLS ETC. SHALL BE SUPPORTED BY SUITABLE WELDING/CLEATING AT INTERVALS OF 750 MM. WHEREVER IT PASSES THROUGH WALLS, FLOORS ETC., PVC SLEEVES SHALL BE PROVIDED FOR THE PASSAGE OF THE CONDUCTOR AND BOTH ENDS OF THE SLEEVE SHALL BE SEALED TO PREVENT THE PASSAGE OF WATER THROUGH THE SLEEVES.
12. EARTHING CONDUCTOR AROUND THE BUILDING SHALL BE BURIED IN EARTH AT A MINIMUM DISTANCE OF 1500 MM FROM THE OUTER BOUNDARY OF THE BUILDING.
13. EARTHING CONDUCTORS CROSSING THE ROAD SHALL BE LAID 300MM BELOW ROAD OR AT GREATER DEPTH TO SUIT THE SITE CONDITIONS.
14. EARTHING CONDUCTORS EMBEDDED IN THE CONCRETE SHALL HAVE APPROXIMATELY 50MM CONCRETE COVER.
15. WHETHER SPECIFICALLY SHOWN IN DRAWINGS OR NOT, STEEL/RCC COLUMNS, METALLIC STAIRS SHALL BE CONNECTED TO THE NEARBY EARTHING GRID CONDUCTOR BY TWO EARTHING ELECTRICAL CONTINUITY SHALL BE ENSURED BY BONDING DIFFERENT SECTIONS OF HAND-RAILS AND METALLIC STAIRS.
16. METALLIC PIPES, CONDUITS AND CABLE TRAY SECTIONS FOR CABLE INSTALLATION SHALL BE BONDED TO ENSURE ELECTRICAL CONTINUITY AND CONNECTED TO EARTHING CONDUCTORS AT REGULAR INTERVAL APART FROM INTERMEDIATE CONNECTIONS, BEGINNING POINTS SHALL ALSO BE CONNECTED TO EARTHING SYSTEM.
17. METALLIC CONDUITS SHALL NOT BE USED AS EARTH CONTINUITY CONDUCTOR.
18. RAILWAY TRACKS WITHIN SWITCHYARD AREA SHALL BE EARTHED AT A SPACING OF 30M AND ALSO AT BOTH ENDS.
19. EARTHING CONDUCTOR SHALL BE BURIED 2000 MM OUTSIDE THE SWITCHYARD FENCE. ALL THE GATES AND EVERY ALTERNATE POST OF THE FENCE SHALL BE CONNECTED TO EARTHING GRID.
20. 50MM X 8MM MS FLAT SHALL RUN ON THE TOP TIER AND ALL ALONG THE CABLE TRENCHES AND THE SAME SHALL BE WELDED TO EACH OF THE RACKS. FURTHER THIS FLAT SHALL BE EARTHED AT BOTH ENDS AND AT AN INTERVAL OF 30 MTRS. THE M.S. FLAT SHALL BE FINALLY PAINTED WITH TWO COATS OF RED OXIDE PRIMER AND TWO COATS OF ZINC RICHED ENAMEL PAINT.
21. ONE NUMBER 40 MM DIA, 3000 MM LONG MS EARTH ELECTRODE WITH TEST LINK, CI FRAME AND COVER SHALL BE PROVIDED TO CONNECT EACH DOWN CONDUCTOR OF SURGE ARRESTERS, CAPACITIVE VOLTAGE TRANSFORMERS, LIGHTNING MASTS AND TOWERS WITH PEAK.
22. EARTHING CONNECTIONS WITH EQUIPMENT EARTHING PADS SHALL BE BOLTED TYPE. CONTACT SURFACES SHALL BE FREE FROM SCALE, PAINT, ENAMEL, GREASE, RUST OR DIRT. TWO BOLTS SHALL BE PROVIDED FOR MAKING EACH CONNECTION. EQUIPMENT BOLTED CONNECTIONS, AFTER BEING CHECKED AND TESTED, SHALL BE PAINTED WITH ANTI CORROSIVE PAINT/COMPOUND.
23. CONNECTION BETWEEN EQUIPMENT EARTHING LEAD AND MAIN EARTHING CONDUCTORS AND BETWEEN MAIN EARTHING CONDUCTORS SHALL BE WELDED TYPE. FOR RUST PROTECTIONS, THE WELDS SHOULD BE TREATED WITH RED OXIDE PRIMER AND AFTERWARDS COATED WITH TWO LAYERS BITUMEN COMPOUND TO PREVENT CORROSION.
24. STEEL TO COPPER CONNECTIONS SHALL BE BRAZED TYPE AND SHALL BE TREATED TO PREVENT MOISTURE INGRESSION.
25. RESISTANCE OF THE JOINT SHALL NOT BE MORE THAN THE RESISTANCE OF THE EQUIVALENT LENGTH OF THE CONDUCTOR.
26. ALL GROUND CONNECTIONS SHALL BE MADE BY ELECTRIC ARC WELDING. ALL WELDED JOINTS SHALL BE ALLOWED TO COOL DOWN GRADUALLY TO ATMOSPHERIC TEMPERATURE BEFORE PUTTING ANY LOAD ON IT. ARTIFICIAL COOLING SHALL NOT BE ALLOWED.
29. ALL ARC WELDING WITH LARGE DIA. CONDUCTORS SHALL BE DONE WITH LOW HYDROGEN CONTENT ELECTRODES.
30. THE 75X12MM GS FLAT SHALL BE CLAMPED WITH THE EQUIPMENT SUPPORT STRUCTURES AT 1000MM INTERVAL.
31. EACH EARTHING LEAD FROM THE NEUTRAL OF THE POWER TRANSFORMER/REACTOR SHALL BE DIRECTLY CONNECTED TO TWO NUMBERS PIPE ELECTRODES IN TREATED EARTH PIT (AS PER IS) WHICH IN TURN, SHALL BE BURIED IN CEMENT CONCRETE PIT WITH A GI MARKED CAST IRON COVER HINGED TO A CAST IRON FRAME TO HAVE AN ACCESS TO THE JOINTS. ALL ACCESSORIES ASSOCIATED WITH TRANSFORMER/REACTOR LIKE COOLING BANKS, RADIATORS ETC. SHALL BE CONNECTED TO THE EARTHING GRID AT MINIMUM TWO POINTS.
32. EARTHING TERMINAL OF EACH LIGHTNING ARRESTOR & CAPACITOR VOLTAGE TRANSFORMER SHALL BE DIRECTLY CONNECTED TO ROD EARTH ELECTRODE WHICH IN TURN, SHALL BE CONNECTED TO STATION EARTHING GRID.
33. AUXILIARY EARTHING MAT COMPRISING OF 40MM DIA M.S. RODS CLOSELY SPACED (300 MM X 300 MM) CONDUCTORS SHALL BE PROVIDED AT DEPTH OF 300MM FROM GROUND LEVEL BELOW THE OPERATING HANDLES OF THE M.O.M. BOX OF THE ISOLATORS (MAIN SWITCH AND EARTH SWITCH). M.O.M. BOXES SHALL BE DIRECTLY CONNECTED TO THE AUXILIARY EARTHING MAT. FLEXIBLE COPPER BRAID CONNECTION TO BE PROVIDED BETWEEN MOM BOX AND GI FLAT TO TAKE CARE OF SOIL SAGGING. THE SIZE OF AUXILIARY EARTHING MAT SHALL BE OF 1500MMX1500MM SIZE FOR 220KV AND ABOVE VOLTAGE CLASS ISOLATORS AND 900MMX900MM SIZE FOR 132KV AND BELOW VOLTAGE CLASS ISOLATORS.



S.NO.	SYMBOL	ITEM DESCRIPTION	ENGG. QUANTITY	LOA QUANTITY
1	——	40MM DIA. MS ROD EARTHMAT CONDUCTOR	22000 MTR	27000 MTR
2	⊕	PERIPHERAL ROD ELECTRODE WITHOUT PIT (3M LONG)	327 MTR (109 NO.)	
3	⊕	ROD EARTH ELECTRODE WITH TEST EARTH PIT (3M LONG)	945 MTR (315 NO.)	1 LOT.
4	▥	40MM DIA. MS ROD FOR AUX. EARTHMAT (1008 NOS)	18108 MTR (APPROX.)	
5	......	40MM DIA. MS ROD FOR RISERS	75000 MTR	
6		40MM DIA. MS ROD FOR ICT/REACTOR RING	2700 MTR △	
7	⊕	PIPE ELECTRODE WITH TREATED EARTH PIT (3M LONG)	40 NO. △	

NOA NO. : CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01

REV.	DATE	ALTERED	SY	REV.	DATE	ALTERED	SY	REV.	DATE	ALTERED	SY
03	17.01.25	CHECKED	SS	02	08.01.25	CHECKED	SS	01	22.11.24	CHECKED	SS
		APPROVED	SKS			APPROVED	SKS			APPROVED	SKS
ZONE	REVISED AS PER POWERGRID COMMENTS			ZONE	REVISED AS PER POWERGRID COMMENTS			ZONE	REVISED AS PER POWERGRID COMMENTS		

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

NAME OF CUSTOMER / NAME OF CLIENT / NAME OF PROJECT:
BIKANER-III NEEMRANA TRANSMISSION LIMITED
POWERGRID CORPORATION OF INDIA LIMITED
Establishment of 6x1500 MVA, 765/400 kV & 6x500 MVA 400/220 kV Bikaner-III Pooling Station (Including 400kV, 2x125MVAR, reactor at Bikaner-III)

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION BUSINESS GROUP

	नाम /NAME	हस्ता./SIGN.	दि./DATE
बनाया DRAWN	SY	-SGD-	12.09.24
जांचा CHECKED	SS	-SGD-	12.09.24
स्वीकृत APPROVED	SKS	-SGD-	12.09.24

विभाग DEPT. / कोड CODE
अनुपात / SCALE
कार्ड कोड CARD CODE
POWERGRID DRAWING NO. TB202359-1002269-BS3480-EMAT-LAYOUT

शीर्षक/TITLE
BIKANER III NEW S/S- EARTHMAT LAYOUT DRGS

ड्राइंग.सं./DRAWING NO. TB-0-424-316-005
पुनः/REV. 03
पृष्ठ सं./SHEET No. 01 | अगला पृष्ठ/NEXT SHEET --

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IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY

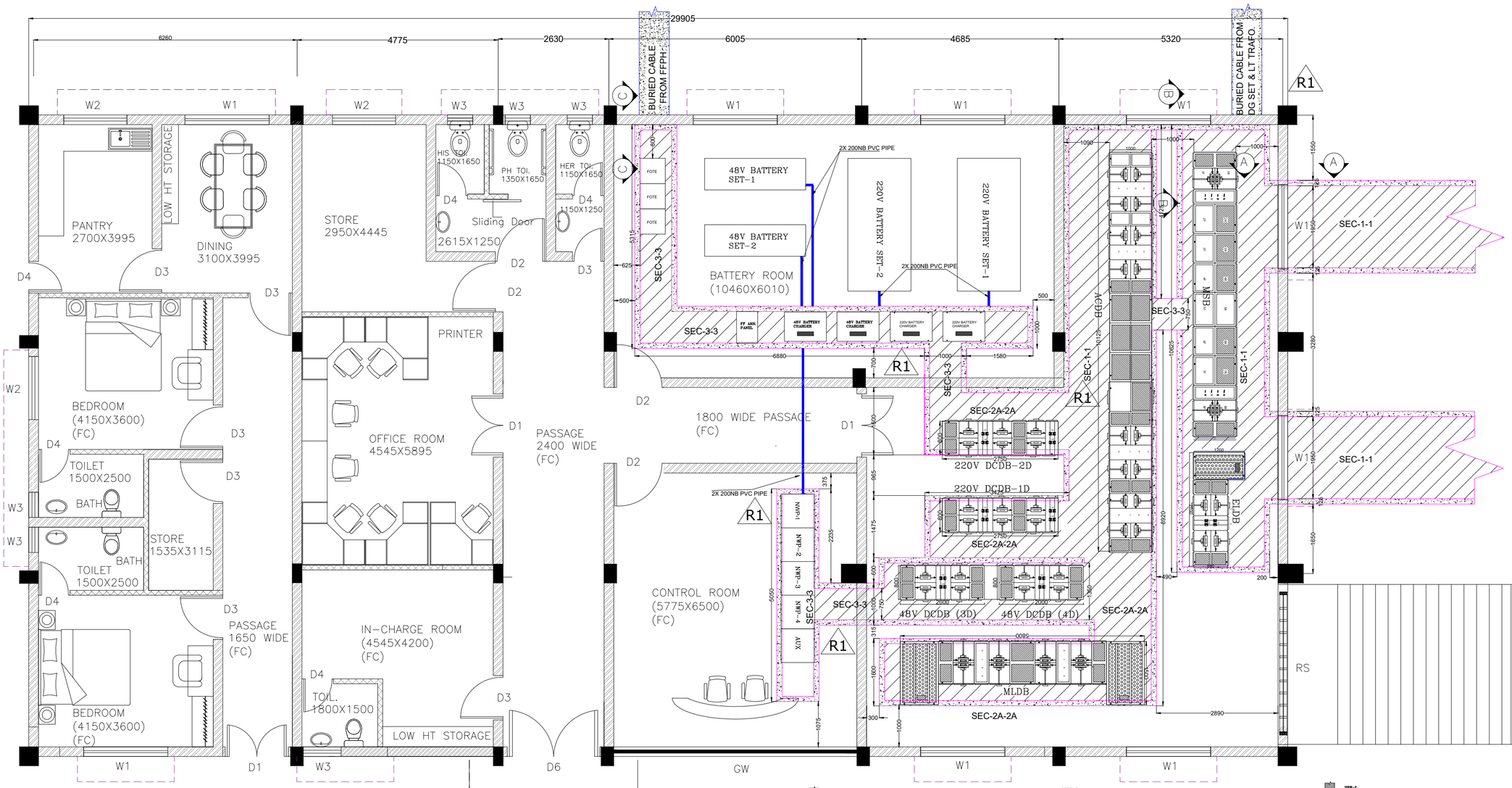
COMPUTER DRG. PATH NAME :
REF. DRG. NO.
SIGN. AND DATE
INVENTORY NO

PROJECT TITLE	**Establishment of 6X1500 MVA, 765/400 kV & 5X500 MVA 400/220 kV Bikaner-III Pooling Station (including 400kV, 2x125MVAR, reactor at Bikaner-III)**
CUSTOMER	**BIKANER III NEEMRANA TRANSMISSION LIMITED**
CONSULTANT	**POWERGRID CORPORATION OF INDIA LIMITED**
EPC CONTRACTOR	**BHARAT HEAVY ELECTRICALS LIMITED (BHEL)**
REVIEW OF	**BIKANER III NEW S/S- CONTROL ROOM BUILDING CABLE TRENCH LAYOUT**

Sl. NO.	POWERGRID Comments dated 29/01/2025	BHEL reply dated 14/02/2025
1	This portion to be shifted on edge of wall and space to be kept between two Section for coridor, Section 1-1	incorporated
2	Pipe opening to be shown for buried cable trench	Cable will be crossing through cable transit system as per section-B, hence pipe opening not required.
3	MLDB is kept outside the cable trench, please align the same	incorporated
4	Section 3-3	incorporated
5	200 NB	incorporated

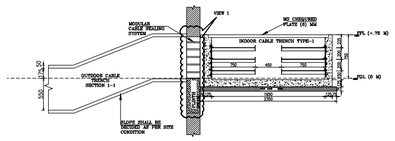
FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRG. NO. TB-2-424-316-009

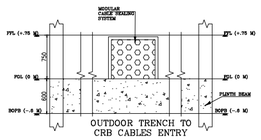


REFERENCE DRAWINGS:

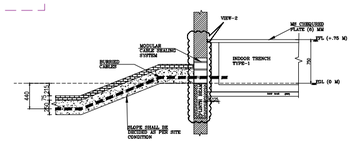
1. TB-2-424-316-105-CRB Rev.02 :- BIKANER III NEW S/S- CONTROL ROOM BUILDING PANEL ARRANGEMENT LAYOUT.
2. TB-0-424-316-007 Rev.02 :- BIKANER III NEW S/S-CABLE TRENCH LAYOUT



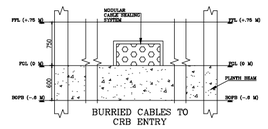
SECTION-A



OUTDOOR TRENCH TO CRB CABLES ENTRY
VIEW-1



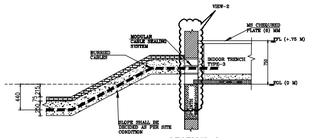
SECTION-B



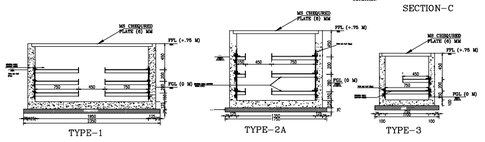
BURRIED CABLES TO CRB ENTRY
VIEW-2

LEGENDS:

- PVC PIPE
- INDOOR TRENCH



SECTION-C



TYPE-1 TYPE-2A TYPE-3

NOA NO. : CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01

ADDITIONAL INFORMATION W.O.No.	NAME OF CUSTOMER: BIKANER-III NEEMRANA TRANSMISSION LIMITED
STATUS OF DRAWING	NAME OF CLIENT: POWERGRID CORPORATION OF INDIA LIMITED
DISTRIBUTION OF PRINTS	NAME OF PROJECT: Establishment of 6x1500 MVA, 765/400 kV & 5x500 MVA 400/220 kV Bikaner-III Pooling Station (including 400kV, 2x125MVAR, reactor at Bikaner-III)

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION BUSINESS GROUP

	नाम /NAME	हस्ता./SIGN.	दि./DATE
बनाया DRAWN	SY	-SGD-	16.01.25
जाँचा CHECKED	SS	-SGD-	16.01.25
स्वीकृत APPROVED	SKS	-SGD-	16.01.25

REV.	DATE		
01	14.02.25	ALTERED	SY
		CHECKED	SS
		APPROVED	SKS

ZONE: REVISED AS PER POWERGRID COMMENTS

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

POWERGRID DRAWING NO.: TB202359-1002269-SS3480-CRB CABLE TRENCH LAYOUT

शीर्षक/TITLE: BIKANER III NEW S/S- CONTROL ROOM BUILDING CABLE TRENCH LAYOUT

ड्राईंग क्र./DRAWING NO.: TB-2-424-316-009 | पुनः/REV. 01

पृष्ठ क्र./SHEET No. | अगला पृष्ठ /NEXT SHEET

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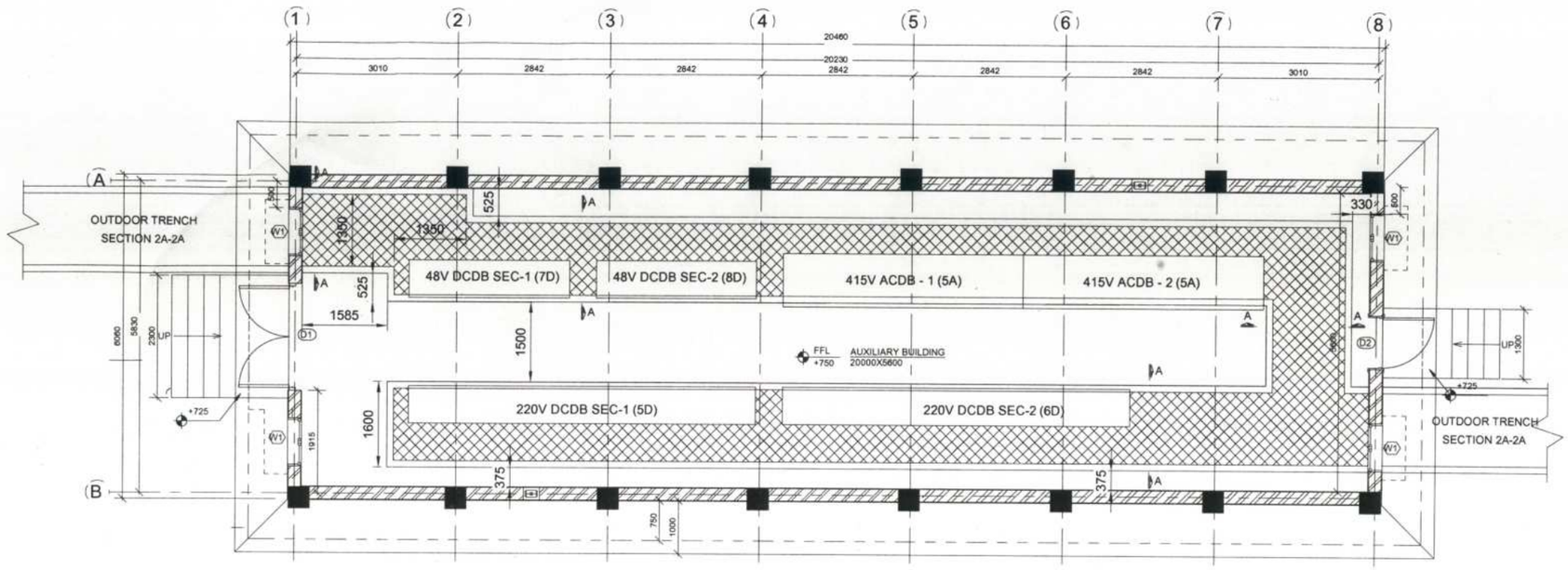
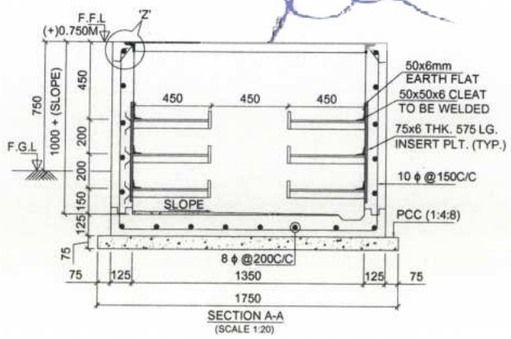
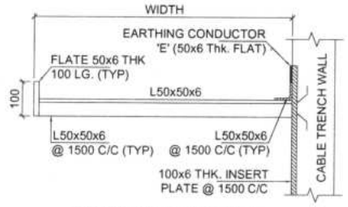
COMPUTER DRG. PATH NAME :
REF. DRG. NO.
SIGN. AND DATE
INVENTORY NO



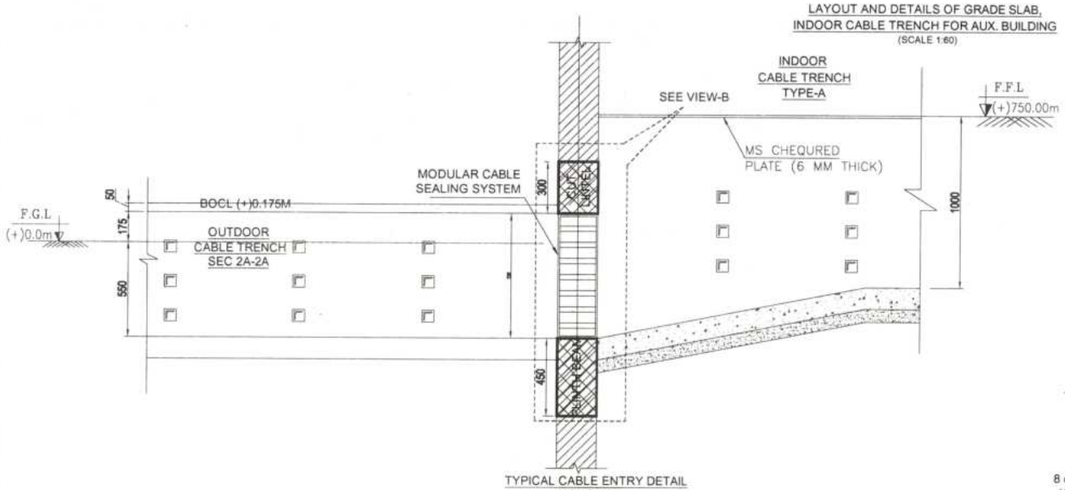
LAYOUT AND DETAILS OF GRADE SLAB, INDOOR CABLE TRENCH FOR AUX. BUILDING
(SCALE 1:60)



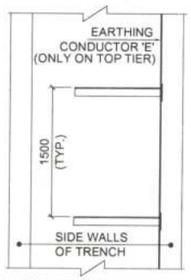
SECTION A-A
(SCALE 1:20)



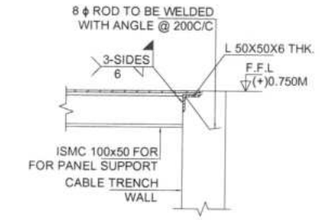
TYPICAL CABLE SUPPORT
(FOR ONE SIDE WALL)
(SCALE-1:10)



TYPICAL CABLE ENTRY DETAIL
(SCALE-1:20)



PLAN OF CABLE TRAY SUPPORT
FOR CABLE TRENCH SECTION 2-2 & 3-3
(COVER NOT SHOWN FOR CLARITY)
(SCALE 1:20)



(#) TYPICAL ARRANGEMENT OF
TRENCH COVER
(FOR PORTION OF TRENCH COVERED BY PANELS)
(SCALE-1:10)

NOTES:-

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. 50x6mm MS FLAT SHALL RUN ALONG THE TRENCH ROUTE FOR CABLE SUPPORT EARTHING.
3. CABLE SEALING DETAILS SHALL BE SUBMITTED SEPARATELY.

LEGENDS:-

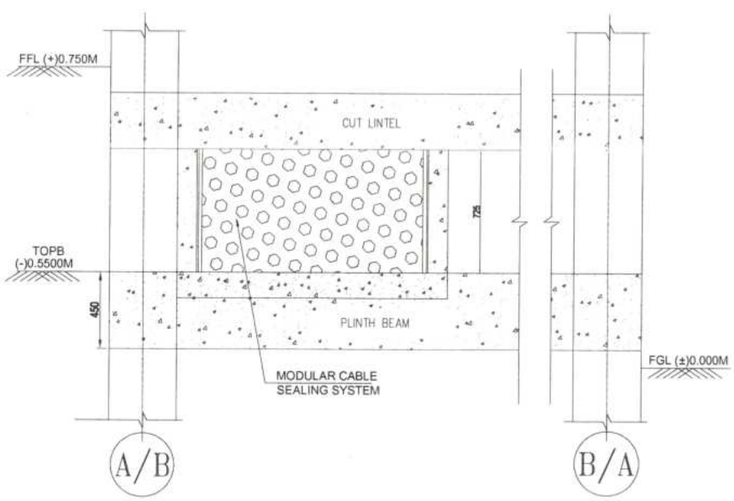
INDOOR CABLE TRENCH

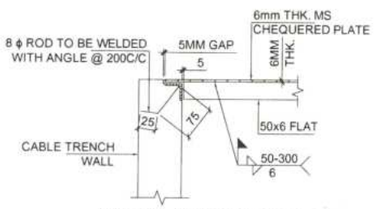
PVC PIPE

REFERENCE DRAWINGS:-

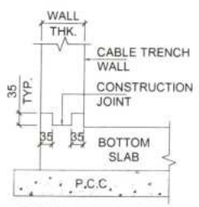
1. AUXILIARY BUILDING ARCHITECTURE DRAWING-
   C/ENGG/NR1/BIKANER-III/SS01/ARCH/GF & ROOF PLAN/01
   C/ENGG/NR1/BIKANER-III/SS01/ARCH/ELEV & SECTION/01

2. AUXILIARY BUILDING STRUCTURE DRAWING:-
   C/ENGG/NR-I/BIK-III/SS-01/AUX BLDG/FDN-COL/01
   C/ENGG/NR-I/BIK-III/SS-01/AUX BLDG/PB/01
   C/ENGG/NR-I/BIK-III/SS-01/AUX BLDG/LB/01
   C/ENGG/NR-I/BIK-III/SS-01/AUX BLDG/RB/01
   C/ENGG/NR-I/BIK-III/SS-01/AUX BLDG/SLB/01

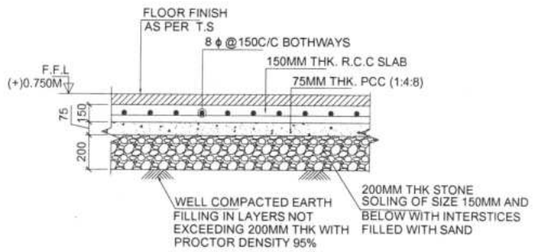




(#) DETAIL-'Z' TYPICAL DETAIL OF
CHEQUERED PLATE SUPPORT
NOT COVERED BY PANELS
(SCALE-1:10)



TYPICAL DETAIL OF
CONSTRUCTION JOINT
(SCALE-1:10)



TYP. DETAIL OF FLOORING 150MM THK. GRADE SLAB
(SCALE 1:20)

POWER GRID CORPORATION
OF INDIA LIMITED
(A Government of India Enterpr

पावरग्रिड
POWERGRID

PROJECT:

SUBSTATION PACKAGE SS-01 FOR (I) ESTABLISHMENT OF 765/400/220KV BIKANER-III (NEW) POOLING STATION INCLUDING 400KV CLASS BUS REACTOR AT BIKANER-III S/S; (II) EXTENSION OF 765KV NEEMRANA-II S/S FOR TERMINATION OF 765 KV D/C LINE NEEMRANA-II-BIKANER-III T/L AND (III) EXTENSION OF 400KV BIKANER-II S/S FOR TERMINATION OF 400KV BIKANER-II BIKANER-III T/L UNDER "TRANSMISSION SYSTEM FOR EVACUATION OF POWER FROM RAJASTHAN REZ PH-IV (PART-1) (BIKANER COMPLEX): PART-A"

TITLE:
RCC DETAILS OF GRADE SLAB AND INDOOR CABLE TRENCHES FOR AUXILIARY BUILDING

REVD.	REVD.(ELEC.)	REVD.	APPD.	DATE	DRAWING NO.	SCALE	SIZE	REV.
				13/01/23	C/ENGG/NR1/BIKANER-III/SS01/IND CAB TRENCH/01	NTS	A1	1

पावरग्रिड
POWERGRID

पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

संदर्भ/Ref : CC-ENGG-TB202359-1002269-SS3480-LTSWR-DRG **Date :** 18/02/2025

From : Somiran Das
Senior GM

To : Bharat Heavy Electricals Limited
Plot No.-7, Sector-142 Noida 201305
201305

Cc :

Subject : Substation Package SS-01 for (i) Establishment of 765/400/220kV Bikaner-III (New) Pooling Station including 400kV class Bus Reactor at Bikaner-III S/s; (ii) Extension of 765kV Neemrana-II S/s for termination of 765 kV D/c line Neemrana-II–Bikaner-III T/L and (iii) Extension of 400kV Bikaner-II S/s for termination of 400kV Bikaner-II Bikaner-III T/L under "Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-1) (Bikaner Complex): PART-A"

LOA Ref : CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 Dated 23/02/2024

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

Vendor Drg. No.	:	USL/PGCIL/BHEL/2024-2025/1241A
Orgn. Drg. No.	:	TB202359-1002269-SS3480-LTSWR-DRG
Revision No.	:	00
Drg. Title	:	BIKANER III NEW S/S- LT SWITCHGEAR - DRGS
App. Category	:	CAT-I
Release Date	:	18/02/2025

Scan to verfiy

Comments : Generally in order with minor comments

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 रिवाइजड 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/ REL-CON निर्माण हेतु जारी।
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.

CLIENT	POWER GRID CORPORATION OF INDIA LIMITED.
CONTRACTOR	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
PROJECT NAME	765/400/220kV BIKANER-III POOLING STATION
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024
VENDOR NAME	ULTIMA SWITCHGEARS LTD.
DOC NAME	DRG - ANNEXURE
DOC NO	USL/PGCIL/BHEL/2024-2025/1241A

S.NO.	DRG NO.	ITEM DESCRIPTION	NO. OF SHEET	REV.	PGCIL Approval Reference	REMARKS
DRAWINGS DETAILS FOR 415V MAIN SWITCH BOARD (1A) (MCRB)						
1	USL/PGCIL/BHEL/2024-2025/1241A-001	COVER SHEET	1	0	PROJECT SPECIFIC	Submitted for Project Specific approval for this Project
2	USL/PGCIL/BHEL/2024-2025/1241A-101	GENERAL ARRANGEMENT DRAWING	3	0		
3	USL/PGCIL/BHEL/2024-2025/1241A-201	SINGLE LINE DIAGRAM	4	0		
4	USL/PGCIL/BHEL/2024-2025/1241A-501	SCHEMATIC DRAWING OF ACB OUTGOING FEEDER	1	0		
5	USL/PGCIL/BHEL/2024-2025/1241A-701	BILL OF MATERIAL	6	0		
6		GENERAL TECHNICAL SPECIFICATIONFOR ALL PANEL	25	3	ALREADY APPROVED VIDE LETTER NO. CC-ENGG-TB202313-1001964-SS3420-LTSWR-DRG DATED 05.05.2024	Submitted for Extension of Approval for this Project
7		ELECTRICAL SYMBOL FOR ALL PANEL				
8		KEY LINE DIAGRAM FOR MSB & ACDB				
9		SCHEMATIC DRAWING FOR 415V MAIN SWITCH BOARD (MSB)				
DRAWINGS DETAILS FOR 415V AC DISTRIBUTION BOARD (2A) (MCRB)						
1	USL/PGCIL/BHEL/2024-2025/1241A-002	COVER SHEET	1	0	PROJECT SPECIFIC	Submitted for Project Specific approval for this Project
2	USL/PGCIL/BHEL/2024-2025/1241A-102	GENERAL ARRANGEMENT DRAWING	5	0		
3	USL/PGCIL/BHEL/2024-2025/1241A-202	SINGLE LINE DIAGRAM	12	0		
4	USL/PGCIL/BHEL/2024-2025/1241A-702	BILL OF MATERIAL	6	0		
5		GENERAL TECHNICAL SPECIFICATIONFOR ALL PANEL	26	3	ALREADY APPROVED VIDE LETTER NO. CC-ENGG-TB202313-1001964-SS3420-LTSWR-DRG DATED 05.05.2024	Submitted for Extension of Approval for this Project
6		ELECTRICAL SYMBOL FOR ALL PANEL				
7		KEY LINE DIAGRAM FOR MSB & ACDB				
8		SCHEMATIC DRAWING FOR 415V AC DISTRIBUTION BOARD (ACDB)				

S.NO.	DRG NO.	ITEM DESCRIPTION	NO. OF SHEET	REV.	PGCIL Approval Reference	REMARKS
DRAWINGS DETAILS FOR 415V MAIN LIGHTING DISTRIBUTION BOARD (3A) (MCRB)						
1	USL/PGCIL/BHEL/2024-2025/1241A-003	COVER SHEET	1	0	PROJECT SPECIFIC	Submitted for Project Specific approval for this Project
2	USL/PGCIL/BHEL/2024-2025/1241A-103	GENERAL ARRANGEMENT DRAWING	3	0		
3	USL/PGCIL/BHEL/2024-2025/1241A-203	SINGLE LINE DIAGRAM	7	0		
4	USL/PGCIL/BHEL/2024-2025/1241A-703	BILL OF MATERIAL	3	0		
5		GENERAL TECHNICAL SPECIFICATIONFOR ALL PANEL	12	3	ALREADY APPROVED VIDE LETTER NO. CC-ENGG-TB202313-1001964-SS3420-LTSWR-DRG DATED 05.05.2024	Submitted for Extension of Approval for this Project
6		ELECTRICAL SYMBOL FOR ALL PANEL				
7		SCHEMATIC DRAWING FOR 415V MAIN LIGHTING DISTRIBUTION BOARD				
DRAWINGS DETAILS FOR 415V EMERGENCY LIGHTING DISTRIBUTION BOARD (4A) (MCRB)						
1	USL/PGCIL/BHEL/2024-2025/1241A-004	COVER SHEET	1	0	PROJECT SPECIFIC	Submitted for Project Specific approval for this Project
2	USL/PGCIL/BHEL/2024-2025/1241A-104	GENERAL ARRANGEMENT DRAWING	3	0		
3	USL/PGCIL/BHEL/2024-2025/1241A-204	SINGLE LINE DIAGRAM	3	0		
4	USL/PGCIL/BHEL/2024-2025/1241A-704	BILL OF MATERIAL	2	0		
5		GENERAL TECHNICAL SPECIFICATIONFOR ALL PANEL	11	3	ALREADY APPROVED VIDE LETTER NO. CC-ENGG-TB202313-1001964-SS3420-LTSWR-DRG DATED 05.05.2024	Submitted for Extension of Approval for this Project
6		ELECTRICAL SYMBOL FOR ALL PANEL				
7		SCHEMATIC DRAWING FOR 415V EMERGENCY LIGHTING DISTRIBUTION BOARD				
DRAWINGS DETAILS FOR 220V DC DISTRIBUTION BOARD-1(1D)(MCRB)						
1	USL/PGCIL/BHEL/2024-2025/1241A-005	COVER SHEET	1	0	PROJECT SPECIFIC	Submitted for Project Specific approval for this Project
2	USL/PGCIL/BHEL/2024-2025/1241A-105	GENERAL ARRANGEMENT DRAWING	2	0		
3	USL/PGCIL/BHEL/2024-2025/1241A-205	SINGLE LINE DIAGRAM	5	0		
3	USL/PGCIL/BHEL/2024-2025/1241A-505	SCHEMATIC DRAWING	3	0		
4	USL/PGCIL/BHEL/2024-2025/1241A-705	BILL OF MATERIAL	2	0		
5		GENERAL TECHNICAL SPECIFICATIONFOR ALL PANEL	5	3	ALREADY APPROVED VIDE LETTER NO. CC-ENGG-TB202313-1001964-SS3420-LTSWR-DRG DATED 05.05.2024	Submitted for Extension of Approval for this Project
6		ELECTRICAL SYMBOL FOR ALL PANEL				

S.NO.	DRG NO.	ITEM DESCRIPTION	NO. OF SHEET	REV.	PGCIL Approval Reference	REMARKS
DRAWINGS DETAILS FOR 220V DC DISTRIBUTION BOARD-2(2D)(MCRB)						
1	USL/PGCIL/BHEL/2024-2025/1241A-006	COVER SHEET	1	0	PROJECT SPECIFIC	Submitted for Project Specific approval for this Project
2	USL/PGCIL/BHEL/2024-2025/1241A-106	GENERAL ARRANGEMENT DRAWING	2	0		
3	USL/PGCIL/BHEL/2024-2025/1241A-206	SINGLE LINE DIAGRAM	5	0		
3	USL/PGCIL/BHEL/2024-2025/1241A-506	SCHEMATIC DRAWING	3	0		
4	USL/PGCIL/BHEL/2024-2025/1241A-706	BILL OF MATERIAL	2	0		
5		GENERAL TECHNICAL SPECIFICATIONFOR ALL PANEL	5	3	ALREADY APPROVED VIDE LETTER NO. CC-ENGG-TB202313-1001964-SS3420-LTSWR-DRG DATED 05.05.2024	Submitted for Extension of Approval for this Project
6		ELECTRICAL SYMBOL FOR ALL PANEL				
DRAWINGS DETAILS FOR 48V DC DISTRIBUTION BOARD-1(3D)(MCRB)						
1	USL/PGCIL/BHEL/2024-2025/1241A-007	COVER SHEET	1	0	PROJECT SPECIFIC	Submitted for Project Specific approval for this Project
2	USL/PGCIL/BHEL/2024-2025/1241A-107	GENERAL ARRANGEMENT DRAWING	1	0		
	USL/PGCIL/BHEL/2024-2025/1241A-207	SINGLE LINE DIAGRAM	3	0		
3	USL/PGCIL/BHEL/2024-2025/1241A-507	SCHEMATIC DRAWING	3	0		
4	USL/PGCIL/BHEL/2024-2025/1241A-707	BILL OF MATERIAL	2	0		
5		GENERAL TECHNICAL SPECIFICATIONFOR ALL PANEL	5	3	ALREADY APPROVED VIDE LETTER NO. CC-ENGG-TB202313-1001964-SS3420-LTSWR-DRG DATED 05.05.2024	Submitted for Extension of Approval for this Project
6		ELECTRICAL SYMBOL FOR ALL PANEL				
DRAWINGS DETAILS FOR 48V DC DISTRIBUTION BOARD-2(4D)(MCRB)						
1	USL/PGCIL/BHEL/2024-2025/1241A-008	COVER SHEET	1	0	PROJECT SPECIFIC	Submitted for Project Specific approval for this Project
2	USL/PGCIL/BHEL/2024-2025/1241A-108	GENERAL ARRANGEMENT DRAWING	1	0		
	USL/PGCIL/BHEL/2024-2025/1241A-208	SINGLE LINE DIAGRAM	3	0		
3	USL/PGCIL/BHEL/2024-2025/1241A-508	SCHEMATIC DRAWING	3	0		
4	USL/PGCIL/BHEL/2024-2025/1241A-708	BILL OF MATERIAL	2	0		
5		GENERAL TECHNICAL SPECIFICATIONFOR ALL PANEL	5	3	ALREADY APPROVED VIDE LETTER NO. CC-ENGG-TB202313-1001964-SS3420-LTSWR-DRG DATED 05.05.2024	Submitted for Extension of Approval for this Project
6		ELECTRICAL SYMBOL FOR ALL PANEL				

S.NO.	DRG NO.	ITEM DESCRIPTION	NO. OF SHEET	REV.	PGCIL Approval Reference	REMARKS
DRAWINGS DETAILS FOR 415V AC DISTRIBUTION BOARD (5A) (AB)						
1	USL/PGCIL/BHEL/2024-2025/1241A-009	COVER SHEET	1	0	PROJECT SPECIFIC	Submitted for Project Specific approval for this Project
2	USL/PGCIL/BHEL/2024-2025/1241A-900	GENERAL TECHNICAL SPECIFICATION	1	0		
3	USL/PGCIL/BHEL/2024-2025/1241A-000-09	ELECTRICAL SYMBOL FOR ALL PANEL	1	0		
4	USL/PGCIL/BHEL/2024-2025/1241A-109	GENERAL ARRANGEMENT DRAWING	3	0		
5	USL/PGCIL/BHEL/2024-2025/1241A-209	SINGLE LINE DIAGRAM	13	0		
6	USL/PGCIL/BHEL/2024-2025/1241A-509-00	KEY LINE DIAGRAM	1	0		
7	USL/PGCIL/BHEL/2024-2025/1241A-509	SCHEMATIC DIAGRAM	3	0		
8	USL/PGCIL/BHEL/2024-2025/1241A-709	BILL OF MATERIAL	1	0		
DRAWINGS DETAILS FOR 220V DC DISTRIBUTION BOARD-1(5D) & 2(6D) (AB)						
1	USL/PGCIL/BHEL/2024-2025/1241A-010	COVER SHEET	1	0	PROJECT SPECIFIC	Submitted for Project Specific approval for this Project
2	USL/PGCIL/BHEL/2024-2025/1241A-1000	GENERAL TECHNICAL SPECIFICATION	1	0		
3	USL/PGCIL/BHEL/2024-2025/1241A-000-10	ELECTRICAL SYMBOL FOR ALL PANEL	1	0		
4	USL/PGCIL/BHEL/2024-2025/1241A-110	GENERAL ARRANGEMENT DRAWING	2	0		
5	USL/PGCIL/BHEL/2024-2025/1241A-210	SINGLE LINE DIAGRAM	10	0		
6	USL/PGCIL/BHEL/2024-2025/1241A-510	SCHEMATIC DIAGRAM	1	0		
7	USL/PGCIL/BHEL/2024-2025/1241A-710	BILL OF MATERIAL	1	0		
DRAWINGS DETAILS FOR 48V DC DISTRIBUTION BOARD-1(7D) & 2(8D) (AB)						
1	USL/PGCIL/BHEL/2024-2025/1241A-011	COVER SHEET	1	0	PROJECT SPECIFIC	Submitted for Project Specific approval for this Project
2	USL/PGCIL/BHEL/2024-2025/1241A-1100	GENERAL TECHNICAL SPECIFICATION	1	0		
3	USL/PGCIL/BHEL/2024-2025/1241A-000-11	ELECTRICAL SYMBOL FOR ALL PANEL	1	0		
4	USL/PGCIL/BHEL/2024-2025/1241A-111	GENERAL ARRANGEMENT DRAWING	2	0		
5	USL/PGCIL/BHEL/2024-2025/1241A-211	SINGLE LINE DIAGRAM	4	0		
6	USL/PGCIL/BHEL/2024-2025/1241A-511	SCHEMATIC DIAGRAM	1	0		
7	USL/PGCIL/BHEL/2024-2025/1241A-711	BILL OF MATERIAL	1	0		

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ENGINEERING DRAWING DETAILS FOR

415V MAIN SWITCH BOARD (1A) (MCRB)

PROJECT :- 765/400/220kV BIKANER-III POOLING STATION

CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED

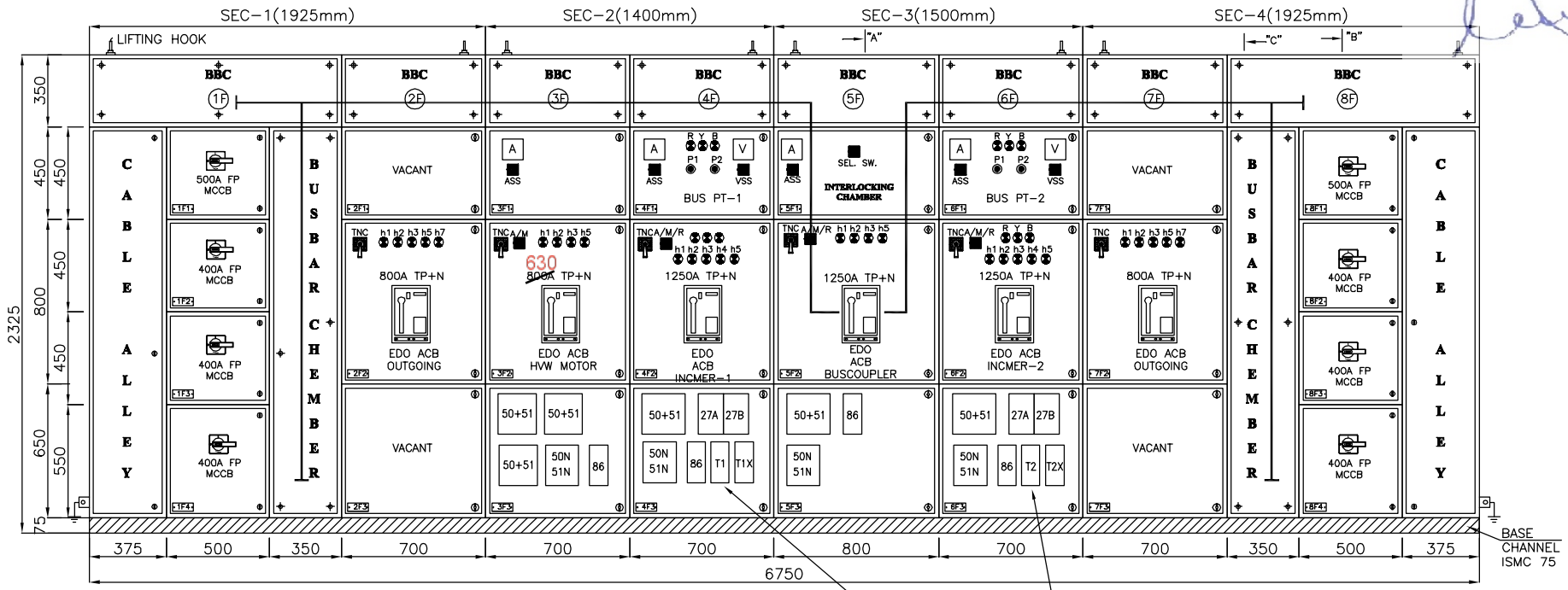
CONTRACTOR :- BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

		SIGN.
DRAWN	MP	
CHKD.	VDP	
APPD.	--	
ALL DIMENSIONS IN mm.		
TOLERANCE 5%		
REVISIONS : 00		

MANUFACTURER
ULTIMA® SWITCHGEARS LTD.
UNIT-I KHASRA NO. 215, IND. AREA, VILLAGE RAIPUR (BHAGWANPUR), TEHSIL - ROORKEE, DISTRICT HARIDWAR (UTTRAKHAND) - 247667, INDIA, TEL : 01332-235043 FAX : 01332-235042
UNIT-II F-6 & F-7, SITE-C, UPSIDC, SURAJPUR INDUSTRIAL AREA, GREATER NOIDA - 201306 G. B. NAGAR (U.P.) INDIA
E-mail : info@ultimaswitchgear.com

DRAWING	COVER PAGE	JOB NO. 1241A
TITLE	415V MAIN SWITCH BOARD (1A) (MCRB)	
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER-III POOLING STATION	
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:- BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-001	SH. NO. 01 OF 01



	04.	–	DRAWN	MP	
	03.	–	CHKD.	VDP	
	02.	–	APPD.	--	
	01.		ALL DIMENSIONS IN mm.		SIGN.
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL	TOLERANCE 5%		
DATE	No.	REVISIONS DESCRIPTION	REVISIONS : 00		

MANUFACTURER

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E-mail : info@ultimaswitchgear.com

DRAWING	GENERAL ARRANGEMENT DRAWING	JOB NO. 1241A
TITLE	415V MAIN SWITCH BOARD (1A) (MCRB)	
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER-III POOLING STATION	

CLIENT
POWER GRID CORPORATION OF INDIA LIMITED

CONTRACTOR:–
BHARAT HEAVY ELECTRICAL LIMITED (BHEL)
TRANSMISSION PROJECTS DIVISION

DRG. NO. USL/PGCIL/BHEL/2024-2025/1241A-101 | SH. NO. 01 OF 03

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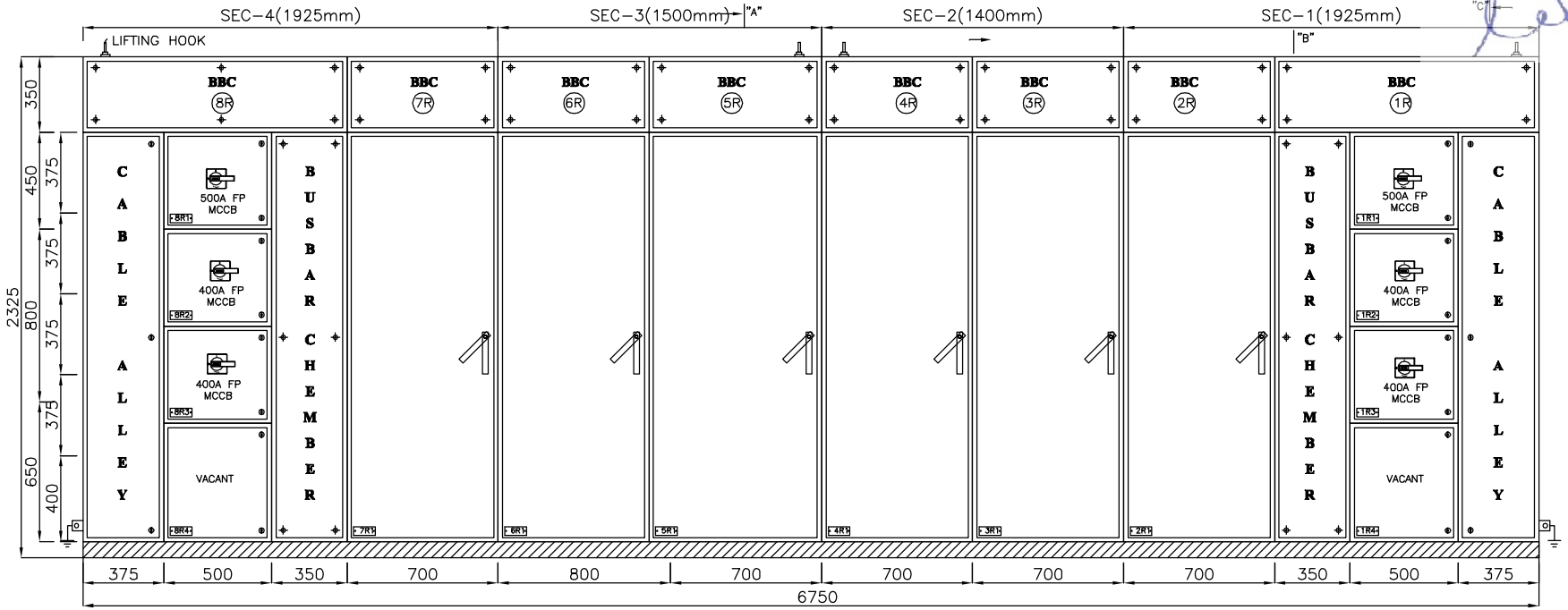

REAR VIEW

LEGEND DETAILS

R	=	'R' PHASE
Y	=	'Y' PHASE
B	=	'B' PHASE
h1	=	ACB ON INDICATION RED
h2	=	ACB OFF INDICATION GREEN
h3	=	ACB TRIP INDICATION AMBER
h4	=	TRANSFORMER FAULT INDICATION WHITE
h5	=	ACB SPRING CHARGE INDICATION BLUE
h6	=	DC HEALTHY INDICATION BLUE
h7	=	ILLUMINATION PUSH BUTTON FOR TCS WHITE
P1	=	TRF TRIP FAULT RESET PUSH BUTTON SPRING RETURN TYPE BLACK
P2	=	TRF N-TRIP FAULT RESET PUSH BUTTON SPRING RETURN TYPE BLACK
A	=	ANALOG AMMETER
V	=	ANALOG VOLT METER
ASS	=	AMPERE SELECTOR SWITCH
VSS	=	VOLTMETER SELECTOR SWITCH
BCS/TNC	=	BREAKER CONTROL SWITCH
27A&27B	=	UNDER VOLTAGE RELAY
86	=	MASTER TRIP RELAY (HAND RESET)
50+51	=	3POLE CURRENT EARTH FAULT RELAY
50N+51N	=	EARTH FAULT RELAY
VMR	=	VOLTAGE MONITORING RELAY
A/M	=	AUTO/MANUAL SELECTOR SWITCH

HORIZONTAL BUS BAR SIZE:-

PHASE	:	1x150X10 Sq. mm Al. OR Eqv.
NEUTRAL	:	1x150X06 Sq. mm Al. OR Eqv.
EARTH	:	1X50X05 Sq. mm GS. OR Eqv.

VERTICAL BUS BAR SIZE:-

PHASE	:	2X75X10 SQ. MM AL. OR Eqv.
NEUTRAL	:	1X75X10 SQ. MM AL._ OR Eqv.

PANEL DIMENSIONS

HEIGHT	:	2325 mm.
WIDTH	:	6750 mm.
DEPTH	:	1000 mm.

CABLE ENTRY

BOTTOM ENTRY

DATE	No.	REVISIONS DESCRIPTION			
	04.	-	DRAWN	MP	
	03.	-	CHKD.	VDP	
	02.	-	APPD.	--	
	01.		ALL DIMENSIONS IN mm.		SIGN.
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL	TOLERANCE 5%		
			REVISIONS : 00		

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E-mail : info@ultimaswitchgear.com

DRAWING	GENERAL ARRANGEMENT DRAWING	JOB NO. 1241A
TITLE	415V MAIN SWITCH BOARD (1A) (MCRB)	
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER-III POOLING STATION	
CLIENT: POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:- BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION	
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-101	SH. NO. 02 OF 03

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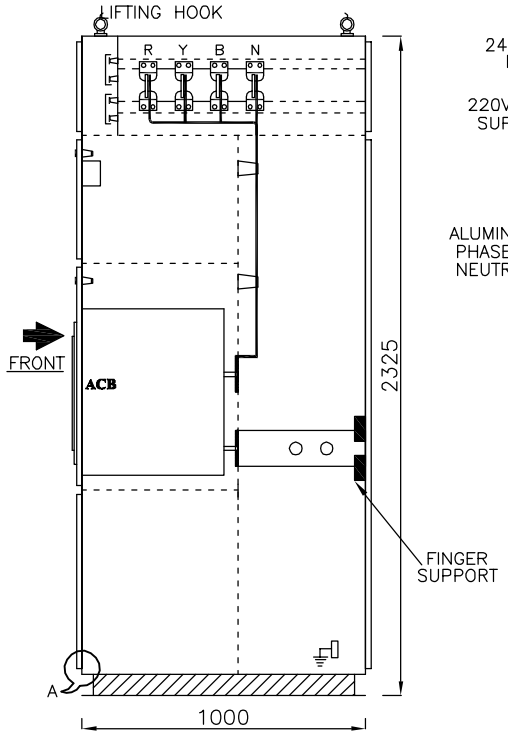
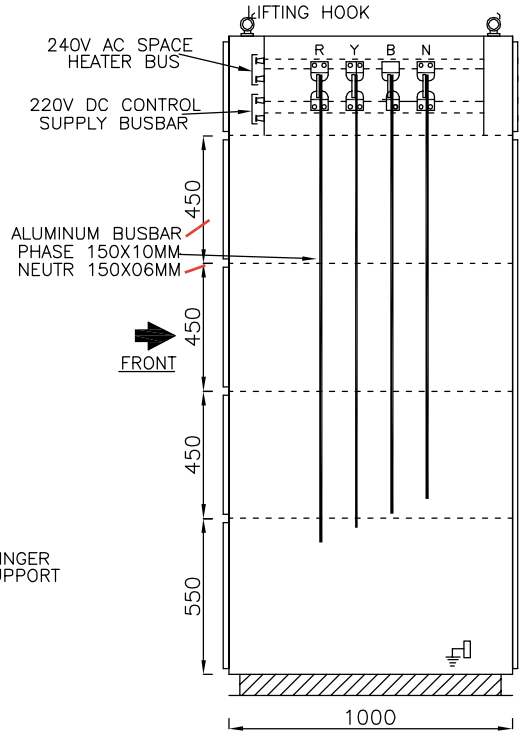
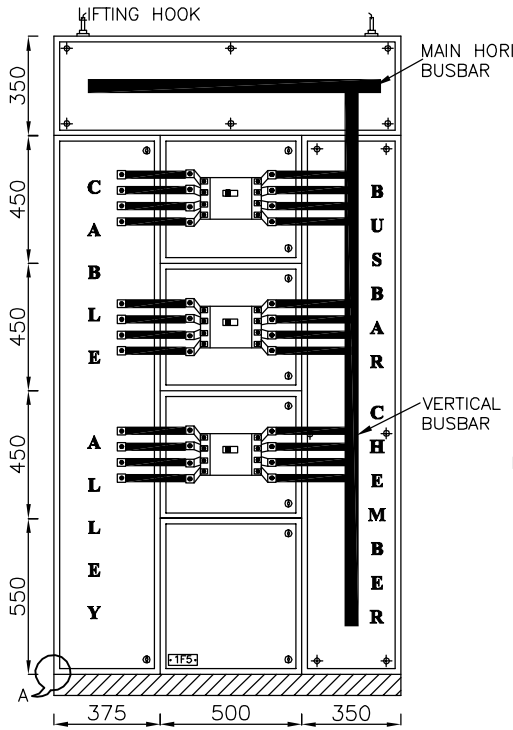


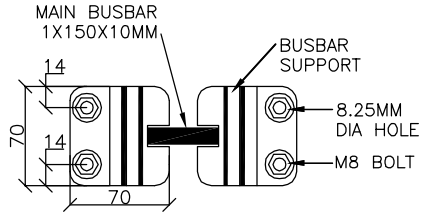
SECTIONAL VIEW AT "A"-"A"



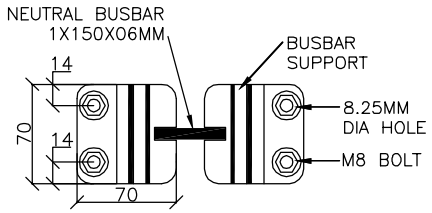
SECTIONAL VIEW AT "B"-"B"



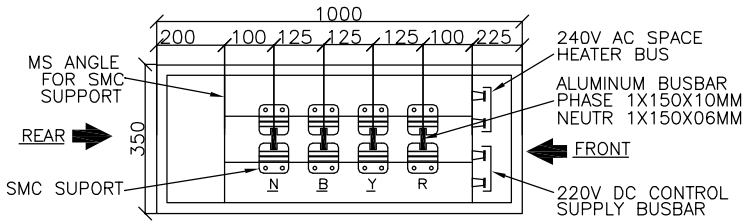
TYP. DETAIL OF PANEL NO-1
(FRONT VIEW W/O DOOR & COVER)



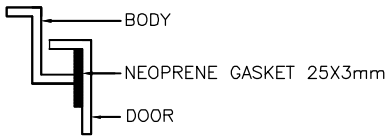
DETAIL OF PHASE BUSBAR SUPPORT



DETAIL OF NEUTRAL BUSBAR SUPPORT



SECTIONAL VIEW AT "C"-"C"
FOR HORIZONTAL BUSBAR
TOLERANCE AS PER IS



DETAIL-'A'

	04.	–	DRAWN	MP	
	03.	–	CHKD.	VDP	
	02.	–	APPD.	--	
	01.		ALL DIMENSIONS IN mm.		SIGN.
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL	TOLERANCE 5%		
DATE	No.	REVISIONS DESCRIPTION	REVISIONS : 00		

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E-mail : info@ultimaswitchgear.com

DRAWING	GENERAL ARRANGEMENT DRAWING	JOB NO. 1241A
TITLE	415V MAIN SWITCH BOARD (1A) (MCRB)	
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER-III POOLING STATION	
CLIENT: POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:- BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION	
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-101	SH. NO. 03 OF 03

1 2 3 4 5 6 7 8 9

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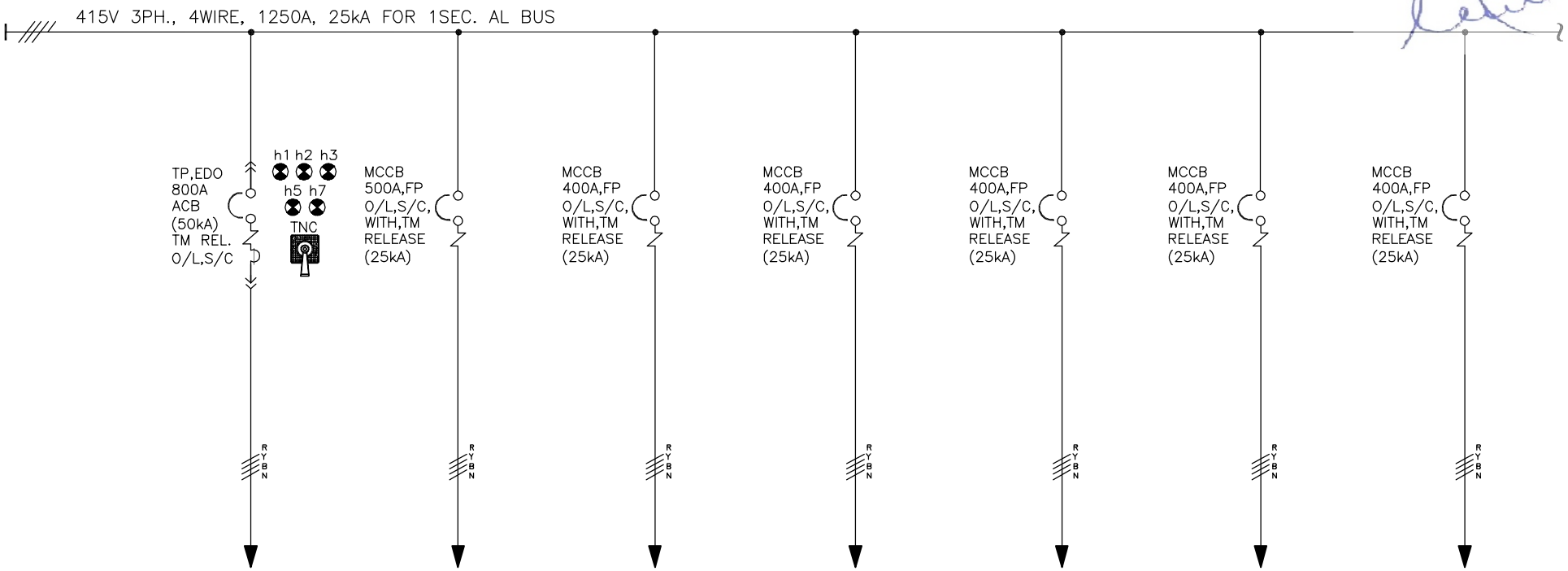

FEEDER NUMBER	2F2	1R1	1F2	1F3	1F4	1R2	1R3
MODULE TYEP	AE	E	E	E	E	E	E
FEEDER RATING	800A	500A	400A	400A	400A	400A	400A
FEEDER TYPE	ACB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB
FEEDER DESCRIPTION	TO ACDB–2A (ACDB INCOMER–1)	SPARE–1	OUTDOOR RECEPTACLES OIL FILTRATION UNIT–1 765/400kV ICT	OUTDOOR RECEPTACLES OIL FILTRATION UNIT–2 765/400kV ICT	OUTDOOR RECEPTACLES OIL FILTRATION UNIT–3 765/400kV ICT	OUTDOOR RECEPTACLES OIL FILTRATION UNIT–4 765/400kV ICT	COLONY LIGHTING
CABLE SIZE	2RX3.5CX300Sqmm AL. XLPE CABLE	––	1RX3.5CX300Sqmm AL. XLPE CABLE	1RX3.5CX300Sqmm AL. XLPE CABLE	1RX3.5CX300Sqmm AL. XLPE CABLE	1RX3.5CX300Sqmm AL. XLPE CABLE	1RX3.5CX300Sqmm AL. XLPE CABLE

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN	MP	
CHKD.	VDP	
APPD.	––	
ALL DIMENSIONS IN mm.		SIGN.
TOLERANCE 5%		
REVISIONS : 00		

MANUFACTURER
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E-mail : info@ultimaswitchgear.com

DRAWING	SINGLE LINE DIAGRAM	JOB NO. 1241A
TITLE	415V MAIN SWITCH BOARD (1A) (MCRB)	
CA NO.	CC/T/W–AIS/DOM/A10/23/01956/NOA–1/24–102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER–III POOLING STATION	
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:– BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024–2025/1241A–201	SH. NO. 01 OF 04

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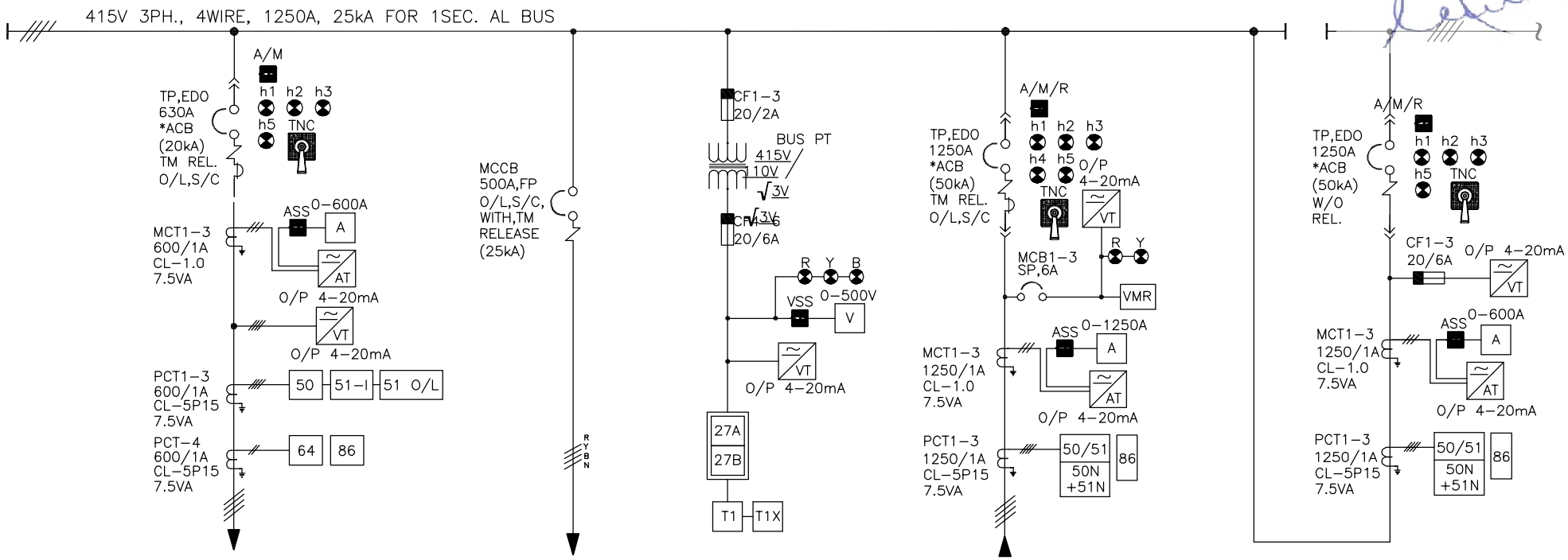

FEEDER NUMBER	3F1+3F2+3F3	1F1	4F1+4F3	4F1+4F2+4F3	5F1+5F2+5F3
MODULE TYEP	M	E	G1	AE	AE
FEEDER RATING	630A	500A	––	1250A	1250A
FEEDER TYPE	ACB	MCCB	BUS PT	ACB	ACB
FEEDER DESCRIPTION	HVW MOTOR	300KVA, LIGHTING TRANSFORMER–1	VT MODULE–1	INCOMER–1 FROM LT TRANSFORMER–1	BUSCOUPLER
CABLE SIZE	1RX3.5CX300Sqmm AL. XLPE CABLE	2RX3.5CX300Sqmm AL. XLPE CABLE	––	2Rx1Cx630Sqmm. AL XLPE FOR PHASE 1Rx1Cx630Sqmm. AL XLPE FOR NEUTRAL	––

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN MP
CHKD. VDP
APPD. ––
ALL DIMENSIONS IN mm. SIGN.
TOLERANCE 5%
REVISIONS : 00

MANUFACTURER
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E-mail : info@ultimaswitchgear.com

DRAWING	SINGLE LINE DIAGRAM
TITLE	415V MAIN SWITCH BOARD (1A) (MCRB)
CA NO.	CC/T/W–AIS/DOM/A10/23/01956/NOA–1/24–102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER–III POOLING STATION

JOB NO. 1241A

CLIENT
POWER GRID CORPORATION OF INDIA LIMITED

CONTRACTOR:–
BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION

DRG. NO. USL/PGCIL/BHEL/2024–2025/1241A–201

SH. NO. 02 OF 04

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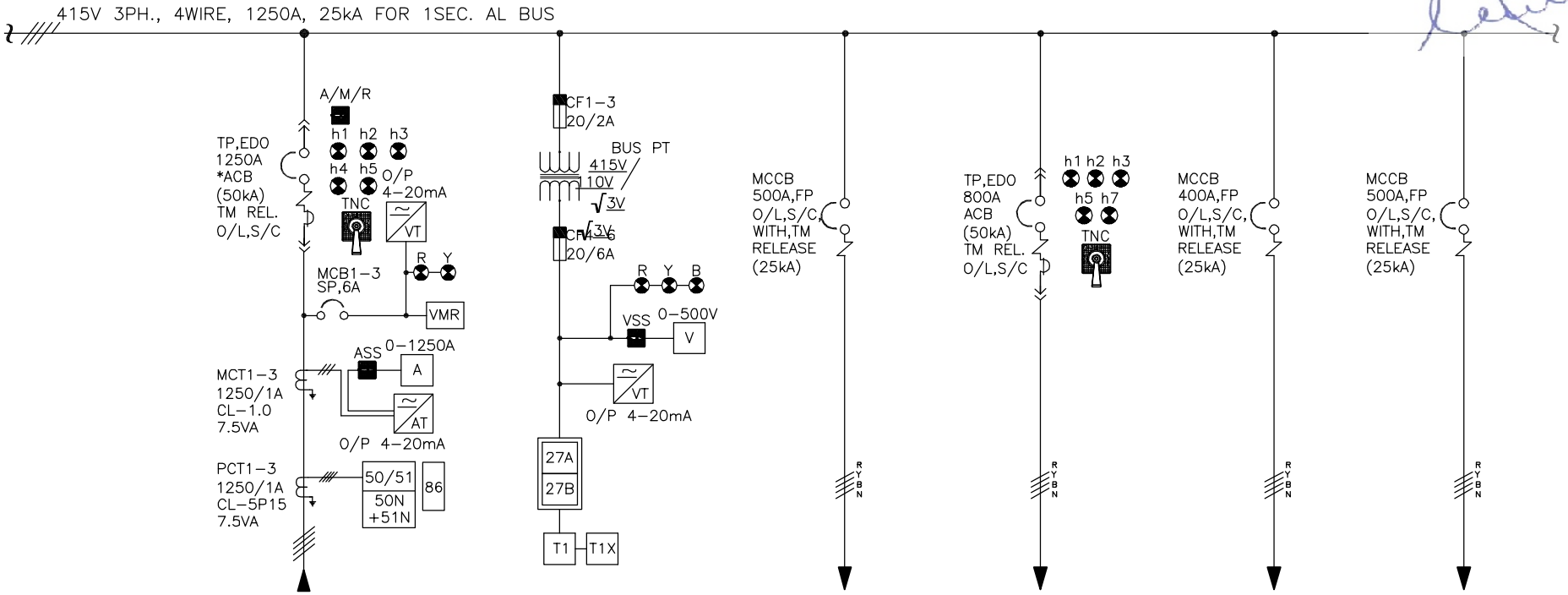

FEEDER NUMBER	6F1+6F2+6F3	6F1+6F3	8F1	7F2	8F2	8R1
MODULE TYEP	AE	G1	E	AE	E	E
FEEDER RATING	1250A	––	500A	800A	400A	500A
FEEDER TYPE	ACB	BUS PT	MCCB	ACB	MCCB	MCCB
FEEDER DESCRIPTION	INCOMER–2 FROM LT TRANSFORMER–2	VT MODULE–2	300KVA, LIGHTING TRANSFORMER–2	TO ACDB–2A (ACDB INCOMER–2)	COLONY LIGHTING	SPARE–2
CABLE SIZE	2Rx1Cx630Sqmm. AL XLPE FOR PHASE 1Rx1Cx630Sqmm. AL XLPE FOR NEUTRAL	––	2RX3.5CX300Sqmm AL. XLPE CABLE	2RX3.5CX300Sqmm AL. XLPE CABLE	1RX3.5CX300Sqmm AL. XLPE CABLE	––

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN	MP	
CHKD.	VDP	
APPD.	––	
ALL DIMENSIONS IN mm.		SIGN.
TOLERANCE 5%		
REVISIONS : 00		

MANUFACTURER
ULTIMA® SWITCHGEARS LTD.
UNIT-I KHASRA NO. 215, IND. AREA, VILLAGE RAIPUR (BHAGWANPUR), TEHSIL - ROORKEE, DISTRICT HARIDWAR (UTTRAKHAND) - 247667, INDIA, TEL : 01332-235043 FAX : 01332-235042
UNIT-II F-6 & F-7, SITE-C, UPSIDC, SURAJPUR INDUSTRIAL AREA, GREATER NOIDA - 201306 G. B. NAGAR (U.P.) INDIA
E-mail : info@ultimaswitchgear.com

DRAWING	SINGLE LINE DIAGRAM	JOB NO. 1241A
TITLE	415V MAIN SWITCH BOARD (1A) (MCRB)	
CA NO.	CC/T/W–AIS/DOM/A10/23/01956/NOA–1/24–102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER–III POOLING STATION	
CLIENT: POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:– BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION	
DRG. NO.	USL/PGCIL/BHEL/2024–2025/1241A–201	SH. NO. 03 OF 04

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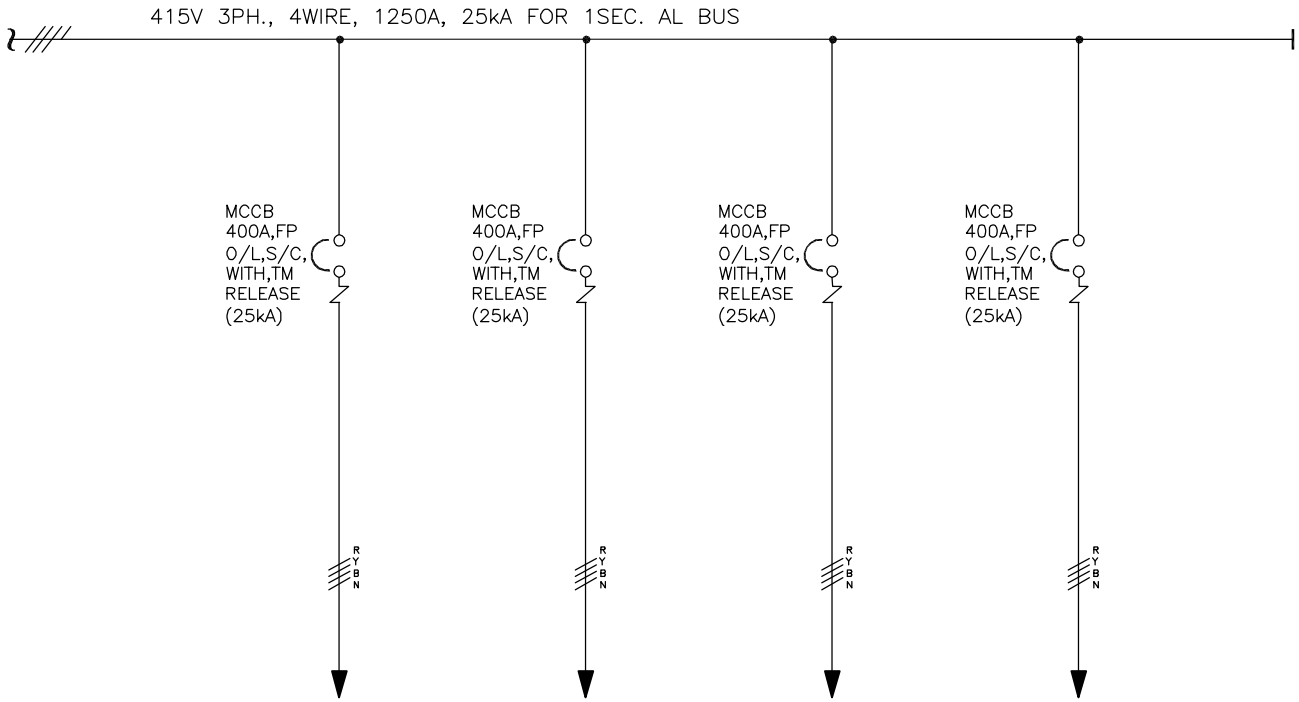

FEEDER NUMBER	8F3	8F4	8R2	8R3
MODULE TYEP	E	E	E	E
FEEDER RATING	400A	400A	400A	400A
FEEDER TYPE	MCCB	MCCB	MCCB	MCCB
FEEDER DESCRIPTION	OUTDOOR RECEPTACLES OIL FILTRATION UNIT–5 765/400kV ICT	OUTDOOR RECEPTACLES OIL FILTRATION UNIT–6 765/400kV ICT	OUTDOOR RECEPTACLES OIL FILTRATION UNIT–7 765/400kV ICT	OUTDOOR RECEPTACLES OIL FILTRATION UNIT–8 765/400kV ICT
CABLE SIZE	1RX3.5CX300Sqmm AL. XLPE CABLE	1RX3.5CX300Sqmm AL. XLPE CABLE	1RX3.5CX300Sqmm AL. XLPE CABLE	1RX3.5CX300Sqmm AL. XLPE CABLE

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN: MP
CHKD.: VDP
APPD.: ––
ALL DIMENSIONS IN mm. SIGN.
TOLERANCE 5%
REVISIONS : 00

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E-mail : info@ultimaswitchgear.com

DRAWING	SINGLE LINE DIAGRAM
TITLE	415V MAIN SWITCH BOARD (1A) (MCRB)
CA NO.	CC/T/W–AIS/DOM/A10/23/01956/NOA–1/24–102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER–III POOLING STATION
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED
CONTRACTOR:–	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024–2025/1241A–201
SH. NO.	04 OF 04

JOB NO. 1241A

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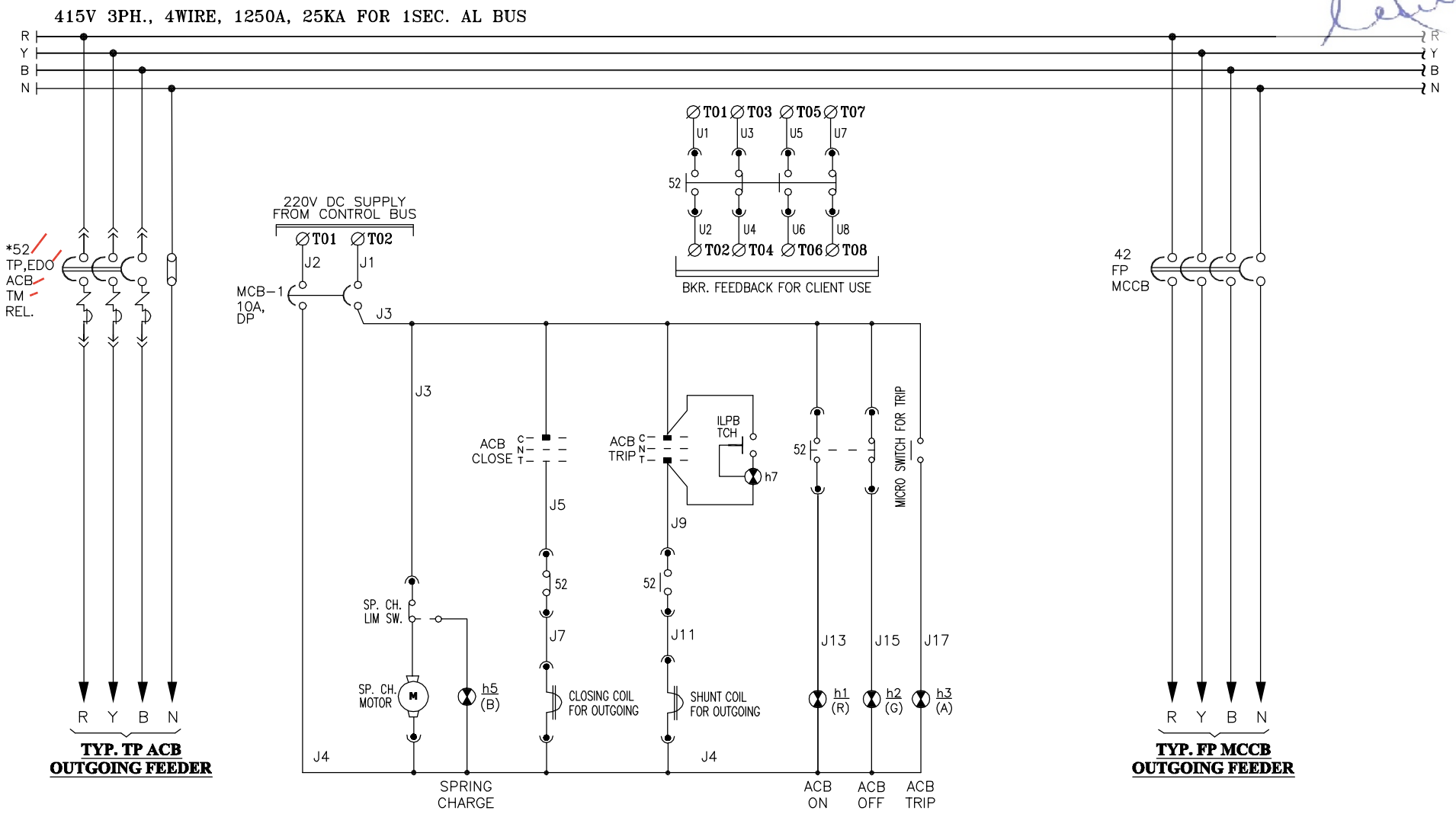

SCHEMATIC DRAWING FOR ACB OUTGOING FFEDER (AE) CIRCUIT BREAKER

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN	MP	
CHKD.	VDP	
APPD.	--	
ALL DIMENSIONS IN mm.		SIGN.
TOLERANCE 5%		
REVISIONS : 00		

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E-mail : info@ultimaswitchgear.com

DRAWING	SCHEMATIC DRAWING	JOB NO. 1241A
TITLE	415V MAIN SWITCH BOARD (1A) (MCRB)	
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER-III POOLING STATION	
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:– BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-501	SH. NO. 01 OF 01

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BILL OF MATERIAL FOR 415V MAIN SWITCH BOARD (1A) (MCRB)

S.NO.	ITEM CODE	DESCRIPTION	MAKE	RATING	QTY.
A	**BILL OF MATERIAL FOR MODULE - (AE) INCOMER 1&2**				**2NOs**
1	**52A & 52B**	TP ACB, EDO, WITH THERMAL MAGNETIC BASED RELEASE FOR O/L,S/C PROTECTION, 1. SPRING CHARGE MOTOR 220V DC WITH SPRING CHARGE SWITCH 2. CLOSING COIL 220V DC 3. SHUNT COIL 220V DC 4. LIMIT SWITCH FOR TEST/ISOLATE/SERVICE POSITION 5. 4NO + 4NC POTENTIAL FREE CONTACT.	L&T/C&S/HAVELLS	1250A, 50kA	01
2	**CF7-13**	HRC FUSE BASE	L&T/C&S/HAVELLS	20A	07
3	**CF7-13**	HRC FUSE LINK	L&T/C&S/HAVELLS	6A	07
4	**94,SX,1TX,52AX**	AUX. CONTACTOR RELAY, COIL VOLTAGE 220V DC WITH 2NO+2NC AUX. CONTACT	L&T/C&S/HAVELLS	--	04
5	**T1X**	AUX. CONTACTOR RELAY, COIL VOLTAGE 220V DC WITH 3NO+1NC AUX. CONTACT	L&T/C&S/HAVELLS		01
6	**BZ,WT,OT**	AUX. CONTACTOR RELAY, COIL VOLTAGE 220V DC WITH 4NO AUX. CONTACT	L&T/C&S/HAVELLS	--	06
7	**52AX**	2NO+2NC ADD ON BLOCK	L&T/C&S/HAVELLS	--	01
8	**MCB**	DP MINIATURE CIRCUIT BREAKER, DC TYPE	L&T/C&S/HAVELLS	10A, DP	01
9	**MCB**	DP MINIATURE CIRCUIT BREAKER, DC TYPE	L&T/C&S/HAVELLS	6A, DP	01
10	**MCB**	SP MINIATURE CIRCUIT BREAKER, 'C' CURVE	L&T/C&S/HAVELLS	6A, SP	03
11	**MCTs**	CURRENT TRANSFORMER, RESIN CAST TYPE	NEWTEK/AE/PRECISE/ PROCOM/ASHMOR	1250/1A, CL-1, 7.5VA	03
12	**PCTs**	CURRENT TRANSFORMER, RESIN CAST TYPE		1250/1A, CL-5P15, 7.5VA	04
13	**A**	ANALOG AMMETER, SINGLE PHASE, SIZE-96X96 Sq. mm, CL-1.0, CTR-/1A	AE/RISHAB/NEWTEK/SECURE	0-1250A	01
14	**ASS**	AMMETER SELECTOR SWITCH, ROTARY TYPE	SALZER/KAYCEE/TELERGON	6A	01
15	**A/M/R**	AUTO/MANUAL/REMOTE SELECTOR SWITCH WITH OFF, 3POLE 3WAY, ROTARY TYPE	SALZER/KAYCEE/TELERGON	6A	01
16	**TNC**	BREAKER CONTROL SWITCH, ROTARY TYPE	SALZER/KAYCEE/TELERGON	16A	01
17	**86**	HIGH SPEED TRIPPING RELAY (AUTO RESET)	L&T/JVS/C&S	NOMINAL VOLTAGE 220V DC	01
18	**50 + 51**	TRIPLE POLE INSTANTANEOUS OVER-CURRENT RELAY HAVING THE SETTING RANGE OF 200-800% OR 500-2000% OF CT SECONDARY AND ADJUSTABLE DEFINITE MINIMUM TIME, AUX. SUPPLY 220V DC .	L&T/JVS/C&S	-/1A	01
19	**50N + 51N**	INSTANTANEOUS EARTH FAULT RELAY HAVING AN ADJUSTABLE SETTING RANGE OF 10-40% OR 20 - 80% OF CT SECONDARY CURRENT AND ADJUSTABLE DEFINITE MINIMUM TIME. THE EARTH FAULT RELAY SHALL BE PROVIDED WITH A STABILISING RESISTOR, AUX. SUPPLY 220V DC.	L&T/JVS/C&S	-/1A	01

NOTE:- ALL COMPONENTS SHALL BE POWER GRID (QA&I) APPROVED MAKE

DATE	No.	REVISIONS DESCRIPTION
	04.	-
	03.	-
	02.	-
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN: MP
CHKD.: VDP
APPD.: --
ALL DIMENSIONS IN mm.
TOLERANCE 5%
REVISIONS : 00
SIGN.

MANUFACTURER
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E-mail : info@ultimaswitchgear.com

DRAWING	BILL OF MATERIAL	JOB NO. 1241A
TITLE	415V MAIN SWITCH BOARD (1A) (MCRB)	
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER-III POOLING STATION	
CLIENT: POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:- BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION	
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-701	SH. NO. 01 OF 06

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BILL OF MATERIAL FOR 415V MAIN SWITCH BOARD (1A) (MCRB)

S.NO.	ITEM CODE	DESCRIPTION	MAKE	RATING	QTY.
A	**BILL OF MATERIAL FOR MODULE - (AE) INCOMER 1&2**				**2NOs**
20	**VMR-1, VMR-2**	415V AC, THREE PHASE, 3WIRE, VOLTAGE MONITORING RELAY	MINILEC/PGCIL APPROVED MAKE	--	01
21	**Ct**	AC CURRENT TRANSDUCER, SINGLE OUTPUT- 4-20mA, CT RATIO-1250/1A, AUX. SUPPLY 220V DC	AE/RISHAB/SECURE/PGCIL APPROVED	--	03
22	**Vt**	AC VOLTAGE TRANSDUCER, SINGLE OUTPUT- 4-20mA, PTR-415V AC, AUX. SUPPLY 220V DC	AE/RISHAB/SECURE	--	03
23	**R-PHASE**	'R' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, RED	ESBEE/VAISHNO/C&S	240V AC	01
24	**Y-PHASE**	'Y' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, YELLOW	ESBEE/VAISHNO/C&S	240V AC	01
25	**B-PHASE**	'B' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, BLUE	ESBEE/VAISHNO/C&S	240V AC	01
26	**h1**	'ON' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, RED	ESBEE/VAISHNO/C&S	220V DC	01
27	**h2**	'OFF' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, GREEN	ESBEE/VAISHNO/C&S	220V DC	01
28	**h3**	'TRIP' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, AMBER	ESBEE/VAISHNO/C&S	220V DC	01
29	**h4**	TRANSFORMER FAULT INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, WHITE	ESBEE/VAISHNO/C&S	220V DC	01
30	**h5**	'SPRING CHARGE' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, BLUE	ESBEE/VAISHNO/C&S	220V DC	01
31	**P1, P2**	TRIP & NON-TRIP FAULT RESET PUSH BUTTON, 22.5 Sq. mm. DIA, SPRING RETURN TYPE, BLACK WITH 4NC CONTACT	ESBEE/VAISHNO/C&S	--	02
32	**1T, 2T**	ON DELAY TIMER WITH 1C/O AUXILIARY SWITCH, 0-60 SEC.	GIC/PGCIL APPROVED MAKE	220V DC	01
33	**T1A, T2A**	ON DELAY TIMER WITH 1C/O AUXILIARY SWITCH, 0-60 SEC.	GIC/PGCIL APPROVED MAKE	220V DC	01
0					
B	**BILL OF MATERIAL FOR MODULE - (E) FOR OUTGOINGS**				
1	**MCCB**	FP MCCB 415V, WITH THERMAL MAGNETIC BASED RELEASE FOR O/L,S/C PROTECTION WITH SPREADER LINK & EXTENDED ROM, Ics = 100% Icu	L&T/C&S/HAVELLS	500A, 25kA	04
2	**MCCB**	FP MCCB 415V, WITH THERMAL MAGNETIC BASED RELEASE FOR O/L,S/C PROTECTION WITH SPREADER LINK & EXTENDED ROM, Ics = 100% Icu	L&T/C&S/HAVELLS	400A, 25kA	10

NOTE:- ALL COMPONENTS SHALL BE POWER GRID (QA&I) APPROVED MAKE

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	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN: MP
CHKD.: VDP
APPD.: --
ALL DIMENSIONS IN mm. SIGN.
TOLERANCE 5%
REVISIONS : 00

MANUFACTURER
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DRAWING	BILL OF MATERIAL
TITLE	415V MAIN SWITCH BOARD (1A) (MCRB)
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER-III POOLING STATION
JOB NO.	1241A

CLIENT
POWER GRID CORPORATION OF INDIA LIMITED

CONTRACTOR:-
BHARAT HEAVY ELECTRICAL LIMITED (BHEL)
TRANSMISSION PROJECTS DIVISION

DRG. NO. USL/PGCIL/BHEL/2024-2025/1241A-701 SH. NO. 02 OF 06

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BILL OF MATERIAL FOR 415V MAIN SWITCH BOARD (1A) (MCRB)

S.NO.	ITEM CODE	DESCRIPTION	MAKE	RATING	QTY.
C	**BILL OF MATERIAL FOR MODULE - (M1) CIRCUIT BREAKER CONTROLLED MOTOR FEEDER**				**1NO**
1	**52**	TP ACB, EDO, WITH THERMAL MAGNETIC BASED RELEASE FOR O/L,S/C PROTECTION, 1. SPRING CHARGE MOTOR 220V DC WITH SPRING CHARGE SWITCH 2. CLOSING COIL 220V DC 3. SHUNT COIL 220V DC 4. LIMIT SWITCH FOR TEST/ISOLATE/SERVICE POSITION 5. 4NO + 4NC POTENTIAL FREE CONTACT.	L&T/C&S/HAVELLS	630A, 20kA	01
2	**CF1-7**	HRC FUSE BASE	L&T/C&S/HAVELLS	20A	7
3	**CF1-7**	HRC FUSE LINK	L&T/C&S/HAVELLS	6A	7
4	**MCB**	DP MINIATURE CIRCUIT BREAKER, DC TYPE	L&T/C&S/HAVELLS	10A, DP	01
5	**MCB**	DP MINIATURE CIRCUIT BREAKER, DC TYPE	L&T/C&S/HAVELLS	6A, DP	01
6	**MCB**	SP MINIATURE CIRCUIT BREAKER, 'C' CURVE	L&T/C&S/HAVELLS	6A, SP	03
7	**94, 52X**	AUX. CONTACTOR RELAY, COIL VOLTAGE 220V DC WITH 2NO+2NC AUX. CONTACT	L&T/C&S/HAVELLS	2NO+2NC, 220V DC	02
8		2NO+2NC ADD ON BLOCK	L&T/C&S/HAVELLS	2NO+2NC	01
9	**MCTs**	CURRENT TRANSFORMER, RESIN CAST TYPE	NEWTEK/AE/PRECISE/ PROCOM/ASHMOR	600/1A, CL-1, 7.5VA	03
10	**PCTs**	CURRENT TRANSFORMER, RESIN CAST TYPE		600/1A, CL-5P15, 7.5VA	04
11	**A**	ANALOG AMMETER, SINGLE PHASE, SIZE-96X96 Sq. mm, CL-1.0, CTR-/1A	AE/RISHAB/NEWTEK/SECURE	0-600A	01
12	**ASS**	AMMETER SELECTOR SWITCH, ROTARY TYPE	SALZER/KAYCEE/TELERGON	6A	01
13	**A/M**	AUTO/MANUAL SELECTOR SWITCH WITH OFF, 6POLE 3WAY, ROTARY TYPE	SALZER/KAYCEE/TELERGON	6A	01
14	**TNC**	BREAKER CONTROL SWITCH, ROTARY TYPE	SALZER/KAYCEE/TELERGON	16A	01
15	**86**	HIGH SPEED TRIPPING RELAY (AUTO RESET)	L&T/JVS/C&S	NOMINAL VOLTAGE-220V DC	01
16	**50 + 51**	TRIPLE POLE INSTANTANEOUS OVER-CURRENT RELAY FOR PROVIDING POSITIVE SEQUENCE CURRENT PROTECTION IN ALL THE THREE PHASES. THE RELAY SETTING RANGE SHALL BE CONTINUOUSLY ADJUSTABLE BETWEEN 200-800% OR 400-1600% OF CT SECONDARY RATED CURRENT AS REQUIRED., AUX. SUPPLY 220V DC .	L&T/JVS/C&S	600/1A	01
17	**50 + 51**	DOUBLE POLE INVERSE DEFINITE MINIMUM TIME OVER CURRENT RELAYS CONNECTED IN R & B PHASES FOR OVER CURRENT PROTECTION OF MOTOR RATED 110 KW - 200 KW. THE RELAY SHALL HAVE AN ADJUSTABLE SETTING RANGE OF 50% - 200% OF CT SECONDARY CURRENT AND TIME SETTING RANGE OF 0-30 SECOND. THE RELAY SHALL BE CDGM-22 OF EE OR EQUIVALENT. AUX. SUPPLY 220V DC .	L&T/JVS/C&S	600/1A	01
18	**50 + 51**	SINGLE POLE ADJUSTABLE DEFINITE TIME DELAY RELAY FOR MOTOR OVERLOAD ALARM CONNECTED IN Y-PHASE ONLY. THE RELAY SHALL HAVE RESETTING RATIO OF NOT LESS THAN 90%. THE RELAY SHALL HAVE CONTINUOUSLY ADJUSTABLE TIME DELAY RANGE OF 2.5 TO 25 SEC., AUX. SUPPLY 220V DC .	L&T/JVS/C&S	600/1A	01
19	**50N + 51N**	INSTANTANEOUS EARTH FAULT RELAY HAVING AN ADJUSTABLE SETTING RANGE OF 10-40% OR 20 - 80% OF CT SECONDARY CURRENT. THE EARTH FAULT RELAY SHALL BE PROVIDED WITH A STABILISING RESISTOR, AUX. SUPPLY 220V DC.	L&T/JVS/C&S	600/1A	01
20	**h1**	'ON' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, RED	ESBEE/VAISHNO/C&S	220V DC	01
21	**h2**	'OFF' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, GREEN	ESBEE/VAISHNO/C&S	220V DC	01
22	**h3**	'TRIP' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, AMBER	ESBEE/VAISHNO/C&S	220V DC	01
23	**h5**	'SPRING CHARGE' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, BLUE	ESBEE/VAISHNO/C&S	220V DC	01
24	**Vt**	AC VOLTAGE TRANSDUCER, SINGLE OUTPUT- 4-20mA, PT RATIO-415V, AUX. SUPPLY 220V DC	AE/RISHAB/SECURE	--	03
25	**Ct**	AC CURRENT TRANSDUCER, SINGLE OUTPUT- 4-20mA, CT RATIO-600/1A, AUX. SUPPLY 220V DC	AE/RISHAB/SECURE	--	03

NOTE:- ALL COMPONENTS SHALL BE POWER GRID (QA&I) APPROVED MAKE

DATE	No.	REVISIONS DESCRIPTION
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	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN	MP	
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ALL DIMENSIONS IN mm.		SIGN.
TOLERANCE 5%		
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DRAWING	BILL OF MATERIAL	JOB NO. 1241A
TITLE	415V MAIN SWITCH BOARD (1A) (MCRB)	
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER-III POOLING STATION	
CLIENT: POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:- BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION	
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-701	SH. NO. 03 OF 06

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BILL OF MATERIAL FOR 415V MAIN SWITCH BOARD (1A) (MCRB)

S.NO.	ITEM CODE	DESCRIPTION	MAKE	RATING	QTY.
D		**BILL OF MATERIAL FOR MODULE - (AE) BUS-COUPLER**			1NO
1	52C	TP ACB 415V,EDO, WITH OUT RELEASE , 1. SPRING CHARGE MOTOR 220V DC WITH SPRING CHARGE SWITCH 2. CLOSING RELEASE 220V DC 3. SHUNT RELEASE 220V DC 4. UNDER VOLTAGE RELEASE 415V AC 5. LIMIT SWITCH FOR TEST/ISOLATE/SERVICE POSITION 6. 4NO + 4NC POTENTIAL FREE CONTACT.	L&T/C&S/HAVELLS	1250A, 50kA	01
2	CF1-12	HRC FUSE BASE	L&T/C&S/HAVELLS	20A	12
3	CF1-12	HRC FUSE LINK	L&T/C&S/HAVELLS	6A	12
4	MCB	DP MINIATURE CIRCUIT BREAKER, DC TYPE	L&T/C&S/HAVELLS	10A	01
5	94, CO, 52CX, SX,	AUX. CONTACTOR RELAY, COIL VOLTAGE 220V DC WITH 2NO+2NC AUX. CONTACT	L&T/C&S/HAVELLS	--	04
6	T3X	AUX. CONTACTOR RELAY, COIL VOLTAGE 220V DC WITH 3NO+1NC AUX. CONTACT	L&T/C&S/HAVELLS	--	01
7	52CX	2NO+2NC ADD ON BLOCK	L&T/C&S/HAVELLS	--	01
8	MCTs	CURRENT TRANSFORMER, RESIN CAST TYPE	NEWTEK/AE/PRECISE/PROCOM/ASHMOR	1250/1A, CL-1, 7.5VA	03
9	PCTs	CURRENT TRANSFORMER, RESIN CAST TYPE	NEWTEK/AE/PRECISE/PROCOM/ASHMOR	1250/1A, CL-5P15, 7.5VA	04
10	A	ANALOG AMMETER, SINGLE PHASE, SIZE-96X96 Sq. mm, CL-1.0, CTR-/1A	AE/RISHAB/NEWTEK/SECURE	0-1250A	01
11	ASS	AMMETER SELECTOR SWITCH, ROTARY TYPE	SALZER/KAYCEE/TELERGON	6A	01
12	A/M/R	AUTO/MANUAL/REMOTE SELECTOR SWITCH WITH OFF, 3POLE 3WAY, ROTARY TYPE	SALZER/KAYCEE/TELERGON	6A	01
13	TNC	BREAKER CONTROL SWITCH, ROTARY TYPE	SALZER/KAYCEE/TELERGON	16A	01
14	86	HIGH SPEED TRIPPING RELAY (AUTO RESET)	L&T/JVS/C&S	NOMINAL VOLTAGE 220V DC	01
15	50 + 51	TRIPLE POLE INSTANTANEOUS OVER-CURRENT RELAY HAVING THE SETTING RANGE OF 200-800% OR 500-2000% OF CT SECONDARY AND ADJUSTABLE DEFINITE MINIMUM TIME, AUX. SUPPLY 220V DC .	L&T/JVS/C&S	-/1A	01
16	50N + 51N	INSTANTANEOUS EARTH FAULT RELAY HAVING AN ADJUSTABLE SETTING RANGE OF 10-40% OR 20 - 80% OF CT SECONDARY CURRENT AND ADJUSTABLE DEFINITE MINIMUM TIME. THE EARTH FAULT RELAY SHALL BE PROVIDED WITH A STABILISING RESISTOR, AUX. SUPPLY 220V DC.	L&T/JVS/C&S	-/1A	01
17	h1	'ON' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, RED	ESBEE/VAISHNO/C&S	220V DC	01
18	h2	'OFF' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, GREEN	ESBEE/VAISHNO/C&S	220V DC	01
19	h3	'TRIP' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, AMBER	ESBEE/VAISHNO/C&S	220V DC	01
20	h5	'SPRING CHARGE' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, BLUE	ESBEE/VAISHNO/C&S	220V DC	01
21	T3	ON DELAY TIMER WITH 1C/O AUXILIARY SWITCH, 0-60 SEC.	GIC/PGCIL APPROVED MAKE	220V DC	01
22	Vt	AC VOLTAGE TRANSDUCER, SINGLE OUTPUT- 4-20mA, PTR-415V AC, AUX. SUPPLY 220V DC	AE/RISHAB/SECURE	--	03
23	Ct	AC CURRENT TRANSDUCER, OUTPUT- 4-20mA, WITH SINGLE OUTPUT, AUX. SUPPLY 220V DC	AE/RISHAB/SECURE	1250/1A	03

NOTE:- ALL COMPONENTS SHALL BE POWER GRID (QA&I) APPROVED MAKE

DATE	No.	REVISIONS DESCRIPTION
	04.	-
	03.	-
	02.	-
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN: MP
CHKD.: VDP
APPD.: --
ALL DIMENSIONS IN mm.
TOLERANCE 5%
REVISIONS : 00
SIGN.

MANUFACTURER
ULTIMA SWITCHGEARS LTD.
UNIT-I KHASRA NO. 215, IND. AREA, VILLAGE RAIPUR (BHAGWANPUR), TEHSIL - ROORKEE, DISTRICT HARIDWAR (UTTRAKHAND) - 247667, INDIA, TEL : 01332-235043 FAX : 01332-235042
UNIT-II F-6 & F-7, SITE-C, UPSIDC, SURAJPUR INDUSTRIAL AREA, GREATER NOIDA - 201306 G. B. NAGAR (U.P.) INDIA
E-mail : info@ultimaswitchgear.com

DRAWING	BILL OF MATERIAL
TITLE	415V MAIN SWITCH BOARD (1A) (MCRB)
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER-III POOLING STATION
JOB NO.	1241A
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED
CONTRACTOR:-	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-701
SH. NO.	04 OF 06

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BILL OF MATERIAL FOR 415V MAIN SWITCH BOARD (1A) (MCRB)

PT & FUSE WILL MOUNTED ON THE DETACHABLE CHANNEL (DRAWOUT)

S.NO.	ITEM CODE	DESCRIPTION	MAKE	RATING	QTY.
E	**BILL OF MATERIAL FOR MODULE - (G1) (BUS PT MODULE)**				**2NOs**
1	**CF1-6**	HRC FUSE BASE (MOUNTED ON CHASSIS OF VOLTAGE TRANSFORMER)	L&T/C&S/HAVELLS	20A	06
2	**CF1-3**	HRC FUSE LINK	L&T/C&S/HAVELLS	2A	03
3	**CF4-6**	HRC FUSE LINK	L&T/C&S/HAVELLS	6A	03
4	**BUS-PT**	(415/√3V)/(110/√3V)VOLTS SINGLE PHASE VOLTAGE TRANSFORMER STAR/STAR CONNECT WITH STAR POINT SOLIDLY EARTHED MOUNTED ON COMMON DRAW OUT CHASSIS. ACCURACY CLASS 0.5 FOR PROTECTION AND METERING WITH 50VA BURDEN.	NEWTEK/AE/PRECISE/PROCOM/ ASHMOR	--	03
5	**Vt**	AC VOLTAGE TRANSDUCER, SINGLE OUTPUT (4-20mA), PT RATIO-PTR-(415/√3V)/(110/√3V) AC, AUX. SUPPLY 220V DC	AE/RISHAB/SECURE	--	03
6	**V**	ANALOG VOLTMETER, SINGLE PHASE, SIZE-96X96 Sq. mm, CL-1.0, PTR-(415/√3 V)/(110/√3V) AC	AE/RISHAB/NEWTEK/SECURE	0-500V	01
7	**VSS**	FOUR POSITION VOLTMETER SELECTOR SWITCH, ROTARY TYPE	SALZER/KAYCEE/TELERGON	--	01
8	**27A+27B**	DOUBLE POLE INSTANTANEOUS UNDER VOLTAGE RELAYS WITH CONTINUOUS VARIABLE SETTING RANGE OF 40-80% OF 110 VOLTS, PT RATIO, (415/√3 V)/(110/√3V) AUX. SUPPLY 220V DC	L&T/JVS/C&S	--	01
9	T1, T2	TIME DELAY PICK UP RELAY HAVING A TIME SETTING RANGE OF 0.5 TO 3 SECS. WITH 3 'NO'. SELF RESET CONTACTS, SUITABLE FOR 220V	L&T/JVS/C&S	--	01
10	T1X, T2X	AUXILIARY RELAY 220V DC WITH 2 NO. SELF RESET CONTACTS.	L&T/JVS/C&S	--	01
11	**R-PHASE**	'R' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, RED	ESBEE/VAISHNO/C&S	63.5V AC	01
12	**Y-PHASE**	'Y' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, YELLOW	ESBEE/VAISHNO/C&S	63.5V AC	01
13	**B-PHASE**	'B' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, BLUE	ESBEE/VAISHNO/C&S	63.5V AC	01
F	**BILL OF MATERIAL FOR MISC.**				
1	**MCB**	DP MINIATURE CIRCUIT BREAKER, 'C' CURVE	L&T/C&S/HAVELLS	25A, 10kA	01
2	**MCB**	DP MINIATURE CIRCUIT BREAKER, DC TYPE	L&T/C&S/HAVELLS	25A	02
3	**MCB**	SP MINIATURE CIRCUIT BREAKER, 'C' CURVE	L&T/C&S/HAVELLS	16A, 10kA	08
4	**SW - SOCKET**	SWITCH WITH SOCKET	ANCHOR/REPUTED	5/15A	02
5	**SS**	SELECTOR SWITCH, 2P, 2W WITH OFF	SALZER/KAYCEE	32A	01
6	**DS**	DOOR SWITCH	SURAJ/PGCIL APPROVED MAKE	1 C/O	08
7	**PL**	PANEL ILLUMINATION LIGHT, 230V AC	HAVELLS//PGCIL APPROVED MAKE	5W	08
8	**SH**	SPACE HEATER, 230V AC	HOTWEL/PGCIL APPROVED MAKE	60W	08
9	**TH**	THERMOSTATE	ELCON/PGCIL APPROVED MAKE	30 - 85°C	08
10	**TS**	TOGGLE SWITCH	FTC/PGCIL APPROVED MAKE	6A	08

NOTE:- ALL COMPONENTS SHALL BE POWER GRID (QA&I) APPROVED MAKE

DATE	No.	REVISIONS DESCRIPTION
	04.	-
	03.	-
	02.	-
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN: MP | CHKD.: VDP | APPD.: -- | ALL DIMENSIONS IN mm. | TOLERANCE 5% | REVISIONS : 00 | SIGN.

MANUFACTURER
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E-mail : info@ultimaswitchgear.com

DRAWING	BILL OF MATERIAL
TITLE	415V MAIN SWITCH BOARD (1A) (MCRB)
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER-III POOLING STATION
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED
CONTRACTOR:-	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-701
JOB NO.	1241A
SH. NO.	05 OF 06

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BILL OF MATERIAL FOR 415V MAIN SWITCH BOARD (1A) (MCRB)

S.NO.	ITEM CODE	DESCRIPTION	MAKE	RATING	QTY.
G	**BILL OF MATERIAL FOR MODULE - (AE) FOR ACB OUTGOINGS**				**2NOs**
1	**52**	TP ACB, EDO, WITH TM BASED RELEASE FOR O/L,S/C PROTECTION, 1. SPRING CHARGE MOTOR 220V DC WITH SPRING CHARGE SWITCH 2. CLOSING COIL 220V DC 3. SHUNT COIL 220V DC 4. LIMIT SWITCH FOR TRIP POSITION 5. 4NO + 4NC POTENTIAL FREE CONTACT.	L&T/C&S/HAVELLS	800A, 50kA	01
2	**TNC**	BREAKER CONTROL SWITCH, ROTARY TYPE	SALZER/KAYCEE/TELERGON	16A	01
3	**MCB**	DP MINIATURE CIRCUIT BREAKER, DC TYPE	L&T/C&S/HAVELLS	10A, DP	01
4	**h1**	'ON' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, RED	ESBEE/VAISHNO/C&S	220V DC	01
5	**h2**	'OFF' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, GREEN	ESBEE/VAISHNO/C&S	220V DC	01
6	**h3**	'TRIP' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, AMBER	ESBEE/VAISHNO/C&S	220V DC	01
7	**h5**	'SPRING CHARGE' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, BLUE	ESBEE/VAISHNO/C&S	220V DC	01
8	**h7**	ILLUMINATION PUSH BUITTON, 22.5 Sq. mm. DIA ,LED TYPE, WHITE	ESBEE/VAISHNO/C&S	220V DC	01

NOTE:– ALL COMPONENTS SHALL BE POWER GRID (QA&I) APPROVED MAKE

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN MP
CHKD. VDP
APPD. --
ALL DIMENSIONS IN mm. SIGN.
TOLERANCE 5%
REVISIONS : 00

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DRAWING	BILL OF MATERIAL
TITLE	415V MAIN SWITCH BOARD (1A) (MCRB)
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER-III POOLING STATION
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED
CONTRACTOR:–	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024–2025/1241A–701
SH. NO.	06 OF 06

JOB NO. 1241A

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ENGINEERING DRAWING DETAILS FOR

415V AC DISTRIBUTION BOARD (2A) (MCRB)

PROJECT :- 765/400/220kV BIKANER-III POOLING STATION

CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED

CONTRACTOR :- BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN	MP	
CHKD.	VDP	
APPD.	--	
ALL DIMENSIONS IN mm.		SIGN.
TOLERANCE 5%		
REVISIONS : 00		

MANUFACTURER
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E-mail : info@ultimaswitchgear.com

DRAWING	COVER PAGE	JOB NO. 1241A
TITLE	415V AC DISTRIBUTION BOARD (2A) (MCRB)	
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER-III POOLING STATION	
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:- BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-002	SH. NO. 01 OF 01

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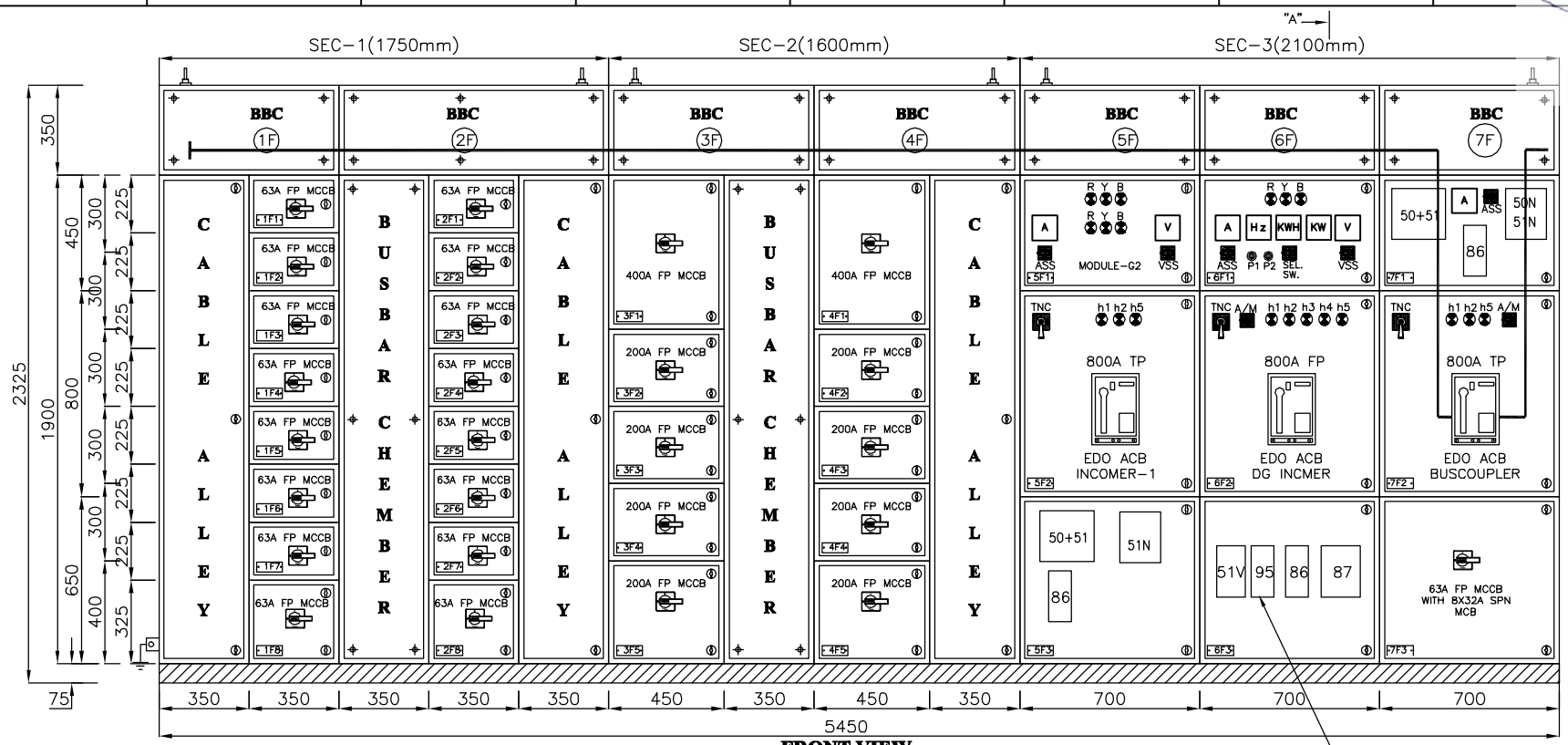
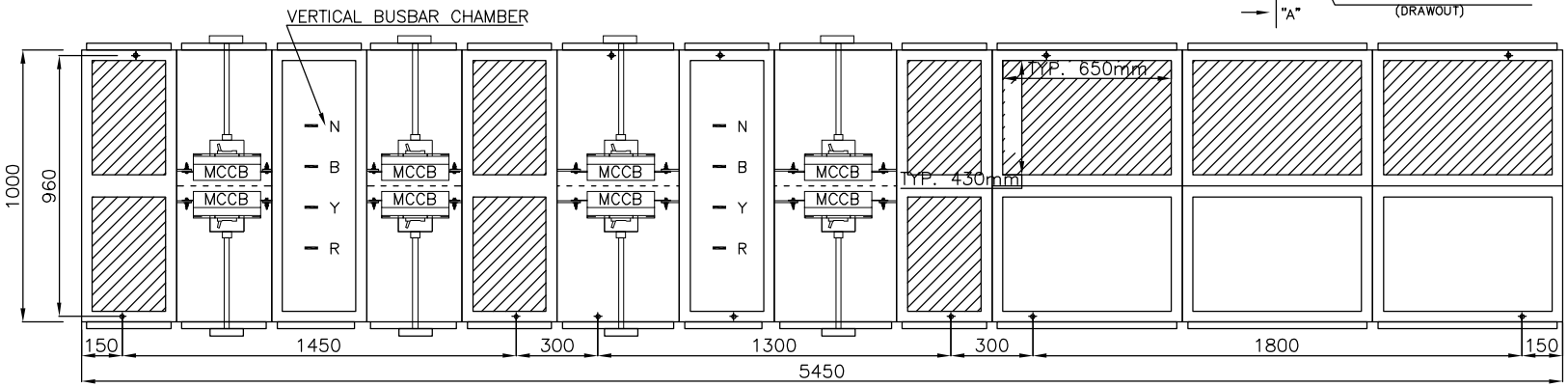


FRONT VIEW



BOTTOM VIEW

	04.	–	DRAWN	MP	
	03.	–	CHKD.	VDP	
	02.	–	APPD.	--	
	01.		ALL DIMENSIONS IN mm.		SIGN.
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL	TOLERANCE 5%		
DATE	No.	REVISIONS DESCRIPTION	REVISIONS : 00		

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UNIT-I KHASRA NO. 215, IND. AREA, VILLAGE RAIPUR (BHAGWANPUR), TEHSIL - ROORKEE, DISTRICT HARIDWAR (UTTRAKHAND) - 247667, INDIA, TEL : 01332-235043 FAX : 01332-235042
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E-mail : info@ultimaswitchgear.com

DRAWING	GENERAL ARRANGEMENT DRAWING		JOB NO. 1241A
TITLE	415V AC DISTRIBUTION BOARD (2A) (MCRB)		
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024		
PROJECT	765/400/220kV BIKANER-III POOLING STATION		
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:- BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION	
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-102		SH. NO. 01 OF 05

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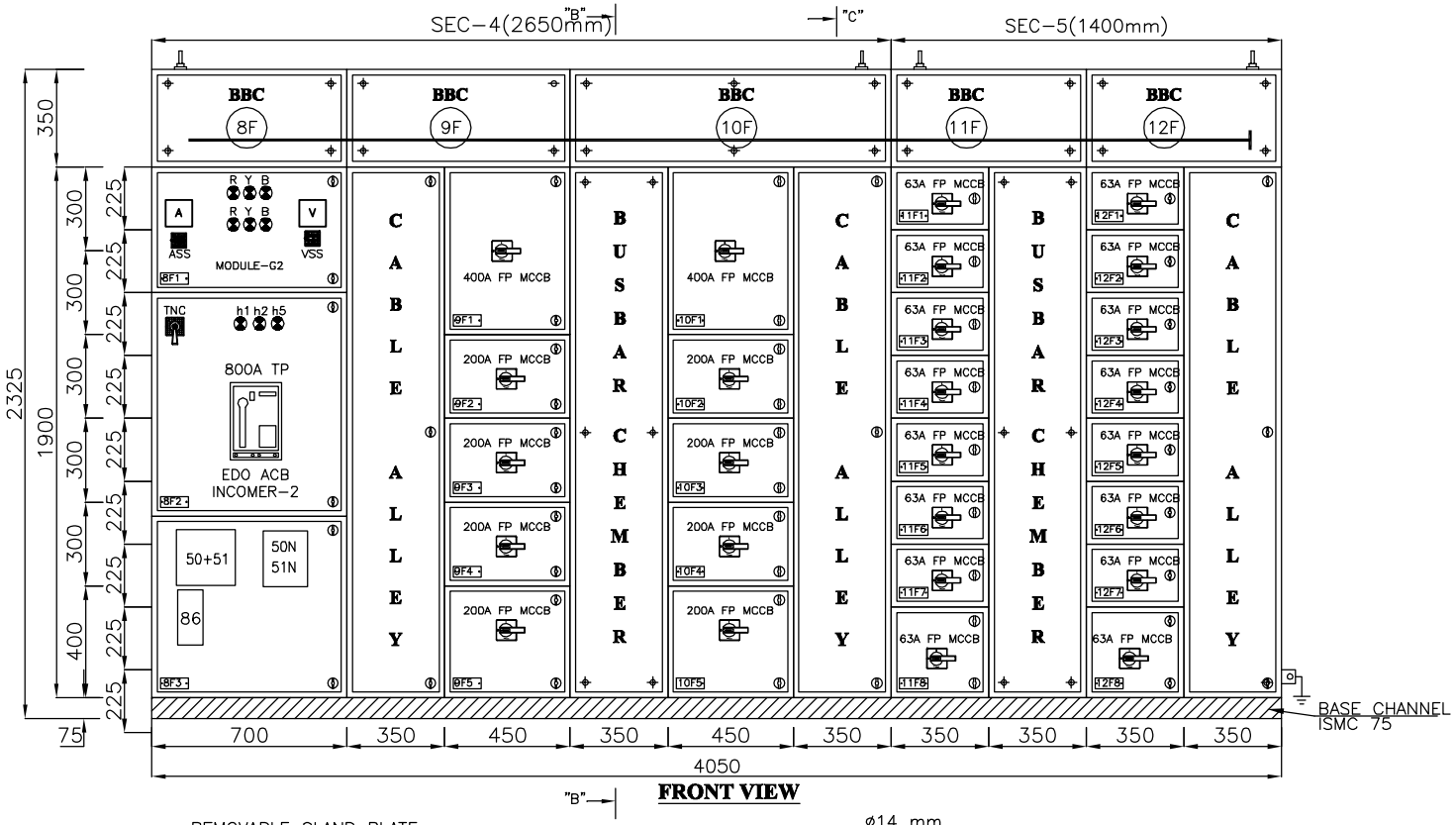
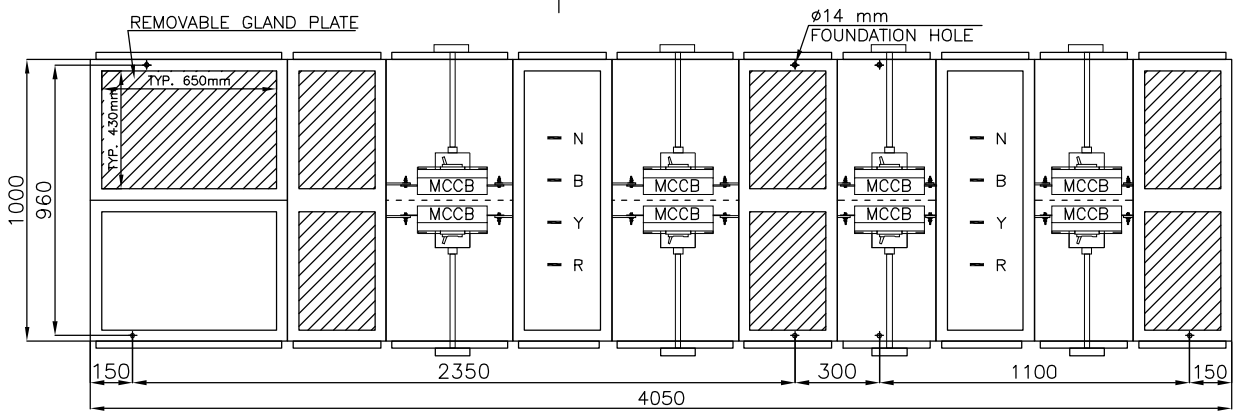


FRONT VIEW



BOTTOM VIEW

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN	MP	
CHKD.	VDP	
APPD.	--	
ALL DIMENSIONS IN mm.		SIGN.
TOLERANCE 5%		
REVISIONS : 00		

MANUFACTURER
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DRAWING	GENERAL ARRANGEMENT DRAWING
TITLE	415V AC DISTRIBUTION BOARD (2A) (MCRB)
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER-III POOLING STATION

JOB NO. 1241A

CLIENT
POWER GRID CORPORATION OF INDIA LIMITED

CONTRACTOR:–
BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION

DRG. NO. USL/PGCIL/BHEL/2024-2025/1241A-102

SH. NO. 02 OF 05

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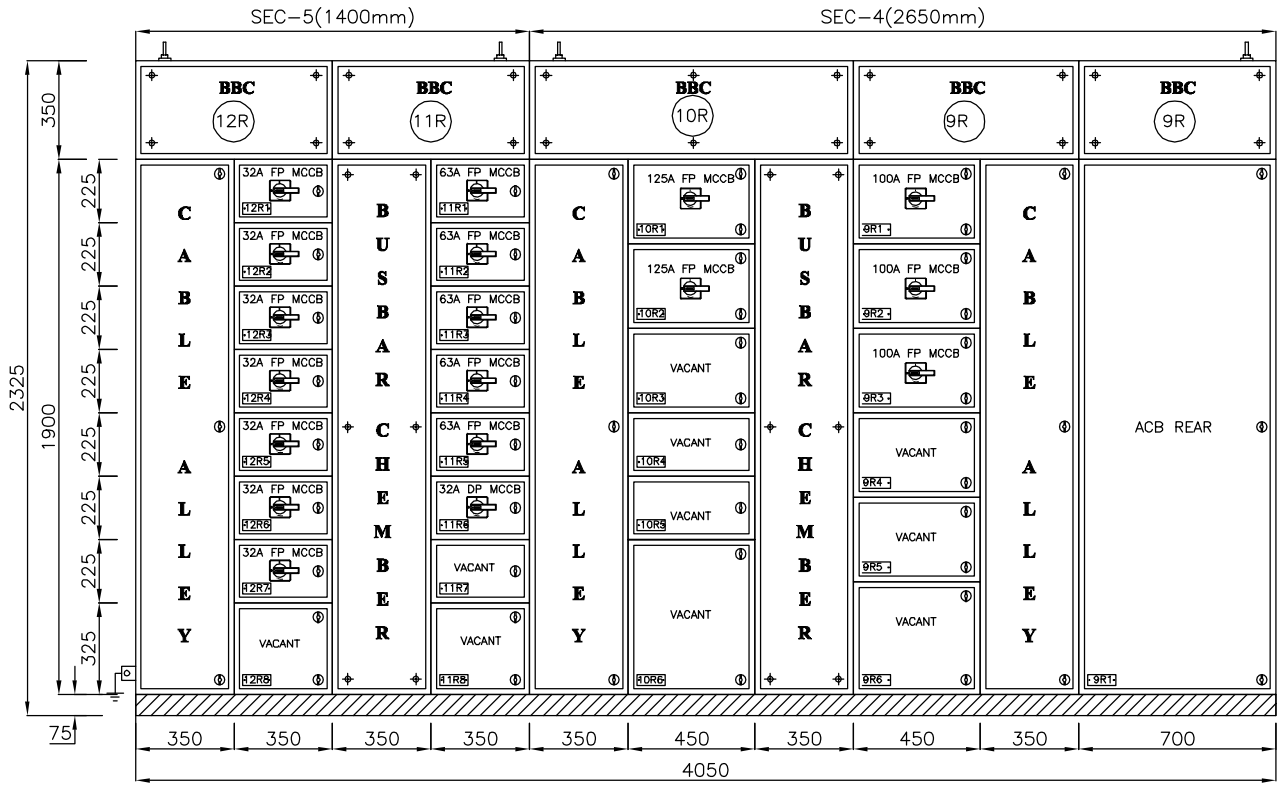

REAR VIEW

LEGEND DETAILS

R	=	'R' PHASE
Y	=	'Y' PHASE
B	=	'B' PHASE
h1	=	ACB/MCCB OFF INDICATION GREEN
h2	=	ACB/MCCB ON INDICATION RED
h3	=	ACB TRIP INDICATION AMBER
h5	=	ACB SPRING CHARGE INDICATION BLUE
V	=	ANALOG VOLTMETER
A	=	ANALOG AMMETER
Hz	=	FREQUENCY METER
KW	=	KILOWATT METER
KWH	=	KILOWATT HOUR METER
P1	=	MCCB OFF PUSH BUTTON (RED)
P2	=	MCCB ON PUSH BUTTON (GREEN)
87	=	DEFERENTIAL PROTECTION RELAY
51V	=	VOLTAGE CONTROLLED DEFINITE DELAY RELAY
95	=	SINGLE POLE DEFINITE TIME OVER CURRENT RELAY
VMR	=	VOLTAGE MONITORING RELAY
86	=	MASTER TRIP RELAY (HAND RESET)
VSS	=	VOLTMETER SELECTOR SWITCH
ASS	=	AMMETER SELECTOR SWITCH
A/M	=	AUTO/MANUAL SELECTOR SWITCH

PANEL DIMENSIONS

HEIGHT : 2325 mm.
WIDTH : 9500 mm. (5450+4050)
DEPTH : 1000 mm.

HORIZONTAL MAIN BUS BAR SIZE

PHASE : 1x80X10 Sq. mm Al.
NEUTRAL : 1x80X06 Sq. mm Al.
EARTH : 1X50X06 Sq. mm Al.

VERTICAL MAIN BUS BAR SIZE FOR BAY#1&2 , BAY#3&4, BAY#9&10 AND BAY#11&12

PHASE : 1X80X10 SQ. MM AL.
NEUTRAL : 1X80X06 SQ. MM AL.

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN: MP
CHKD.: VDP
APPD.: --
ALL DIMENSIONS IN mm. SIGN.
TOLERANCE 5%
REVISIONS : 00

MANUFACTURER
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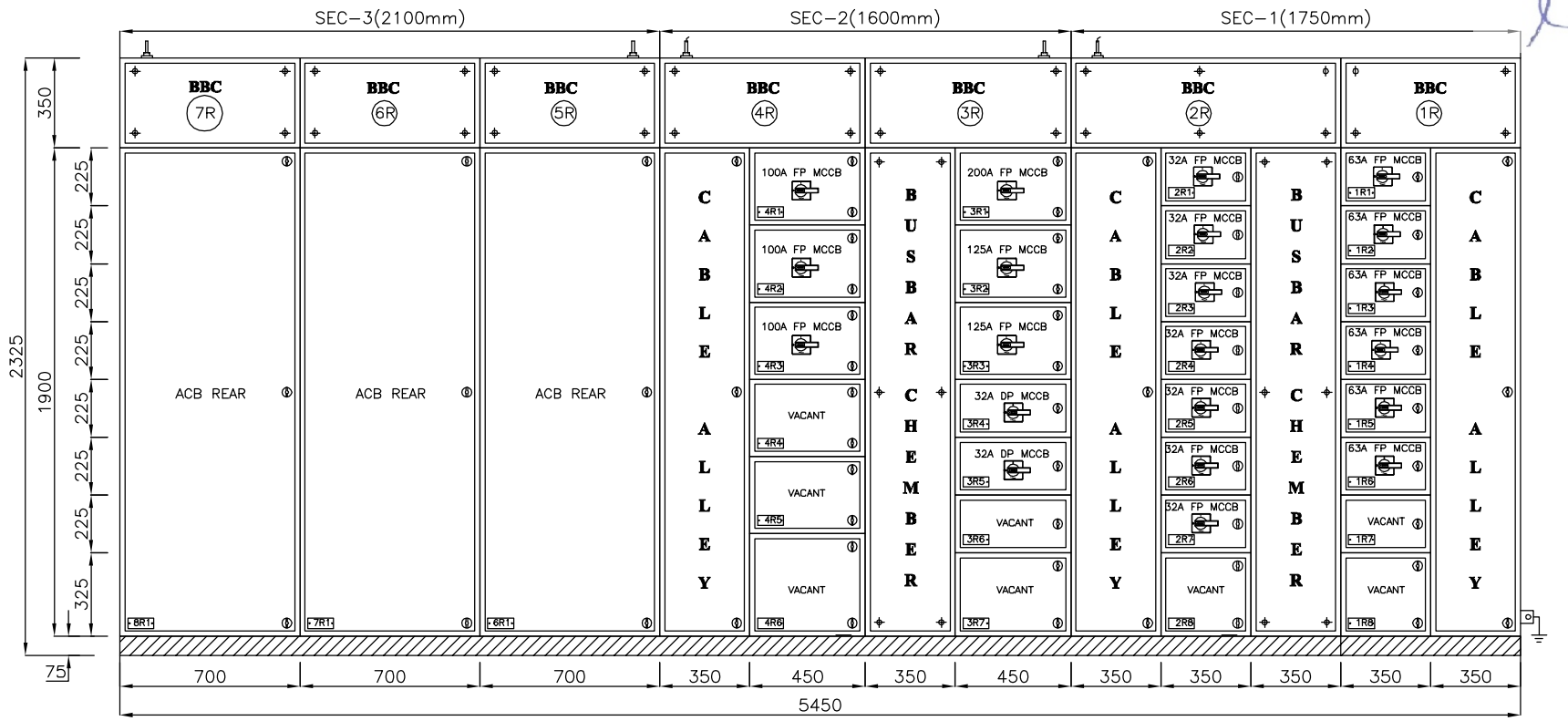
DRAWING	GENERAL ARRANGEMENT DRAWING
TITLE	415V AC DISTRIBUTION BOARD (2A) (MCRB)
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER-III POOLING STATION
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED
CONTRACTOR:–	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024–2025/1241A–102

JOB NO. 1241A

SH. NO. 03 OF 05



REAR VIEW

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DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN	MP
CHKD.	VDP
APPD.	--
ALL DIMENSIONS IN mm.	SIGN.
TOLERANCE 5%	
REVISIONS : 00	

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DRAWING	GENERAL ARRANGEMENT DRAWING
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CONTRACTOR:–	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-102
SH. NO.	04 OF 05

JOB NO. 1241A

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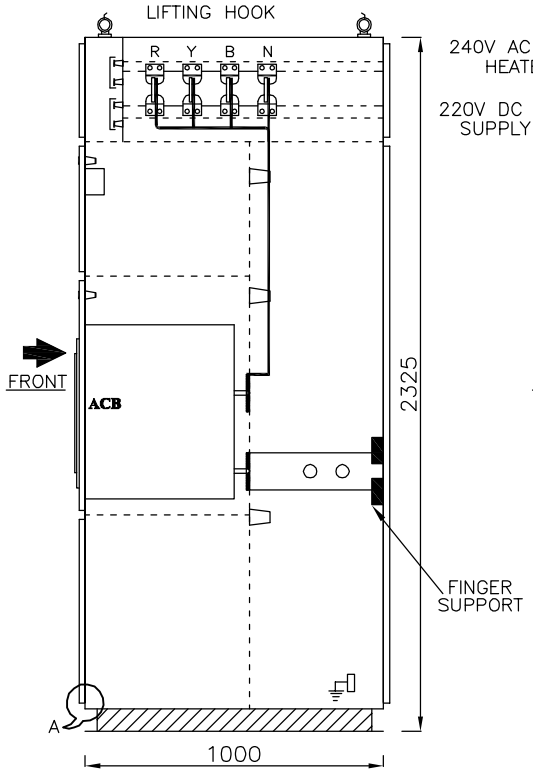
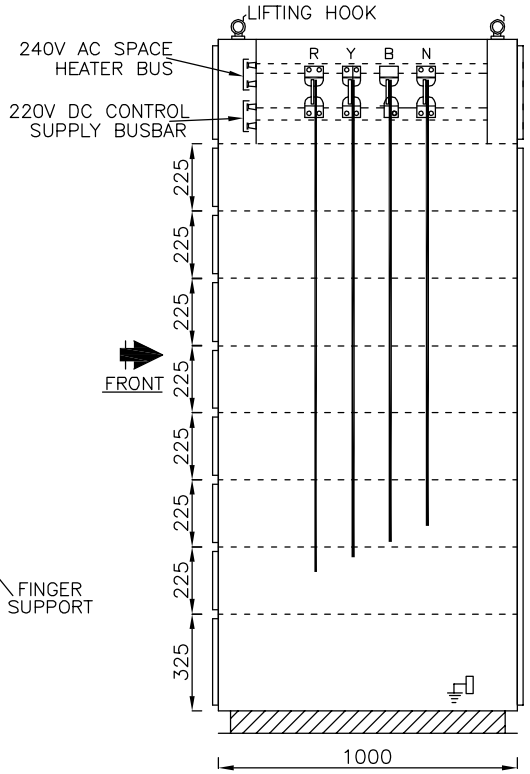
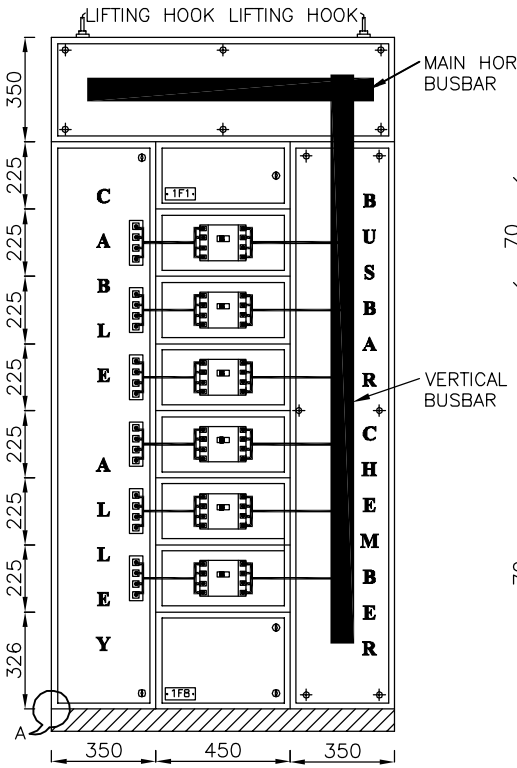


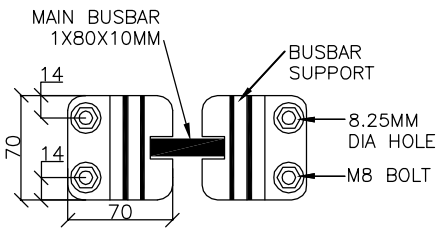
SECTIONAL VIEW AT "A"-"A"



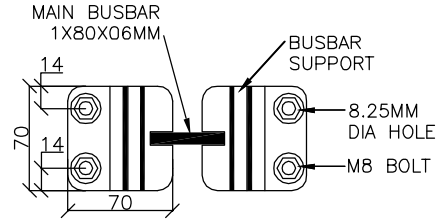
SECTIONAL VIEW AT "B"-"B"



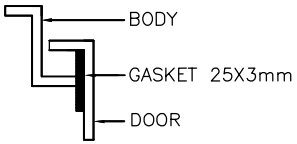
TYP. DETAIL OF PANEL NO-1 (FRONT VIEW W/O DOOR & COVER)



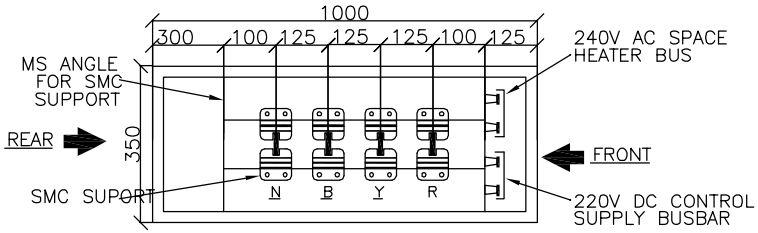
DETAIL OF PHASE BUSBAR SUPPORT



DETAIL OF NEUTRAL BUSBAR SUPPORT



DETAIL-'A'



SECTIONAL VIEW AT "C"-"C" FOR HORIZONTAL BUSBAR TOLERANCE AS PER IS

DATE	No.	REVISIONS DESCRIPTION	REVISIONS : 00		
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL	TOLERANCE 5%		
	01.		ALL DIMENSIONS IN mm.		SIGN.
	02.	–	APPD.	--	
	03.	–	CHKD.	VDP	
	04.	–	DRAWN	MP	

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E-mail : info@ultimaswitchgear.com

DRAWING	GENERAL ARRANGEMENT DRAWING		JOB NO. 1241A
TITLE	415V AC DISTRIBUTION BOARD (2A) (MCRB)		
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024		
PROJECT	765/400/220kV BIKANER-III POOLING STATION		
CLIENT: POWER GRID CORPORATION OF INDIA LIMITED		CONTRACTOR:- BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION	
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-102		SH. NO. 05 OF 05

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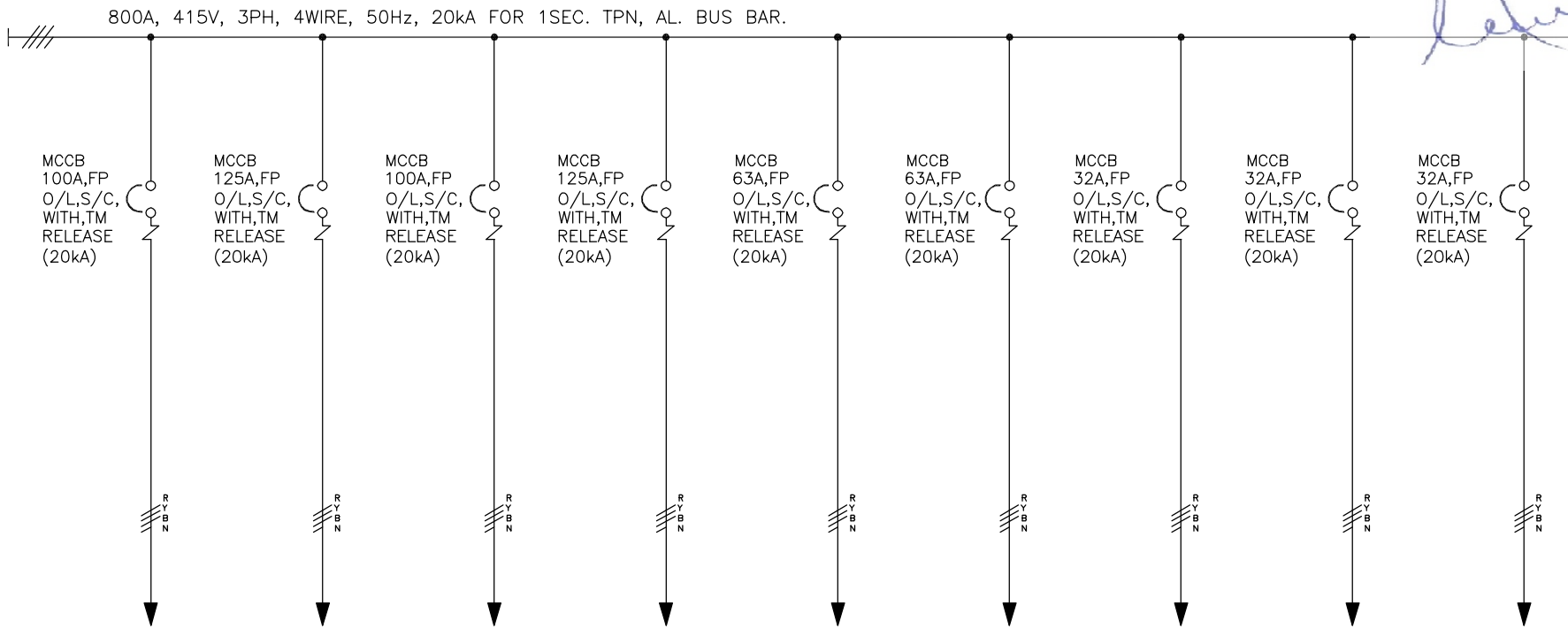

FEEDER NUMBER	4R1	3R2	4R2	3R3	1F1	1F2	2R1	2R2	2R3
MODULE TYEP	E	E	E	E	E	E	E	E	E
FEEDER RATING	100A	125A	100A	125A	63A	63A	32A	32A	32A
FEEDER TYPE	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB
DESCRIPTION	48V BATTERY CHARGER–1, SOURCE – 1	220V BATTERY CHARGER–1, SOURCE – 1	48V BATTERY CHARGER–2, SOURCE – 1	220V BATTERY CHARGER–2, SOURCE – 1	AIR CONDITIONING DB BATTERY ROOM	AIR CONDITIONING DB SAS ROOM	SUMP PUMP–1	JOCKEY PUMP (LCP)	SUPPLY POWER TO FF ACDB
POWER CABLE SIZE	1x3.5Cx70 Sqmm.	1x3.5Cx70 Sqmm.	1x3.5Cx70 Sqmm.	1x3.5Cx70 Sqmm.	1X3.5CX35 Sqmm.	1X3.5CX35 Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.

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	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN	MP	
CHKD.	VDP	
APPD.	--	
ALL DIMENSIONS IN mm.		SIGN.
TOLERANCE 5%		
REVISIONS : 00		

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DRAWING	SINGLE LINE DIAGRAM	JOB NO. 1241A
TITLE	415V AC DISTRIBUTION BOARD (2A) (MCRB)	
CA NO.	CC/T/W–AIS/DOM/A10/23/01956/NOA–1/24–102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER–III POOLING STATION	
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:– BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024–2025/1241A–202	SH. NO.:– 01 OF 12

1 2 3 4 5 6 7 8 9

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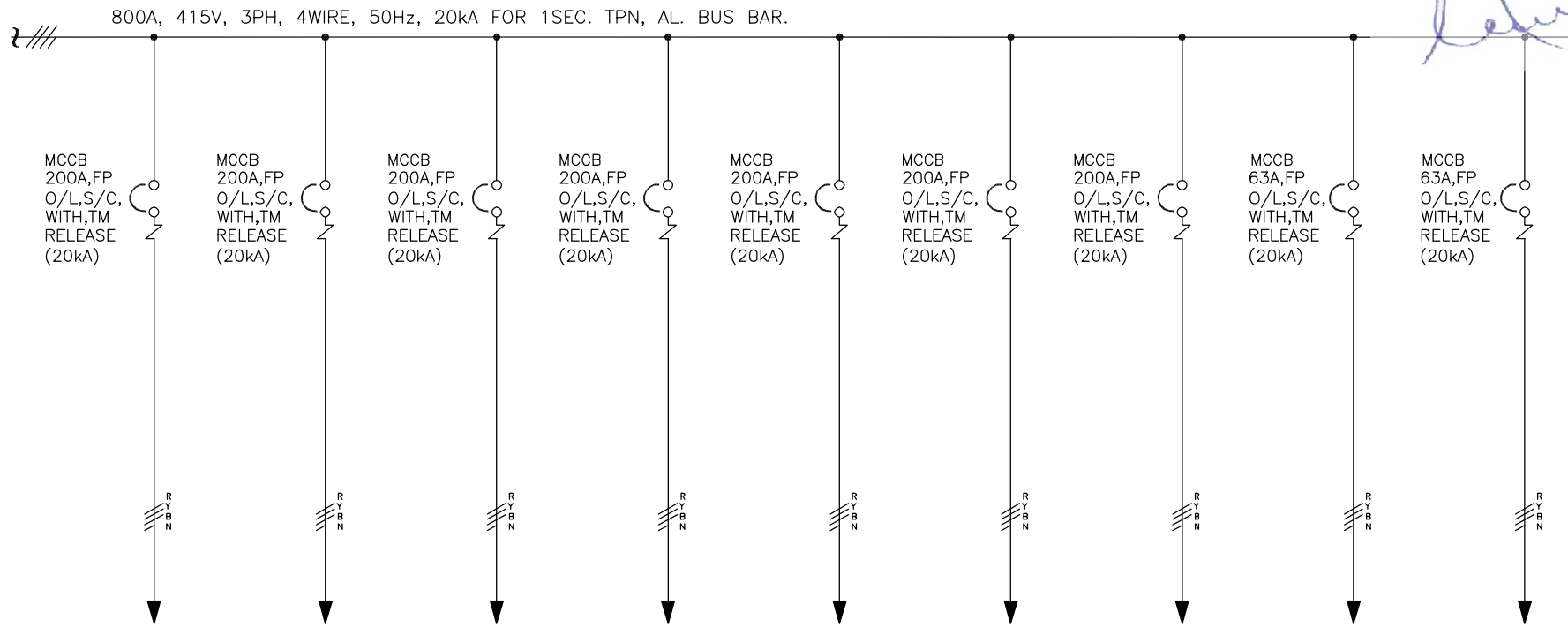

FEEDER NUMBER	3F2	3F3	3F4	3F5	4F2	4F3	4F4	1F3	1F4
MODULE TYEP	E	E	E	E	E	E	E	E	E
FEEDER RATING	200A	200A	200A	200A	200A	200A	200A	63A	63A
FEEDER TYPE	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB
DESCRIPTION	765/400KV AUTO TRANSFORMER BANK-1 COMMON MB	765/400KV AUTO TRANSFORMER BANK-2 COMMON MB	765/400KV AUTO TRANSFORMER BANK-3 COMMON MB	765/400KV AUTO TRANSFORMER BANK-4 COMMON MB	765/400KV AUTO TRANSFORMER BANK-5 COMMON MB	765/400KV AUTO TRANSFORMER BANK-6 COMMON MB	765/400KV AUTO TRANSFORMER BANK-7 COMMON MB(F)	765kV LINE REACTOR 703 LR MB (F)	765kV LINE REACTOR 709 LR MB
POWER CABLE SIZE	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN	MP	
CHKD.	VDP	
APPD.	--	
ALL DIMENSIONS IN mm.		SIGN.
TOLERANCE 5%		
REVISIONS : 00		

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DRAWING	SINGLE LINE DIAGRAM	**JOB NO. 1241A**
TITLE	415V AC DISTRIBUTION BOARD (2A) (MCRB)	
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER-III POOLING STATION	
CLIENT **POWER GRID CORPORATION OF INDIA LIMITED**	CONTRACTOR:- **BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION**	
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-202	SH. NO.:- 02 OF 12

1 2 3 4 5 6 7 8 9

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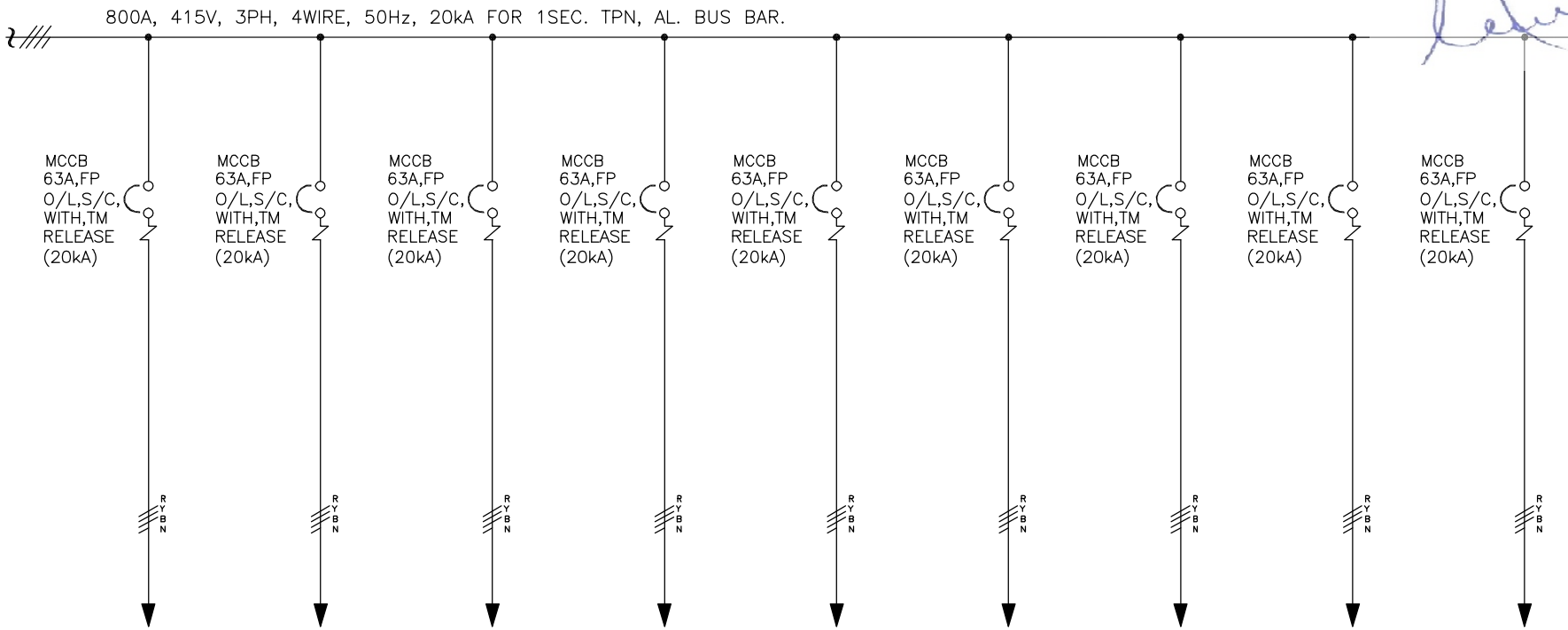

FEEDER NUMBER	1F5	1F6	1F7	1F8	2F1	2F2	2F3	2F4	2F5
MODULE TYEP	E	E	E	E	E	E	E	E	E
FEEDER RATING	63A	63A	63A	63A	63A	63A	63A	63A	63A
FEEDER TYPE	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB
DESCRIPTION	765kV BUS REACTOR-1 715 LR MB	765kV LINE REACTOR 721 LR MB (F)	765kV LINE REACTOR 727 LR MB (F)	765kV BUS REACTOR 722 LR MB (F)	BMK-701	BMK-704	BMK-707	BMK-710	BMK-713
POWER CABLE SIZE	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.

DATE	No.	REVISIONS DESCRIPTION
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	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN	MP	
CHKD.	VDP	
APPD.	--	
ALL DIMENSIONS IN mm.		SIGN.
TOLERANCE 5%		
REVISIONS : 00		

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DRAWING	SINGLE LINE DIAGRAM	**JOB NO. 1241A**
TITLE	415V AC DISTRIBUTION BOARD (2A) (MCRB)	
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER-III POOLING STATION	
CLIENT	**POWER GRID CORPORATION OF INDIA LIMITED**	CONTRACTOR:- **BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION**
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-202	SH. NO.:- 03 OF 12

1 2 3 4 5 6 7 8 9

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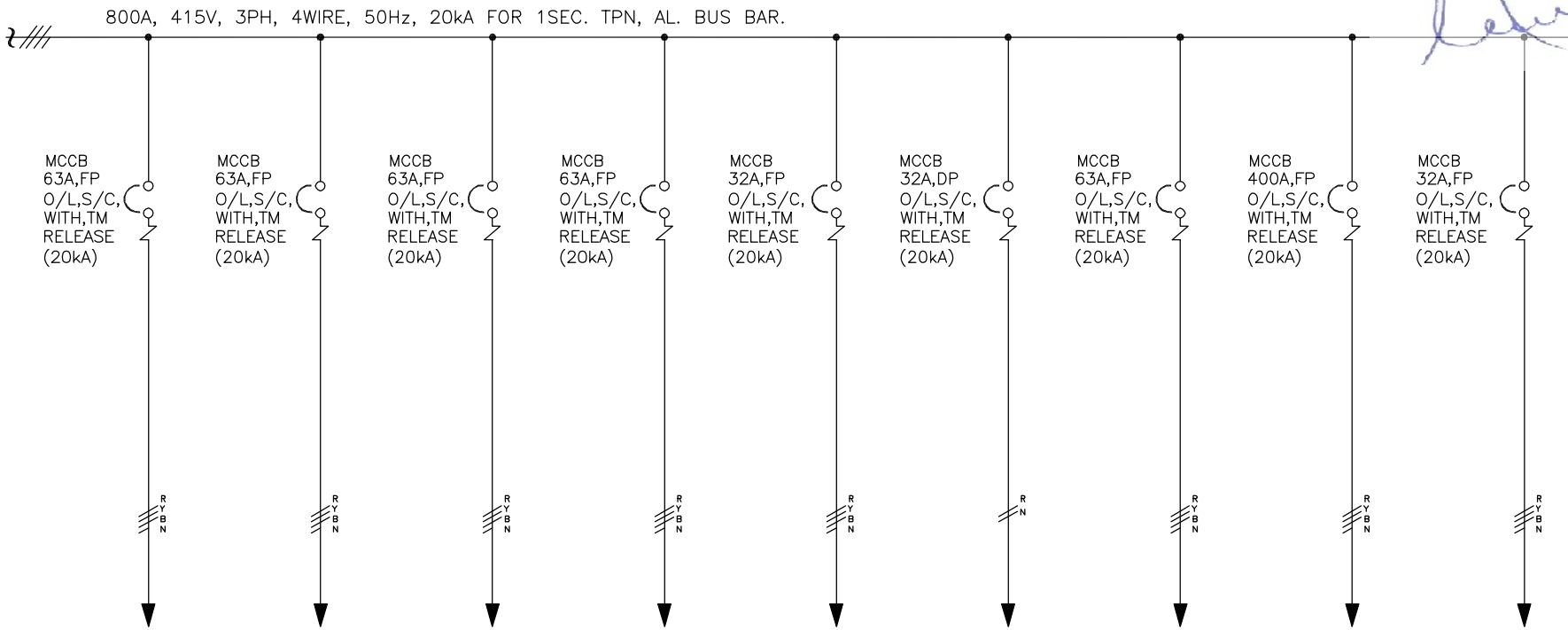

FEEDER NUMBER	2F6	2F7	2F8	1R1	2R4	3R4	1R2	3F1	2R5
MODULE TYEP	E	E	E	E	E	E	E	E	E
FEEDER RATING	63A	63A	63A	63A	32A	32A	63A	400A	32A
FEEDER TYPE	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB
DESCRIPTION	BMK–716	BMK–719 (F)	BMK–722 (F)	BMK–725 (F)	SUPPLY TO FF ANN. PANEL	VISUAL MONITORING SYSTEM	LT TRANSFORMER MB	400kV & 220kV ACDB (AUX. BUILDING)	SAS PANEL
POWER CABLE SIZE	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.	1X3.5CX70 Sqmm.	2X3.5CX300Sqmm.	1X4CX16 Sqmm.

DATE	No.	REVISIONS DESCRIPTION
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	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN	MP
CHKD.	VDP
APPD.	--
ALL DIMENSIONS IN mm.	SIGN.
TOLERANCE 5%	
REVISIONS : 00	

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DRAWING	SINGLE LINE DIAGRAM
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DRG. NO.	USL/PGCIL/BHEL/2024–2025/1241A–202
SH. NO.:–	04 OF 12

JOB NO. 1241A

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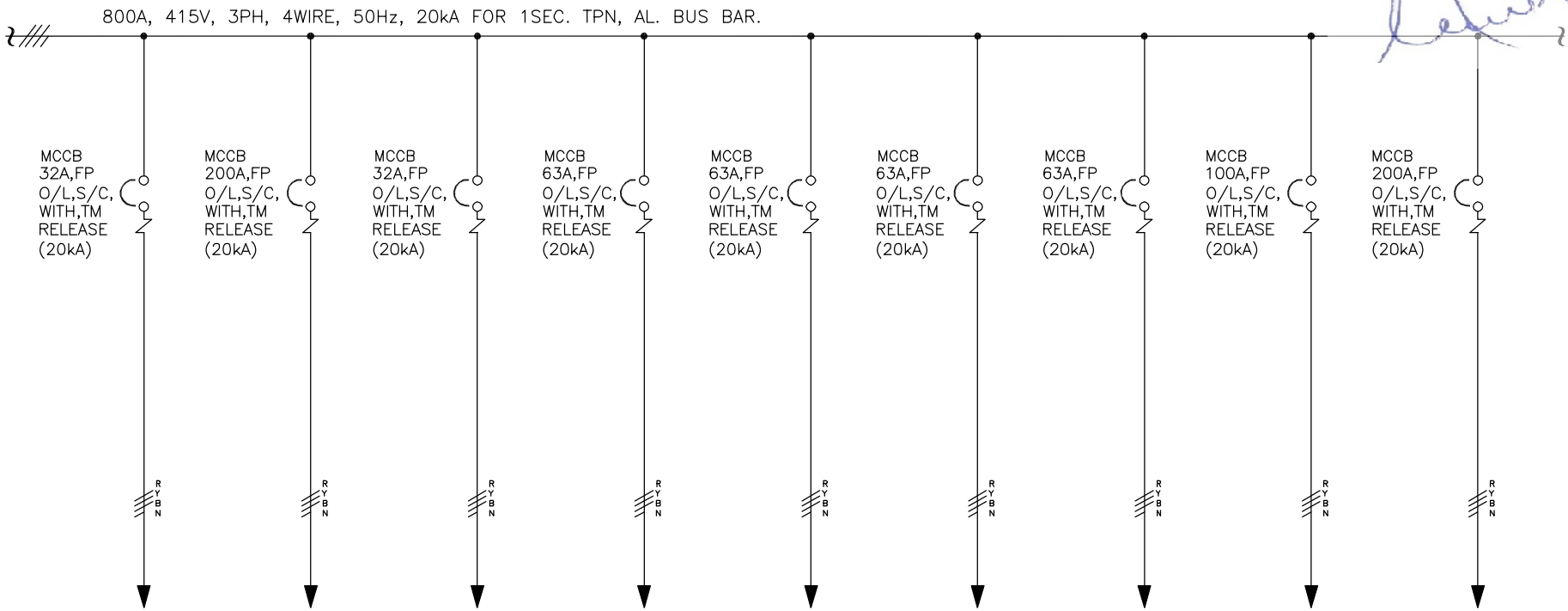

FEEDER NUMBER	2R6	4F5	2R7	1R3	1R4	1R5	1R6	4R3	3R1
MODULE TYEP	E	E	E	E	E	E	E	E	E
FEEDER RATING	32A	200A	32A	63A	63A	63A	63A	100A	200A
FEEDER TYPE	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB
DESCRIPTION	765kV CRP PANEL	415V ELDB	SPARE–1	SPARE–2	SPARE–3	SPARE–4	SPARE–5	SPARE–6	SPARE–7
POWER CABLE SIZE	1X4CX16 Sqmm.	1X3.5CX70 Sqmm.	––	––	––	––	––	––	––

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	03.	–
	02.	–
	01.	
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DRAWN: MP
CHKD.: VDP
APPD.: ––
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DRAWING	SINGLE LINE DIAGRAM
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CONTRACTOR:–	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
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SH. NO.:–	05 OF 12

JOB NO. 1241A

1 2 3 4 5 6 7 8 9

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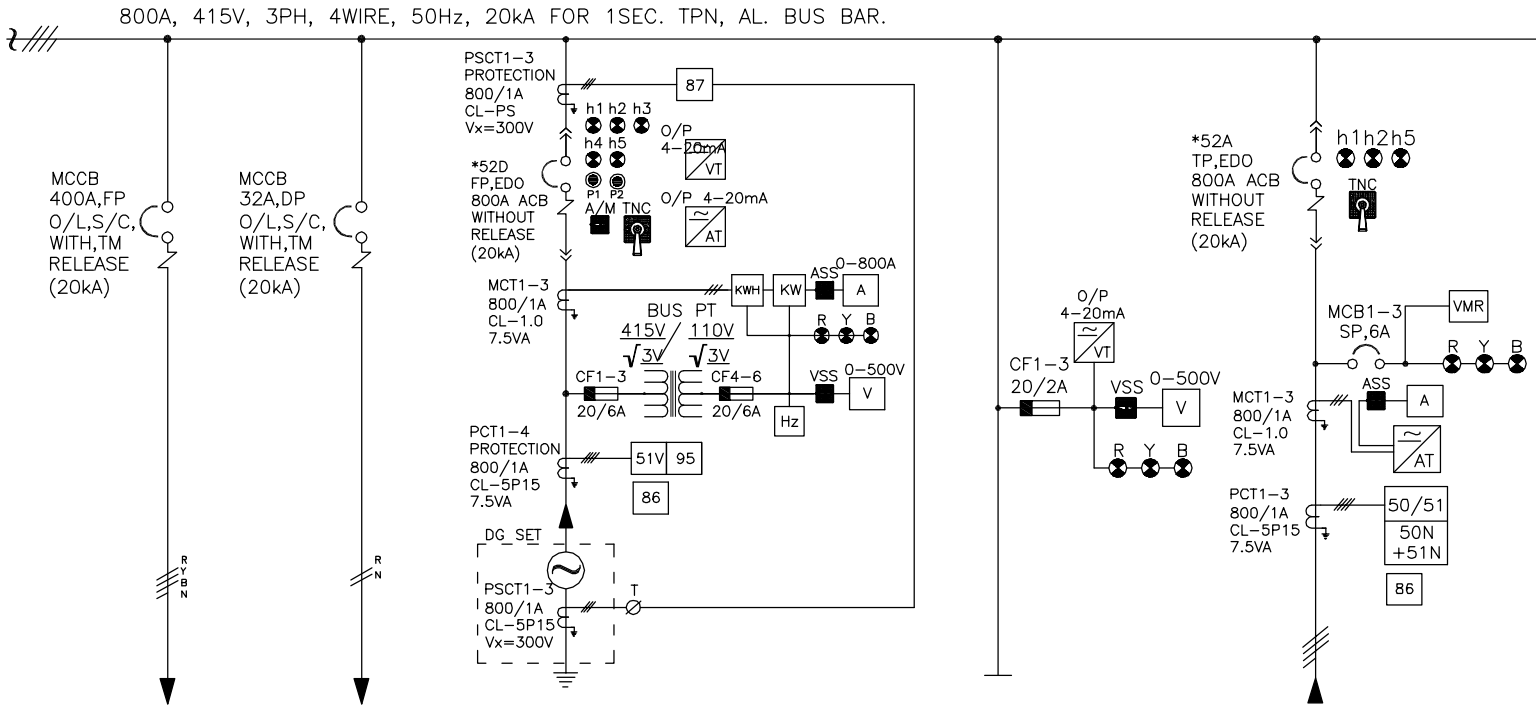

FEEDER NUMBER	4F1	3R5	6F1+6F2+6F3	5F1+5F2+5F3	
MODULE TYEP	E	E	DG	G2	AE
FEEDER RATING	400A	32A	800A	--	800A
FEEDER TYPE	MCCB	MCCB	ACB	METERING	ACB
DESCRIPTION	SPARE-8	SPARE-9	415V AC SUPPLY FROM 415V 500kVA DG SET	--	415V AC SUPPLY FROM 415V MAIN SWITCH BOARD (INCOMER-1)
POWER CABLE SIZE	--	--	2X3.5CX300 Sqmm.		2X3.5CX300 Sqmm.

DATE	No.	REVISIONS DESCRIPTION
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	03.	-
	02.	-
	01.	
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CHKD.: VDP
APPD.: --
ALL DIMENSIONS IN mm.
TOLERANCE 5%
REVISIONS : 00
SIGN.

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E-mail : info@ultimaswitchgear.com

DRAWING	SINGLE LINE DIAGRAM
TITLE	415V AC DISTRIBUTION BOARD (2A) (MCRB)
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER-III POOLING STATION
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED
CONTRACTOR:-	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-202
SH. NO.:-	06 OF 12

JOB NO. 1241A

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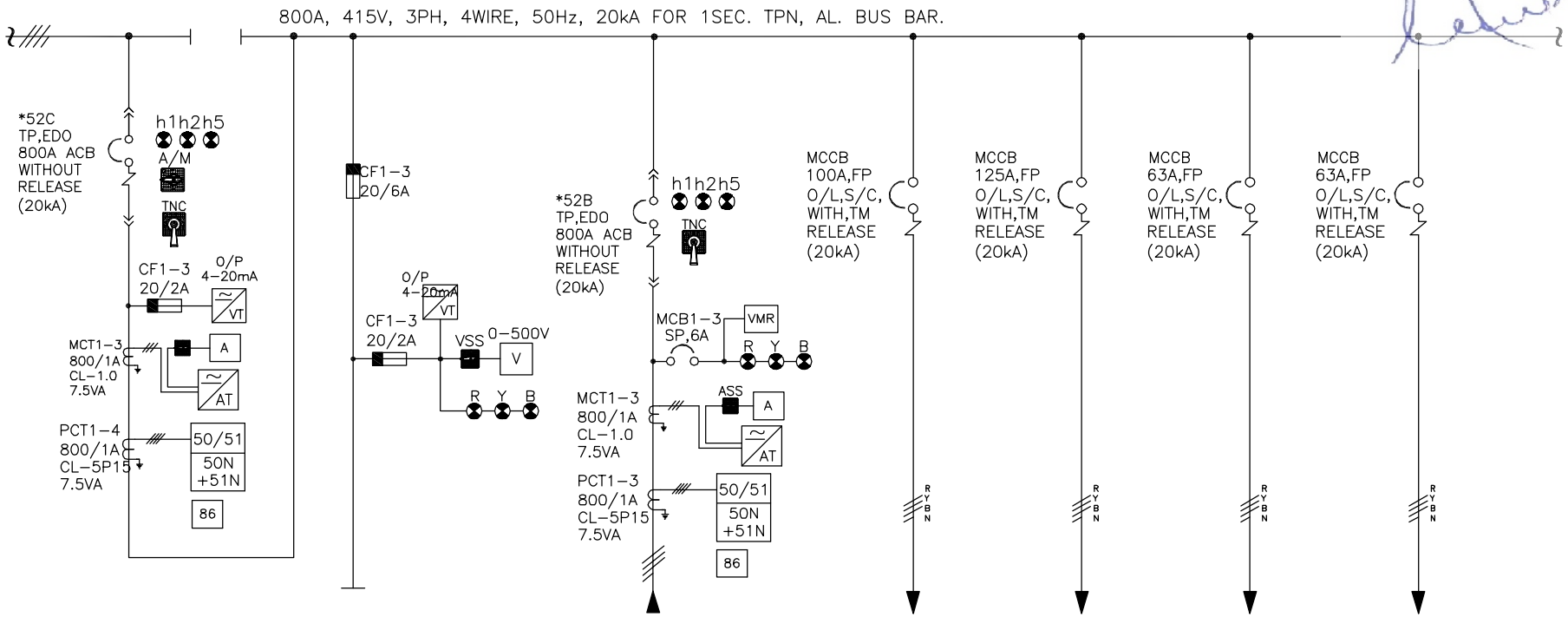

FEEDER NUMBER	7F1+7F2+7F3	8F1+8F3	8F1+8F2+8F3	9R1	10R1	11F1	11F2
MODULE TYEP	AE	G2	AE	E	E	E	E
FEEDER RATING	800A	--	800A	100A	125A	63A	63A
FEEDER TYPE	ACB	METERING	ACB	MCCB	MCCB	MCCB	MCCB
DESCRIPTION	BUS COUPLER	--	415V AC SUPPLY FROM 415V MAIN SWITCH BOARD (INCOMER-2)	48V BATTERY CHARGER-1, SOURCE - 2	220V BATTERY CHARGER-1, SOURCE - 2	AIR CONDITIONING DB INCHARGE OFFICE	AIR CONDITIONING DB TRASIT GUEST ROOM
POWER CABLE SIZE			2X3.5CX300 Sqmm.	1x3.5Cx70 Sqmm.	1x3.5Cx70 Sqmm.	1X3.5CX35 Sqmm.	1X3.5CX35 Sqmm.

DATE	No.	REVISIONS DESCRIPTION
	04.	-
	03.	-
	02.	-
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN	MP	
CHKD.	VDP	
APPD.	--	
ALL DIMENSIONS IN mm.		SIGN.
TOLERANCE 5%		
REVISIONS : 00		

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DRAWING	SINGLE LINE DIAGRAM	JOB NO. 1241A
TITLE	415V AC DISTRIBUTION BOARD (2A) (MCRB)	
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER-III POOLING STATION	
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:- BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-202	SH. NO.:- 07 OF 12

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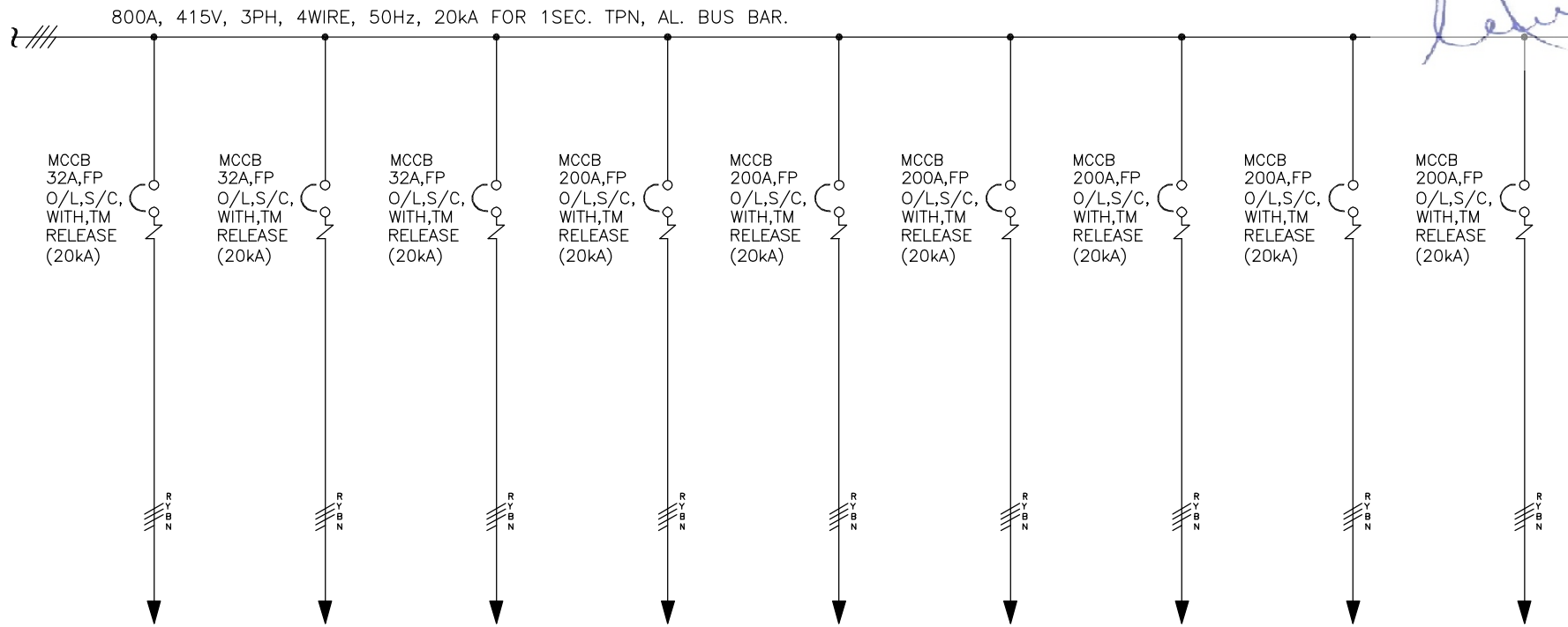

FEEDER NUMBER	12R1	12R2	12R3	9F2	9F3	9F4	9F5	10F2	10F3
MODULE TYEP	E	E	E	E	E	E	E	E	E
FEEDER RATING	32A	32A	32A	200A	200A	200A	200A	200A	200A
FEEDER TYPE	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB
DESCRIPTION	SUMP PUMP–2	JOCKEY PUMP (LCP)	SUPPLY POWER TO FF ACDB	765/400KV AUTO TRANSFORMER BANK–1 COMMON MB	765/400KV AUTO TRANSFORMER BANK–2 COMMON MB	765/400KV AUTO TRANSFORMER BANK–3 COMMON MB	765/400KV AUTO TRANSFORMER BANK–4 COMMON MB	765/400KV AUTO TRANSFORMER BANK–5 COMMON MB	765/400KV AUTO TRANSFORMER BANK–6 COMMON MB
POWER CABLE SIZE	1X4CX16 Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

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CHKD.	VDP	
APPD.	--	
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DRAWING	SINGLE LINE DIAGRAM	**JOB NO. 1241A**
TITLE	415V AC DISTRIBUTION BOARD (2A) (MCRB)	
CA NO.	CC/T/W–AIS/DOM/A10/23/01956/NOA–1/24–102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER–III POOLING STATION	
CLIENT	**POWER GRID CORPORATION OF INDIA LIMITED**	CONTRACTOR:– **BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION**
DRG. NO.	USL/PGCIL/BHEL/2024–2025/1241A–202	SH. NO.:– 08 OF 12

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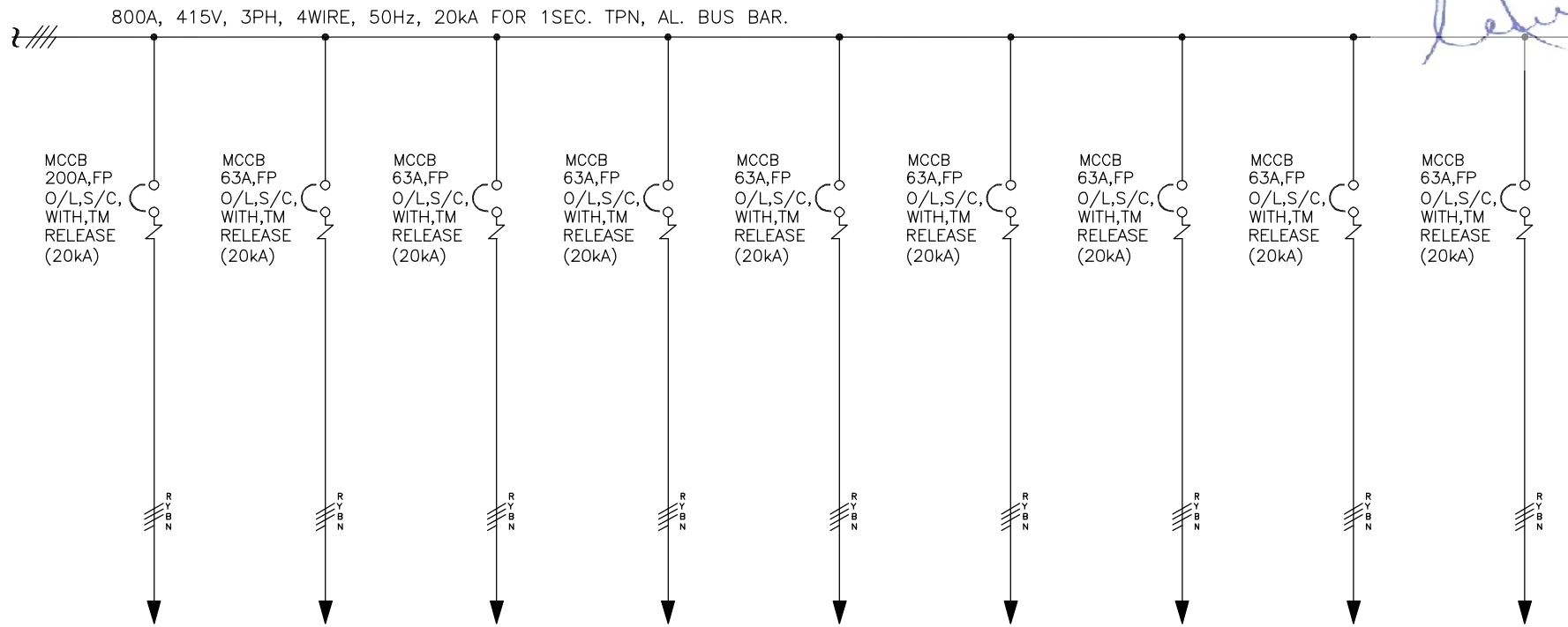

FEEDER NUMBER	10F4	11F3	11F4	11F5	11F6	11F7	11F8	12F1	12F2
MODULE TYEP	E	E	E	E	E	E	E	E	E
FEEDER RATING	200A	63A	63A	63A	63A	63A	63A	63A	63A
FEEDER TYPE	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB
DESCRIPTION	765/400KV AUTO TRANSFORMER BANK-7 COMMON MB(F)	765kV LINE REACTOR 706 LR MB (F)	765kV LINE REACTOR 712 LR MB	765kV LINE REACTOR 724 LR MB (F)	765kV LINE REACTOR 725 LR MB (F)	765kV BUS REACTOR-2 727 BR MB	BMK-703(F)	BMK-706(F)	BMK-709
POWER CABLE SIZE	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN	MP	
CHKD.	VDP	
APPD.	--	
ALL DIMENSIONS IN mm.		SIGN.
TOLERANCE 5%		
REVISIONS : 00		

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DRAWING	SINGLE LINE DIAGRAM
TITLE	415V AC DISTRIBUTION BOARD (2A) (MCRB)
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER-III POOLING STATION
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED
CONTRACTOR:-	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-202
SH. NO.:-	09 OF 12

JOB NO. 1241A

1 2 3 4 5 6 7 8 9

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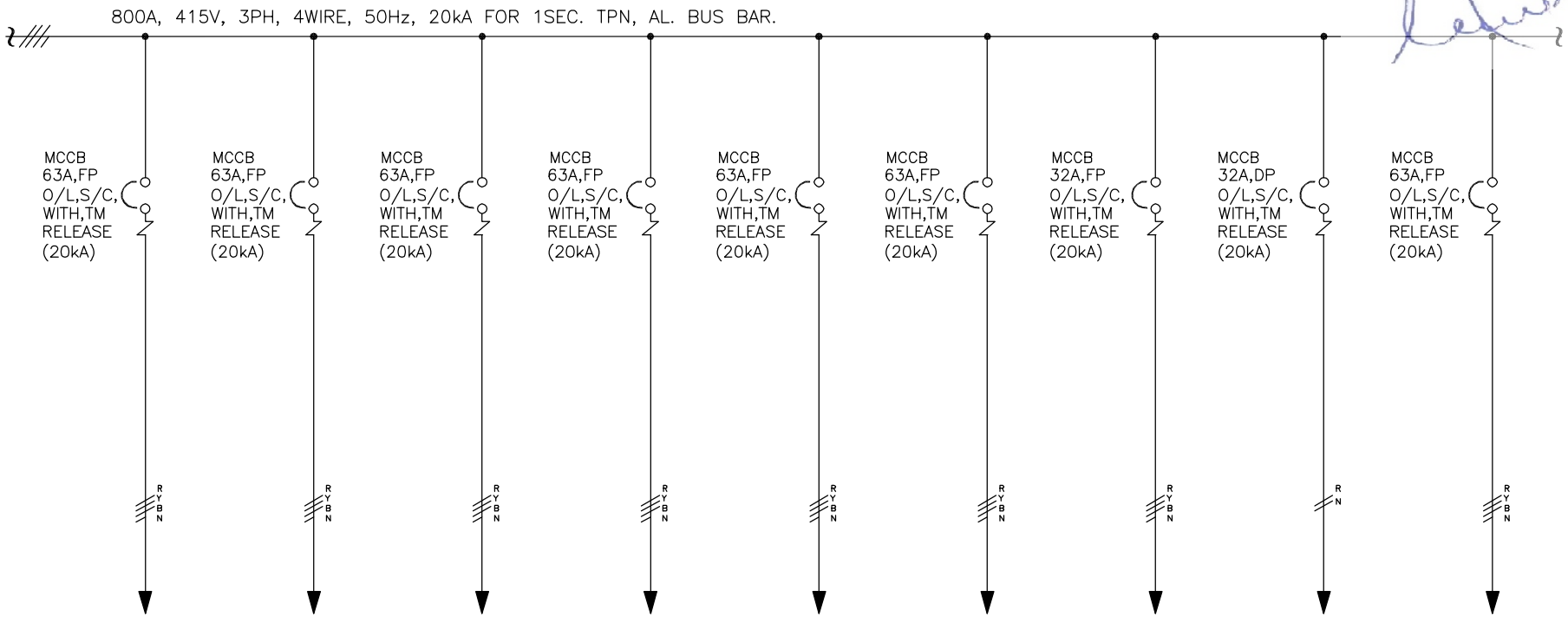

FEEDER NUMBER	12F3	12F4	12F5	12F6	12F7	12F8	12R4	11R6	11R1
MODULE TYEP	E	E	E	E	E	E	E	E	E
FEEDER RATING	63A	63A	63A	63A	63A	63A	32A	32A	63A
FEEDER TYPE	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB
DESCRIPTION	BMK–712	BMK–715	BMK–718	BMK–721(F)	BMK–724(F)	BMK–727(F)	SUPPLY TO FF ANN. PANEL	VISUAL MONITORING SYSTEM	LT TRANSFORMER MB
POWER CABLE SIZE	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X3.5CX70 Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.	1X3.5CX70 Sqmm.

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN	MP
CHKD.	VDP
APPD.	--
ALL DIMENSIONS IN mm.	SIGN.
TOLERANCE 5%	
REVISIONS : 00	

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DRAWING	SINGLE LINE DIAGRAM	JOB NO. 1241A
TITLE	415V AC DISTRIBUTION BOARD (2A) (MCRB)	
CA NO.	CC/T/W–AIS/DOM/A10/23/01956/NOA–1/24–102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER–III POOLING STATION	
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:– BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024–2025/1241A–202	SH. NO.:– 10 OF 12

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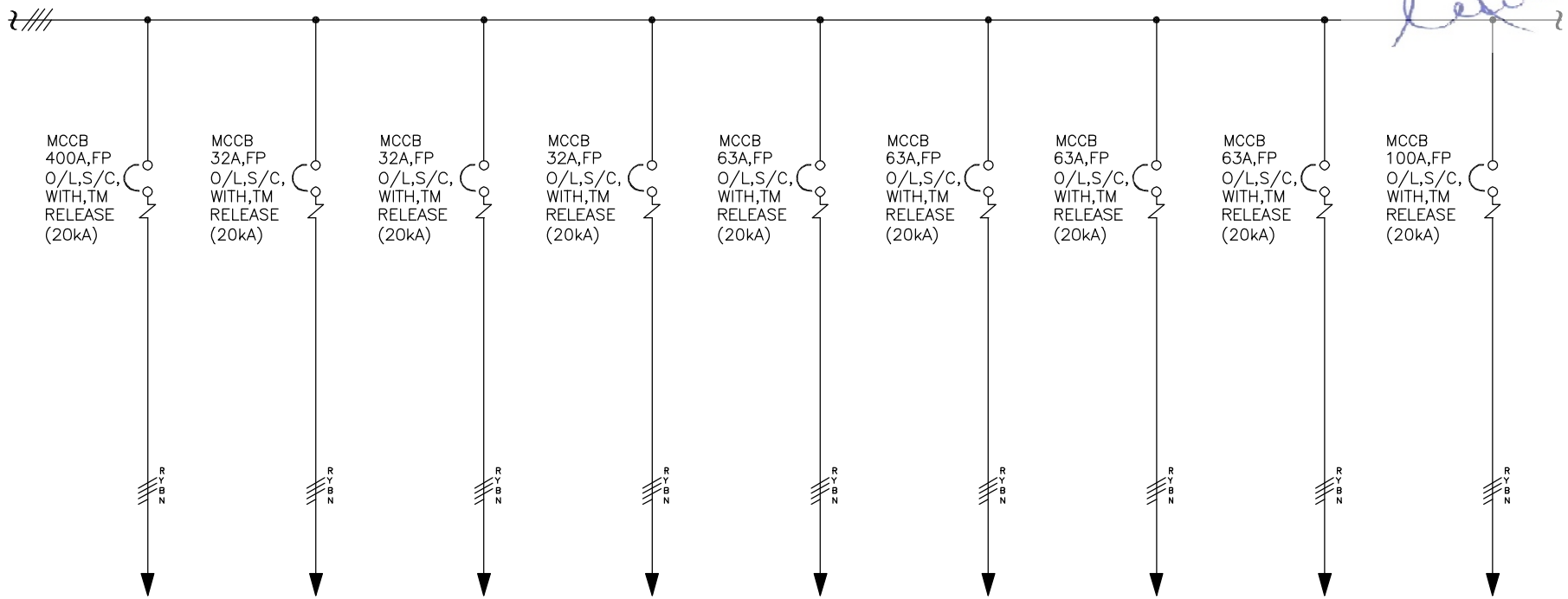

FEEDER NUMBER	9F1	12R5	12R6	12R7	11R2	11R3	11R4	11R5	9R2
MODULE TYEP	E	E	E	E	E	E	E	E	E
FEEDER RATING	400A	32A	32A	32A	63A	63A	63A	63A	100A
FEEDER TYPE	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB
DESCRIPTION	400kV & 220kV ACDB (AUX. BUILDING)	SAS PANEL	765kV CRP PANEL	SPARE–10	SPARE–11	SPARE–12	SPARE–13	SPARE–14	SPARE–15
POWER CABLE SIZE	2X3.5CX300Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.	--	--	--	--	--	--

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN: MP
CHKD.: VDP
APPD.: --
ALL DIMENSIONS IN mm. SIGN.
TOLERANCE 5%
REVISIONS : 00

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PROJECT	765/400/220kV BIKANER–III POOLING STATION
JOB NO.	1241A
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED
CONTRACTOR:–	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024–2025/1241A–202
SH. NO.:–	11 OF 12

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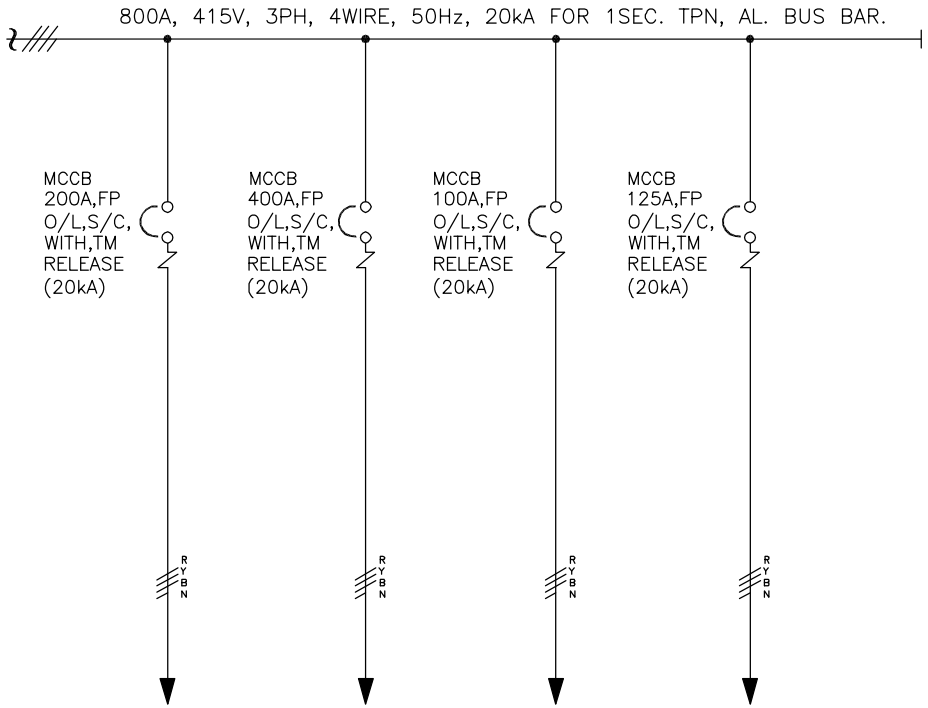

FEEDER NUMBER	10F5	10F1	9R3	10R2
MODULE TYEP	E	E	E	E
FEEDER RATING	200A	400A	100A	125A
FEEDER TYPE	MCCB	MCCB	MCCB	MCCB
DESCRIPTION	SPARE–16	SPARE–17	48V BATTERY CHARGER–2, SOURCE – 2	220V BATTERY CHARGER–2, SOURCE – 2
POWER CABLE SIZE	––	––	1x3.5Cx70 Sqmm.	1x3.5Cx70 Sqmm.

DATE	No.	REVISIONS DESCRIPTION
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	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

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CLIENT	POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:– BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024–2025/1241A–202	SH. NO.:– 12 OF 12

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BILL OF MATERIAL FOR 415V AC DISTRIBUTION BOARD (2A) (MCRB)

S.NO.	ITEM CODE	DESCRIPTION	MAKE	RATING	QTY.
A	**BILL OF MATERIAL FOR MODULE - (AE) INCOMER 1&2**				**2 Nos.**
1	**52A & 52B**	TP ACB 415V,EDO, WITHOUT RELEASE, 1. SPRING CHARGE MOTOR 220V DC WITH SPRING CHARGE SWITCH 2. CLOSING RELEASE 220V DC 3. SHUNT RELEASE 220V DC 4. LIMIT SWITCH FOR TEST/ISOLATE/SERVICE POSITION 5. 4NO + 4NC POTENTIAL FREE CONTACT.	L&T/C&S/HAVELLS	800A, 50kA	01
2	**CF4-10**	HRC FUSE BASE	L&T/C&S/HAVELLS	20A	07
3	**CF4-10**	HRC FUSE LINK	L&T/C&S/HAVELLS	6A	07
4		AUX. CONTACTOR RELAY, COIL VOLTAGE 220V DC WITH 2NO+2NC AUX. CONTACT	L&T/C&S/HAVELLS	--	03
5		AUX. CONTACTOR RELAY, COIL VOLTAGE 220V DC WITH 3NO+1NC AUX. CONTACT	L&T/C&S/HAVELLS	--	02
6		2NO+2NC ADD ON BLOCK	L&T/C&S/HAVELLS	--	01
7	**MCB**	DP MINIATURE CIRCUIT BREAKER, DC TYPE	L&T/C&S/HAVELLS	10A, 4kA	02
8	**MCB**	SP MINIATURE CIRCUIT BREAKER, 'C' CURVE	L&T/C&S/HAVELLS	6A, 10kA	03
9	**VMR-1, VMR-2**	415V AC, THREE PHASE, 3WIRE, VOLTAGE MONITORING RELAY	MINILEC/PGCIL APPROVED MAKE	--	01
10	**TNC**	BREAKER CONTROL SWITCH	SALZER/KAYCEE	16A	01
11	**R-PHASE**	'R' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, RED	ESBEE/VAISHNO/C&S	240V AC	01
12	**Y-PHASE**	'Y' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, YELLOW	ESBEE/VAISHNO/C&S	240V AC	01
13	**B-PHASE**	'B' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, BLUE	ESBEE/VAISHNO/C&S	240V AC	01
14	**h1**	'ON' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, RED	ESBEE/VAISHNO/C&S	220V DC	01
15	**h2**	'OFF' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, GREEN	ESBEE/VAISHNO/C&S	220V DC	01
16	**h5**	'SPRING CHARGE' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, BLUE	ESBEE/VAISHNO/C&S	220V DC	01
17	**1T, 2T**	ON DELAY TIMER WITH 1C/O AUXILIARY SWITCH, 0-60 SEC.	GIC/PGCIL APPROVED MAKE	220V DC	01
18	**T1A, T2A**	ON DELAY TIMER WITH 1C/O AUXILIARY SWITCH, 0-60 SEC.	GIC/PGCIL APPROVED MAKE	220V DC	01
19	**MCTs**	CURRENT TRANSFORMER, RESIN CAST TYPE	NEWTEK/AE/PRECISE/PROCOM/ASHMOR	800/1A, CL-1.0, 7.5VA	03
20	**PCTs**	CURRENT TRANSFORMER, RESIN CAST TYPE	NEWTEK/AE/PRECISE/PROCOM/ASHMOR	800/1A, CL-5P15, 7.5VA	04
21	**A**	ANALOG AMMETER, SINGLE PHASE, SIZE-96X96 Sq. mm, CL-1.0, CTR-/1A	AE/RISHAB/NEWTEK/SECURE /PGCIL APPROVED MAKE	0-800A	01
22	**ASS**	AMMETER SELECTOR SWITCH, ROTARY TYPE	SALZER/KAYCEE	6A	01

NOTE:- ALL COMPONENTS SHALL BE POWER GRID (QA&I) APPROVED MAKE

DATE	No.	REVISIONS DESCRIPTION
	04.	-
	03.	-
	02.	-
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

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TOLERANCE 5%	
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DRAWING	BILL OF MATERIAL
TITLE	415V AC DISTRIBUTION BOARD (2A) (MCRB)
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PROJECT	765/400/220kV BIKANER-III POOLING STATION
JOB NO.	1241A

CLIENT
POWER GRID CORPORATION OF INDIA LIMITED

CONTRACTOR:-
BHARAT HEAVY ELECTRICAL LIMITED (BHEL)
TRANSMISSION PROJECTS DIVISION

DRG. NO. USL/PGCIL/BHEL/2024-2025/1241A-702 SH. NO. 01 OF 06

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BILL OF MATERIAL FOR 415V AC DISTRIBUTION BOARD (2A) (MCRB)

S.NO.	ITEM CODE	DESCRIPTION	MAKE	RATING	QTY.
A	**BILL OF MATERIAL FOR MODULE - (AE) INCOMER 1&2**				**2 Nos.**
23	**Vt**	AC VOLTAGE TRANSDUCER, SINGLE OUTPUT– 4–20mA, PTR–415V AC, AUX. SUPPLY 220V DC	AE/RISHAB/SECURE	––	03
24	**Ct**	AC CURRENT TRANSDUCER, OUTPUT– 4–20mA, WITH SINGLE OUTPUT, AUX. SUPPLY 220V DC	AE/RISHAB/SECURE	800/1A	03
25	**86**	HIGH SPEED TRIPING RELAY WITH 3NO+1NC CONTACT (AUTO RESET HIGH SPEED), AUX. SUPPLY 220V DC	L&T/JVS/C&S	––	01
26	**50 + 51**	TRIPLE POLE INSTANTANEOUS OVER–CURRENT RELAY HAVING THE SETTING RANGE OF 200–800% OR 500–2000% OF CT SECONDARY AND ADJUSTABLE DEFINITE MINIMUM TIME, AUX. SUPPLY 220V DC .	L&T/JVS/C&S	–/1A	01
27	**50N + 51N**	INSTANTANEOUS EARTH FAULT RELAY HAVING AN ADJUSTABLE SETTING RANGE OF 10–40% OR 20 – 80% OF CT SECONDARY CURRENT AND ADJUSTABLE DEFINITE MINIMUM TIME. THE EARTH FAULT RELAY SHALL BE PROVIDED WITH A STABILISING RESISTOR, AUX. SUPPLY 220V DC.	L&T/JVS/C&S	–/1A	01

NOTE:– ALL COMPONENTS SHALL BE POWER GRID (QA&I) APPROVED MAKE

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN: MP
CHKD.: VDP
APPD.: ––
ALL DIMENSIONS IN mm.
TOLERANCE 5%
REVISIONS : 00
SIGN.

MANUFACTURER
ULTIMA® SWITCHGEARS LTD.
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E-mail : info@ultimaswitchgear.com

DRAWING	BILL OF MATERIAL
TITLE	415V AC DISTRIBUTION BOARD (2A) (MCRB)
CA NO.	CC/T/W–AIS/DOM/A10/23/01956/NOA–1/24–102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER–III POOLING STATION
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED
CONTRACTOR:–	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024–2025/1241A–702
JOB NO.	1241A
SH. NO.	02 OF 06

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BILL OF MATERIAL FOR 415V AC DISTRIBUTION BOARD (2A) (MCRB)

S.NO.	ITEM CODE	DESCRIPTION	MAKE	RATING	QTY.
B	**BILL OF MATERIAL FOR MODULE - (AE-BC) BUS-COUPLER**				1 No.
1	**52D**	TP ACB 415V,EDO, WITHOUT RELEASE, 1. SPRING CHARGE MOTOR 220V DC WITH SPRING CHARGE SWITCH 2. CLOSING RELEASE 220V DC 3. SHUNT RELEASE 220V DC 4. LIMIT SWITCH FOR TEST/ISOLATE/SERVICE POSITION 5. 4NO + 4NC POTENTIAL FREE CONTACT.	L&T/C&S/HAVELLS	800A, 50kA	01
2	**CF1-10**	HRC FUSE BASE	L&T/C&S/HAVELLS	20A	10
3	**CF1-10**	HRC FUSE LINK	L&T/C&S/HAVELLS	6A	10
4		AUX. CONTACTOR RELAY, COIL VOLTAGE 220V DC WITH 2NO+2NC AUX. CONTACT	L&T/C&S/HAVELLS	--	04
5		AUX. CONTACTOR RELAY, COIL VOLTAGE 220V DC WITH 4NO AUX. CONTACT	L&T/C&S/HAVELLS	--	02
6		2NO+2NC ADD ON BLOCK	L&T/C&S/HAVELLS	--	01
7		4NO ADD ON BLOCK	L&T/C&S/HAVELLS	--	01
8	**MCB**	DP MINIATURE CIRCUIT BREAKER, DC TYPE	L&T/C&S/HAVELLS	10A, 4kA	01
9	**MCTs**	CURRENT TRANSFORMER, RESIN CAST TYPE	NEWTEK/AE/PRECISE/PROCOM/ASHMOR	800/1A, CL-1.0, 7.5VA	03
10	**PCTs**	CURRENT TRANSFORMER, RESIN CAST TYPE	NEWTEK/AE/PRECISE/PROCOM/ASHMOR	800/1A, CL-5P15, 7.5VA	04
11	**A**	ANALOG AMMETER, SINGLE PHASE, SIZE-96X96 Sq. mm, CL-1.0, CTR-/1A	AE/RISHAB/NEWTEK/SECURE	0-800A	01
12	**ASS**	AMMETER SELECTOR SWITCH, ROTARY TYPE	SALZER/KAYCEE	6A	01
13	**Vt**	AC VOLTAGE TRANSDUCER, SINGLE OUTPUT- 4-20mA, PTR-415V AC, AUX. SUPPLY 220V DC	AE/RISHAB/SECURE	--	03
14	**Ct**	AC CURRENT TRANSDUCER, OUTPUT- 4-20mA, WITH SINGLE OUTPUT, AUX. SUPPLY 220V DC	AE/RISHAB/SECURE	800/1A	03
15	**TNC**	BREAKER CONTROL SWITCH	SALZER/KAYCEE	16A	01
16	**A/M**	AUTO/MANUAL SELECTOR SWITCH WITH OFF, 3POLE 2WAY, ROTARY TYPE	SALZER/KAYCEE	6A	01
17	**h1**	'ON' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, RED	ESBEE/VAISHNO/C&S	220V DC	01
18	**h2**	'OFF' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, GREEN	ESBEE/VAISHNO/C&S	220V DC	01
19	**h5**	'SPRING CHARGE' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, BLUE	ESBEE/VAISHNO/C&S	220V DC	01
20	**T3**	'ON' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, RED	GIC/PGCIL APPROVED MAKE	220V DC	01
21	**86**	HIGH SPEED TRIPING RELAY WITH 3NO+1NC CONTACT (AUTO RESET HIGH SPEED), AUX. SUPPLY 220V DC	L&T/JVS/C&S	--	01
22	**50 + 51**	TRIPLE POLE INSTANTANEOUS OVER-CURRENT RELAY HAVING THE SETTING RANGE OF 200-800% OR 500-2000% OF CT SECONDARY AND ADJUSTABLE DEFINITE MINIMUM TIME, AUX. SUPPLY 220V DC .	L&T/JVS/C&S	-/1A	01
23	**50N + 51N**	INSTANTANEOUS EARTH FAULT RELAY HAVING AN ADJUSTABLE SETTING RANGE OF 10-40% OR 20 - 80% OF CT SECONDARY CURRENT AND ADJUSTABLE DEFINITE MINIMUM TIME. THE EARTH FAULT RELAY SHALL BE PROVIDED WITH A STABILISING RESISTOR, AUX. SUPPLY 220V DC.	L&T/JVS/C&S	-/1A	01
C	**BILL OF MATERIAL FOR MODULE - (G2)**				2 Nos.
1	**CF1-3**	HRC FUSE BASE	L&T/C&S/HAVELLS	20A	03
2	**CF1-3**	HRC FUSE LINK	L&T/C&S/HAVELLS	2A	03
3	**V**	ANALOG VOLTMETER, SINGLE PHASE, SIZE-96X96 Sq. mm, CL-1.0, PTR-415AC	AE/RISHAB/NEWTEK/SECURE	0-500V	01
4	**VSS**	FOUR POSITION VOLTMETER SELECTOR SWITCH, ROTARY TYPE	SALZER/KAYCEE	6A	01
5	**R-PHASE**	'R' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, RED	ESBEE/VAISHNO/C&S	240V AC	01
6	**Y-PHASE**	'Y' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, YELLOW	ESBEE/VAISHNO/C&S	240V AC	01
7	**B-PHASE**	'B' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, BLUE	ESBEE/VAISHNO/C&S	240V AC	01

NOTE:- ALL COMPONENTS SHALL BE POWER GRID (QA&I) APPROVED MAKE

DATE	No.	REVISIONS DESCRIPTION			SIGN.
	04.	-	DRAWN	MP	
	03.	-	CHKD.	VDP	
	02.	-	APPD.	--	
	01.		ALL DIMENSIONS IN mm.		
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL	TOLERANCE 5%		
			REVISIONS : 00		

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E-mail : info@ultimaswitchgear.com

DRAWING	BILL OF MATERIAL	JOB NO. 1241A
TITLE	415V AC DISTRIBUTION BOARD (2A) (MCRB)	
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER-III POOLING STATION	
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:- BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-702	SH. NO. 03 OF 06

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BILL OF MATERIAL FOR 415V AC DISTRIBUTION BOARD (2A) (MCRB)

S.NO.	ITEM CODE	DESCRIPTION	MAKE	RATING	QTY.
D	**BILL OF MATERIAL FOR MODULE - (DG1)**				**1 No.**
1	**52C**	FP ACB 415V AC, EDO, WITHOUT RELEASE, 1. SPRING CHARGE MOTOR 220V DC WITH SPRING CHARGE SWITCH 2. CLOSING RELEASE 220V DC 3. SHUNT RELEASE 220V DC 4. LIMIT SWITCH FOR TEST/ISOLATE/SERVICE POSITION 5. 4NO + 4NC POTENTIAL FREE CONTACT.	L&T/C&S/HAVELLS	800A, 50kA	01
2	**CF1-13**	HRC FUSE BASE	L&T/C&S/HAVELLS	20A	13
3	**CF1-13**	HRC FUSE LINK	L&T/C&S/HAVELLS	6A	13
4		AUX. CONTACTOR RELAY, COIL VOLTAGE 220V DC WITH 2NO+2NC AUX. CONTACT	L&T/C&S/HAVELLS	--	03
5		2NO+2NC ADD ON BLOCK	L&T/C&S/HAVELLS	--	01
6	**MCB**	DP MINIATURE CIRCUIT BREAKER, DC TYPE	L&T/C&S/HAVELLS	10A	02
7	**MCTs**	CURRENT TRANSFORMER, RESIN CAST TYPE	NEWTEK/AE/PRECISE/PROCOM/ASHMOR	800/1A, CL-1, 7.5VA	03
8	**PCTs**	CURRENT TRANSFORMER, RESIN CAST TYPE	NEWTEK/AE/PRECISE/PROCOM/ASHMOR	800/1A, CL-5P15, 7.5VA	03
9	**PSCTs**	CURRENT TRANSFORMER, RESIN CAST TYPE	NEWTEK/AE/PRECISE/PROCOM/ASHMOR	800/1A, CL-PS, 7.5VA, Vx=300V	06*
10	**Hz**	FREQUENCY METER (Hz), 110V AC	NEWTEK/AE/PRECISE/PROCOM/ASHMOR	45Hz-55Hz	01
11	**KWH**	DIGITAL KILO WATT HOUR METER WITH SIX DIGITS AND MINIMUM COUNT OF ONE KWH,110V AC 3Ph 4 WIRE, SIZE - 96 X 96 Sq.mm., AUX. SUPPLY 240V AC	AE/RISHAB/NEWTEK/SECURE	800/1A	01
12	**KW**	DIGITAL KILO WATT METER, 110V AC 3Ph 4 WIRE, 0-300KW RANGE, AUX. SUPPLY 240V AC	AE/RISHAB/NEWTEK/SECURE	800/1A	01
13	**A**	ANALOG AMMETER, SINGLE PHASE, SIZE-96X96 Sq. mm, CL-1.0, CTR-/1A	AE/RISHAB/NEWTEK/SECURE /PGCIL APPROVED MAKE	0-800A	01
14	**V**	ANALOG VOLTMETER, SINGLE PHASE, SIZE-96X96 Sq. mm, CL-1.0, PTR-(415/√3 V)/(110/√3V) AC		0-500V	01
15	**A/M**	AUTO/MANUAL SELECTOR SWITCH, 3POLE 2WAY WITH OFF, ROTARY TYPE	SALZER/KAYCEE	6A	01
16	**ASS**	AMMETER SELECTOR SWITCH, ROTARY TYPE	SALZER/KAYCEE	6A	01
17	**VSS**	FOUR POSITION VOLTMETER SELECTOR SWITCH, ROTARY TYPE	SALZER/KAYCEE	6A	01
18	**TNC**	BREAKER CONTROL SWITCH, ROTARY TYPE	SALZER/KAYCEE	16A	01
19	**51V**	THREE POLE VOLTAGE CONTROLLED DEFINITE TIME OVER CURRENT RELAY, SETTING 50-200% OF CT SECONDARY CURRENT. A TIME DELAY 2.5-3SEC. CONNECTED IN CT OF Y PHASE FOR OVERLOAD ALARM, AUX. SUPPLY 220V DC, PTR-(415/√3 V)/(110/√3V) AC	L&T/JVS/C&S	800/1A	01
20	**95**	SINGLE POLE NON DIRECTIONAL DEFINITE TIME OVER CURRENT RELAY WITH INBUILT TIMER SETTING RANGE 50-200% IN STEP OF 10% TIME DELAY RANGE 0-25 SEC IN STEP OF 0.1 SEC, AUX. SUPPLY 220V DC, SETTING RATIO OF NOT LESS THAN 90%.	L&T/JVS/C&S	800/1A	01

*PROTECTION CT 3 NOS. WILL BE SUPPLIED LOOSE FOR MOUNTING IN DG SET PANEL

DATE	No.	REVISIONS DESCRIPTION
	04.	-
	03.	-
	02.	-
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN	MP
CHKD.	VDP
APPD.	--
ALL DIMENSIONS IN mm.	SIGN.
TOLERANCE 5%	
REVISIONS : 00	

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E-mail : info@ultimaswitchgear.com

DRAWING	BILL OF MATERIAL
TITLE	415V AC DISTRIBUTION BOARD (2A) (MCRB)
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER-III POOLING STATION
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED
CONTRACTOR:-	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-702
SH. NO.	04 OF 06

JOB NO. 1241A

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BILL OF MATERIAL FOR 415V AC DISTRIBUTION BOARD (2A) (MCRB)

S.NO.	ITEM CODE	DESCRIPTION	MAKE	RATING	QTY.
D		**BILL OF MATERIAL FOR MODULE - (DG1)**			**1 No.**
21	**86**	HIGH SPEED TRIPING RELAY WITH 3NO+1NC CONTACT (AUTO RESET HIGH SPEED), AUX. SUPPLY 220V DC	L&T/JVS/C&S	--	01
22	**87**	THREE POLE DIFFERENTIAL PROTECTION RELAY HAVING AN OPERATING CURRENT SETTING RANGE OF 10-40% OF GENERATOR FULL LOAD CURRENT. THE RELAY SHALL BE OF HIGH IMPEDANCE TYPE, WITH NECESSARY STABILIZING RESISTORS., AUX. SUPPLY 220V DC	L&T/JVS/C&S	800/1A	01
23	**Vt**	AC VOLTAGE TRANSDUCER, SINGLE OUTPUT- 4-20mA, PTR-(415/√3 V)/(110/√3V) AC, AUX. SUPPLY 220V DC	AE/RISHAB/SECURE	--	03
24	**Ct**	AC CURRENT TRANSDUCER, OUTPUT- 4-20mA, WITH SINGLE OUTPUT, AUX. SUPPLY 220V DC	AE/RISHAB/SECURE	800/1A	03
25	**R-PHASE**	'R' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, RED	ESBEE/VAISHNO/C&S	63.5V AC	01
26	**Y-PHASE**	'Y' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, YELLOW	ESBEE/VAISHNO/C&S	63.5V AC	01
27	**B-PHASE**	'B' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, BLUE	ESBEE/VAISHNO/C&S	63.5V AC	01
28	**h1**	'ON' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, RED	ESBEE/VAISHNO/C&S	220V DC	01
29	**h2**	'OFF' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, GREEN	ESBEE/VAISHNO/C&S	220V DC	01
30	**h3**	'TRIP' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, AMBER	ESBEE/VAISHNO/C&S	220V DC	01
31	**h5**	'SPRING CHARGE' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, BLUE	ESBEE/VAISHNO/C&S	220V DC	01
32	**P1**	'STOP' PUSH BUTTON, SPRING RETURN TYPE, 22.5 Sq. mm. DIA WITH 2NC CONTACT, RED	ESBEE/VAISHNO/C&S	220V DC	01
33	**P2**	'START' PUSH BUTTON, SPRING RETURN TYPE, 22.5 Sq. mm. DIA WITH 2NO CONTACT, GREEN	ESBEE/VAISHNO/C&S	220V DC	01
34	**BUS-PT**	(415/√3V)/(110/√3V)VOLTS SINGLE PHASE VOLTAGE TRANSFORMER STAR/STAR CONNECT WITH STAR POINT SOLIDLY EARTHED MOUNTED ON COMMON DRAW OUT CHASSIS. ACCURACY CLASS 0.5 FOR PROTECTION AND METERING WITH 50VA BURDEN.	NEWTEK/AE/PRECISE/PROCOM /ASHMOR	--	03
E	**BILL OF MATERIAL FOR MISC.**				
1	**MCB**	DP MINIATURE CIRCUIT BREAKER, 'C' CURVE	L&T/C&S/HAVELLS	25A, 10kA	01
2	**MCB**	DP MINIATURE CIRCUIT BREAKER, DC TYPE	L&T/C&S/HAVELLS	25A	02
3	**MCB**	SP MINIATURE CIRCUIT BREAKER, 'C' CURVE	L&T/C&S/HAVELLS	16A, 10kA	11
4	**SW - SOCKET**	SWITCH WITH SOCKET	ANCHOR/REPUTED	5/15A	03
5	SS	SELECTOR SWITCH, 2P, 2W WITH OFF	SALZER/KAYCEE	32A	01
6	**DS**	DOOR SWITCH	SURAJ/REPUTED	1 C/O	11
7	**PL**	PANEL ILLUMINATION LIGHT, 240V AC	COMPACT/REPUTED	5W	11
8	**SH**	SPACE HEATER, 240V AC	HOTWEL/REPUTED	60W	11
9	**TH**	THERMOSTATE	ELCON/REPUTED	30 - 85°C	11
10	**TS**	TOGGLE SWITCH	FTC/REPUTED	6A	11

NOTE:- ALL COMPONENTS SHALL BE POWER GRID (QA&I) APPROVED MAKE

DATE	No.	REVISIONS DESCRIPTION
	04.	-
	03.	-
	02.	-
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN: MP | CHKD.: VDP | APPD.: -- | ALL DIMENSIONS IN mm. | TOLERANCE 5% | REVISIONS : 00 | SIGN.

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E-mail : info@ultimaswitchgear.com

DRAWING	BILL OF MATERIAL
TITLE	415V AC DISTRIBUTION BOARD (2A) (MCRB)
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER-III POOLING STATION
JOB NO.	1241A
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED
CONTRACTOR:-	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-702
SH. NO.	05 OF 06

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BILL OF MATERIAL FOR 415V AC DISTRIBUTION BOARD (2A) (MCRB)

S.NO.	ITEM CODE	DESCRIPTION	MAKE	RATING	QTY.
F	**BILL OF MATERIAL FOR MODULE - (E) FOR OUTGOINGS**				
1	**MCCB**	FP MCCB 415V, WITH THERMAL MAGNETIC BASED RELEASE FOR O/L,S/C PROTECTION WITH SPREADER & EXTENDED ROM, Ics = 100% Icu	L&T/C&S/HAVELLS	400A, 20kA	02
2	**MCCB**	FP MCCB 415V, WITH THERMAL MAGNETIC BASED RELEASE FOR O/L,S/C PROTECTION WITH SPREADER & EXTENDED ROM, Ics = 100% Icu	L&T/C&S/HAVELLS	200A, 20kA	03
3	**MCCB**	FP MCCB 415V, WITH THERMAL MAGNETIC BASED RELEASE FOR O/L,S/C PROTECTION WITH SPREADER & EXTENDED ROM, Ics = 100% Icu	L&T/C&S/HAVELLS	100A, 20kA	35
4	**MCCB**	FP MCCB 415V, WITH THERMAL MAGNETIC BASED RELEASE FOR O/L,S/C PROTECTION WITH EXTENDED ROM, Ics = 100% Icu	L&T/C&S/HAVELLS	63A, 20kA	91
5	**MCCB**	FP MCCB 415V, WITH THERMAL MAGNETIC BASED RELEASE FOR O/L,S/C PROTECTION WITH EXTENDED ROM, Ics = 100% Icu	L&T/C&S/HAVELLS	32A, 20kA	13
6	**MCB**	SPN MINIATURE CIRCUIT BREAKER, 'C' CURVE	L&T/C&S/HAVELLS	32A, 10kA	16

NOTE:– ALL COMPONENTS SHALL BE POWER GRID (QA&I) APPROVED MAKE

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN: MP
CHKD.: VDP
APPD.: --
ALL DIMENSIONS IN mm. SIGN.
TOLERANCE 5%
REVISIONS : 00

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DRAWING	BILL OF MATERIAL
TITLE	415V AC DISTRIBUTION BOARD (2A) (MCRB)
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER-III POOLING STATION
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED
CONTRACTOR:–	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-702
SH. NO.	06 OF 06

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ENGINEERING DRAWING DETAILS FOR

415V MAIN LIGHTING DISTRIBUTION BOARD (3A) (MCRB)

PROJECT :- 765/400/220kV BIKANER-III POOLING STATION

CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED

CONTRACTOR :- BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION

DATE	No.	REVISIONS DESCRIPTION			SIGN.
	04.	–	DRAWN	MP	
	03.	–	CHKD.	VDP	
	02.	–	APPD.	--	
	01.		ALL DIMENSIONS IN mm.		
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL	TOLERANCE 5%		
			REVISIONS : 00		

MANUFACTURER
ULTIMA® SWITCHGEARS LTD.
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E-mail : info@ultimaswitchgear.com

DRAWING	COVER PAGE	JOB NO. 1241A
TITLE	415V MAIN LIGHTING DISTRIBUTION BOARD (3A) (MCRB)	
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER-III POOLING STATION	
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:- BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-003	SH. NO. 01 OF 01

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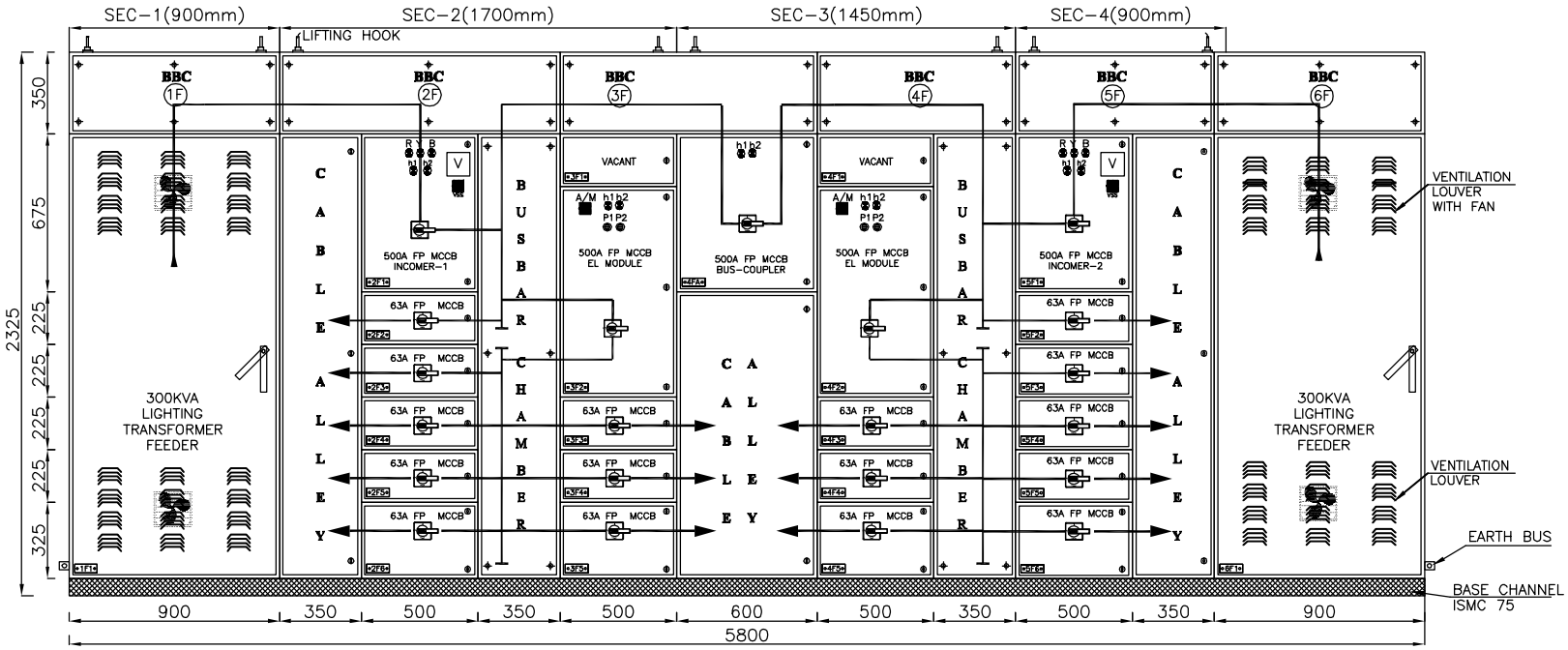
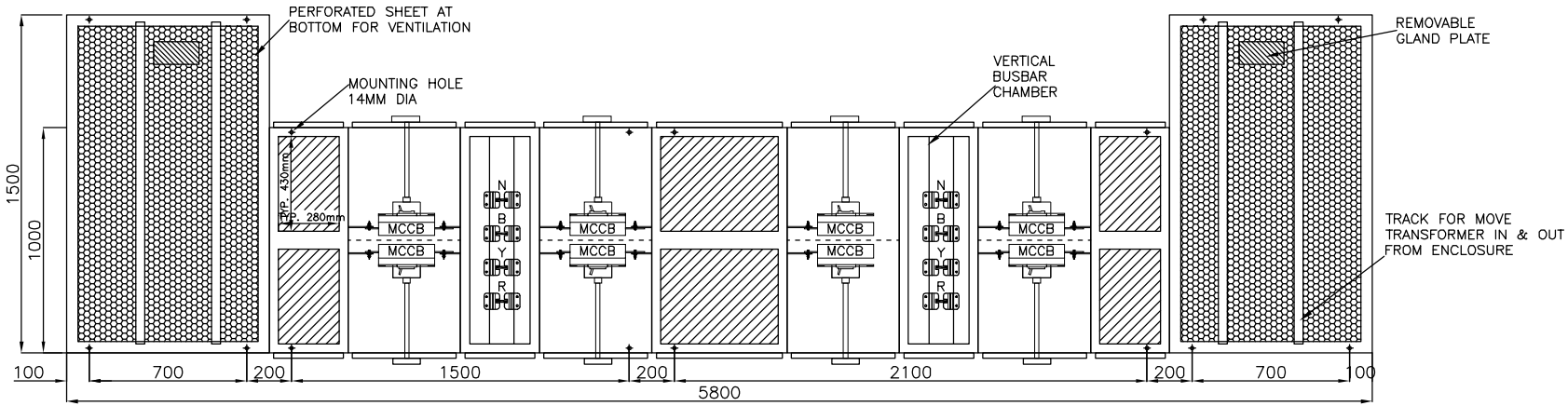


FRONT VIEW



BOTTOM VIEW

	04.	–	DRAWN	MP	
	03.	–	CHKD.	VDP	
	02.	–	APPD.	--	
	01.		ALL DIMENSIONS IN mm.		SIGN.
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL	TOLERANCE 5%		
DATE	No.	REVISIONS DESCRIPTION	REVISIONS : 00		

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E-mail : info@ultimaswitchgear.com

DRAWING	GENERAL ARRANGEMENT DRAWING	JOB NO. 1241A
TITLE	415V MAIN LIGHTING DISTRIBUTION BOARD (3A) (MCRB)	
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER-III POOLING STATION	
CLIENT: POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:- BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION	
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-103	SH. NO. 01 OF 03

1 2 3 4 5 6 7 8 9

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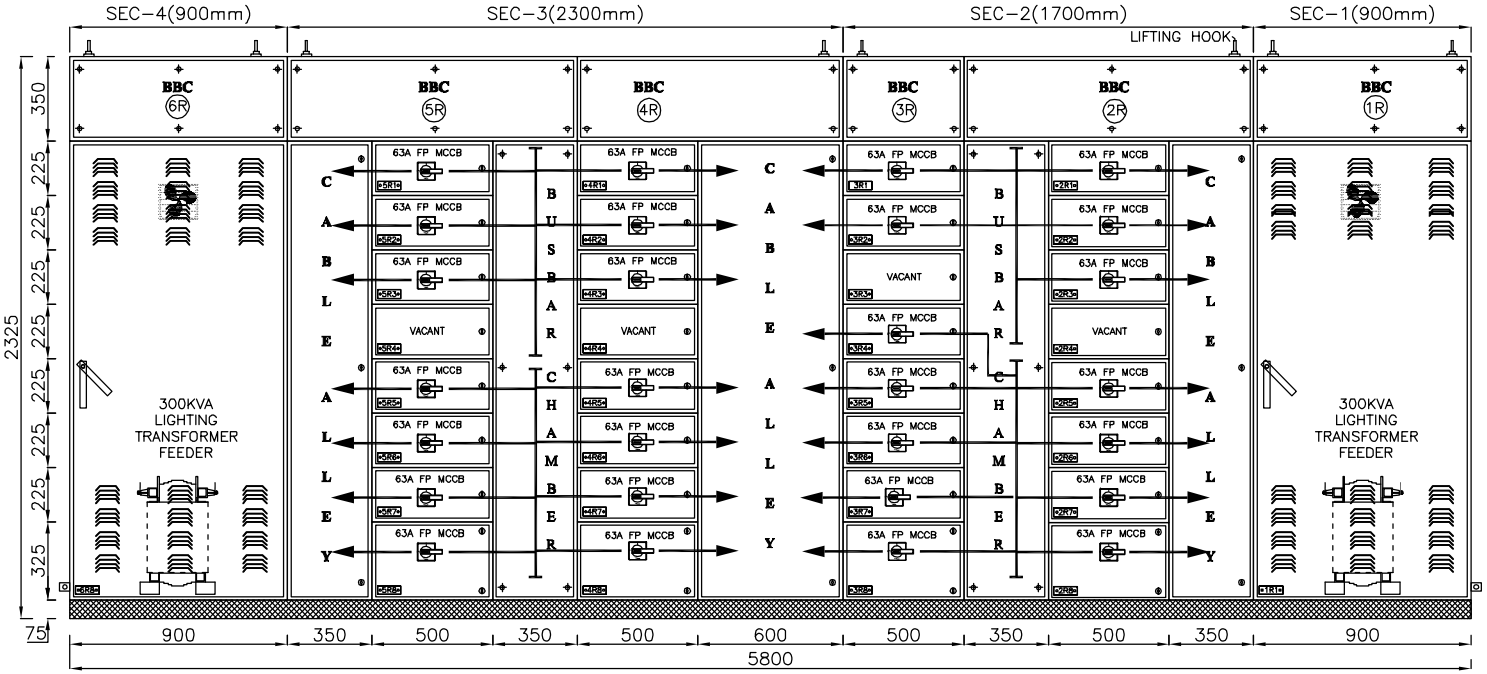

REAR VIEW

PANEL DIMENSIONS

HEIGHT 2325 mm.
WIDTH 5800 mm.
DEPTH 1500/1000 mm.

CABLE ENTRY

BOTTOM ENTRY

HORIZONTAL BUS BAR SIZE :-

PHASE : 1x50x10 Sq.mm Al. .
NEUTRAL : 1x50x06 Sq.mm Al.
EARTH : 1x50x06 Sq.mm. GS.

VERTICAL BUS BAR SIZE :-

PHASE : 1X50X10 SQ.MM AL.
NEUTRAL : 1X50X06 SQ.MM AL.

LEGEND DESCRIPTION

R = R-PHASE INDICATION (RED)
Y = Y-PHASE INDICATION (YELLOW)
B = B-PHASE INDICATION (BLUE)
h1 = ON INDICATION RED
h2 = OFF INDICATION GREEN
A = DIGITAL AMMETER
V = DIGITAL VOLT METER
ASS = AMMETER SELECTOR SWITCH
VSS = VOLTAGE SELECTOR SWITCH
P1 = CONTACTOR OFF PUSH BUTTON
P2 = CONTACTOR ON PUSH BUTTON
A/M = AUTO/MANUAL SELECTOR SWITCH

DATE	No.	REVISIONS DESCRIPTION			SIGN.
	04.	–	DRAWN	MP	
	03.	–	CHKD.	VDP	
	02.	–	APPD.	--	
	01.		ALL DIMENSIONS IN mm.		
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL	TOLERANCE 5%		
			REVISIONS : 00		

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E-mail : info@ultimaswitchgear.com

DRAWING	GENERAL ARRANGEMENT DRAWING	JOB NO. 1241A
TITLE	415V MAIN LIGHTING DISTRIBUTION BOARD (3A) (MCRB)	
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER-III POOLING STATION	
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:- BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-103	SH. NO. 02 OF 03

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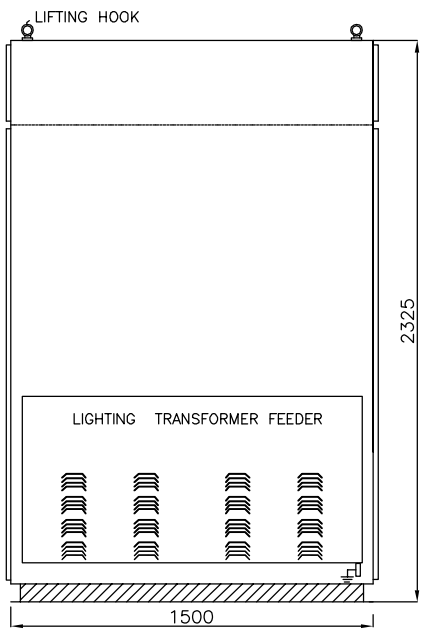
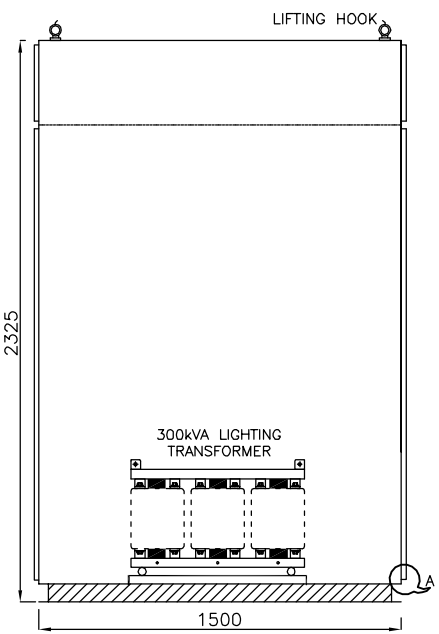
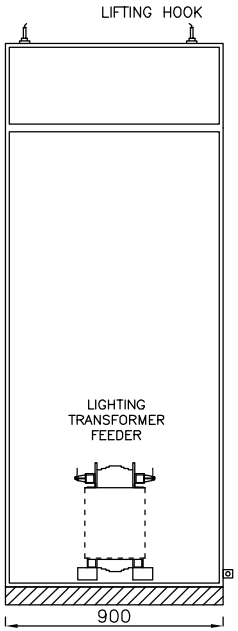


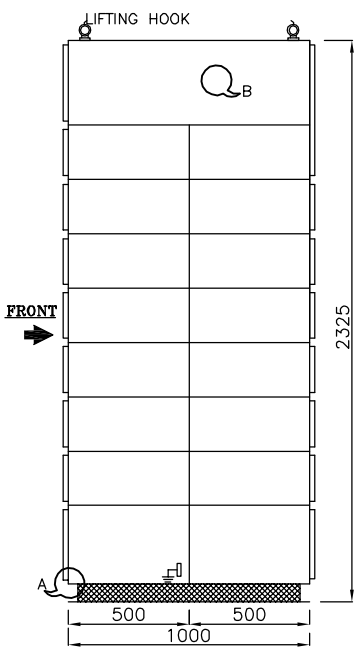
SIDE VIEW



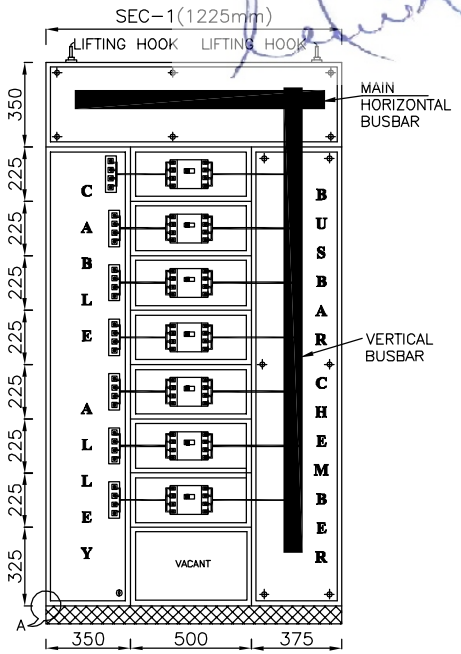
SIDE VIEW WITHOUT DOOR



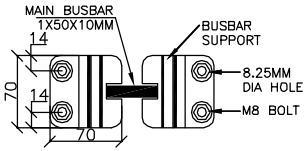
FRONT VIEW WITHOUT DOOR



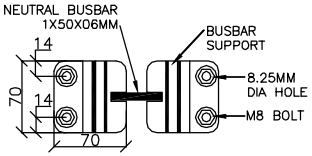
SIDE VIEW



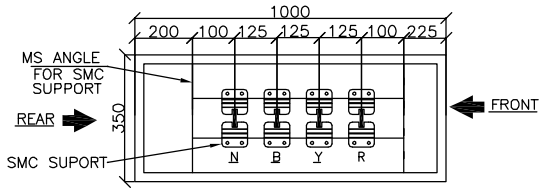
MCCB & BUSBAR SECTION (FRONT VIEW W/O DOOR & COVER)



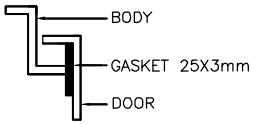
DETAIL OF PHASE BUSBAR SUPPORT



DETAIL OF NEUTRAL BUSBAR SUPPORT



SECTIONAL VIEW AT FOR HORIZONTAL BUSBAR TOLERANCE DETAIL-B



DETAIL-'A'

	04.	–	DRAWN	MP	
	03.	–	CHKD.	VDP	
	02.	–	APPD.	--	
	01.		ALL DIMENSIONS IN mm.		SIGN.
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL	TOLERANCE 5%		
DATE	No.	REVISIONS DESCRIPTION	REVISIONS : 00		

MANUFACTURER
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UNIT-II F-6 & F-7, SITE-C, UPSIDC, SURAJPUR INDUSTRIAL AREA, GREATER NOIDA - 201306 G. B. NAGAR (U.P.) INDIA
E-mail : info@ultimaswitchgear.com

DRAWING	GENERAL ARRANGEMENT DRAWING		JOB NO. 1241A
TITLE	415V MAIN LIGHTING DISTRIBUTION BOARD (3A) (MCRB)		
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024		
PROJECT	765/400/220kV BIKANER-III POOLING STATION		
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:- BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION	
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-103		SH. NO. 03 OF 03

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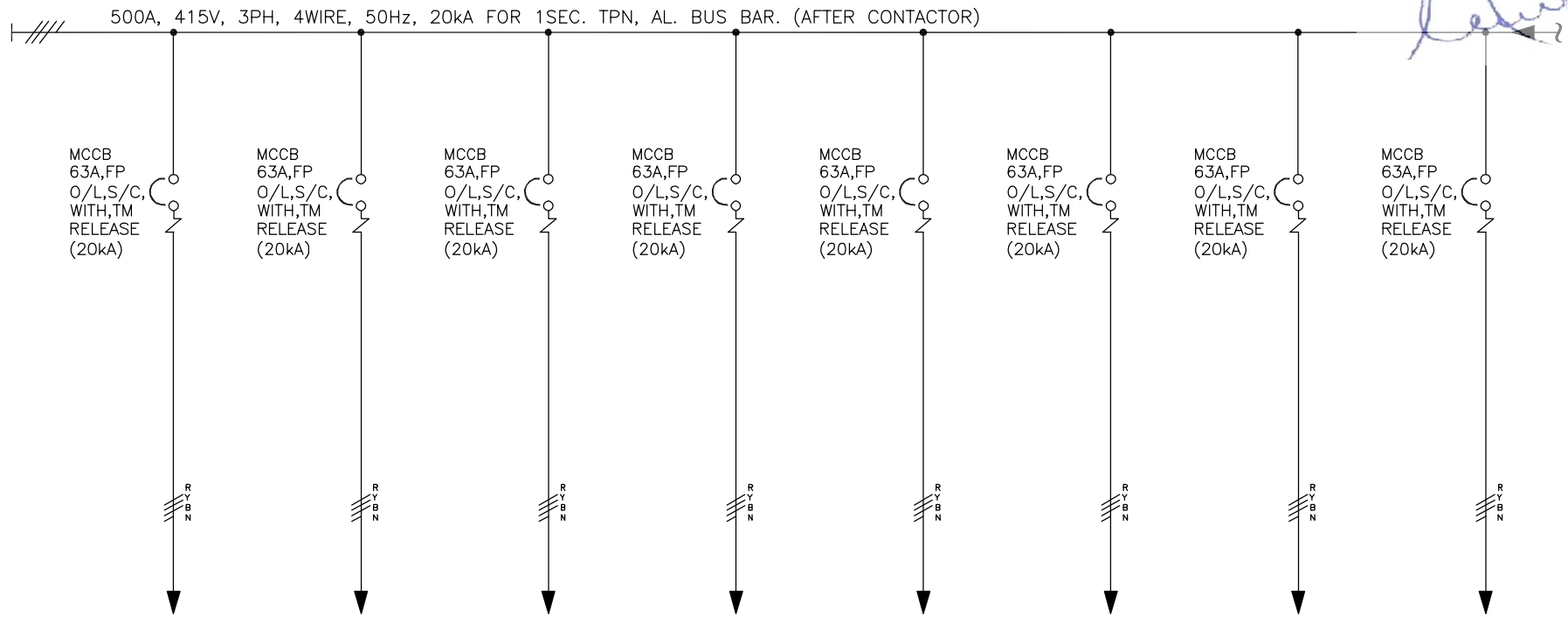

FEEDER NUMBER	2F3	2F4	2F5	2F6	3F3	3F4	3F5	2R5
MODULE TYEP	E	E	E	E	E	E	E	E
FEEDER RATING	63A	63A	63A	63A	63A	63A	63A	63A
FEEDER TYPE	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB
DESCRIPTION	765kV SWITCHYARD LIGHTING PANEL (1) ACP-2	765kV SWITCHYARD LIGHTING PANEL (2) ACP-2	765kV SWITCHYARD LIGHTING PANEL (3) ACP-2	765kV SWITCHYARD LIGHTING PANEL (4) ACP-2	765kV SWITCHYARD LIGHTING PANEL (5) ACP-2	765kV SWITCHYARD LIGHTING PANEL (6) ACP-2	400kV SWITCHYARD LIGHTING PANEL (7) ACP-2	400kV SWITCHYARD LIGHTING PANEL (8) ACP-2
POWER CABLE SIZE	3.5CX70 Sqmm.	3.5CX70 Sqmm.	3.5CX70 Sqmm.	3.5CX70 Sqmm.	3.5CX70 Sqmm.	3.5CX70 Sqmm.	3.5CX70 Sqmm.	3.5CX70 Sqmm.

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN	MP	
CHKD.	VDP	
APPD.	--	
ALL DIMENSIONS IN mm.		SIGN.
TOLERANCE 5%		
REVISIONS : 00		

MANUFACTURER
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E-mail : info@ultimaswitchgear.com

DRAWING	SINGLE LINE DIAGRAM
TITLE	415V MAIN LIGHTING DISTRIBUTION BOARD (3A) (MCRB)
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER-III POOLING STATION
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED
CONTRACTOR:-	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-203
SH. NO.:-	01 OF 07

JOB NO. 1241A

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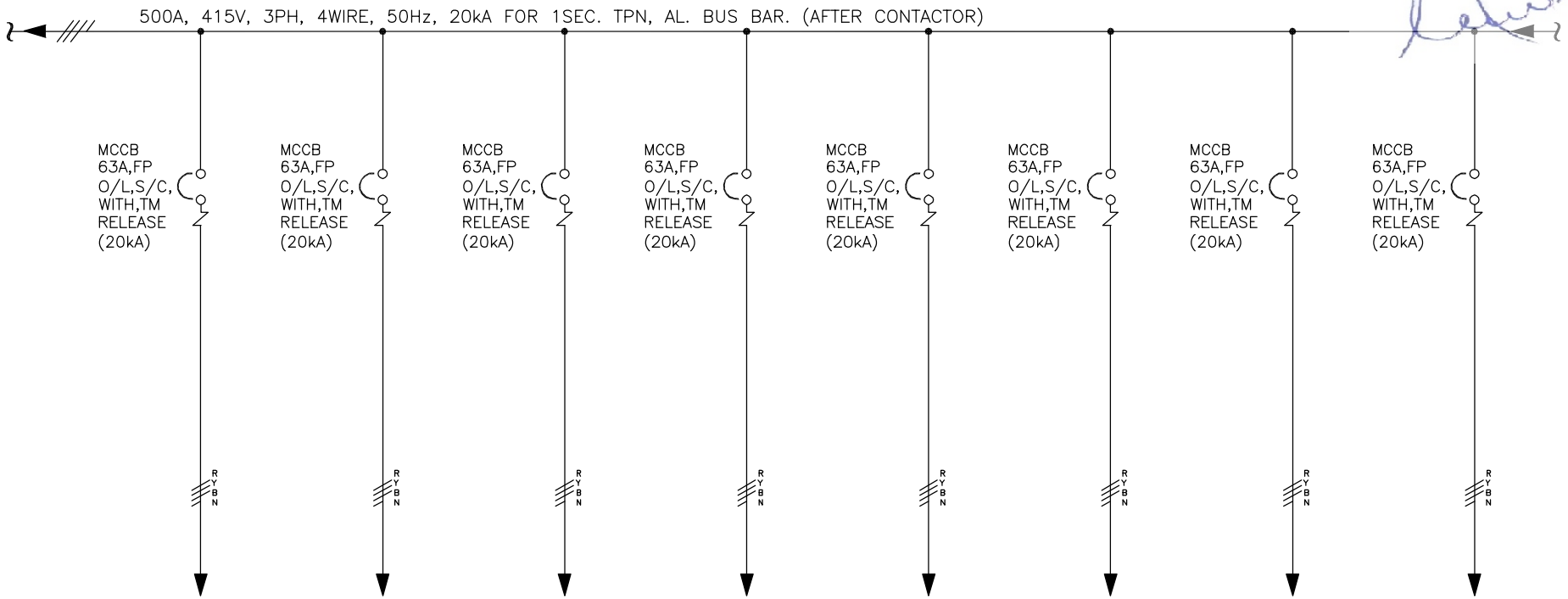

FEEDER NUMBER	2R6	2R7	2R8	3R4	3R5	3R6	3R7	3R8
MODULE TYEP	E	E	E	E	E	E	E	E
FEEDER RATING	63A	63A	63A	63A	63A	63A	63A	63A
FEEDER TYPE	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB
DESCRIPTION	SWITCHYARD STREET LIGHTING PANEL ACP–3	SPARE 1	SPARE 2	FUTURE SWITCHYARD	FUTURE SWITCHYARD	FUTURE SWITCHYARD	FUTURE SWITCHYARD	FUTURE SWITCHYARD
POWER CABLE SIZE	3.5CX70 Sqmm.	––	––	3.5CX35 Sqmm.	3.5CX35 Sqmm.	3.5CX35 Sqmm.	3.5CX35 Sqmm.	3.5CX35 Sqmm.

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN: MP
CHKD.: VDP
APPD.: ––
ALL DIMENSIONS IN mm. SIGN.
TOLERANCE 5%
REVISIONS : 00

MANUFACTURER
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DRAWING	SINGLE LINE DIAGRAM
TITLE	415V MAIN LIGHTING DISTRIBUTION BOARD (3A) (MCRB)
CA NO.	CC/T/W–AIS/DOM/A10/23/01956/NOA–1/24–102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER–III POOLING STATION
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED
CONTRACTOR:–	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024–2025/1241A–203
SH. NO.:–	02 OF 07

JOB NO. 1241A

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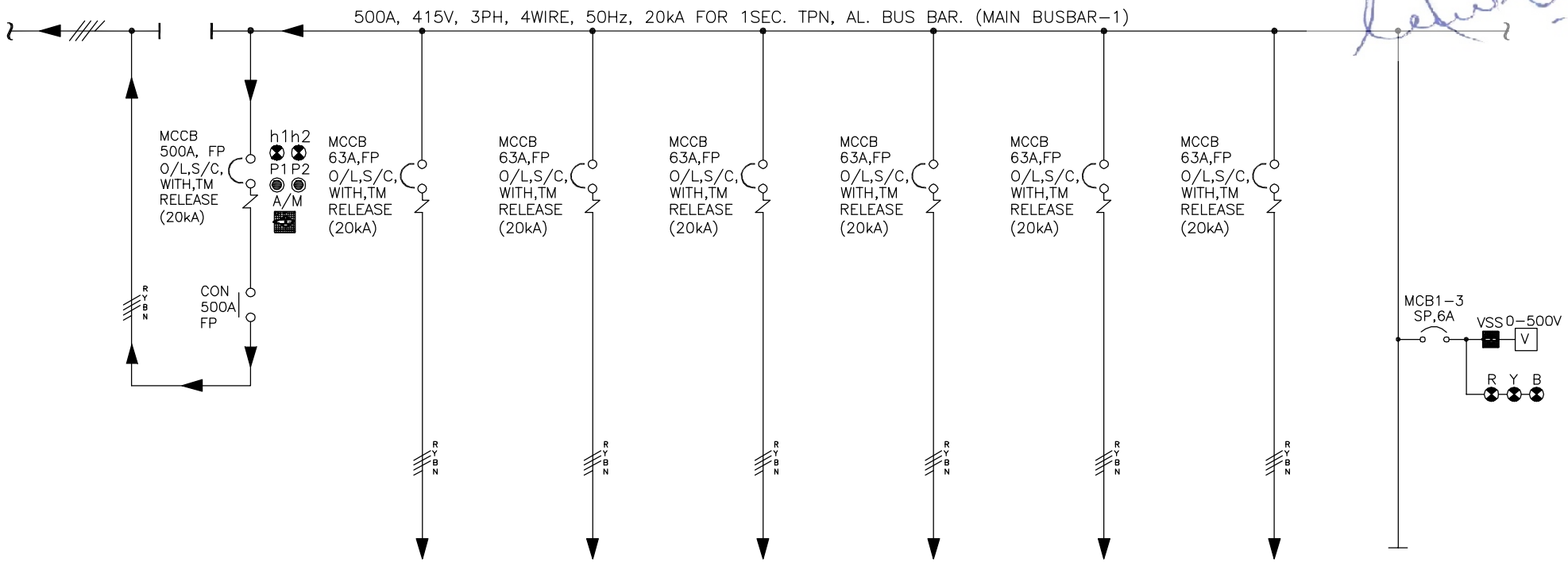

FEEDER NUMBER	3F2	2F2	2R1	2R2	2R3	3R1	3R2	2F1
MODULE TYEP	EL	E	E	E	E	E	E	G2
FEEDER RATING	500A	63A	63A	63A	63A	63A	63A	--
FEEDER TYPE	MCCB+CONT.	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	METERING
DESCRIPTION	MODULE EL	INDOOR LIGHTING PANEL (1) CRB	INDOOR LIGHTING PANEL (2) AUX BUILDING	INDOOR LIGHTING PANEL (3) FFPH	RECEPTACLE-1	RECEPTACLE-2	RECEPTACLE-3	--
POWER CABLE SIZE	--	3.5CX35 Sqmm.	3.5CX35 Sqmm.	3.5CX35 Sqmm.	3.5CX35 Sqmm.	3.5CX35 Sqmm.	3.5CX35 Sqmm.	--

DATE	No.	REVISIONS DESCRIPTION
	04.	-
	03.	-
	02.	-
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN: MP
CHKD.: VDP
APPD.: --
ALL DIMENSIONS IN mm. SIGN.
TOLERANCE 5%
REVISIONS : 00

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DRAWING	SINGLE LINE DIAGRAM
TITLE	415V MAIN LIGHTING DISTRIBUTION BOARD (3A) (MCRB)
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER-III POOLING STATION
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED
CONTRACTOR:-	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-203
SH. NO.:-	03 OF 07

JOB NO. 1241A

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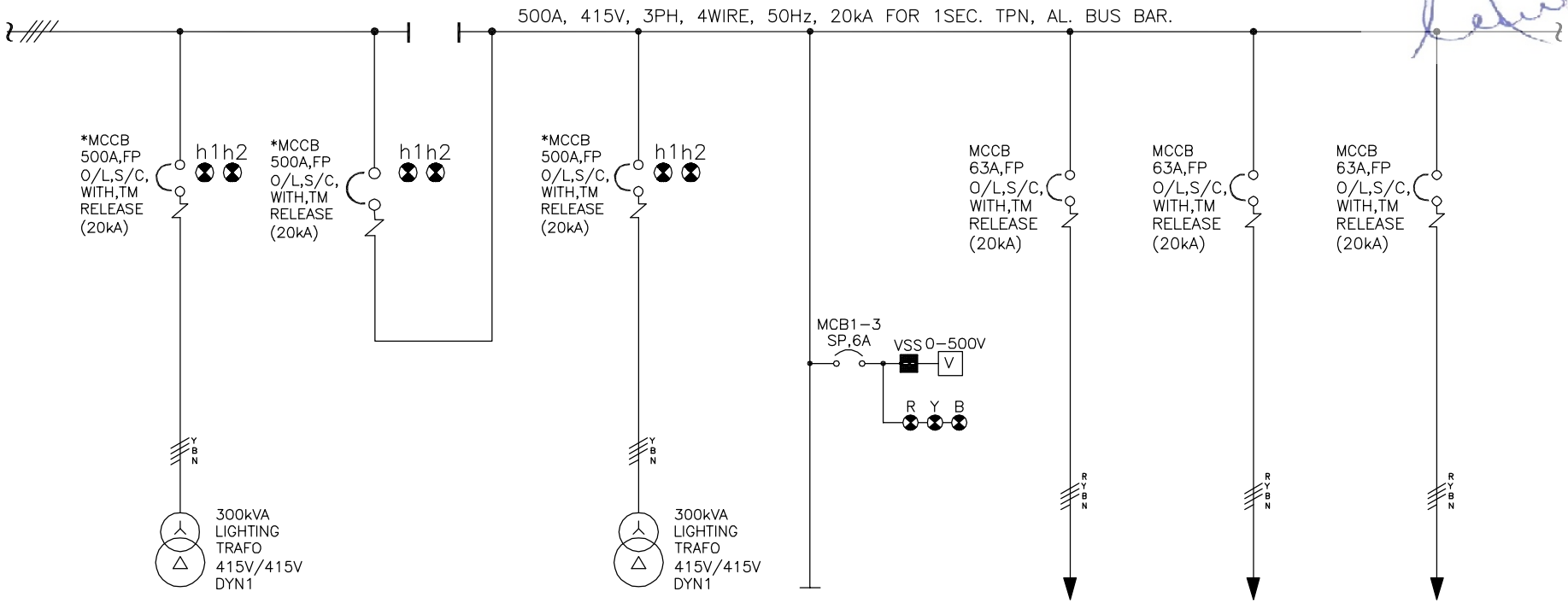

FEEDER NUMBER	1F1+2F1	4FA	5F1+6F1	5F1	5F2	4R1	4R2
MODULE TYEP	H	H (BC)	H	G2	E	E	E
FEEDER RATING	500A	500A	500A	--	63A	63A	63A
FEEDER TYPE	MCCB	MCCB	MCCB	METERING	MCCB	MCCB	MCCB
DESCRIPTION	415V AC SUPPLY INCOMER -1 FROM 300kVA TRANSFORMER	BUSCOUPLER	415V AC SUPPLY INCOMER -2 FROM 300kVA TRANSFORMER	--	RECEPTACLE-4	RECEPTACLE-5	RECEPTACLE-6
POWER CABLE SIZE	2RX3.5CX300 Sqmm. AL XLPE CABLE	--	2RX3.5CX300 Sqmm. AL XLPE CABLE	--	3.5CX35 Sqmm.	3.5CX35 Sqmm.	3.5CX35 Sqmm.

DATE	No.	REVISIONS DESCRIPTION
	04.	-
	03.	-
	02.	-
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN: MP
CHKD.: VDP
APPD.: --
ALL DIMENSIONS IN mm. SIGN.
TOLERANCE 5%
REVISIONS : 00

MANUFACTURER
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DRAWING	SINGLE LINE DIAGRAM
TITLE	415V MAIN LIGHTING DISTRIBUTION BOARD (3A) (MCRB)
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER-III POOLING STATION

JOB NO. 1241A

CLIENT
POWER GRID CORPORATION OF INDIA LIMITED

CONTRACTOR:-
BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION

DRG. NO. USL/PGCIL/BHEL/2024-2025/1241A-203

SH. NO.:- 04 OF 07

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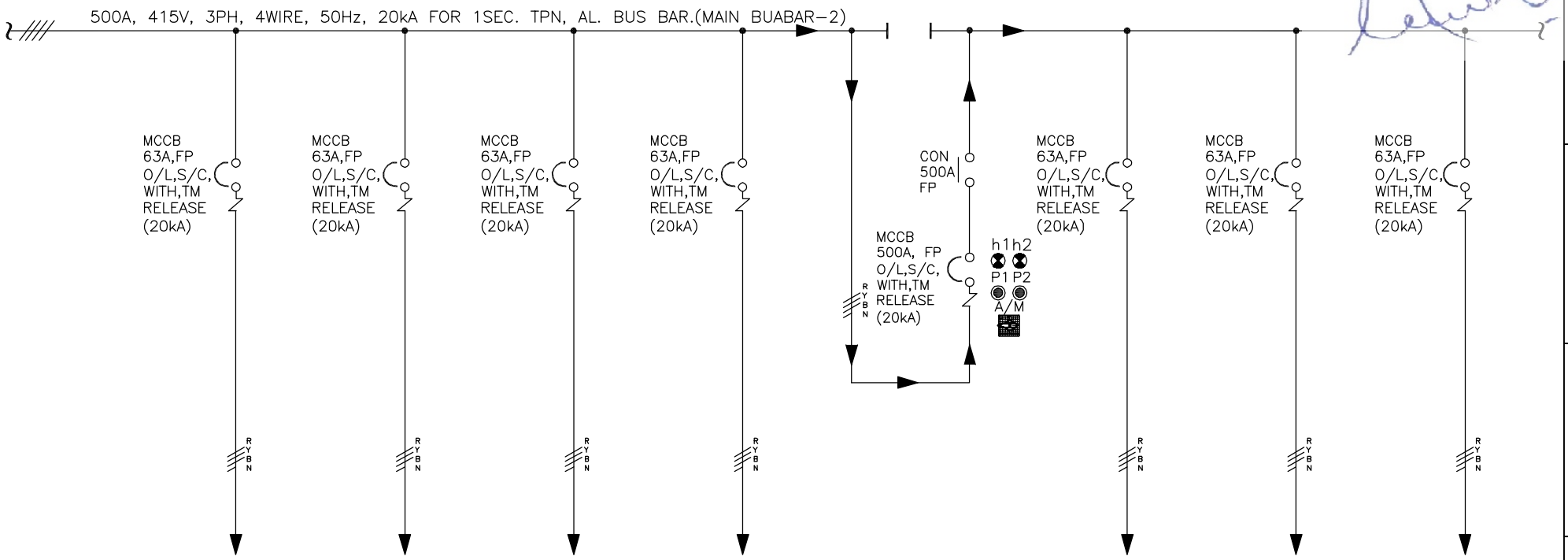

FEEDER NUMBER	4R3	5R1	5R2	5R3	4F2	4F3	4F4	4F5
MODULE TYEP	E	E	E	E	EL	E	E	E
FEEDER RATING	63A	63A	63A	63A	500A	63A	63A	63A
FEEDER TYPE	MCCB	MCCB	MCCB	MCCB	MCCB+CONT.	MCCB	MCCB	MCCB
DESCRIPTION	RECEPTACLE-7	RECEPTACLE-8	RECEPTACLE-9	RECEPTACLE-10	MODULE EL	FUTURE SWITCHYARD	FUTURE SWITCHYARD	FUTURE SWITCHYARD
POWER CABLE SIZE	3.5CX35 Sqmm.	3.5CX35 Sqmm.	3.5CX35 Sqmm.	3.5CX35 Sqmm.	--	3.5CX35 Sqmm.	3.5CX35 Sqmm.	3.5CX35 Sqmm.

DATE	No.	REVISIONS DESCRIPTION
	04.	-
	03.	-
	02.	-
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN	MP	
CHKD.	VDP	
APPD.	--	
ALL DIMENSIONS IN mm.		SIGN.
TOLERANCE 5%		
REVISIONS : 00		

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E-mail : info@ultimaswitchgear.com

DRAWING	SINGLE LINE DIAGRAM
TITLE	415V MAIN LIGHTING DISTRIBUTION BOARD (3A) (MCRB)
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER-III POOLING STATION
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED
CONTRACTOR:-	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-203
SH. NO.:-	05 OF 07

JOB NO. 1241A

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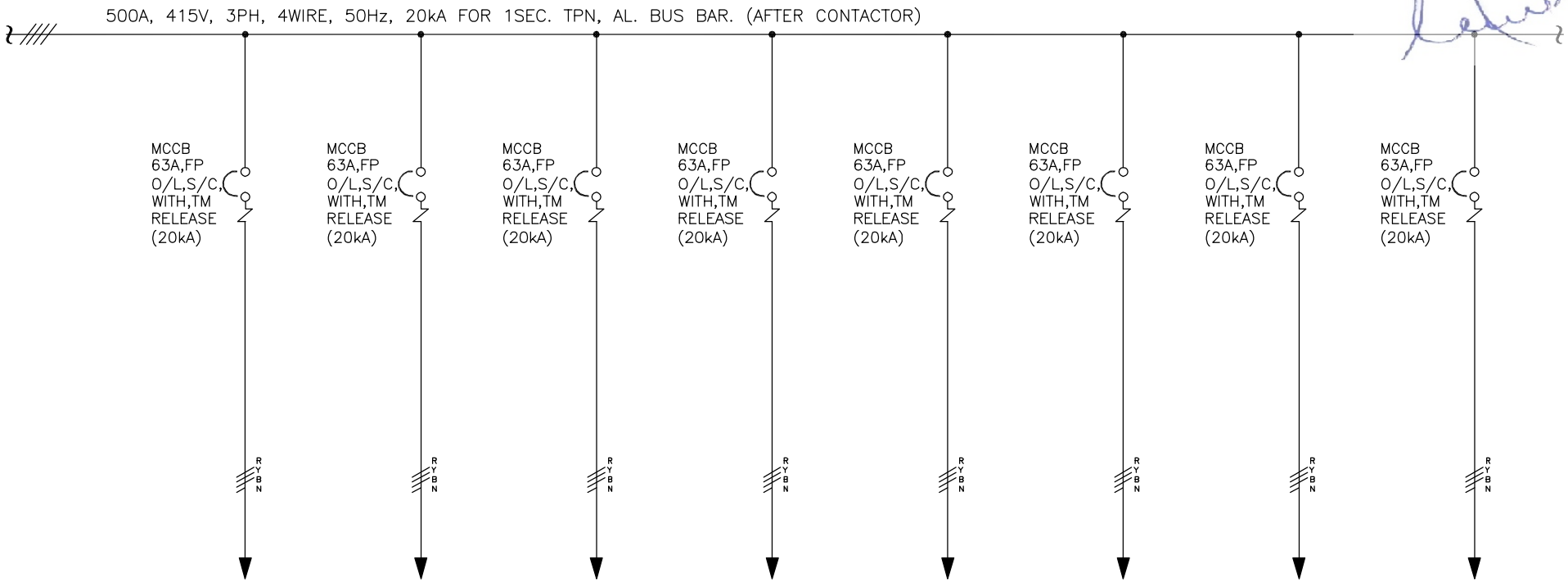

FEEDER NUMBER	5F3	5F4	5F5	5F6	4R5	4R6	4R7	4R8
MODULE TYEP	E	E	E	E	E	E	E	E
FEEDER RATING	63A	63A	63A	63A	63A	63A	63A	63A
FEEDER TYPE	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB
DESCRIPTION	FUTURE SWITCHYARD	FUTURE SWITCHYARD	400kV SWITCHYARD LIGHTING PANEL (9) ACP-2	400kV SWITCHYARD LIGHTING PANEL (10) ACP-2	400kV SWITCHYARD LIGHTING PANEL (11) ACP-2	400kV SWITCHYARD LIGHTING PANEL (12) ACP-2	220kV SWITCHYARD LIGHTING PANEL (13) ACP-2	200kV SWITCHYARD LIGHTING PANEL (14) ACP-2
POWER CABLE SIZE	3.5CX35 Sqmm.	3.5CX35 Sqmm.	3.5CX70 Sqmm.	3.5CX70 Sqmm.	3.5CX70 Sqmm.	3.5CX70 Sqmm.	3.5CX70 Sqmm.	3.5CX70 Sqmm.

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN	MP
CHKD.	VDP
APPD.	--
ALL DIMENSIONS IN mm.	SIGN.
TOLERANCE 5%	
REVISIONS : 00	

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E-mail : info@ultimaswitchgear.com

DRAWING	SINGLE LINE DIAGRAM
TITLE	415V MAIN LIGHTING DISTRIBUTION BOARD (3A) (MCRB)
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER-III POOLING STATION
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED
CONTRACTOR:-	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-203
SH. NO.:-	06 OF 07

JOB NO. 1241A

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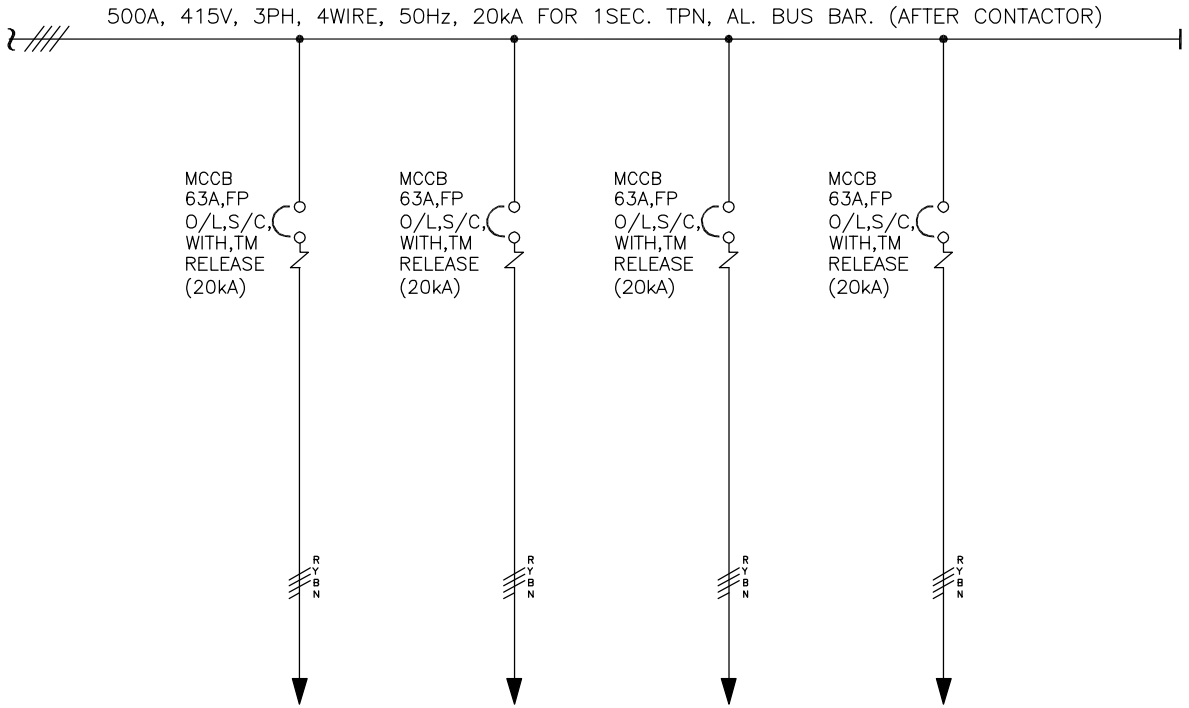

FEEDER NUMBER	5R5	5R6	5R7	5R8
MODULE TYEP	E	E	E	E
FEEDER RATING	63A	63A	63A	63A
FEEDER TYPE	MCCB	MCCB	MCCB	MCCB
DESCRIPTION	200kV SWITCHYARD LIGHTING PANEL (15) ACP-2	200kV SWITCHYARD LIGHTING PANEL (16) ACP-2	SPARE	SPARE
POWER CABLE SIZE	3.5CX70 Sqmm.	3.5CX70 Sqmm.	--	--

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN: MP
CHKD.: VDP
APPD.: --
ALL DIMENSIONS IN mm.
TOLERANCE 5%
REVISIONS : 00
SIGN.

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DRAWING	SINGLE LINE DIAGRAM
TITLE	415V MAIN LIGHTING DISTRIBUTION BOARD (3A) (MCRB)
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER-III POOLING STATION
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED
CONTRACTOR:-	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-203
SH. NO.:-	07 OF 07

JOB NO. 1241A

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BILL OF MATERIAL FOR 415V MAIN LIGHTING DISTRIBUTION BOARD (3A) (MCRB)

S.NO.	ITEM CODE	DESCRIPTION	MAKE	RATING	QTY.
A	**BILL OF MATERIAL FOR MODULE - (H)**				02 Nos.
1	**MCCB**	FP MCCB, WITH THERMAL MAGNETIC BASED RELEASE FOR 80–100 % O/L, S/C PROTECTION WITH SPREADER LINK, ROTARY OPERATING MECHANISM (ROM) & 1C/O AUX. CONTACT, Ics=100% Icu	L&T/C&S/HAVELLS	500A, 20kA	01
2	**MCB**	SP MINIATURE CIRCUIT BREAKER, 'C' CURVE	L&T/C&S/HAVELLS	6A, 10kA	01
3	**LIGHTING TRF**	LIGHTING TRANSFORMER 415/415 Dyn1	PGCIL APPROVED	300kVA	01
4	**h1**	'ON' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, RED	ESBEE/VAISHNO/C&S	240V AC	01
5	**h2**	'OFF' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, GREEN	ESBEE/VAISHNO/C&S	240V AC	01
B	**BILL OF MATERIAL FOR MODULE - (EL)**				02 Nos.
1	**MCCB**	FP MCCB, WITH THERMAL MAGNETIC BASED RELEASE FOR 80–100 % O/L, S/C PROTECTION WITH SPREADER LINK & ROTARY OPERATING MECHANISM (ROM), Ics=100% Icu	L&T/C&S/HAVELLS	500A, 20kA	01
2	**CM**	FP POWER CONTACTOR, COIL VOLTAGE 240V AC, WITH 2NO+2NC AUX. CONTACT, AC–1 DUTY	L&T/C&S/HAVELLS	500A	01
3	**MCB**	SP MINIATURE CIRCUIT BREAKER, 'C' CURVE	L&T/C&S/HAVELLS	6A, 10kA	01
4	**h1**	'ON' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, RED	ESBEE/VAISHNO/C&S	240V AC	01
5	**h2**	'OFF' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, GREEN	ESBEE/VAISHNO/C&S	240V AC	01
6	**P1**	'STOP' PUSH BUTTON, SPRING RETURN TYPE, 22.5 Sq. mm. DIA WITH 2NC CONTACT, RED	ESBEE/VAISHNO/C&S	240VAC	01
7	**P2**	'START' PUSH BUTTON, SPRING RETURN TYPE, 22.5 Sq. mm. DIA WITH 2NO CONTACT, GREEN	ESBEE/VAISHNO/C&S	240V AC	01
8	**T**	24 HOURS TIMER SWITCH DIN RAIL MOUNTED , 1C/O AUX. CONTACT	GIC/EAPL	240V AC	01
9	**A/M**	AUTO/MANUAL SELECTOR SWITCH WITH OFF, 2POLE 2WAY, ROTARY TYPE	SALZER/KAYCEE	6A	01

NOTE:– ALL COMPONENTS SHALL BE POWER GRID (QA&I) APPROVED MAKE

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN: MP
CHKD.: VDP
APPD.: --
ALL DIMENSIONS IN mm.
TOLERANCE 5%
REVISIONS : 00
SIGN.

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E-mail : info@ultimaswitchgear.com

DRAWING	BILL OF MATERIAL
TITLE	415V MAIN LIGHTING DISTRIBUTION BOARD (3A) (MCRB)
CA NO.	CC/T/W–AIS/DOM/A10/23/01956/NOA–1/24–102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER–III POOLING STATION
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED
CONTRACTOR:–	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024–2025/1241A–703
SH. NO.:–	01 OF 03

JOB NO. 1241A

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BILL OF MATERIAL FOR 415V MAIN LIGHTING DISTRIBUTION BOARD (3A) (MCRB)

S.NO.	ITEM CODE	DESCRIPTION	MAKE	RATING	QTY.
C	**BILL OF MATERIAL FOR MODULE - (G2)**				02 Nos.
1	**MCB1-3**	SP MINIATURE CIRCUIT BREAKER, 'C' CURVE	L&T/C&S/HAVELLS	6A, 10kA	03
2	**V**	AC ANALOG VOLTMETER, SINGLE PHASE, SIZE-96X96 Sq. mm, CL-1, PTR-415V	AE/RISHAB/NEWTEK/SECURE	0-500V	01
3	**VSS**	VOLTMETER SELECTOR SWITCH, ROTARY TYPE, 4 POSITION	SALZER/KAYCEE	6A	01
4	**R-PHASE**	'R' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, RED	ESBEE/VAISHNO/C&S	240V AC	01
5	**Y-PHASE**	'Y' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, YELLOW	ESBEE/VAISHNO/C&S	240V AC	01
6	**B-PHASE**	'B' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, BLUE	ESBEE/VAISHNO/C&S	240V AC	01
D	**BILL OF MATERIAL FOR MODULE - (H-BC) BUS-COUPLER**				01 No.
1	**MCCB**	FP MCCB, WITH THERMAL MAGNETIC BASED RELEASE FOR 80-100 % O/L, S/C PROTECTION WITH SPREADER LINK, ROTARY OPERATING MECHANISM (ROM) & 1C/O AUX. CONTACT, Ics=100% Icu	L&T/C&S/HAVELLS	500A FP, 20kA	01
2	**MCB**	SP MINIATURE CIRCUIT BREAKER, 'C' CURVE	L&T/C&S/HAVELLS	6A, 10kA	01
3	--	MECHANICAL LOCK 3 LOCK 2-KEY FOR 100A FP MCCB	PGCIL APPROVED	--	1-SET
4	**h1**	'ON' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, RED	ESBEE/VAISHNO/C&S	240V AC	01
5	**h2**	'OFF' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, GREEN	ESBEE/VAISHNO/C&S	240V AC	01
E	**BILL OF MATERIAL FOR MODULE (E)**				
1	**MCCB**	FP MCCB, WITH THERMAL MAGNETIC BASED RELEASE FOR 80-100 % O/L, S/C PROTECTION WITH ROTARY OPERATING MECHANISM (ROM), Ics=100% Icu	L&T/C&S/HAVELLS	63A, 20kA	44

NOTE:- ALL COMPONENTS SHALL BE POWER GRID (QA&I) APPROVED MAKE

DATE	No.	REVISIONS DESCRIPTION
	04.	-
	03.	-
	02.	-
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN: MP
CHKD.: VDP
APPD.: --
ALL DIMENSIONS IN mm.
TOLERANCE 5%
REVISIONS : 00
SIGN.

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E-mail : info@ultimaswitchgear.com

DRAWING	BILL OF MATERIAL
TITLE	415V MAIN LIGHTING DISTRIBUTION BOARD (3A) (MCRB)
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER-III POOLING STATION
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED
CONTRACTOR:-	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-703
SH. NO.:-	02 OF 03

JOB NO. 1241A

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BILL OF MATERIAL FOR 415V MAIN LIGHTING DISTRIBUTION BOARD (3A) (MCRB)

S.NO.	ITEM CODE	DESCRIPTION	MAKE	RATING	QTY.
F	**BILL OF MATERIAL FOR MISC.**				
1	**MCB**	SP MINIATURE CIRCUIT BREAKER, 'C' CURVE	L&T/C&S/HAVELLS	6A, 10kA	05
2	**R-SW**	ON/OFF ROTARY SWITCH	PGCIL APPROVED	6A	02
3	**SW - SOCKET**	5/15A SWITCH SOCKET	ANCHOR//PGCIL APPROVED MAKE	--	02
4	**DS**	DOOR SWITCH, 1C/O	KAYCEE/PGCIL APPROVED MAKE	--	03
5	**PL**	PANEL ILLUMINATION LIGHT, 240V AC	COMPACT/PGCIL APPROVED MAKE	5W	03
6	**SH**	SPACE HEATER, 240V AC	HOTWEL/PGCIL APPROVED MAKE	60W	03
7	**TH**	THERMOSTATE, 240V AC	ELCON/PGCIL APPROVED MAKE	30 – 85°C	05
8	**T1**	ON DELAY TIMER WITH 1C/O AUXILIARY SWITCH, 0–60 SEC., 240V AC	GIC/PGCIL APPROVED MAKE	--	02
9	**T1X**	AUX. CONTACTOR RELAY, COIL VOLTAGE 240V DC WITH 2NO+2NC AUX. CONTACT	L&T/C&S/HAVELLS	--	02
10	**FAN 1-3**	VANTILATION FAN (150MM), 240V AC	HIGH COOL/PGCIL APPROVED MAKE	--	06

NOTE:– ALL COMPONENTS SHALL BE POWER GRID (QA&I) APPROVED MAKE

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN MP
CHKD. VDP
APPD. --
ALL DIMENSIONS IN mm. SIGN.
TOLERANCE 5%
REVISIONS : 00

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DRAWING	BILL OF MATERIAL	JOB NO. 1241A
TITLE	415V MAIN LIGHTING DISTRIBUTION BOARD (3A) (MCRB)	
CA NO.	CC/T/W–AIS/DOM/A10/23/01956/NOA–1/24–102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER–III POOLING STATION	
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:– BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024–2025/1241A–703	SH. NO.:– 03 OF 03

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ENGINEERING DRAWING DETAILS FOR

415V EMERGENCY LIGHTING DISTRIBUTION BOARD (4A) (MCRB)

PROJECT :- 765/400/220kV BIKANER-III POOLING STATION

CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED

CONTRACTOR :- BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION

DATE	No.	REVISIONS DESCRIPTION
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	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

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CHKD.	VDP	
APPD.	--	
ALL DIMENSIONS IN mm.		SIGN.
TOLERANCE 5%		
REVISIONS : 00		

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DRAWING	COVER PAGE	JOB NO. 1241A
TITLE	415V EMERGENCY LIGHTING DISTRIBUTION BOARD (4A) (MCRB)	
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER-III POOLING STATION	
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:- BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-004	SH. NO. 01 OF 01

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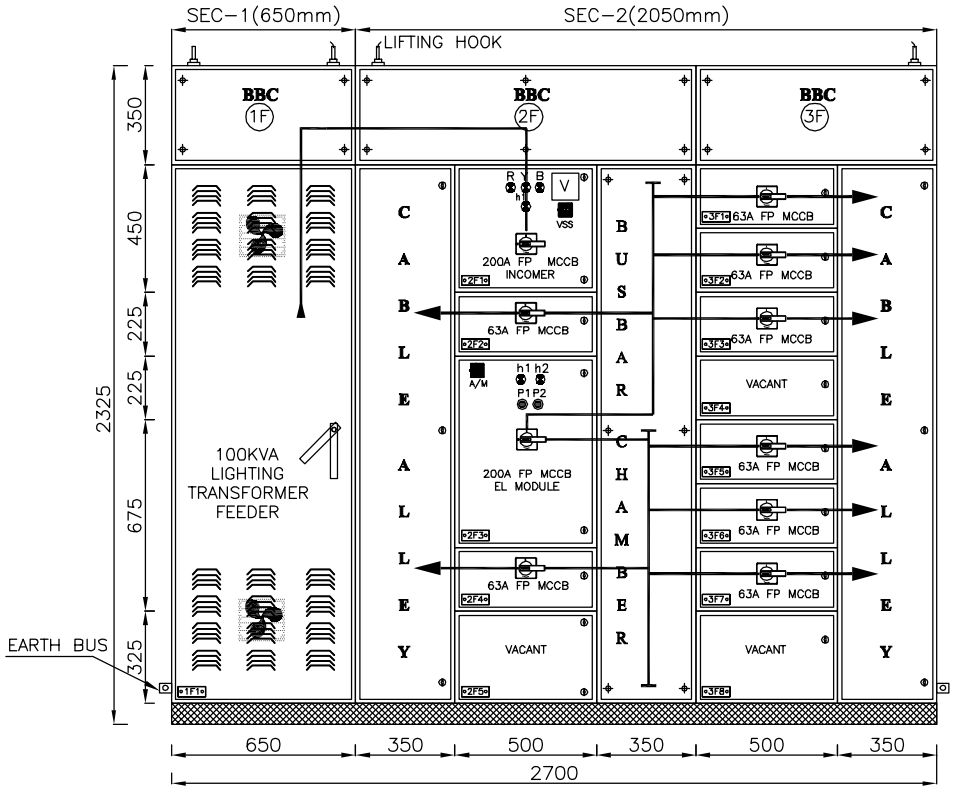
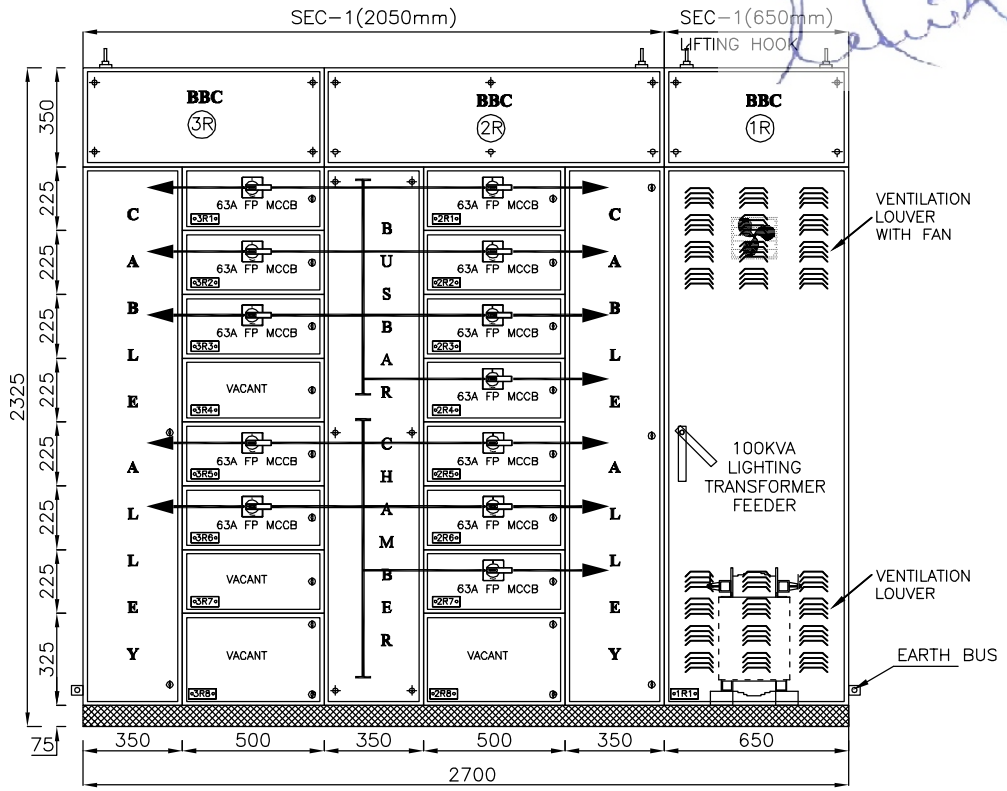
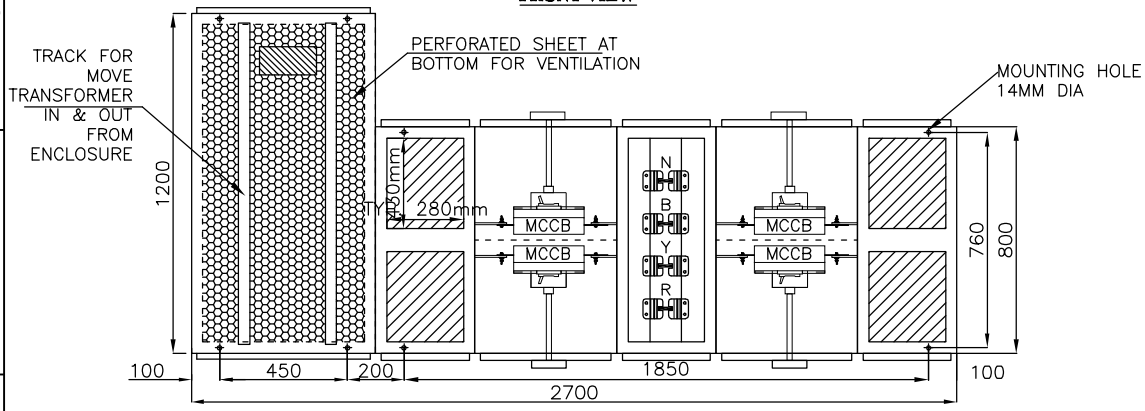


FRONT VIEW



REAR VIEW



BOTTOM VIEW

	04.	–	DRAWN	MP	
	03.	–	CHKD.	VDP	
	02.	–	APPD.	--	
	01.		ALL DIMENSIONS IN mm.		SIGN.
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL	TOLERANCE 5%		
DATE	No.	REVISIONS DESCRIPTION	REVISIONS : 00		

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E-mail : info@ultimaswitchgear.com

DRAWING	GENERAL ARRANGEMENT DRAWING	JOB NO. 1241A
TITLE	415V EMERGENCY LIGHTING DISTRIBUTION BOARD (4A) (MCRB)	
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER-III POOLING STATION	
CLIENT: POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:- BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION	
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-104	SH. NO. 01 OF 03

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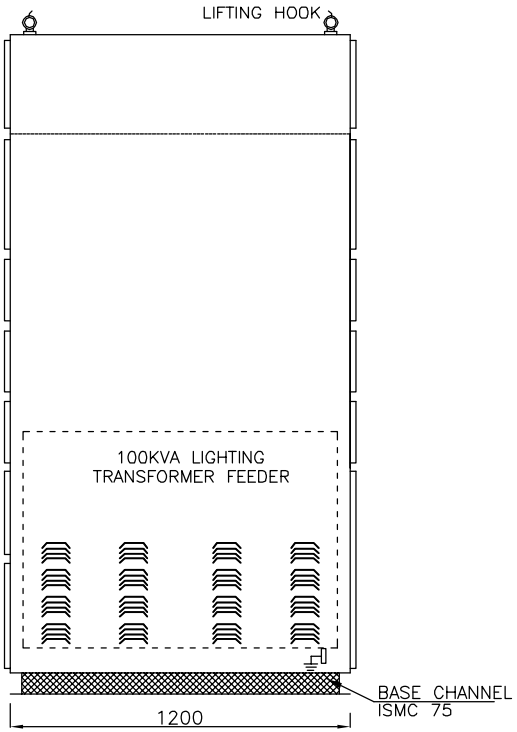
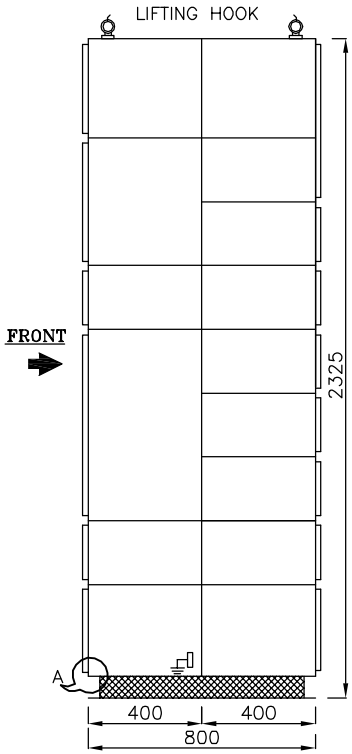
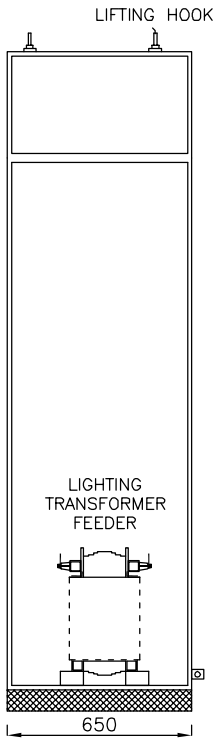


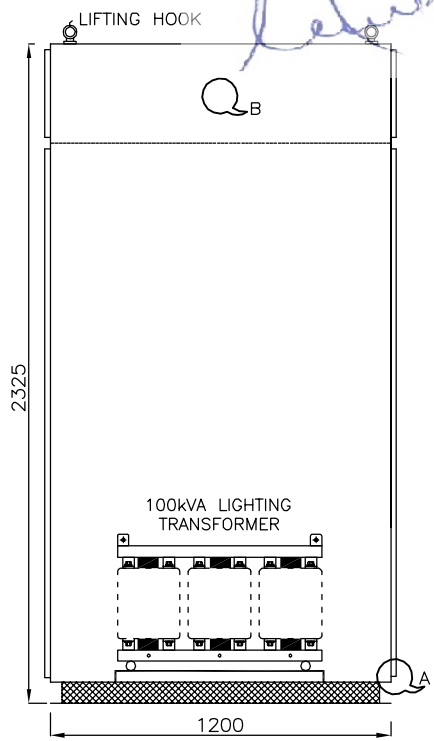
SIDE VIEW



SIDE VIEW



FRONT VIEW WITHOUT DOOR



L.H. SIDE VIEW

PANEL DIMENSIONS

HEIGHT	2325 mm.
WIDTH	2700 mm.
DEPTH	1200/800 mm.

CABLE ENTRY

BOTTOM ENTRY

HORIZONTAL BUS BAR SIZE:-

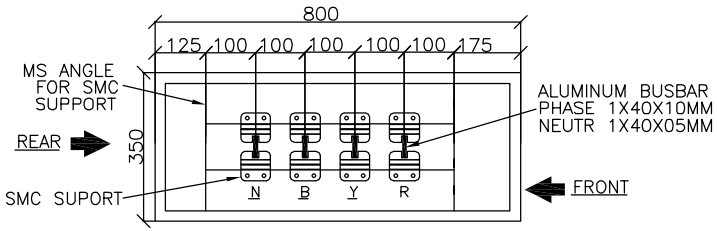
PHASE	:	1x40x10 Sq.mm Al.
NEUTRAL	:	1x40x05 Sq.mm Al.
EARTH	:	1x40x05 Sq.mm. GS.

VERTICAL BUS BAR SIZE:-

PHASE	:1X40X10 SQ.MM AL.
NEUTRAL	:1X40X05 SQ.MM AL.

LEGEND DESCRIPTION

R	=	R–PHASE INDICATION (RED)
Y	=	Y–PHASE INDICATION (YELLOW)
B	=	B–PHASE INDICATION (BLUE)
h1	=	ON INDICATION RED
h2	=	OFF INDICATION GREEN
A	=	DIGITAL AMMETER
V	=	DIGITAL VOLT METER
ASS	=	AMMETER SELECTOR SWITCH
VSS	=	VOLTAGE SELECTOR SWITCH
P1	=	CONTACTOR OFF PUSH BUTTON
P2	=	CONTACTOR ON PUSH BUTTON
A/M	=	AUTO/MANUAL SELECTOR SWITCH



SECTIONAL VIEW AT FOR HORIZONTAL BUSBAR TOLERANCE DETAIL-B

DATE	No.	REVISIONS DESCRIPTION			
	04.	–	DRAWN	MP	
	03.	–	CHKD.	VDP	
	02.	–	APPD.	--	
	01.		ALL DIMENSIONS IN mm.		SIGN.
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL	TOLERANCE 5%		
			REVISIONS : 00		

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UNIT-II F-6 & F-7, SITE-C, UPSIDC, SURAJPUR INDUSTRIAL AREA, GREATER NOIDA - 201306 G. B. NAGAR (U.P.) INDIA
E-mail : info@ultimaswitchgear.com

DRAWING	GENERAL ARRANGEMENT DRAWING	JOB NO. 1241A
TITLE	415V EMERGENCY LIGHTING DISTRIBUTION BOARD (4A) (MCRB)	
CA NO.	CC/T/W–AIS/DOM/A10/23/01956/NOA–1/24–102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER–III POOLING STATION	
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:– BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024–2025/1241A–104	SH. NO. 02 OF 03

1 2 3 4 5 6 7 8 9

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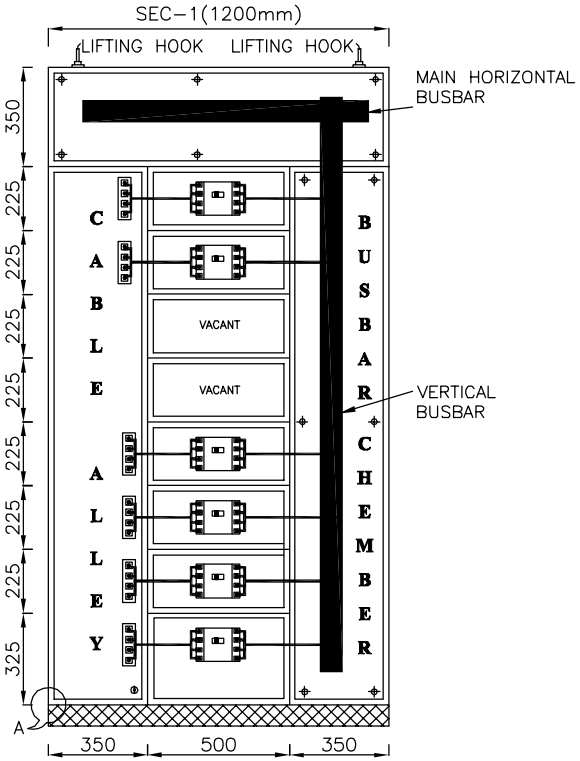
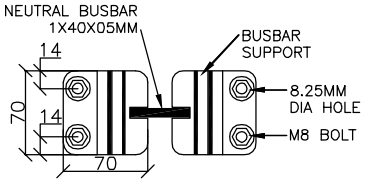
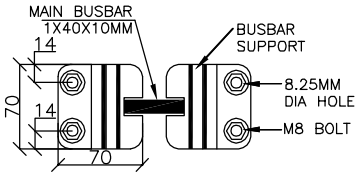


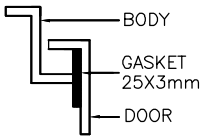
MCCB & BUSBAR SECTION (FRONT VIEW W/O DOOR & COVER)



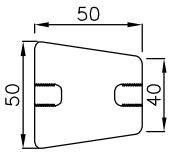
DETAIL OF NEUTRAL BUSBAR SUPPORT



DETAIL OF PHASE BUSBAR SUPPORT



DETAIL-'A'



"DETAIL-E"
CONICAL SUPPORT

DATE	No.	REVISIONS DESCRIPTION			
	04.	–	DRAWN	MP	
	03.	–	CHKD.	VDP	
	02.	–	APPD.	--	
	01.		ALL DIMENSIONS IN mm.		SIGN.
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL	TOLERANCE 5%		
			REVISIONS : 00		

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E-mail : info@ultimaswitchgear.com

DRAWING	GENERAL ARRANGEMENT DRAWING	JOB NO. 1241A
TITLE	415V EMERGENCY LIGHTING DISTRIBUTION BOARD (4A) (MCRB)	
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER-III POOLING STATION	
CLIENT: POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:- BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION	
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-104	SH. NO. 03 OF 03

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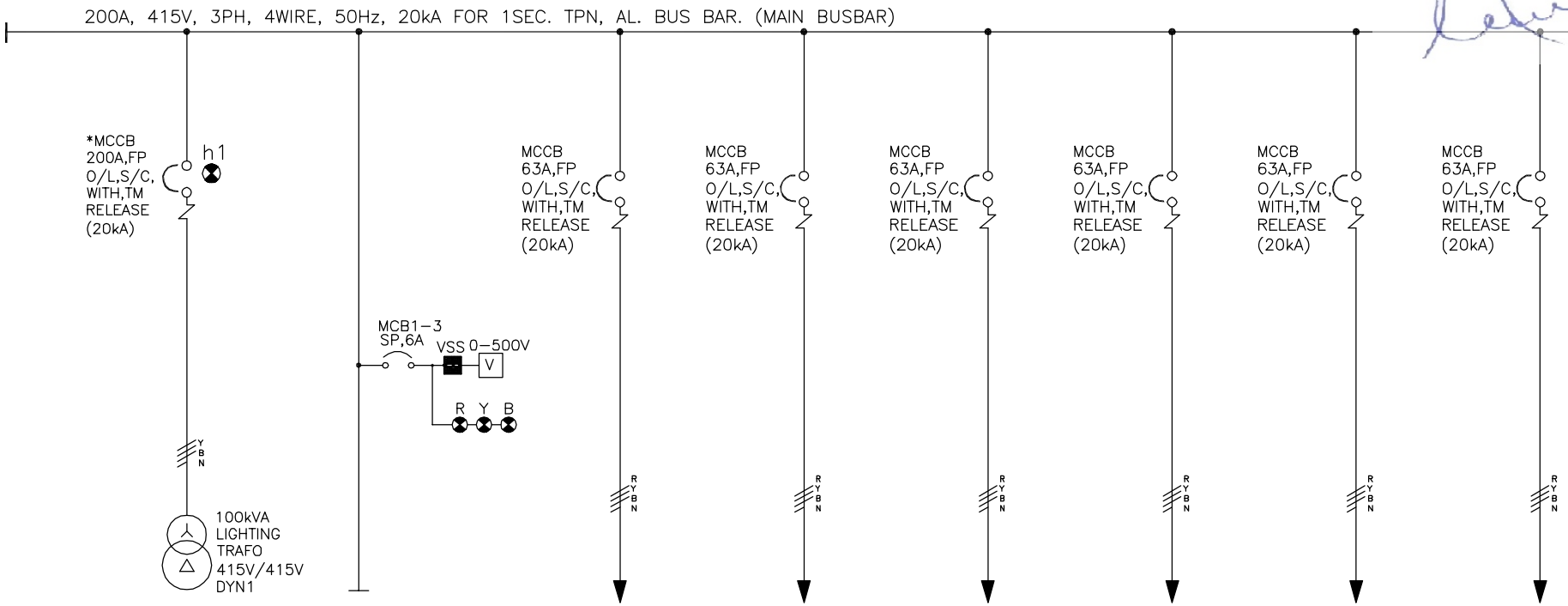

FEEDER NUMBER	1F1+2F1	2F1	2F2	3F1	3F2	3F3	2R1	2R2
MODULE TYEP	H	G2	E	E	E	E	E	E
FEEDER RATING	200A	--	63A	63A	63A	63A	63A	63A
FEEDER TYPE	MCCB	METERING	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB
DESCRIPTION	415V AC SUPPLY INCOMER FROM 100kVA TRANSFORMER	--	INDOOR EMERGENCY LIGHTING PANEL-1 (CRB)	INDOOR EMERGENCY LIGHTING PANEL-2(AUX. BUILDING)	INDOOR EMERGENCY LIGHTING PANEL-3(FFPH)	SPARE	SPARE	765kV SWITCHYARD LP
POWER CABLE SIZE	3.5CX70 Sqmm.	--	3.5CX70 Sqmm.	3.5CX70 Sqmm.	3.5CX70 Sqmm.	--	--	3.5CX70 Sqmm.

DATE	No.	REVISIONS DESCRIPTION			
	04.	-	DRAWN	MP	
	03.	-	CHKD.	VDP	
	02.	-	APPD.	--	
	01.		ALL DIMENSIONS IN mm.		SIGN.
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL	TOLERANCE 5%		
			REVISIONS : 00		

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E-mail : info@ultimaswitchgear.com

DRAWING	SINGLE LINE DIAGRAM
TITLE	415V EMERGENCY LIGHTING DISTRIBUTION BOARD (4A) (MCRB)
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER-III POOLING STATION
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED
CONTRACTOR:-	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-204
SH. NO.:-	01 OF 03

JOB NO. 1241A

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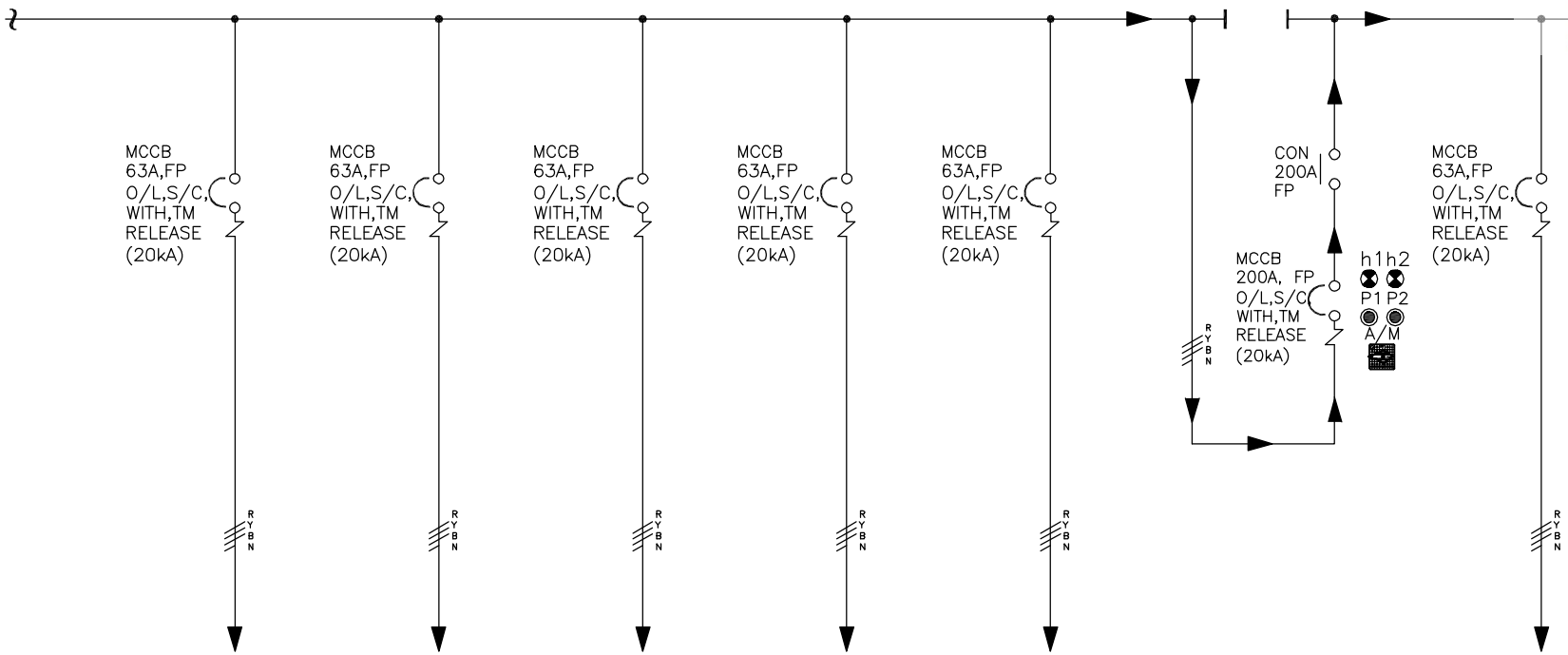

FEEDER NUMBER	2R3	2R4	3R1	3R2	3R3	2F3	2F4
MODULE TYEP	E	E	E	E	E	EL	E
FEEDER RATING	63A	63A	63A	63A	63A	200A	63A
FEEDER TYPE	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB+CONT.	MCCB
DESCRIPTION	765kV SWITCHYARD LP	400kV SWITCHYARD LP	400kV SWITCHYARD LP	220kV SWITCHYARD LP	220kV SWITCHYARD LP	MODULE EL	SWITCHYARD EMERGENCY LIGHTING PANEL-1(ACP2)
POWER CABLE SIZE	3.5CX70 Sqmm.	3.5CX70 Sqmm.	3.5CX70 Sqmm.	3.5CX70 Sqmm.	3.5CX70 Sqmm.	--	3.5CX70 Sqmm.

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN: MP
CHKD.: VDP
APPD.: --
ALL DIMENSIONS IN mm. SIGN.
TOLERANCE 5%
REVISIONS : 00

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DRAWING	SINGLE LINE DIAGRAM
TITLE	415V EMERGENCY LIGHTING DISTRIBUTION BOARD (4A) (MCRB)
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER-III POOLING STATION

JOB NO. 1241A

CLIENT
POWER GRID CORPORATION OF INDIA LIMITED

CONTRACTOR:-
BHARAT HEAVY ELECTRICAL LIMITED (BHEL)
TRANSMISSION PROJECTS DIVISION

DRG. NO. USL/PGCIL/BHEL/2024-2025/1241A-204

SH. NO.:- 02 OF 03

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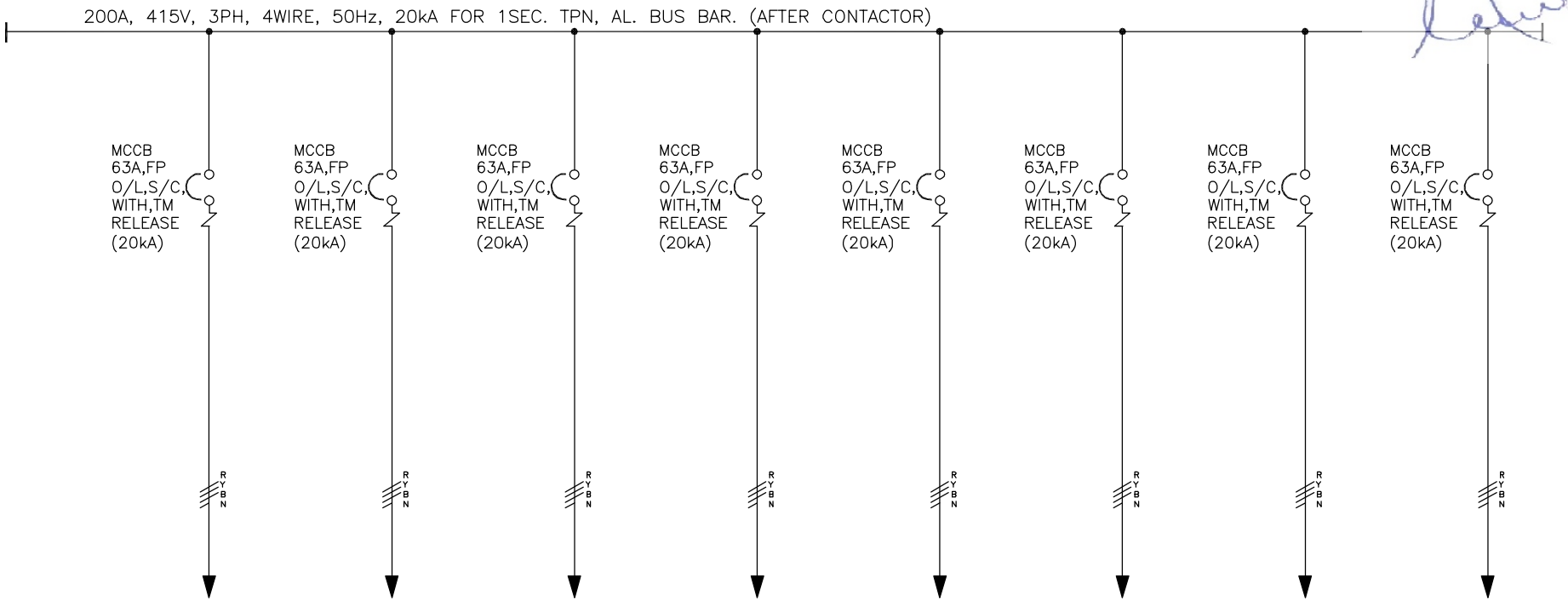

FEEDER NUMBER	3F5	3F6	3F7	2R5	2R6	2R7	3R5	3R6
MODULE TYEP	E	E	E	E	E	E	E	E
FEEDER RATING	63A	63A	63A	63A	63A	63A	63A	63A
FEEDER TYPE	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB
DESCRIPTION	SWITCHYARD EMERGENCY LIGHTING PANEL–2(ACP2)	SWITCHYARD EMERGENCY LIGHTING PANEL–3(ACP2)	SWITCHYARD EMERGENCY LIGHTING PANEL–4(ACP2)	SPARE	FUTURE SWITCHYARD LP	FUTURE SWITCHYARD LP	FUTURE SWITCHYARD LP	FUTURE SWITCHYARD LP
POWER CABLE SIZE	3.5CX70 Sqmm.	3.5CX70 Sqmm.	3.5CX70 Sqmm.	––	3.5CX70 Sqmm.	3.5CX70 Sqmm.	3.5CX70 Sqmm.	3.5CX70 Sqmm.

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN	MP	
CHKD.	VDP	
APPD.	––	
ALL DIMENSIONS IN mm.		SIGN.
TOLERANCE 5%		
REVISIONS : 00		

MANUFACTURER
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E-mail : info@ultimaswitchgear.com

DRAWING	SINGLE LINE DIAGRAM	JOB NO. 1241A
TITLE	415V EMERGENCY LIGHTING DISTRIBUTION BOARD (4A) (MCRB)	
CA NO.	CC/T/W–AIS/DOM/A10/23/01956/NOA–1/24–102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER–III POOLING STATION	
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:– BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024–2025/1241A–204	SH. NO.:– 03 OF 03

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BILL OF MATERIAL FOR 415V EMERGENCY LIGHTING DISTRIBUTION BOARD (4A) (MCRB)

S.NO.	ITEM CODE	DESCRIPTION	MAKE	RATING	QTY.
A	**BILL OF MATERIAL FOR MODULE - (H)**				**1 No.**
1	**MCCB**	FP MCCB, WITH THERMAL MAGNETIC BASED RELEASE FOR 80–100 % O/L, S/C PROTECTION WITH SPREADER LINK, ROTARY OPERATING MECHANISM (ROM) & 1C/O AUX. CONTACT, Ics=100% Icu	L&T/C&S/HAVELLS	200A, 20kA	01
2	**MCB**	SP MINIATURE CIRCUIT BREAKER, 'C' CURVE	L&T/C&S/HAVELLS	6A, 10kA	01
3	**LIGHTING TRF**	LIGHTING TRANSFORMER 415/415 Dyn1	PGCIL APPROVED	100kVA	01
4	**h1**	'ON' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, RED, 240V AC	ESBEE/VAISHNO/C&S	--	01
B	**BILL OF MATERIAL FOR MODULE - (EL)**				**1 No.**
1	**MCCB**	FP MCCB, WITH THERMAL MAGNETIC BASED RELEASE FOR 80–100 % O/L, S/C PROTECTION WITH SPREADER LINK & ROTARY OPERATING MECHANISM (ROM), Ics = 100% Icu	L&T/C&S/HAVELLS	200A, 20kA	01
2	**CM**	FP POWER CONTACTOR, COIL VOLTAGE 240V AC, WITH 2NO+2NC AUX. CONTACT, AC–1 DUTY	L&T/C&S/HAVELLS	200A	01
3	**MCB**	SP MINIATURE CIRCUIT BREAKER, 'C' CURVE	L&T/C&S/HAVELLS	6A, 10kA	01
4	**h1**	'ON' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, RED, 240V AC	ESBEE/VAISHNO/C&S	--	01
5	**h2**	'OFF' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, GREEN, 240V AC	ESBEE/VAISHNO/C&S	--	01
6	**P1**	'STOP' PUSH BUTTON, SPRING RETURN TYPE, 22.5 Sq. mm. DIA WITH 2NC CONTACT, RED	ESBEE/VAISHNO/C&S	--	01
7	**P2**	'START' PUSH BUTTON, SPRING RETURN TYPE, 22.5 Sq. mm. DIA WITH 2NO CONTACT, GREEN	ESBEE/VAISHNO/C&S	--	01
8	**T**	24 HOURS TIMER SWITCH DIN RAIL MOUNTED , 1C/O AUX. CONTACT	GIC/EAPL	--	01
9	**A/M**	AUTO/MANUAL SELECTOR SWITCH WITH OFF, 3POLE 3WAY, ROTARY TYPE	SALZER/KAYCEE	--	01

NOTE:– ALL COMPONENTS SHALL BE POWER GRID (QA&I) APPROVED MAKE

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN MP | CHKD. VDP | APPD. -- | ALL DIMENSIONS IN mm. | SIGN. | TOLERANCE 5% | REVISIONS : 00

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DRAWING	BILL OF MATERIAL
TITLE	415V EMERGENCY LIGHTING DISTRIBUTION BOARD (4A) (MCRB)
CA NO.	CC/T/W–AIS/DOM/A10/23/01956/NOA–1/24–102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER–III POOLING STATION
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED
CONTRACTOR:–	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024–2025/1241A–704
SH. NO.:–	01 OF 02

JOB NO. 1241A

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BILL OF MATERIAL FOR 415V EMERGENCY LIGHTING DISTRIBUTION BOARD (4A) (MCRB)

S.NO.	ITEM CODE	DESCRIPTION	MAKE	RATING	QTY.
C	**BILL OF MATERIAL FOR MODULE - (G2)**				**1 No.**
1	**MCB1-3**	SP MINIATURE CIRCUIT BREAKER, 'C' CURVE	L&T/C&S/HAVELLS	6A, 10kA	03
2	**V**	ANALOG VOLTMETER, SINGLE PHASE, SIZE–96X96 Sq. mm, CL–1.0, PTR–415V	AE/RISHAB/NEWTEK/SECURE	0–500V	01
3	**VSS**	VOLTMETER SELECTOR SWITCH, ROTARY TYPE, 4 POSITION	SALZER/KAYCEE	6A	01
4	**R-PHASE**	'R' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, RED, 240V AC	ESBEE/VAISHNO/C&S	––	01
5	**Y-PHASE**	'Y' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, YELLOW	ESBEE/VAISHNO/C&S	––	01
6	**B-PHASE**	'B' INDICATION LAMP, 22.5 Sq. mm. DIA ,LED TYPE, BLUE	ESBEE/VAISHNO/C&S	––	01
D	**BILL OF MATERIAL FOR MODULE (E)**				
1	**MCCB**	FP MCCB 415V, WITH THERMAL MAGNETIC BASED RELEASE FOR O/L,S/C PROTECTION WITH EXTENDED ROM, Ics = 100% Icu	L&T/C&S/HAVELLS	63A, 20kA	20
E	**BILL OF MATERIAL FOR MISC.**				
1	**MCB**	SP MINIATURE CIRCUIT BREAKER, 'C' CURVE	L&T/C&S/HAVELLS	6A, 10kA	03
2	**R-SW**	ON/OFF ROTARY SWITCH	PGCIL APPROVED MAKE	6A	01
3	**SW - SOCKET**	5/15A SWITCH SOCKET	ANCHOR	––	01
4	**DS**	DOOR SWITCH, 1C/O	SURAJ/PGCIL APPROVED MAKE	––	02
5	**PL**	PANEL ILLUMINATION LIGHT, 240V AC	HAVELLS/PGCIL APPROVED MAKE	5W	02
6	**SH**	SPACE HEATER, 240V AC	HOTWEL/PGCIL APPROVED MAKE	60W	02
7	**TH**	THERMOSTATE, 240V AC	ELCON/PGCIL APPROVED MAKE	30 – 85°C	03
8	**T1**	ON DELAY TIMER WITH 1C/O AUXILIARY SWITCH, 0–60 SEC., 240V AC	GIC/EAPL/PGCIL APPROVED MAKE	––	01
9	**T1X**	AUX. CONTACTOR RELAY, COIL VOLTAGE 240V DC WITH 2NO+2NC AUX. CONTACT	L&T/C&S/HAVELLS	––	01
10	**FAN 1-3**	VANTILATION FAN (150MM), 240V AC	HIGH COOL/PGCIL APPROVED MAKE	––	03

NOTE:– ALL COMPONENTS SHALL BE POWER GRID (QA&I) APPROVED MAKE

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN: MP
CHKD.: VDP
APPD.: ––
ALL DIMENSIONS IN mm.
TOLERANCE 5%
REVISIONS : 00
SIGN.

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UNIT-II F-6 & F-7, SITE-C, UPSIDC, SURAJPUR INDUSTRIAL AREA, GREATER NOIDA - 201306 G. B. NAGAR (U.P.) INDIA
E-mail : info@ultimaswitchgear.com

DRAWING	BILL OF MATERIAL
TITLE	415V EMERGENCY LIGHTING DISTRIBUTION BOARD (4A) (MCRB)
CA NO.	CC/T/W–AIS/DOM/A10/23/01956/NOA–1/24–102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER–III POOLING STATION
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED
CONTRACTOR:–	BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024–2025/1241A–704
SH. NO.:–	02 OF 02

JOB NO. 1241A

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ENGINEERING DRAWING DETAILS FOR

220V DC DISTRIBUTION BOARD-1(1D)(MCRB)

PROJECT :- 765/400/220kV BIKANER-III POOLING STATION

CLIENT :- POWER GRID CORPORATION OF INDIA LIMITED

CONTRACTOR :- BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION

DATE	No.	REVISIONS DESCRIPTION			
	04.	–	DRAWN	MP	
	03.	–	CHKD.	VDP	
	02.	–	APPD.	--	
	01.		ALL DIMENSIONS IN mm.		SIGN.
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL	TOLERANCE 5%		
			REVISIONS : 00		

MANUFACTURER
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E-mail : info@ultimaswitchgear.com

DRAWING	COVER PAGE	JOB NO. 1241A
TITLE	220V DC DISTRIBUTION BOARD-1(1D)(MCRB)	
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER-III POOLING STATION	
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:- BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-005	SH. NO. 01 OF 01

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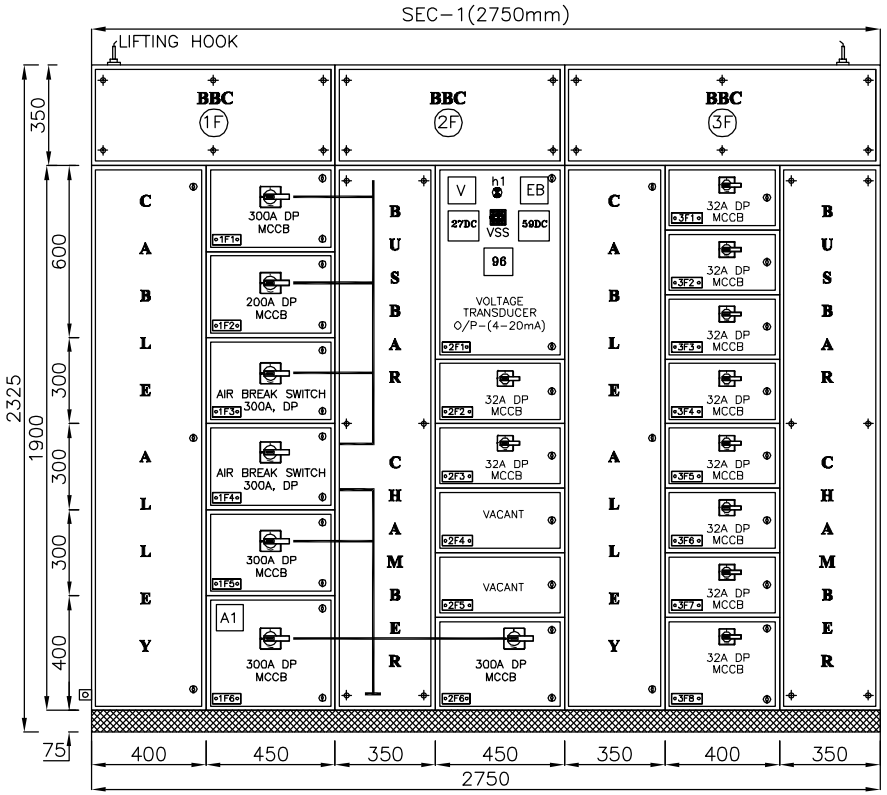
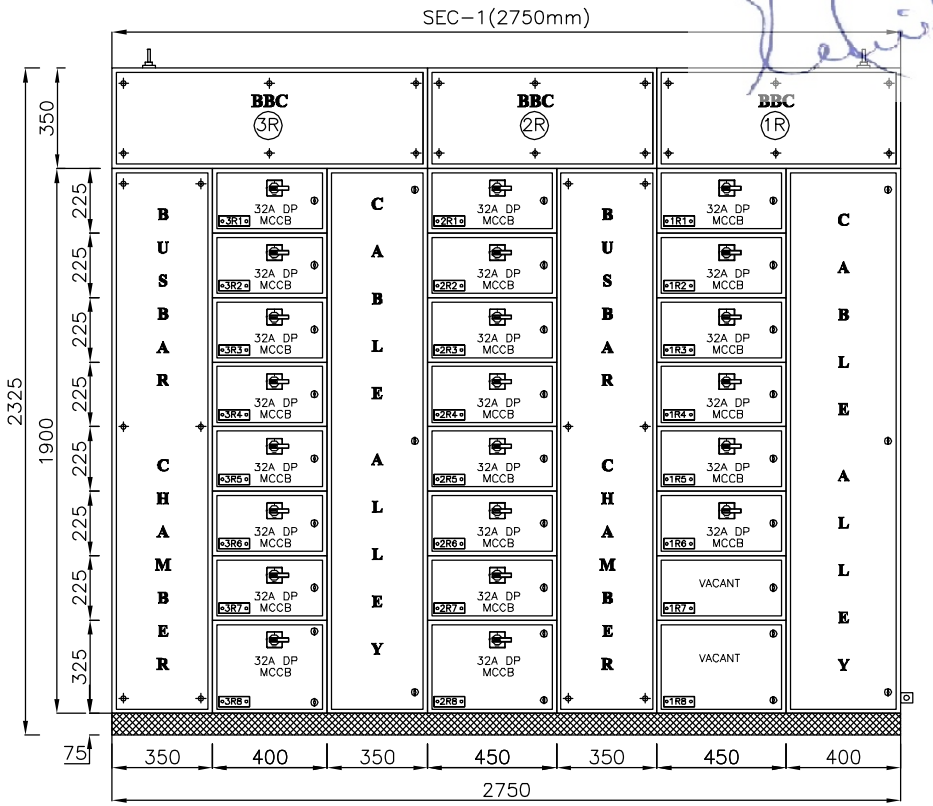
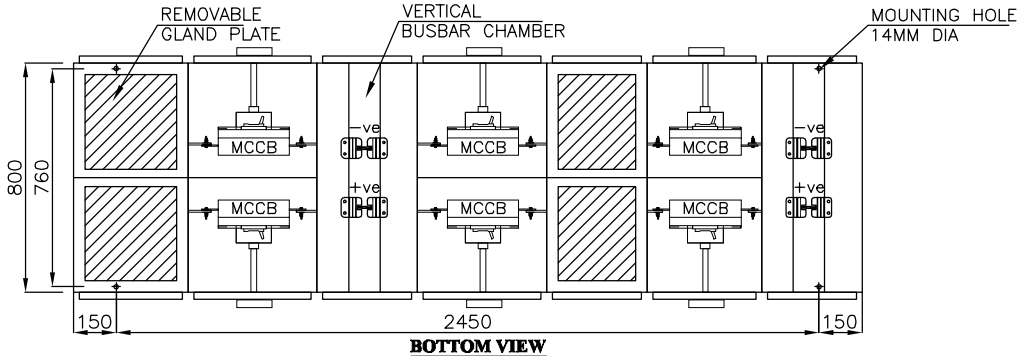


FRONT VIEW



REAR VIEW



BOTTOM VIEW

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN	MP	
CHKD.	VDP	
APPD.	--	
ALL DIMENSIONS IN mm.		SIGN.
TOLERANCE 5%		
REVISIONS : 00		

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E-mail : info@ultimaswitchgear.com

DRAWING	GENERAL ARRANGEMENT DRAWING	JOB NO. 1241A
TITLE	220V DC DISTRIBUTION BOARD–1(1D)(MCRB)	
CA NO.	CC/T/W–AIS/DOM/A10/23/01956/NOA–1/24–102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER–III POOLING STATION	
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:– BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024–2025/1241A–105	SH. NO. 01 OF 02

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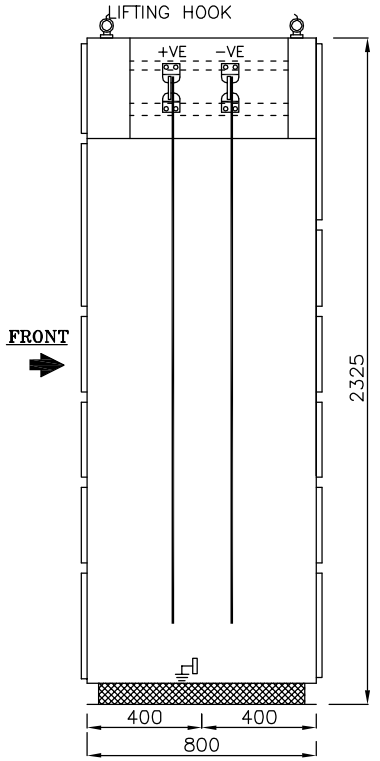


SIDE VIEW(HORIZONTAL BUS BARS ALONG WITH DETAILS OF BUS BAR SUPPORTS.)

PANEL DIMENSIONS

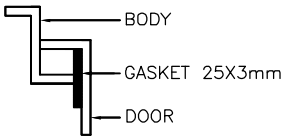
HEIGHT : 2325 mm.
WIDTH : 2750 mm.
DEPTH : 800 mm.

BUS BAR SIZE :-

POSITIVE : 1x40x10 Sq.mm Alu.
NEGATIVE : 1x40x10 Sq.mm Alu.
EARTH : 1x40X05 Sq.mm GS.

LEGEND DETAILS

A1 = ANALOG DC AMMETER
V = ANALOG DC VOLT METER
96 = BATTERY EARTH FAULT RELAY
27DC = DC UNDER VOLTAGE RELAY
59DC = DC OVER VOLTAGE RELAY
EB = ELECTRONIC BUZZER



DETAIL-'A'

DATE	No.	REVISIONS DESCRIPTION			SIGN.
	04.	–	DRAWN	MP	
	03.	–	CHKD.	VDP	
	02.	–	APPD.	--	
	01.		ALL DIMENSIONS IN mm.		
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL	TOLERANCE 5%		
			REVISIONS : 00		

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E-mail : info@ultimaswitchgear.com

DRAWING	GENERAL ARRANGEMENT DRAWING	JOB NO. 1241A
TITLE	220V DC DISTRIBUTION BOARD–1(1D)(MCRB)	
CA NO.	CC/T/W–AIS/DOM/A10/23/01956/NOA–1/24–102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER–III POOLING STATION	
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:– BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024–2025/1241A–105	SH. NO. 02 OF 02

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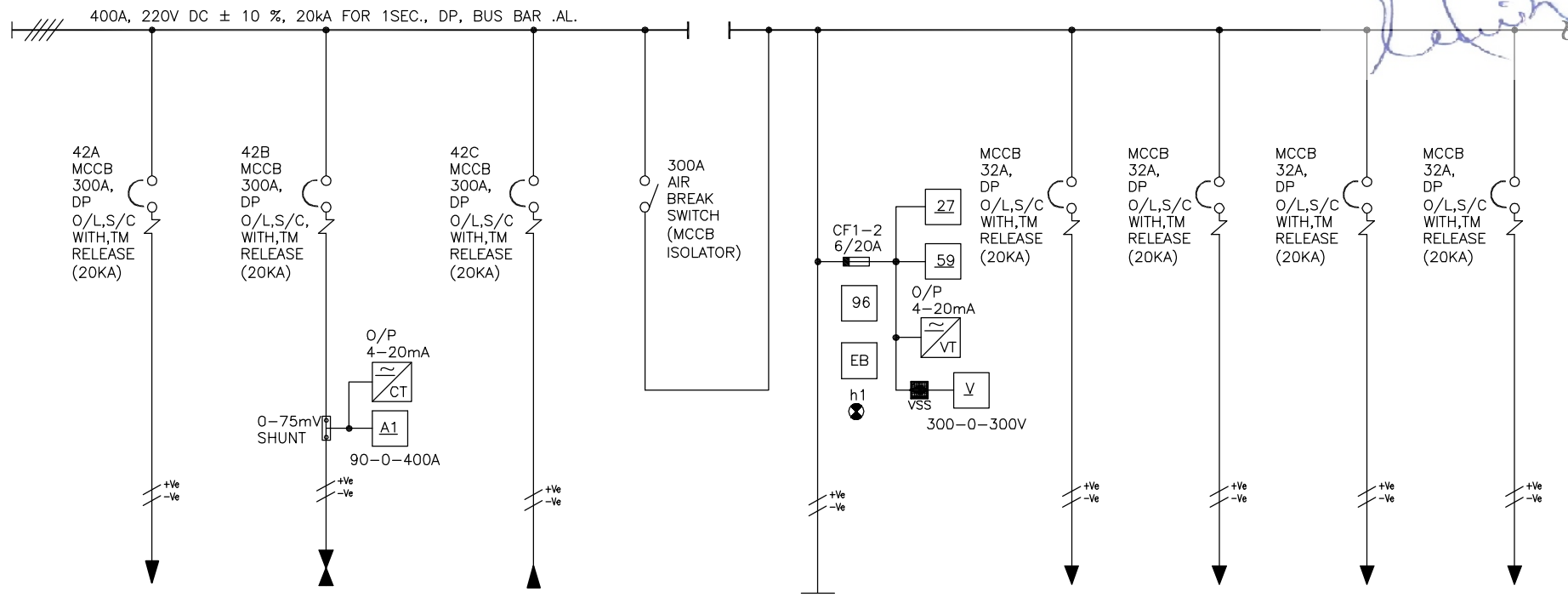

FEEDER NUMBER	2F6	1F6	1F5	1F4	2F1	2F2	2F3	3F1	3F2
MODULE TYEP	DC	DC	DC	H1	S1	X	X	X	X
FEEDER RATING	300A	300A	300A	300A	--	32A	32A	32A	32A
FEEDER TYPE	MCCB	MCCB	MCCB	ISOLATOR	METERING	MCCB	MCCB	MCCB	MCCB
DESCRIPTION	BATTERY CURATIVE DISCHARGE FEEDER	220V DC BATTERY BANK-1	220V DC INCOMER FROM BATTERY CHARGER-1	MAIN BUSBAR CONTROL FEEDER 220V DCDB-1	--	765kV RELAY PANEL 701	765kV RELAY PANEL 703	765kV RELAY PANEL 704	765kV RELAY PANEL 706
POWER CABLE SIZE (AL PVC)	2X1CX150 Sqmm.	2X1CX150 Sqmm.	2X1CX150 Sqmm.	--	--	1X4CX16 Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.

DATE	No.	REVISIONS DESCRIPTION
	04.	-
	03.	-
	02.	-
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN: MP
CHKD.: VDP
APPD.: --
ALL DIMENSIONS IN mm.
TOLERANCE 5%
REVISIONS : 00
SIGN.

MANUFACTURER
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E-mail : info@ultimaswitchgear.com

DRAWING	SINGLE LINE DIAGRAM
TITLE	220V DC DISTRIBUTION BOARD-1(1D)(MCRB)
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER-III POOLING STATION
JOB NO.	1241A

CLIENT
POWER GRID CORPORATION OF INDIA LIMITED

CONTRACTOR:-
BHARAT HEAVY ELECTRICAL LIMITED (BHEL)
TRANSMISSION PROJECTS DIVISION

DRG. NO. USL/PGCIL/BHEL/2024-2025/1241A-205

SH. NO.:- 01 OF 05

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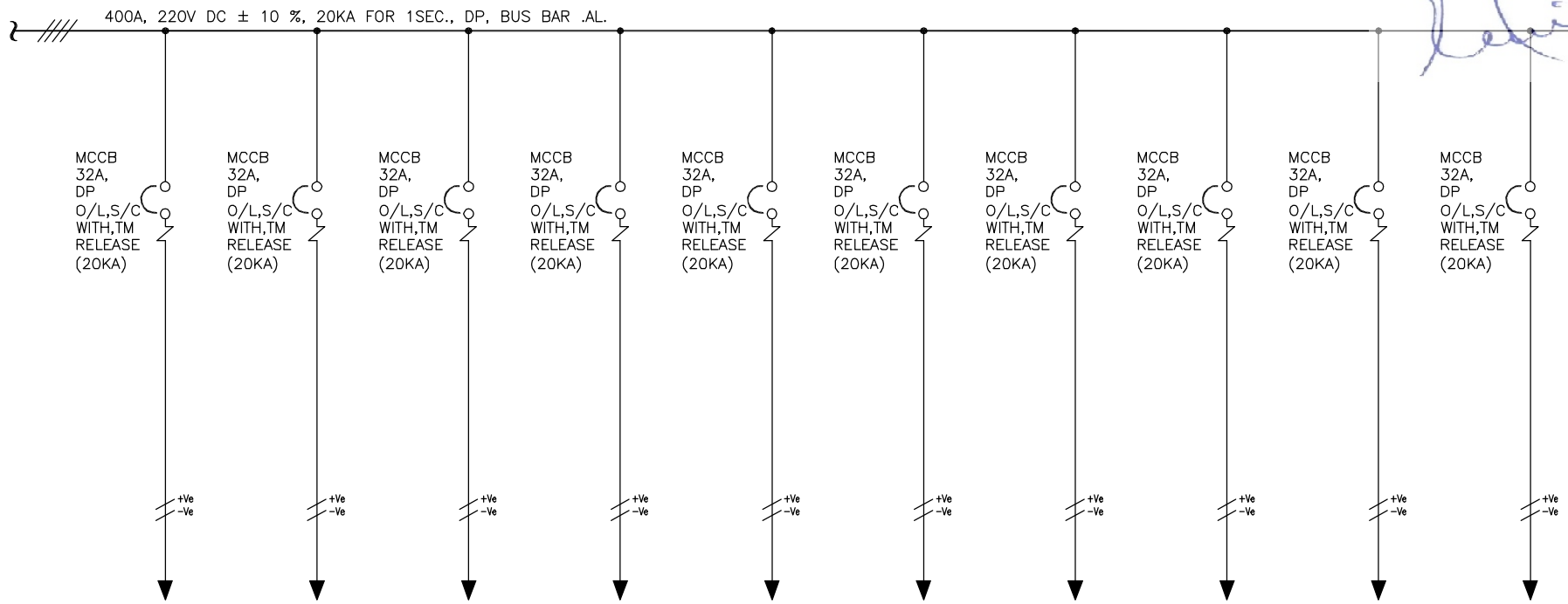

FEEDER NUMBER	3F3	3F4	3F5	3F6	3F7	3F8	1R1	1R2	1R3	1R4
MODULE TYEP	X	X	X	X	X	X	X	X	X	X
FEEDER RATING	32A	32A	32A	32A	32A	32A	32A	32A	32A	32A
FEEDER TYPE	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB
DESCRIPTION	765kV RELAY PANEL 707	765kV RELAY PANEL 709	765kV RELAY PANEL 710	765kV RELAY PANEL 712	765kV RELAY PANEL 713	765kV RELAY PANEL 715	765kV RELAY PANEL 716	765kV RELAY PANEL 718	765kV RELAY PANEL 719 (F)	765kV RELAY PANEL 721 (F)
POWER CABLE SIZE (AL PVC)	1X4CX16 Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.

DATE	No.	REVISIONS DESCRIPTION			SIGN.
	04.	–	DRAWN	MP	
	03.	–	CHKD.	VDP	
	02.	–	APPD.	--	
	01.		ALL DIMENSIONS IN mm.		
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL	TOLERANCE 5%		
			REVISIONS : 00		

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E-mail : info@ultimaswitchgear.com

DRAWING	SINGLE LINE DIAGRAM	JOB NO. 1241A
TITLE	220V DC DISTRIBUTION BOARD–1(1D)(MCRB)	
CA NO.	CC/T/W–AIS/DOM/A10/23/01956/NOA–1/24–102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER–III POOLING STATION	
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:– BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024–2025/1241A–205	SH. NO.:– 02 OF 05

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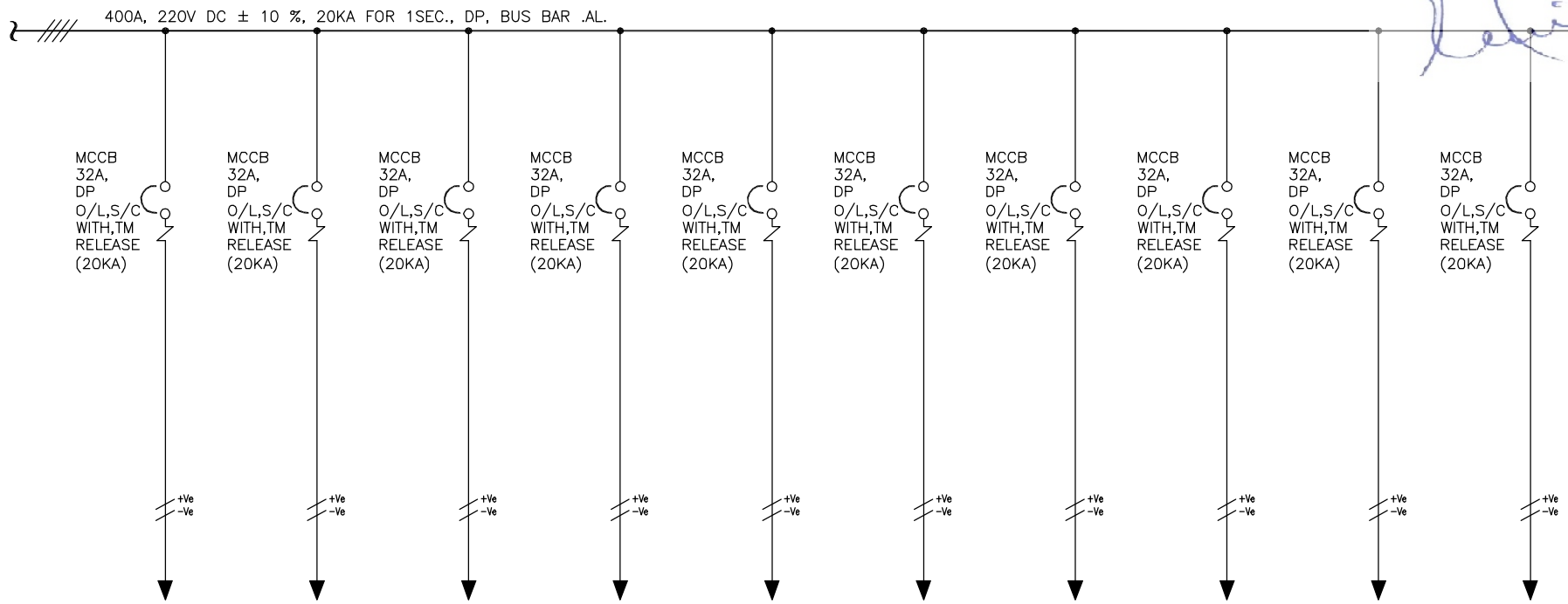

FEEDER NUMBER	1R5	1R6	2R1	2R2	2R3	2R4	2R5	2R6	2R7	2R8
MODULE TYEP	X	X	X	X	X	X	X	X	X	X
FEEDER RATING	32A	32A	32A	32A	32A	32A	32A	32A	32A	32A
FEEDER TYPE	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB
DESCRIPTION	765kV RELAY PANEL 722 (F)	765kV RELAY PANEL 724 (F)	765kV RELAY PANEL 725 (F)	765kV RELAY PANEL 727 (F)	765kV RELAY PANEL BUSBAR	NETWORK PANEL	DC SUPPLY FOR FF DCDB	DC SUPPLY FOR DC LIGHTING PANEL	DC SUPPLY FOR MSB-1A	DC SUPPLY FOR MSB-2A
POWER CABLE SIZE (AL PVC)	1X4CX16 Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN: MP
CHKD.: VDP
APPD.: --
ALL DIMENSIONS IN mm.
TOLERANCE 5%
REVISIONS : 00
SIGN.

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DRAWING	SINGLE LINE DIAGRAM
TITLE	220V DC DISTRIBUTION BOARD-1(1D)(MCRB)
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER-III POOLING STATION
JOB NO.	1241A

CLIENT
POWER GRID CORPORATION OF INDIA LIMITED

CONTRACTOR:-
BHARAT HEAVY ELECTRICAL LIMITED (BHEL)
TRANSMISSION PROJECTS DIVISION

DRG. NO. USL/PGCIL/BHEL/2024-2025/1241A-205

SH. NO.:- 03 OF 05

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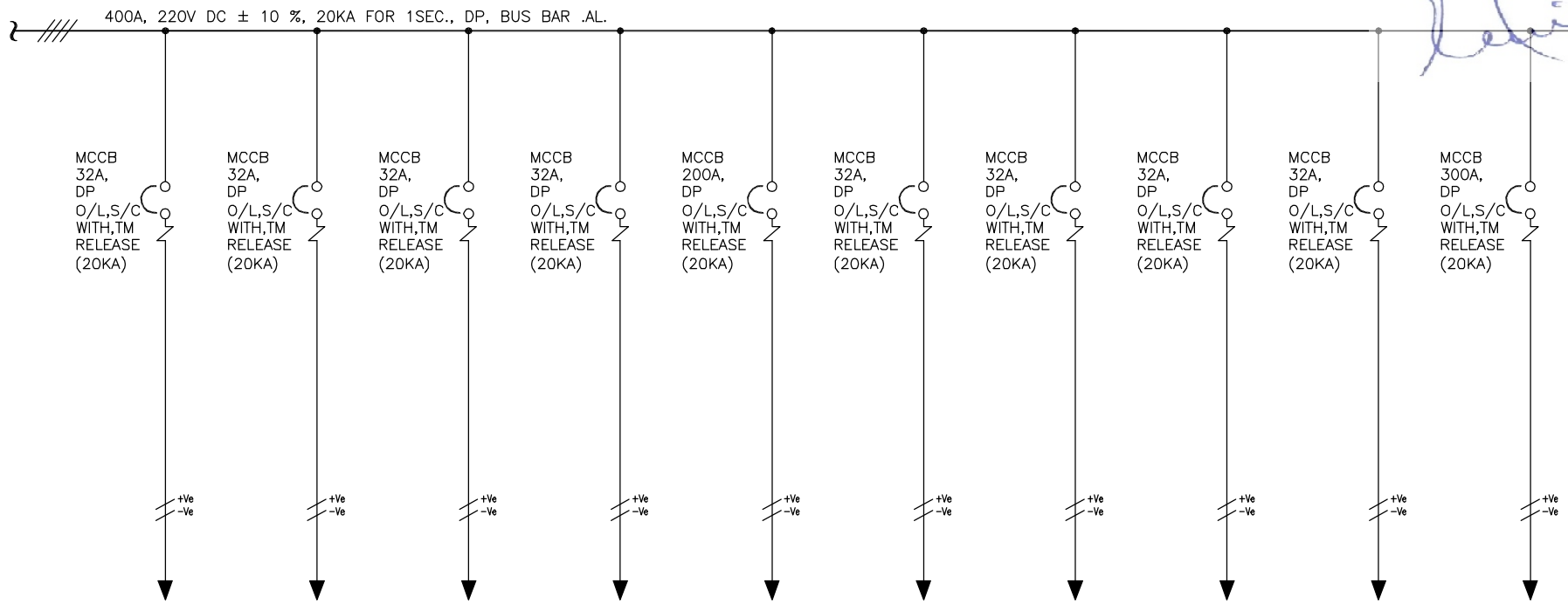

FEEDER NUMBER	3R1	3R2	3R3	3R4	1F2	3R5	3R6	3R7	3R8	1F1
MODULE TYEP	X	X	X	X	X	X	X	X	X	X
FEEDER RATING	32A	32A	32A	32A	200A	32A	32A	32A	32A	300A
FEEDER TYPE	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB	MCCB
DESCRIPTION	DC SUPPLY FOR INVERTER–1	DC SUPPLY FOR ELECTRONIC TEST LAB	DC SUPPLY FOR AUX. BCU PANEL	DC SUPPLY FOR MLDB	OUTGOING FEEDER TO 400&220kV DCDB	STATION HMI	SPARE–1	SPARE–2	SPARE–3	SPARE–4
POWER CABLE SIZE (AL PVC)	1X4CX16 Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.	1X4CX16 Sqmm.	2X1CX150Sqmm.	1X4CX16 Sqmm.	––	––	––	––

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN: MP
CHKD.: VDP
APPD.: ––
ALL DIMENSIONS IN mm. SIGN.
TOLERANCE 5%
REVISIONS : 00

MANUFACTURER
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DRAWING	SINGLE LINE DIAGRAM
TITLE	220V DC DISTRIBUTION BOARD–1(1D)(MCRB)
CA NO.	CC/T/W–AIS/DOM/A10/23/01956/NOA–1/24–102643/01 & 02 DATED 23.02.2024
PROJECT	765/400/220kV BIKANER–III POOLING STATION

JOB NO. 1241A

CLIENT
POWER GRID CORPORATION OF INDIA LIMITED

CONTRACTOR:–
BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION

DRG. NO. USL/PGCIL/BHEL/2024–2025/1241A–205

SH. NO.:– 04 OF 05

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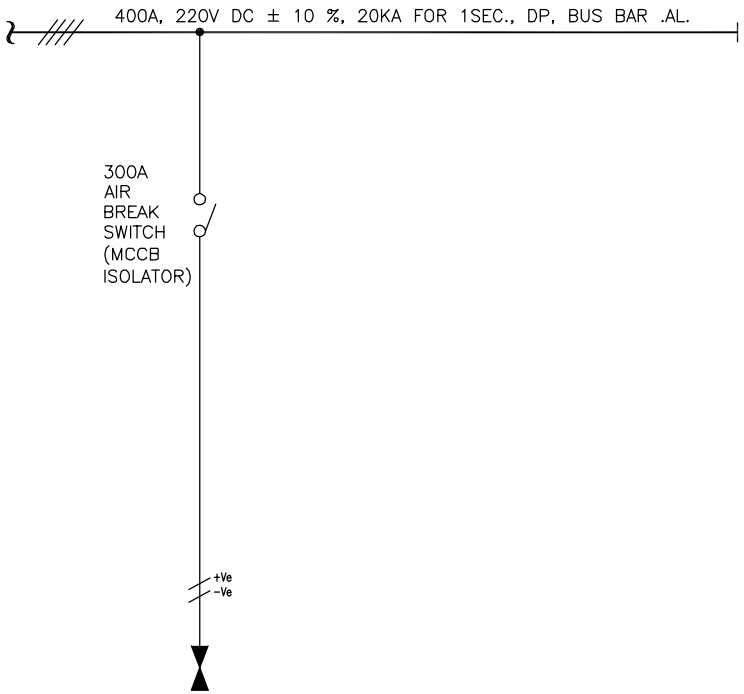

FEEDER NUMBER	1F3
MODULE TYEP	H1
FEEDER RATING	300A
FEEDER TYPE	ISOLATOR
DESCRIPTION	TO 220V DCDB-2
POWER CABLE SIZE (AL PVC)	2X1CX150 Sqmm.

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN	MP	
CHKD.	VDP	
APPD.	--	
ALL DIMENSIONS IN mm.		SIGN.
TOLERANCE 5%		
REVISIONS : 00		

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ULTIMA® SWITCHGEARS LTD.
UNIT-I KHASRA NO. 215, IND. AREA, VILLAGE RAIPUR (BHAGWANPUR), TEHSIL - ROORKEE, DISTRICT HARIDWAR (UTTRAKHAND) - 247667, INDIA, TEL : 01332-235043 FAX : 01332-235042
UNIT-II F-6 & F-7, SITE-C, UPSIDC, SURAJPUR INDUSTRIAL AREA, GREATER NOIDA - 201306 G. B. NAGAR (U.P.) INDIA
E-mail : info@ultimaswitchgear.com

DRAWING	SINGLE LINE DIAGRAM	JOB NO. 1241A
TITLE	220V DC DISTRIBUTION BOARD-1(1D)(MCRB)	
CA NO.	CC/T/W-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER-III POOLING STATION	
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:- BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024-2025/1241A-205	SH. NO.:- 05 OF 05

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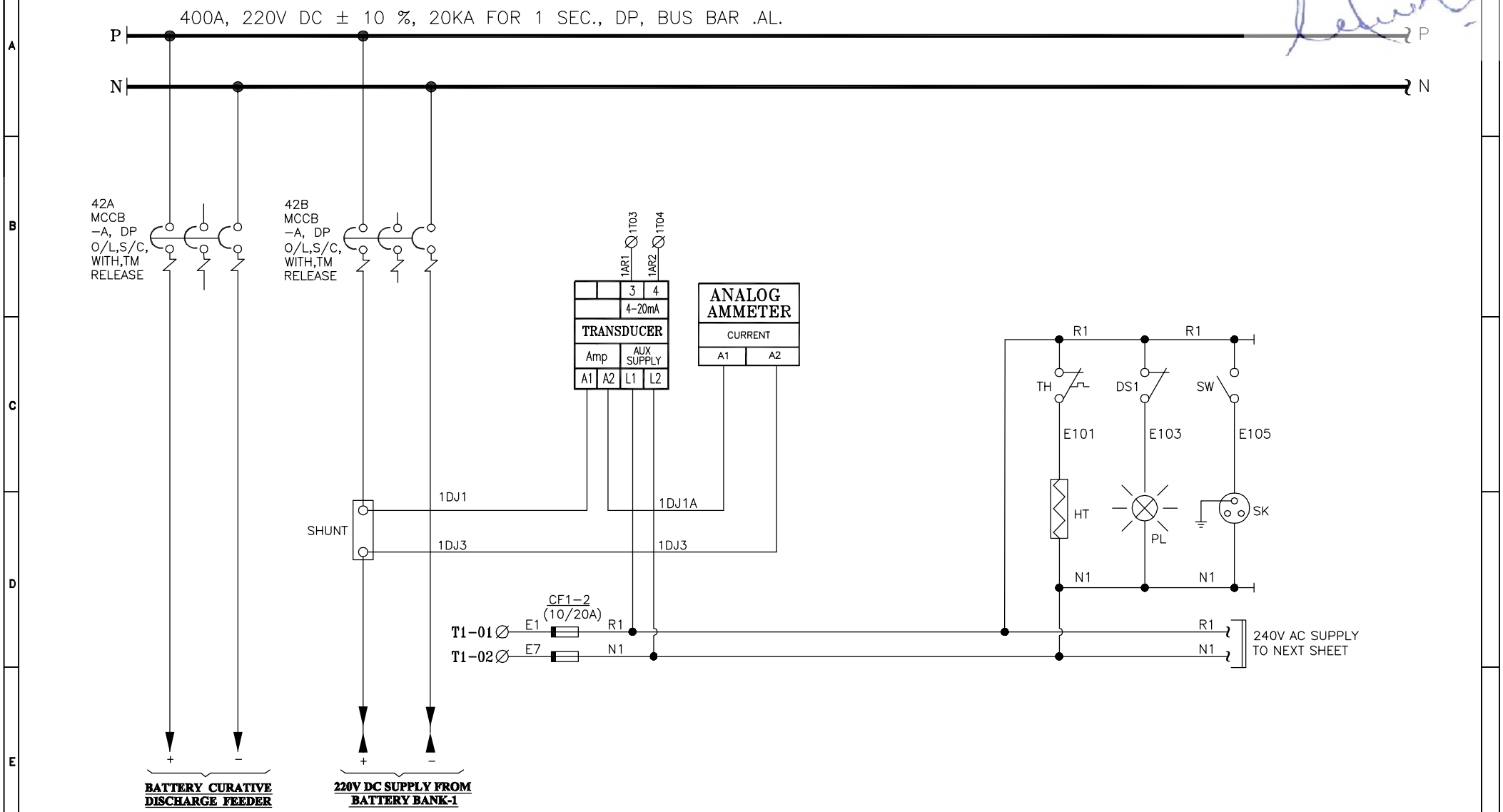

	04.	–	DRAWN	MP	
	03.	–	CHKD.	VDP	
	02.	–	APPD.	--	
	01.		ALL DIMENSIONS IN mm.		SIGN.
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL	TOLERANCE 5%		
DATE	No.	REVISIONS DESCRIPTION	REVISIONS : 00		

MANUFACTURER
ULTIMA® SWITCHGEARS LTD.
UNIT-I KHASRA NO. 215, IND. AREA, VILLAGE RAIPUR (BHAGWANPUR), TEHSIL - ROORKEE, DISTRICT HARIDWAR (UTTRAKHAND) - 247667, INDIA, TEL : 01332-235043 FAX : 01332-235042
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DRAWING	SCHEMATIC DIAGRAM	JOB NO. 1241A
TITLE	220V DC DISTRIBUTION BOARD–1(1D)(MCRB)	
CA NO.	CC/T/W–AIS/DOM/A10/23/01956/NOA–1/24–102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER–III POOLING STATION	
CLIENT: POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:– BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION	
DRG. NO.	USL/PGCIL/BHEL/2024–2025/1241A–505	SH. NO.:– 01 OF 03

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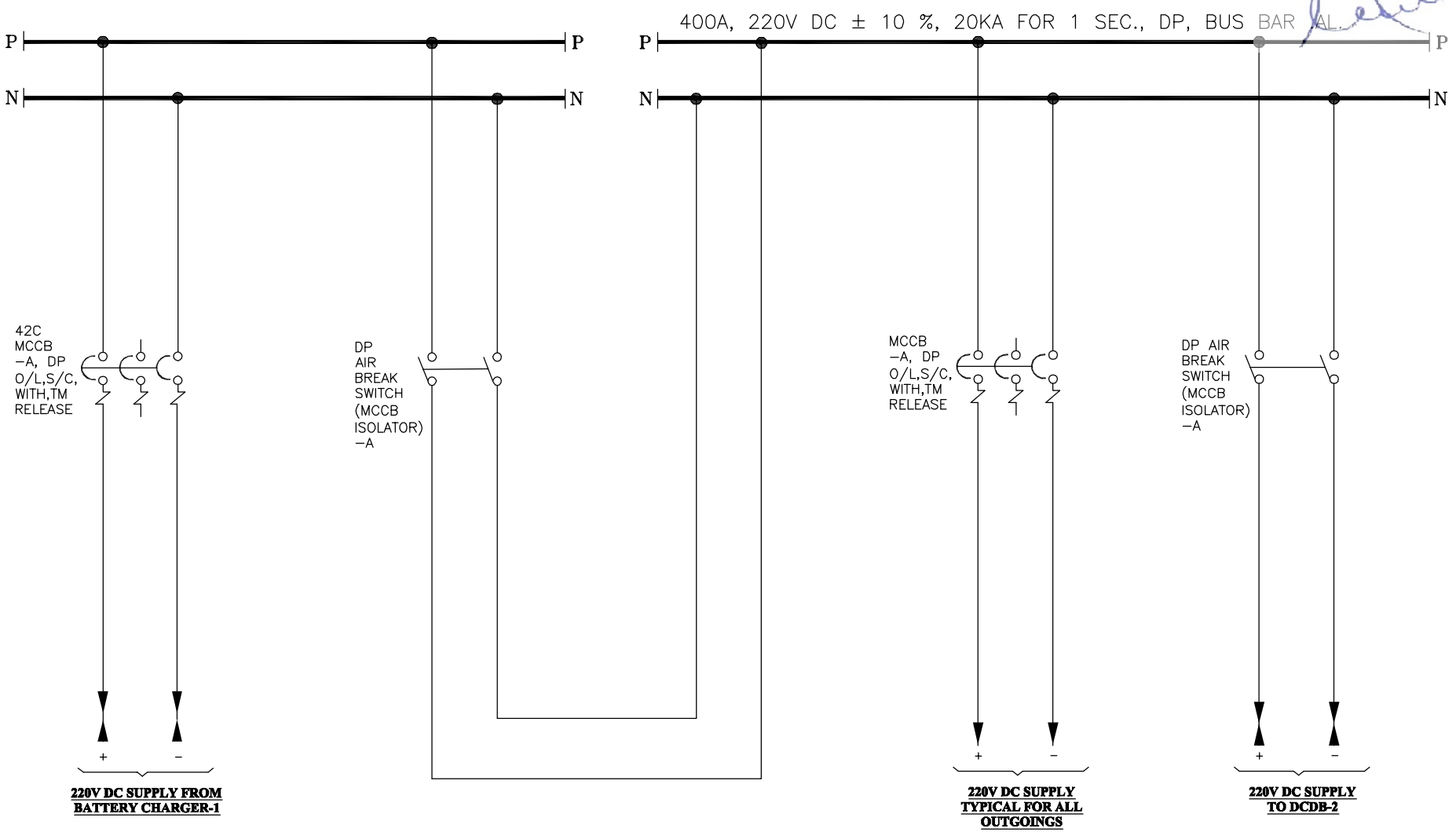

DATE	No.	REVISIONS DESCRIPTION
	04.	–
	03.	–
	02.	–
	01.	
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL

DRAWN	MP	
CHKD.	VDP	
APPD.	--	
ALL DIMENSIONS IN mm.		SIGN.
TOLERANCE 5%		
REVISIONS : 00		

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DRAWING	SCHEMATIC DIAGRAM	JOB NO. 1241A
TITLE	220V DC DISTRIBUTION BOARD–1(1D)(MCRB)	
CA NO.	CC/T/W–AIS/DOM/A10/23/01956/NOA–1/24–102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER–III POOLING STATION	
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:– BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024–2025/1241A–505	SH. NO.:– 02 OF 03

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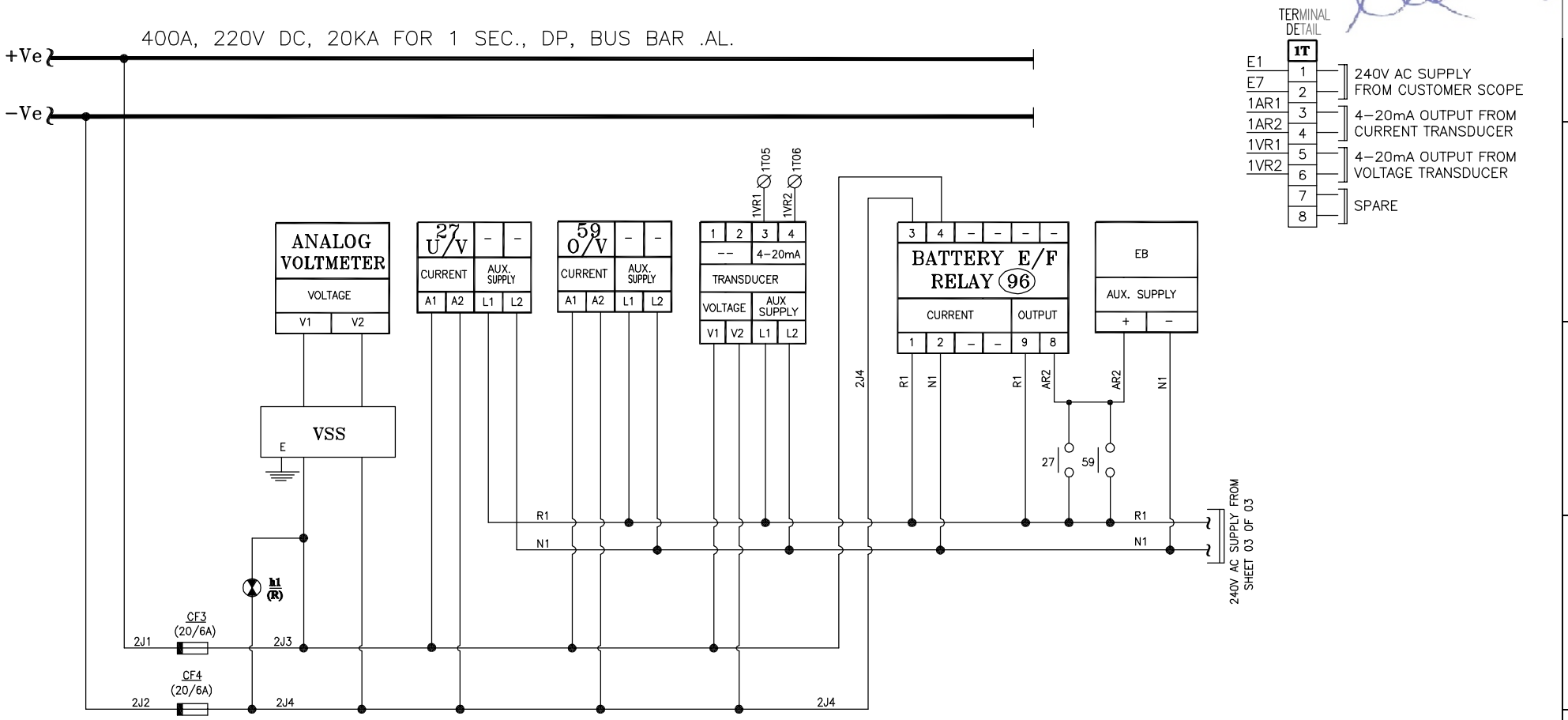

	04.	−	DRAWN	MP	
	03.	−	CHKD.	VDP	
	02.	−	APPD.	−−	
	01.		ALL DIMENSIONS IN mm.		SIGN.
29.01.2025	00.	FIRST SUBMISSION FOR APPROVAL	TOLERANCE 5%		
DATE	No.	REVISIONS DESCRIPTION	REVISIONS : 00		

MANUFACTURER
ULTIMA® SWITCHGEARS LTD.
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DRAWING	SCHEMATIC DIAGRAM	JOB NO. 1241A
TITLE	220V DC DISTRIBUTION BOARD−1(1D)(MCRB)	
CA NO.	CC/T/W−AIS/DOM/A10/23/01956/NOA−1/24−102643/01 & 02 DATED 23.02.2024	
PROJECT	765/400/220kV BIKANER−III POOLING STATION	
CLIENT	POWER GRID CORPORATION OF INDIA LIMITED	CONTRACTOR:− BHARAT HEAVY ELECTRICAL LIMITED (BHEL) TRANSMISSION PROJECTS DIVISION
DRG. NO.	USL/PGCIL/BHEL/2024−2025/1241A−505	SH. NO.:− 03 OF 03

1 2 3 4 5 6 7 8 9