

Annexure - I -383805

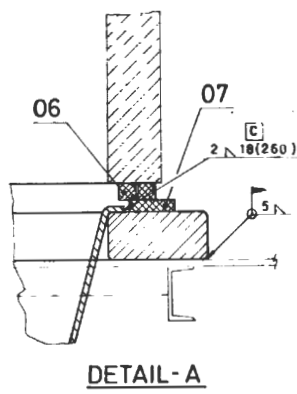
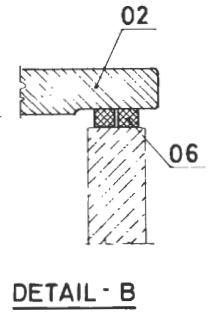
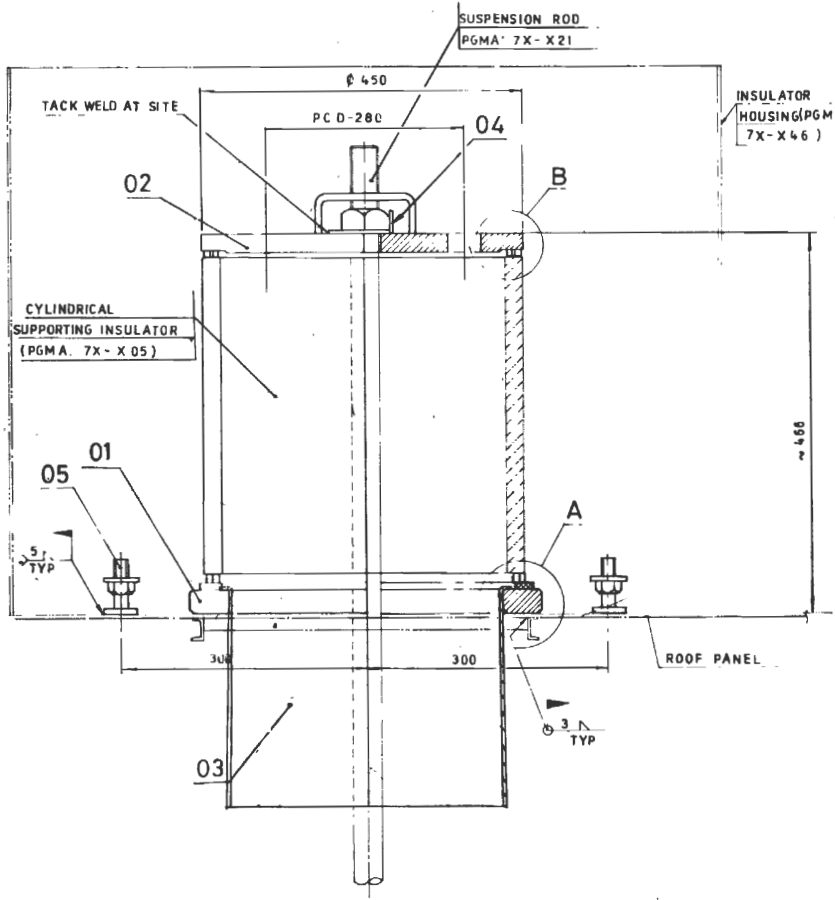
TO BE READ WITH TENDER SPECIFICATION

(TENDER ID 383805 | <https://gipcl.nprocure.com>)

RELEVANT DRAWING for  
DUMMY FIELD REVIVAL &  
INCORPORATION OF TRANSFORMER UP GRADATION

00700 - E10-6L-2

ALL DIMENSIONS ARE IN MILLIMETRES



NOTES:

- 01 ALL PACKINGS AND GASKET ARE TO BE FIXED BY USING SHELLAC AT SITE DURING ERECTION
- 02 ITEM NO 04 IS TO BE LOCKED AS SHOWN AFTER ALIGNMENT OF EMITTING SYSTEM
- 03 FOR ERECTION INSTRUCTIONS, ALSO REFER DRG NO. 3-79-013-00567.
- \* 04 FOR ITEM NO 08 QTY REFER SHIPPING LIST (ERECTION TOOL)
- 05 CARE SHOULD BE TAKEN TO AVOID FALLING OF THE WELD SPATTER ON THE SURFACE OF SUPPORT INSULATOR WHILE WELDING THE COMPONENTS WITH THE ROOF PANEL
- C - CRITICAL WELDING
- 06 FOR FURTHER NOTES REFER ERECTION MANUAL OF ESP (UNDER TOPIC ERECTION PROCEDURE FOR ESP-EMITTING SYSTEM SUSPENSION")

REF: PRQA: 590 FOR PRINTING  
REF: PRQA: 500 FOR MATERIALS

ITEM No	DESCRIPTION	DRAWING No	MATL CODE	UNIT	QTY
08	ALIGNMENT JIG.	3-79-013-00191			8762
07	CAF SKET- 5 X Ø 43	61 720 048	22 020 546		0250
06	WDA ROPE GR-1 SQ 12 MM - 7500 L5.		22 020 364 15-4687		1172
05	ADJUSTING SCREW	3-79-013-00126			0487
04	LOCKING WASHER	4-79-013-00277			0145
03	SCREEN TUBE	3-79-013-00644			4190
02	SUPPORTING BRACKET	3-79-013-00169			43270
01	SUPPORTING FLANGE.	4-79-013-00292			18178

TYPE OF PRODUCT OR NAME OF CUSTOMER PROJECT: **400MM PITCH**

CUSTOMER: THE DIRECTOR GENERAL, BARAT HEAVY ELECTRICALS LTD, BARAT HEAVY ELECTRICALS, 201, BARAT HEAVY ELECTRICALS, BARAT HEAVY ELECTRICALS COMPANY

**BHEL** BHARAT HEAVY ELECTRICALS LTD  
BOILER AUXILIARIES PLANT  
RANIPET 632 408

DESIGNER: K. MUNIES  
CHECKED: P. S. K.  
DATE: 20/11/99

DEPT: AQCS  
GRADE OF UNTOI DIM: PRQA 500  
SCALE: N.T.S.  
WEIGHT (K.G.): 22.432

REF OLD: 1196 NO. 08

TITLE: **EMITTING SYSTEM SUSPENSION**

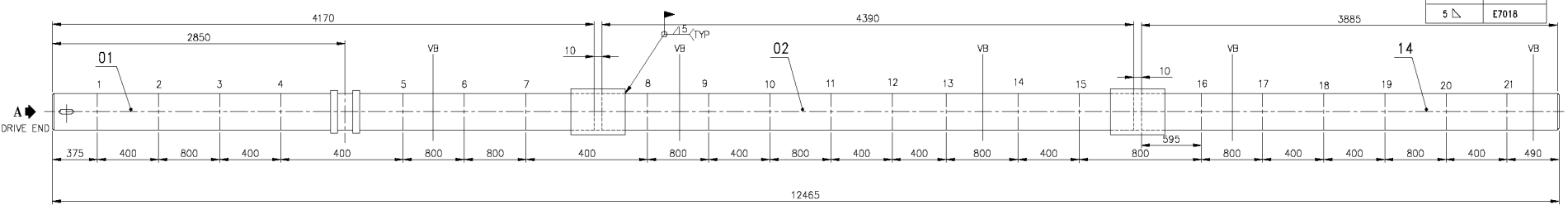
CARD CODE: UBI  
DRAWING NO: **2-79-013-00700**

REV: 0

2-78-116-8L-Z  
DRAWING NO. 03459

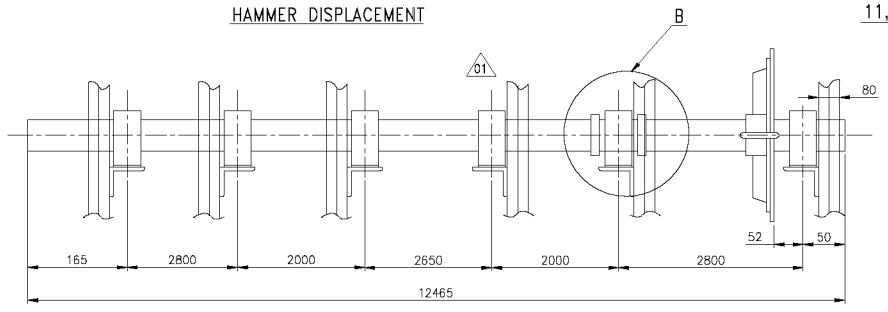
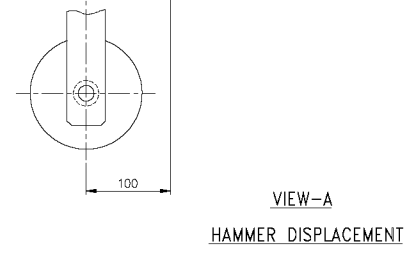
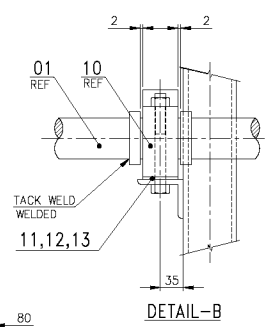
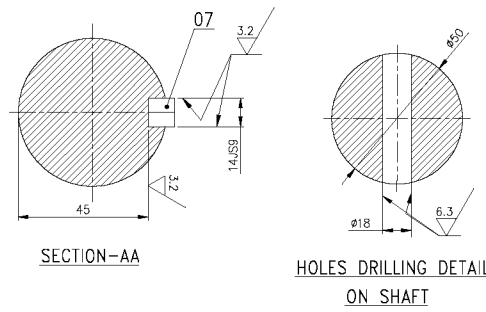
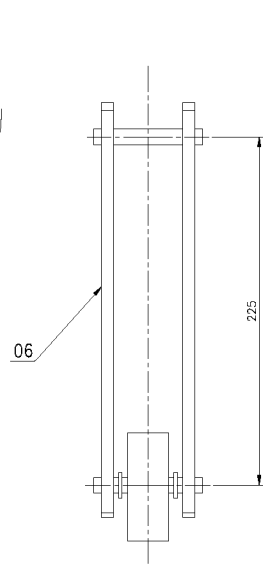
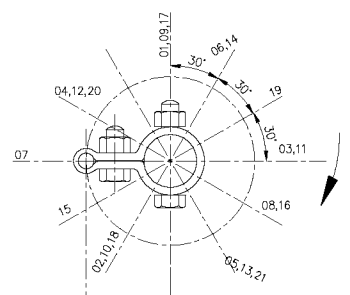
ALL DIMENSIONS ARE IN MILLIMETRES

TYPE OF WELD	ELECTRODE
5	E7018



**ERECTION NOTES:**

01. WELDING OF SLEEVE TO THE SHAFT IS TO BE DONE AS PER THE INSTRUCTION GIVEN BELOW:
  - a. PREHEAT THE SHAFT TO 250°C
  - b. WELD THE SLEEVE TO THE SHAFT ACCORDING TO THE ASSY. DRG.
  - c. CHECK FOR THE STRAIGHTNESS. ENSURE THAT THE SHAFT IS FREE FROM UNDERCUT AND BURRS.
02. SUCCESSIVE HAMMER ASSY. ARE TO BE MOUNTED AT AN ANGULAR DISPLACEMENT OF 210°/240°. (CLOCKWISE ROTATION FOR 400/800mm)
- 03. ITEM NO 04 SET RINGS TO BE POSITIONED BEFORE ASSEMBLING INNER ARMS. REFER EMITTING RAPPING SYSTEM ASSY.



VARIANT NO	ITEM NO	DESCRIPTION	STD	DRAWING NO.	ITEM NO VAR NO	MATL. CODE	A UNIT	UNIT WT.	QTY	ZONE
	14	SHAFT-III -3885		3-70-316-02435				59.370	1	
	13	SHIM SH 2x60x160		4-79-017-00607	03	15-011-104		0.113	12	
	12	SHIM SH 1.6x60x160		4-79-017-00607	02	15-011-089		0.090	12	
	11	SHIM SH 0.63x60x160		4-79-017-00607	01	15-011-251		0.036	12	
	10	PLAIN BEARING		6172 0066		15-277 CL3		3.889	6	
	09	NUT M16				41320 00016		0.034	21	
	08	BOLT 16x100				4123716100		0.186	21	
	07	PARALLEL KEY 9x14x63				15364/1		0.057	1	
	06	OUTER RAM		6172003121		41501 14063		5.776	21	
	05	INNER ARM		6172003021		9428500200		3.240	21	
	04	SET RING		6172003821		9428500700		0.344	2	
	03	SLEEVE TUBE 1		6172004621		9428502000		1.920	2	
	02	SHAFT - II -4390		3-70-316-02434				67.005	1	
	01	SHAFT - I -4170		3-78-616-01206				63.670	1	

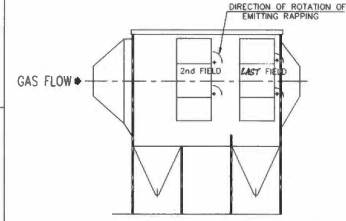
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		BNOM-132 PITCH-400	
BHARAT HEAVY ELECTRICALS LTD.		DRN SURESH	SIGN -SD-
UNIT: BOILER AUXILIARIES PLANT.		CHD M.MANI	-SD-
RANIPET - 632 406.		APPD M.MANI	-SD-
DEPT AQS	GRADE OF UNTO.DIM	SCALE	WEIGHT (KG)
CODE 862	PR:QA:500	N.T.S	414.786
TITLE		CARD CODE	DRAWING NO.
COMPLETE SHAFT FOR EMITTING RAPPING		U 01	2-78-116-03459
REV 01 DATE 03.03.08 ALTERED CHECKED		REV 01	09
ZONE REVISION AS NOTED			

CAUTION: The information on this drawing is the property of Bharat Heavy Electricals Ltd. It must not be used directly or indirectly in any way detrimental to the interest of the company.

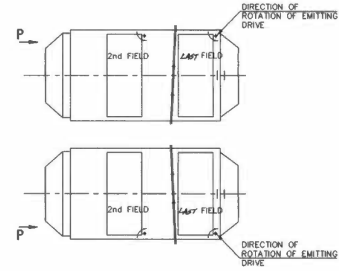
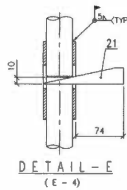
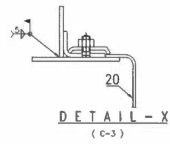
78-117-02582 DRAWING NO.

ALL DIMENSIONS ARE IN MILLIMETRES

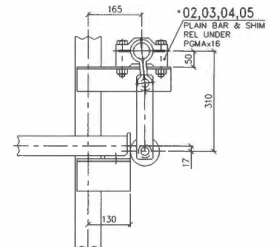
PGMA	WEIGHT IN KG
78-116	828.106
78-117	513.079



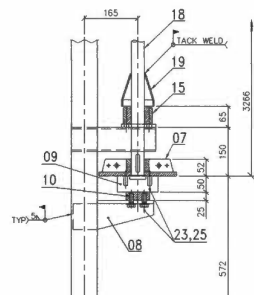
FRONT VIEW KEY DIAGRAM FOR EMITTING RAPPING SYSTEM



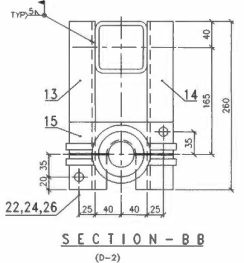
PLAN VIEW KEY DIAGRAM FOR EMITTING RAPPING SYSTEM



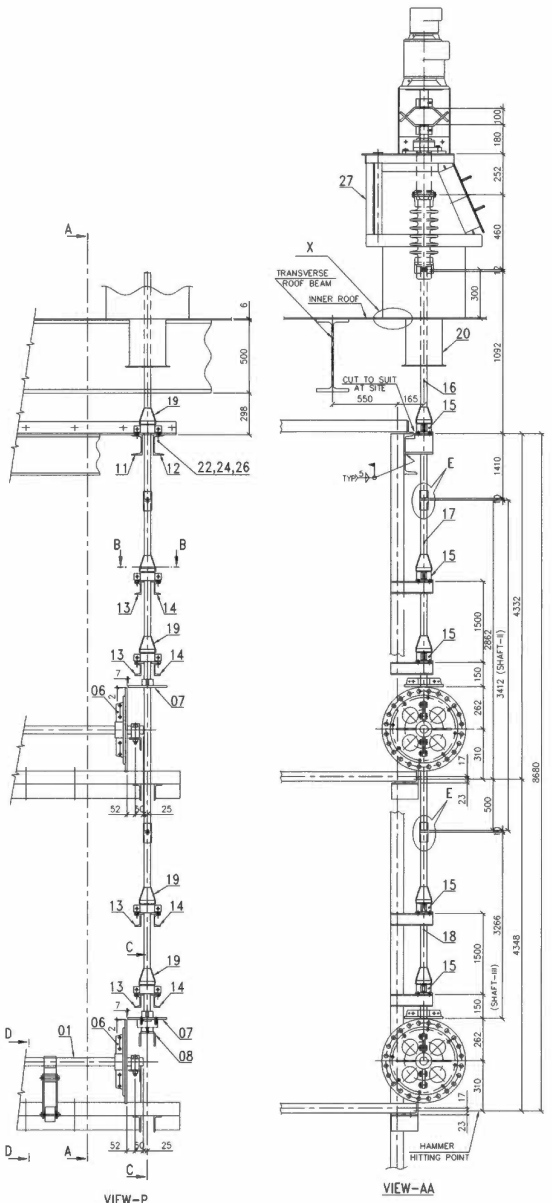
SECTION - DD (G-1)



SECTION - CC (H-2)



SECTION - BB (D-2)



- ERECTION NOTES**
01. START UP WITH THRUST BEARING ITEM NO.09
  02. CONTINUE ERECTION UPWARDS WITH BEARING SHAFT PINWHEEL ETC.
  03. ADJUST THE SHAFT ITEM NO 16 VERTICALLY WITH A WEDGE AS IN DETAIL-E.
  04. DRIVE ARRANGEMENT AND INSULATOR WILL BE MOUNTED.
  05. CHECK THAT TOP EDGE OF INSULATOR IS AT THE SAME LEVEL AS THE TRACE ON DRIVING SHAFT SEE DRG. NO 1-79-017-00530
  06. FINISH THE ERECTION BY WELDING THE SHAFT (ITEM NO 16) WITH SLEEVE AND REMOVE THE WEDGE.
  07. DO NOT INTERCHANGE THE UPPER AND LOWER PART OF ITEM NO. 02 OF 7X-116
  08. ITEM NO. 21 IS DIRECTION TOOL FOR ALIGNING THE SHAFT.
  09. DURING ASSY OF VERTICAL DRIVE SHAFT ASSY ITEM 16,17 & 18 ENSURE KEY WAY OF ITEM 01 TO BE POSITIONED IN SAME LOCATION TO OPERATE BOTH LEVEL HAMMER AT THE SAME TIME.
  10. LEVEL OF PLAIN BEARING TO BE ENSURED BY WATER LEVEL.
  11. THIS DRG FOR SECOND FIELD ON WARDS ONLY AND ASSUMED TO BE MIRROR FOR 1st FIELD.
  12. ITEMS & QUANTITY GIVEN FOR ONE EMITTING FRAME SYSTEM ( PER ELECTRICAL FIELD ONLY )
  13. ITEM RELEASED IN PGMA 7X-116

ITEM NO	DESCRIPTION	DRG NO.	ITEM NO	MATL CODE	A	B	C	UNIT	QTY	NO. OF
NO										
27	DRIVE ARRANGMENT FOR EMITTING RAPPING	1-79-017-00530							279.072	
				41409 00012				1	1	
28	TAPPER WASHER CHN 12			IS 5372				10	0.020	
25	SPRING WASHER SC12			41405 00012				5	0.004	
				IS 3063				1	1	
24	NUT HEX. M12			41304 00012				10	0.017	
				IS 1363				1	1	
23	SCREW M12x30			41222 12030				5	0.045	
				IS 1363				1	1	
22	SCREW M12x40			41222 12040				10	0.060	
				IS 1363				1	1	
21	WEDGE PL 6x25x122	4-79-016-0605		IS 011 092				1	0.140	
				IS 2062				1	1	
20	SCREEN TUBE	3-79-017-00760						1	5.690	
19	COVER			84 285 008				1	1.185	
18	SHAFT-III ( BOTTOM )	3-78-517-01147						1	32.985	
17	SHAFT-II ( MIDDLE )	3-78-517-01146						1	34.345	
16	SHAFT-I			94 285 025				1	27.445	
15	BEARING	4-79-017-00601						1	3.637	
				15 010 036				5	1.760	
14	SUPPORT ISMC 75-280	4-79-017-00600	02	IS 2062				4	1.760	
				15 010 036				1	1.760	
13	SUPPORT ISMC 75-260	4-79-017-00600	01	IS 2062				4	1.760	
				15 010 002				1	2.200	
12	SUPPORT ISMC 125-172	4-79-017-00599	01	IS 2062				1	2.200	
				15 010 002				1	2.200	
11	SUPPORT ISMC 125-172	4-79-017-00599	02	IS 2062				1	2.200	
				15 036 281				1	4.817	
10	PAD DIA 125-56	4-79-017-00598		IS 2062				1	0.790	
				94 067 050				1	3.600	
09	THRUST BEARING							1	9.224	
08	BRACKET	3-79-017-00774						1	31.346	
07	PINWHEEL-II	1-79-017-00527						2	31.346	
06	PINWHEEL-I	1-79-017-00526						2	31.346	
05*	SHM SH 2.0X60X160	4-79-017-00607	03	15-011-104				1	0.113	
				IS 1079				24	0.090	
04*	SHM SH 1.6X60X160	4-79-017-00607	02	IS 513 DD				24	0.036	
				15-011-281				24	0.036	
03*	SHM SH 0.8X60X160	4-79-017-00607	01	IS 277				24	3.889	
				94285050				12	388.415	
02*	PLAIN BEARING	61720066						2	388.415	
01	COMPLETE SHAFT FOR EMITTING RAPPING	2-78-116-03445						2		

COUNTRY: IN INDIA

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: H NOM- 135 B-NOM -132 400 MM PITCH

DATE: 15/07/2006

DEPT: ACOS GRADE OF UNTOLOM CODE: PR-DA-SOI SCALE: N.T.S WEIGHT (KG): CARD CODE: U 01

TITLE: RAPPING MECHANISM FOR EMITTING ELECTRODE

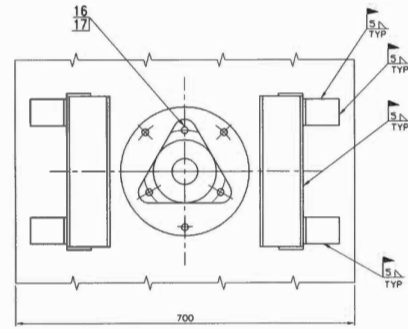
DRAWING NO: 1-78-117-02582

REV: 00

02500-10-17-0530  
ON ONMVA80

ALL DIMENSIONS ARE IN MILLIMETRES

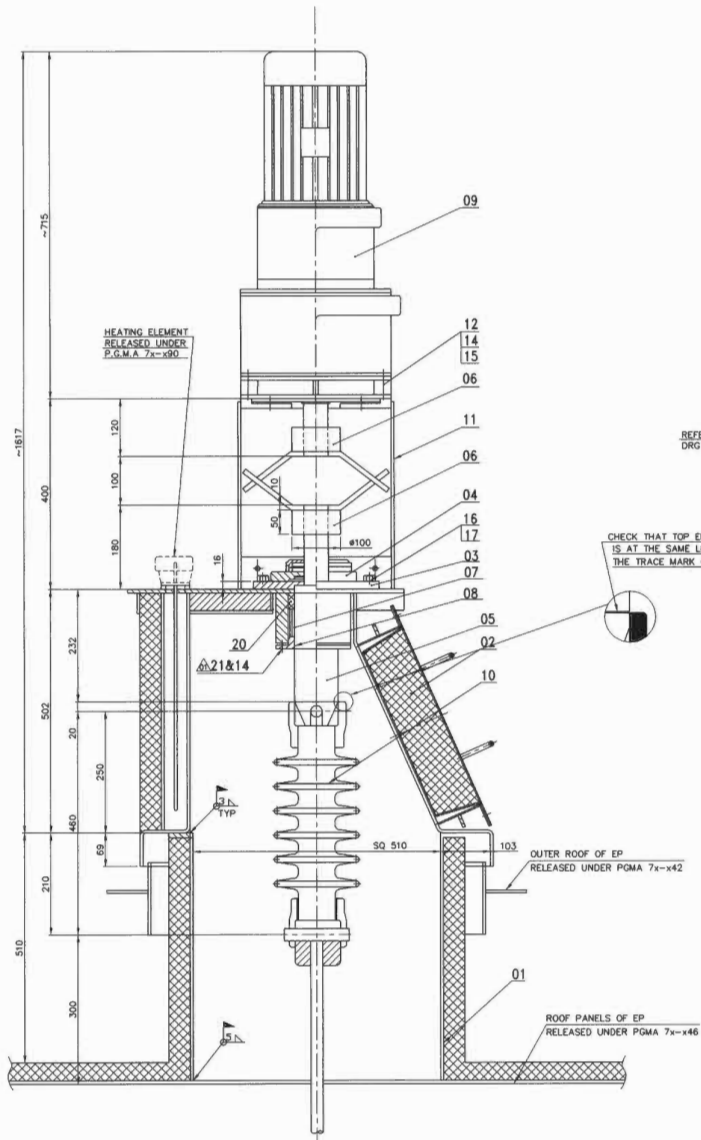
FOR PRODUCTION  
REF.-PGMA50 FOR PAINTING  
REF.-PGMA50 FOR UNTOL. DIMS.



SECTION-AA

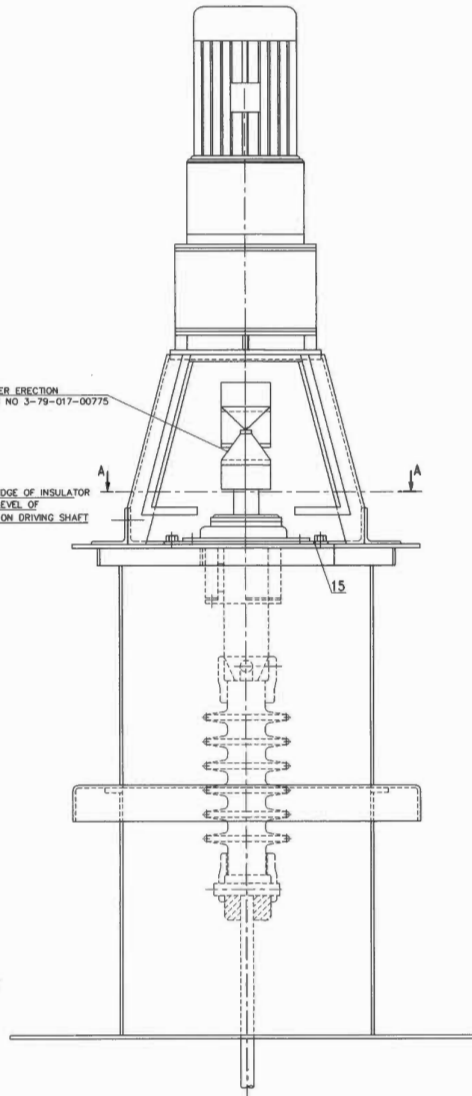
NOTES:-

- \* 01. ITEMS ON 18&19 ARE GIVEN FOR ERECTION PURPOSE ONLY. THEY ARE NOT INDICATED IN THE DRAWING.
- 02. ITEM NOS 4,7,9 & 10 ARE RELEASED UNDER PGMA 7x-x05 HENCE THE WEIGHT OF THE ABOVE ITEMS NOT INCLUDED IN THE TOTAL WEIGHT.
- \* 03. FOR NO OF ITEM NOS 18 & 19 REF GMS.THE WT OF ITEM NO: 18 & 19 ARE NOT INCLUDED.
- 04. INSULATION MATERIALS FOR ITEM NO 01 & 02 ARE RELEASED UNDER 7x-x07 & 7x-x08
- 05. IF NECESSARY GLAND ITEM 08 SHALL BE GROUND LOCALLY DURING ERECTION TO AVOID FOUNLING WITH INSULATOR HOUSING.



REFER ERECTION  
DRG NO 3-79-017-00775

CHECK THAT TOP EDGE OF INSULATOR  
IS AT THE SAME LEVEL OF  
THE TRACE MARK ON DRIVING SHAFT



ITEM NO	DESCRIPTION	DRG NO.	ITEM NO	MAT. CODE	A	B	C	UNIT WT.	NO. OF	NO. OF
									PIECE	PIECE
21	STUD M12x40	411021040	411 0212040					0.045	4	
20	PACKING ROPE LGA SQ 12MM-2M	5125020701	2202055200					0.434	4	
* 19	ALIGNMENT JG FOR MOTOR	3-79-017-00775						4.504	1	
* 18	LIFTING TOOL	4-79-017-00595						4.550	1	
17	SPRING WASHER M12		4140500012					0.004	3	
16	SCREW M12x30		4122212030					0.041	3	
15	WASHER M12		4140800012					0.006	4	
14	NUT M12		4130400012					0.017	4	
13	PACKING ASBESTORS ROPE #6 L 1M		2202066100					0.030	1	
12	BOLT M12x50		4122112050					0.058	4	
11	BRACKET	2-79-017-00791	96150059					31.251	1	
10	SHAFT INSULATOR ASSY.	1-79-017-00074						20.000	1	
09	GEARED MOTOR-3PH 0.33HP-415V-25RPM							~208.000	1	
08	GLAND	4-79-017-00806						1.392	1	
07	CARBON BUSH	3-79-017-00093						0.440	1	
06	GRIP COUPLING	3-79-017-00773						4.529	2	
05	SHAFT	3-79-017-00766						1.674	1	
04	BEARING & HOUSING	3-79-017-00791						4.100	1	
03	PACKING BOX	2-79-017-00766						14.881	1	
02	INSULATOR HOUSING	2-79-017-00790						138.767	1	
01	CONNECTION PIECE	3-79-017-00761						59.272	1	

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT (FOR 400MM PITCH)

**BHARAT HEAVY ELECTRICALS LTD.**  
UNIT: BOILER AUXILIARIES PLANT.  
PROJECT: - 638 - 1008.

DEPT: AGCS GRADE OF UNTOL.DIM: PR-QA-500 SCALE: R.T.S. WEIGHT (KG): 283.008 REF. TO ASSY/OLD DRG.: 1-79-017-0128M

TITLE: DRIVE ARRANGEMENT FOR EMITTING RAPPING

DRW. NO.: 1-79-017-00530

REV. DATE: 01/04/05

ALTERNED: [Signature] CHECKED: [Signature]

REVISAS AS NOTED.

NO. OF SHEETS: 01

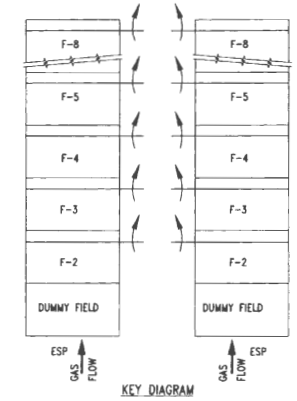
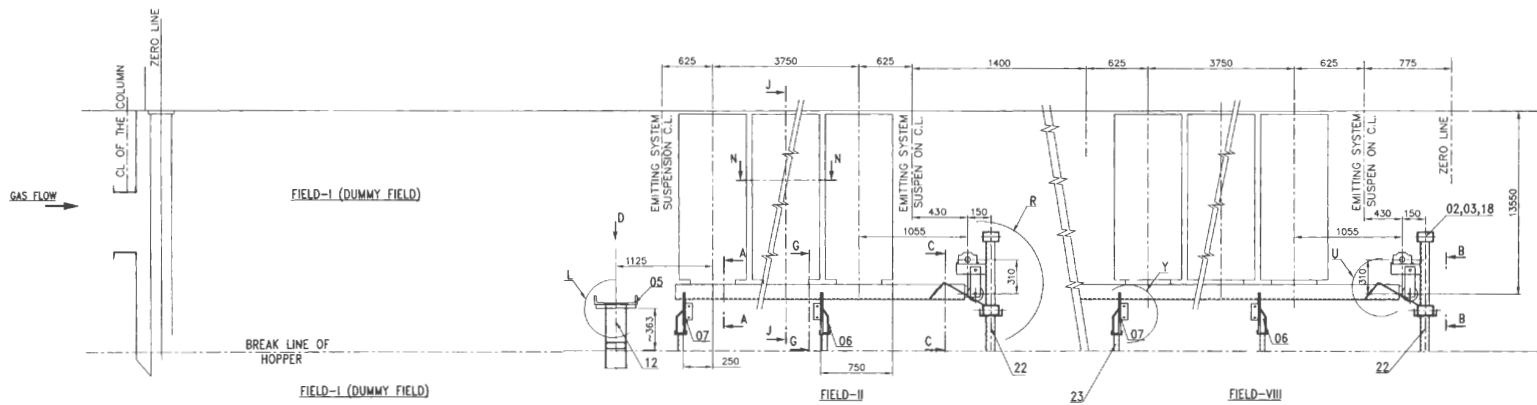
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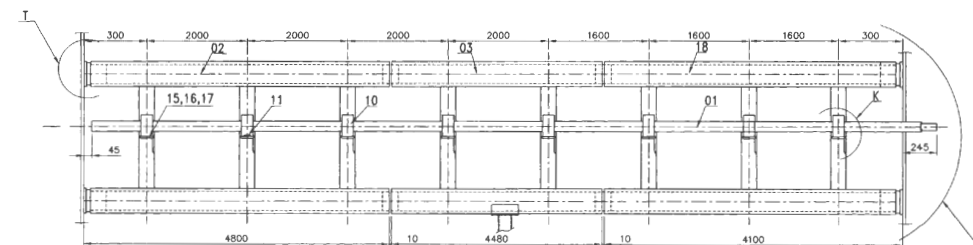
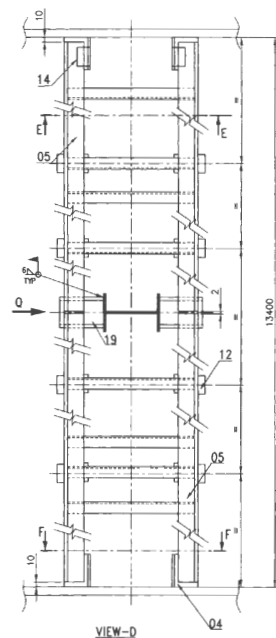
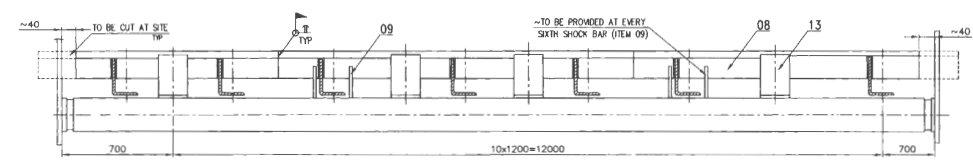
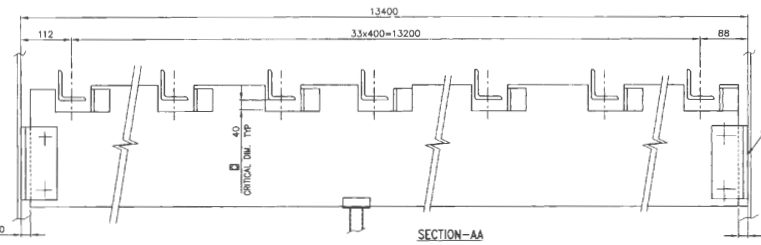
99570-571-1-78-125-02565

ALL DIMENSIONS ARE IN MILLIMETRES

FOR PRODUCTION  
 REF.-REQ.590 FOR PAINTING  
 REF.-REQ.590 FOR UNTOL. DIMS.



NOTE:  
 THIS DRG SHALL BE READ ALONG WITH DRG:1-78-125-02566



ITEM NO	DESCRIPTION	ITEM	DRAWING NO.	MATERIAL CODE	UNIT	QTY	REMARKS
23	SUPPORT FOR SHOCK BAR GUIDE	3-78-125-02195	02			7.025	
22	SUPPORT FOR BRACKET ASSY	3-78-125-02195	01			9.455	
21	SPLICE PL 6x50x150	IS 011 082				0.350	
20	SH 3.15x280x560	IS 2062 Gr.A				3.880	
19	ISWC 150;150	IS 011 182				25	
18	BRACKET ASY-I	2-78-825-03432	03			210.194	
17	SHIM SH 2x60x160	4-79-025-00418	03	15 011 104		0.113	
16	SHIM SH 1.6x60x160	4-79-025-00418	02	15 011 089		0.090	
15	SHIM SH 0.83x60x160	4-79-025-00418	01	15 011 261		0.036	
14	BRACKET	4-79-025-00220	02	IS 1079		1.810	
13	ATTACHMENT	4-79-025-00352				0.680	
12	WALK WAY SUPPORT	3-78-125-02195	01			17.008	
11	STOP PLATE PL 10x200x50	IS 011 098		15 011 098		0.078	
10	PLAIN BEARING	IS 2062 Gr.A		15 011 182		3.880	
09	CLAMP	4-79-025-00353		94285050		56	
08	SHOCK BAR GUIDE ISA 75x75x6;1998	3-78-825-00483		15 013 005		11.117	
07	SHOCK BAR GUIDE NON RAPP SIDE	2-78-825-03437		IS 2062		340.120	
06	SHOCK BAR GUIDE RAPP SIDE	2-78-825-03433				330.090	
05	WALK WAY	3-78-825-02186				77.021	
04	ISA 100x100x10;100			15 013 018		1.490	
03	BRACKET ASY-I	2-78-825-03432	02	IS 2062Gr.A		191.784	
02	BRACKET ASY-I	2-78-825-03432	01			183.426	
01	COMPLETE SHAFT FOR COLLECTOR	2-78-825-03431				601.522	

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: **SLPP - MANGROL EXTN UNIT 3&4**

CUSTOMER: **BHARAT HEAVY ELECTRICALS LTD.**

UNIT: **BOLAR AUSTRALIAN PLANT**

MANUFACTURED BY: **MANUFET - 632 AOB**

DATE: **12/7/76**

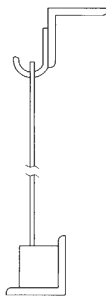
SCALE: **N.T.S.**

WEIGHT (KG): **REF TO ASSY/OLD DRG**

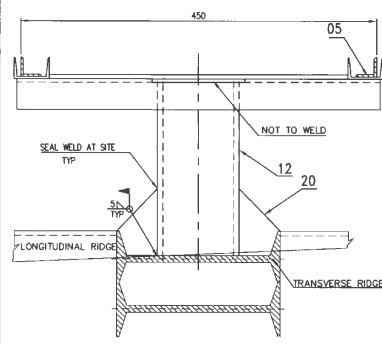
REV: **01**

DRAWING NO: **1-78-125-02565**

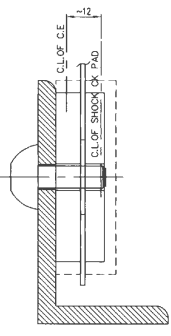
REV: **00**



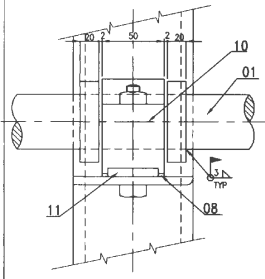
SECTION-J



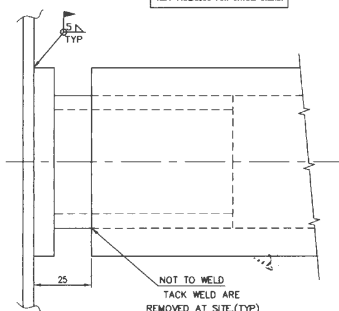
DETAIL-L



SECTION-GG

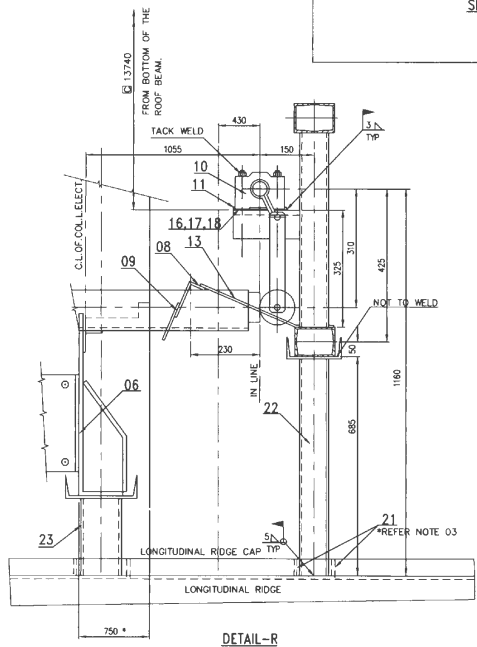


DETAIL-K

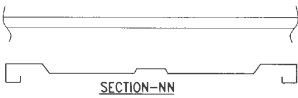


DETAIL-T

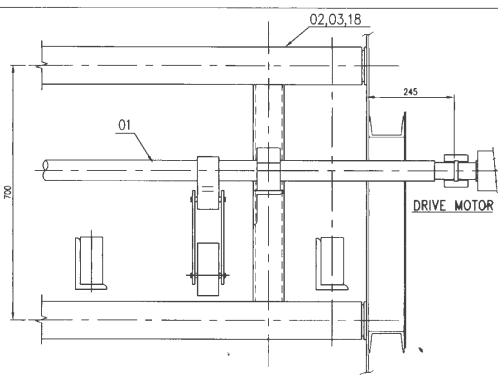
ALL DIMENSIONS ARE IN MILLIMETRES  
FOR PRODUCTION  
REF.-PRES-500 FOR PAINTING  
REF.-PRES-500 FOR UNTIL DRAINS.



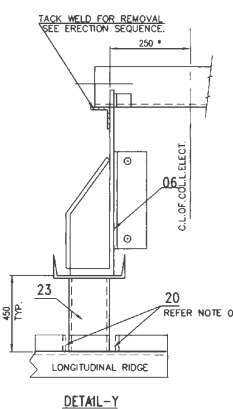
DETAIL-R



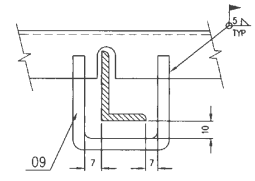
SECTION-NN



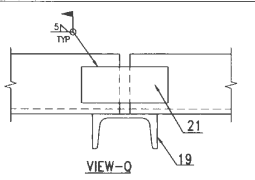
DETAIL-S



DETAIL-Y



SECTION-PP



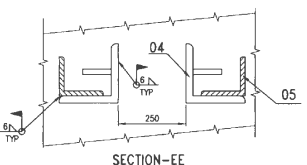
VIEW-Q

**ERECTION SEQUENCE:**

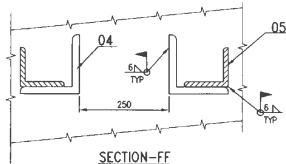
01. THIS DRG. IS TO BE READ ALONG WITH THE ASSY DRG OF 7X-225 PQMA.
02. ERECTION MATERIAL IS TO BE LOCALLY ARRANGED AS PER ERECTION MANUAL.
03. DISTANCES BETWEEN ROOF BEAMS AND C/L FOR FIRST AND LAST COLLECT. IN THE FIELDS LOCATED IN EACH ROW ADJACENT TO EP WALLS TO BE MARKED AND PLUMBED UP ON E.P.WALLS.
04. CHECK MEASUREMENTS AGAINST DISTANCES TO SUPPORT INSULATORS CENTERS AND BEAMS.
05. MARK UP DISTANCES 250mm, 1050mm AND 750mm ON E.P. WALLS.
06. INSTALL SHOCKBAR GUIDES AND ARRANGE SHOCK BARS ON GUIDE PLATES.
07. FIX THE FIELDSTAY AS PER ERECTION MANUAL.
08. LOCATE AND JACKBOLT THE SHOCKPAD WITH SHOCK BAR BY MAINTAINING 1055mm FROM C/L OF COLLECT/USE PLUMB LINE.
09. INSTALL SHOCKPAD WITH TEMPORARY SUPPORT AS SHOWN IN ERECTION MANUAL.
10. TACKLE SHOCKBAR GUIDE ASSY (REAR SIDE) WITH SHOCK BAR AS SHOWN IN DETAIL-R WELD TO BE REMOVED AFTER COMPLETE ALIGNMENT.
11. SUSPEND COLLECT.
12. ALIGN SHOCK BAR WITH COLLECT. USE HYDRAULIC JACK.
13. JACK BOLT COLLECT WITH SHOCK BAR. USE JACK POWER RIG HYDRAULIC UNIT.
14. ADJUST DISTANCES BETWEEN C/L OF COMPLETE SHAFT TO C/L OF SHOCK PAD BY 310mm FOR THIS USE SHIM.
15. REMOVE ANGLE IRON SUPPORT OF SHOCK BAR GUIDE ASSY.

**NOTE:**

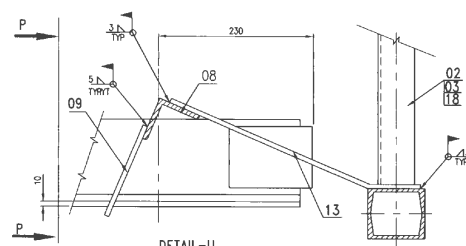
01. LOCATION OF SETTING AT END PLAIN BEARING FROM DRIVE END OF SHAFT.
02. ARRANGEMENT OF SHAFT AS PER KEY DIAGRAM.
03. LOCATION OF ITEM 12 : AS PER SITE COMMENT ON RIDGES.
04. THE LONGITUDINAL RIDGE CAPS ARE TO BE CUT SUITABLY AT SITE. THE VERTICAL OPENINGS ARE TO BE CLOSED BY USING ITEM NO 20 AND SEAL WELDED SUITABLY.



SECTION-EE



SECTION-FF



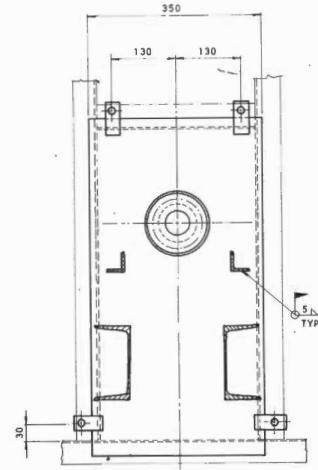
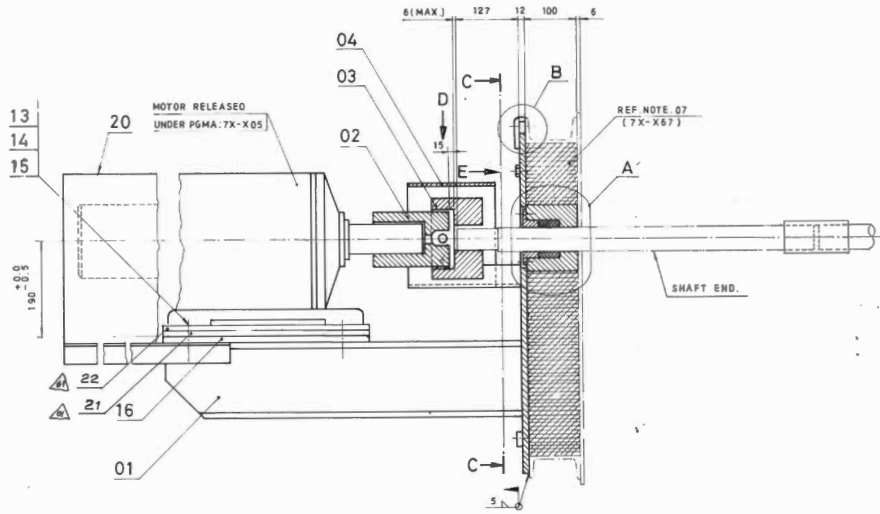
DETAIL-U

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		DRN	NAME	DATE	NO OF VAR.
BHARAT HEAVY ELECTRICALS LTD. UNIT: BOILER AUXILIARIES PLANT, RAMPLET - 632 400.		230	A.PALANI	12/08/05	-
DEPT. ACDS		SCALE	WEIGHT (KG)	REF. TO ASSY/OLD DRG.	REV
CODE 867	GRADE OF UNIFORM	---	---	1-78-925-01440	---
TITLE		CARD CODE	DRAWING NO.	REV	
RAPP.MECH FOR C.E ERECTION DETAILS		U 01	1-78-125-02566	00	

CAUTION: The invention of what is shown in this drawing is the property of BHARAT HEAVY ELECTRICALS LTD. It shall not be permitted to be made or used in any form without the written consent of the company.



10/67700-920-64-1

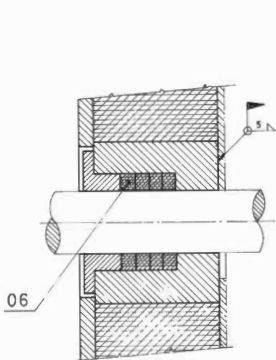


SECTION - CC

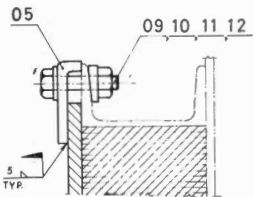
NOTES:

01. NECESSARY HOLES FOR FIXING ITEMS: 17 & 18 TO BE DRILLED AT SITE.
  02. ENSURE PARALLELISM OF MOTOR BASE PLATE WITH RESPECT TO CENTRE LINE OF RAPPING SHAFT. USE SHIMS ITEM NO: 16, 21 & 22 FOR ALIGNMENT.
  03. ELECTRICAL SUPPLY TO MOTOR SHOULD BE SUITABLY GIVEN TO SET THE PROPER DIRECTION OF ROTATION.
  04. ITEMS - 05, 09, 10, 11 & 12 ARE GIVEN FOR ERECTION PURPOSE ONLY.
  05. FOR DIRECTION OF ROTATION OF MOTOR SHAFT REFER KEY DIAGRAM OF RAPPING MECHANISM FOR COLLECTING ELECTRODE ASSY. DRG. RELEASED UNDER PGMA: 7X-X25.
  06. GROOVE IN THE COUPLING MUST COINCIDE WITH THE EDGE OF CLUTCH.
  07. INSULATION MATERIAL THICKNESS OF 100 MM; AREA  $\approx 0.25 M^2$  SHOULD BE USED FROM E. S. P. INSULATION MATERIAL.
  08. MARK THE CORRECT DIRECTION OF ROTATION (AS PER NOTE. 05) OF THE SHAFT AND FIX THE ARC DIRECTION INDICATOR ITEM: 17 & 18 AT A PROMINENT PLACE ON THE GEAR UNIT. PAINT A CAUTION 'DON'T REVERSE THE ROTATION' ON THE BRACKET.
- CAUTION: REVERSE ROTATION WILL CAUSE SERIOUS DAMAGE TO THE SHOCK BAR, SHOCK BAR GUIDE, & SHAFT AND ALSO DISRUPT THE ALIGNMENT OF THE ELECTRODES.
09. FOR FURTHER NOTES REFER ERECTION MANUAL OF ESP ( UNDER TOPIC "ERECTION PROCEDURE FOR ESP-DRIVE ARRANGEMENT FOR COLLECTING ELECTRODE RAPPING MECHANISM")

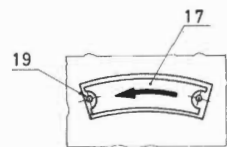
TYPE OF WELD.	ELECTRODE SPEC.
5L	E-6013



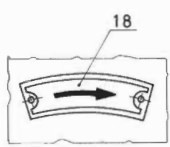
DETAIL - A



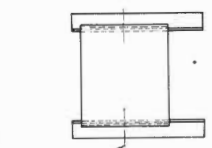
DETAIL - B



VIEW - E  
FOR ANTICLOCK WISE ROTATION  
OF MOTOR SHAFT



VIEW - E  
FOR CLOCK WISE ROTATION  
OF MOTOR SHAFT



VIEW - D

ITEM No.	DESCRIPTION	DRAWING No.	ITEM No.	MATL. CODE	UNIT WT.	QUANTITY
22	SHM 3-15X50X350		94307173		0.423	2
			61720060		0.269	2
21	SHM 2X50X350		94307171		0.269	2
			61720060		0.186	1
20	MOTOR SHIELD.	3-79-017-00150				1
19	SCREW NAIL M 2 X 6.	S 41 601 02006	41 601 02006		0.001	2
18	ARC DIRECTION INDICATOR. CLOCK WISE.		2 2 074 178		0.005	1
17	ARC DIRECTION INDICATOR. ANTI CLOCK WISE.		2 2 074 179		0.006	1
16	SHIM. 1-6X50X350.		94307170		0.215	2
			61720060		0.11	4
15	WASHER. A 16	S	41 408 00016		0.011	4
			15-2016		0.237	4
14	HEX. SCREW & NUT M 16 X 110	S	41 255 16110		0.237	4
			15-1363		0.037	4
13	TAPER WASHER CHN 16 S	S	41 409 00016		0.020	4
			15-5372		0.005	4
12	TAPER WASHER CHN 12 S	S	41 409 00012		0.020	4
			15-5372		0.005	4
11	WASHER - A 12	S	41 408 00012		0.017	4
			15-2016		0.024	2
10	HEX. NUT. M 12	S	41 305 00012		0.024	2
			15-1363/3		0.029	2
09	HEX. SCREW M 12 X 50	S	41 222 12050		0.002	2
			15-1363/2		0.002	2
08	WASHER A 8	S	41 408 00008		0.002	2
			15-2016		0.020	2
07	HEX. SCREW & NUT M 8 X 35	S	41 255 08035		0.020	2
			15-1363		0.020	2
06	LGA ROPE. 67. 3 50.12MM - 1100 L6.		22 0 20 552		0.020	1
			15-4687		0.027	1
05	HOLDER. P.L. 8 X 30 X 75.	4-79-026-00063	15-011-027		0.014	4
			15-2052		0.017	1
04	COVER PLATE. SM. 2 X 180 X 520	4-79-026-00280	15-011-104		0.017	1
			15-1079		0.017	1
03	CLUTCH.	S 61720 036	9 4 285 005		0.017	1
			9 4 285 004		0.017	1
02	COUPLING - 1.	S 61720 035			0.017	1
01	BRACKET.	2-79-026-00185			0.017	1

TYPE OF PRODUCT OR NAME OF SUB-ORDER PROJECT

**Bharat Heavy Electricals Ltd.**  
ROILER AUXILIARIES PLANT  
RANIPET 632 406

DRN. K. N. MURTHY  
CHD. P. S. K.  
SPEE. B. B. R.

DATE OF ORDER: 15/02/20

REV. 01

SCALE: N.T.S.

WEIGHT: 106-557

REF TO: 1-79-026-00176

CARD CODE: U 01

DRAWING No: 1-79-026-00449

REV. 01

DRIVE ARRGT. FOR COLLECTING ELECTRODE RAPPING.

REV	DATE	ALTERED	DEPT.	GRAND	SCALE	WEIGHT	REF TO	ITEM
01	10-09-79	CHECKED	AGCS	DR.	N.T.S.	106-557	1-79-026-00176	01
		ITEM NO: 81, 22, 20, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100						

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FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM

**AS BUILT**

OWNER'S CONSULTANT:



**TCE CONSULTING ENGINEERS LIMITED**  
BANGALORE



**BHARAT HEAVY ELECTRICALS LTD.**  
BOILER AUXILIARIES PLANT  
RANIPET-632 406

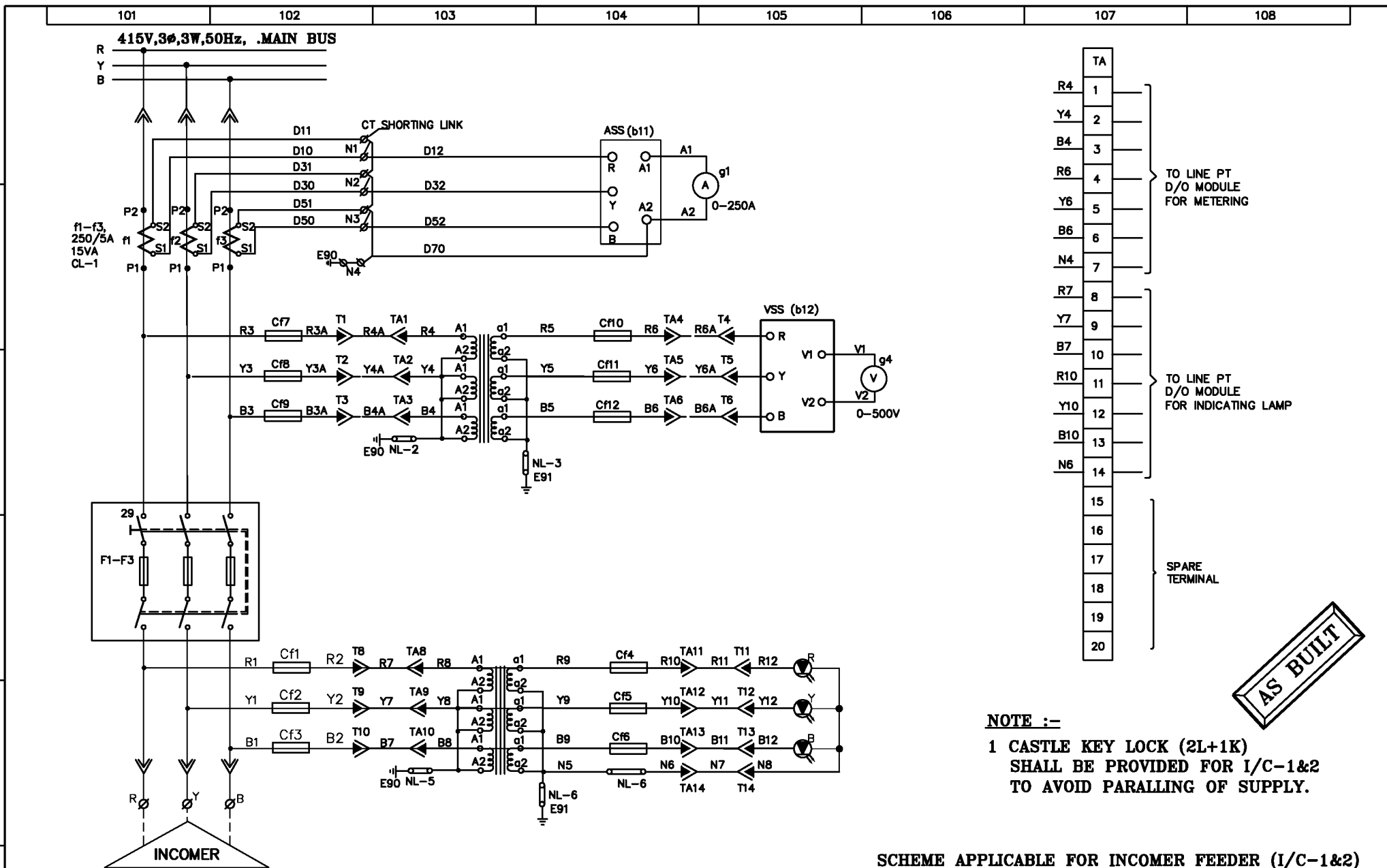


**CONTROLS & SWITCHGEAR COMPANY LTD.**

**TITLE:- SCHEMATIC/WIRING DIAGRAM  
FOR AUXILIARY CONTROL PANEL**

<b>REV.</b>	I- <b>REVISED AS PER COMMENTS RECD. VIDE BHEL LTR. DT. ON 14.06.08</b>	II- <b>REVISED AS PER BHEL E-MAIL DTD. 13.07.08</b>	IV-
	Date	Name	
Drawn	13.05.08	PRADEEP	
Checked			
Approved			
<b>PROJECT:-</b> GUJARAT INDUSTRIES POWER CO. LTD. SLPP-II (UNIT 3&4), 2X125 MW		<b>CONTROLS &amp; SWITCHGEAR COMPANY LTD.</b> C-59 NODA PHASE-II, NODA-201305 DISTT. GAUTAM BUDH NAGAR(U.P) FORMAT No. : QAF-04/04	
<b>CONSULTANT:-</b> TATA CONSULTING ENGINEERING (BANGALORE)		Client:- <b>BHEL-RANIPET</b>	DRG. NO. <b>BHEL/J2435/501</b>
		Work:- <b>AUXILIARY CONTROL PANEL</b>	REV. <b>2</b>
		Details:- <b>SCHEMATIC/WIRING DIAGRAM</b>	SCALE: NTS
		Order No.:- <b>4281057 DT. 11/04/08</b>	SHEET NO. NO.OF SHEET
			<b>01</b> <b>02</b>

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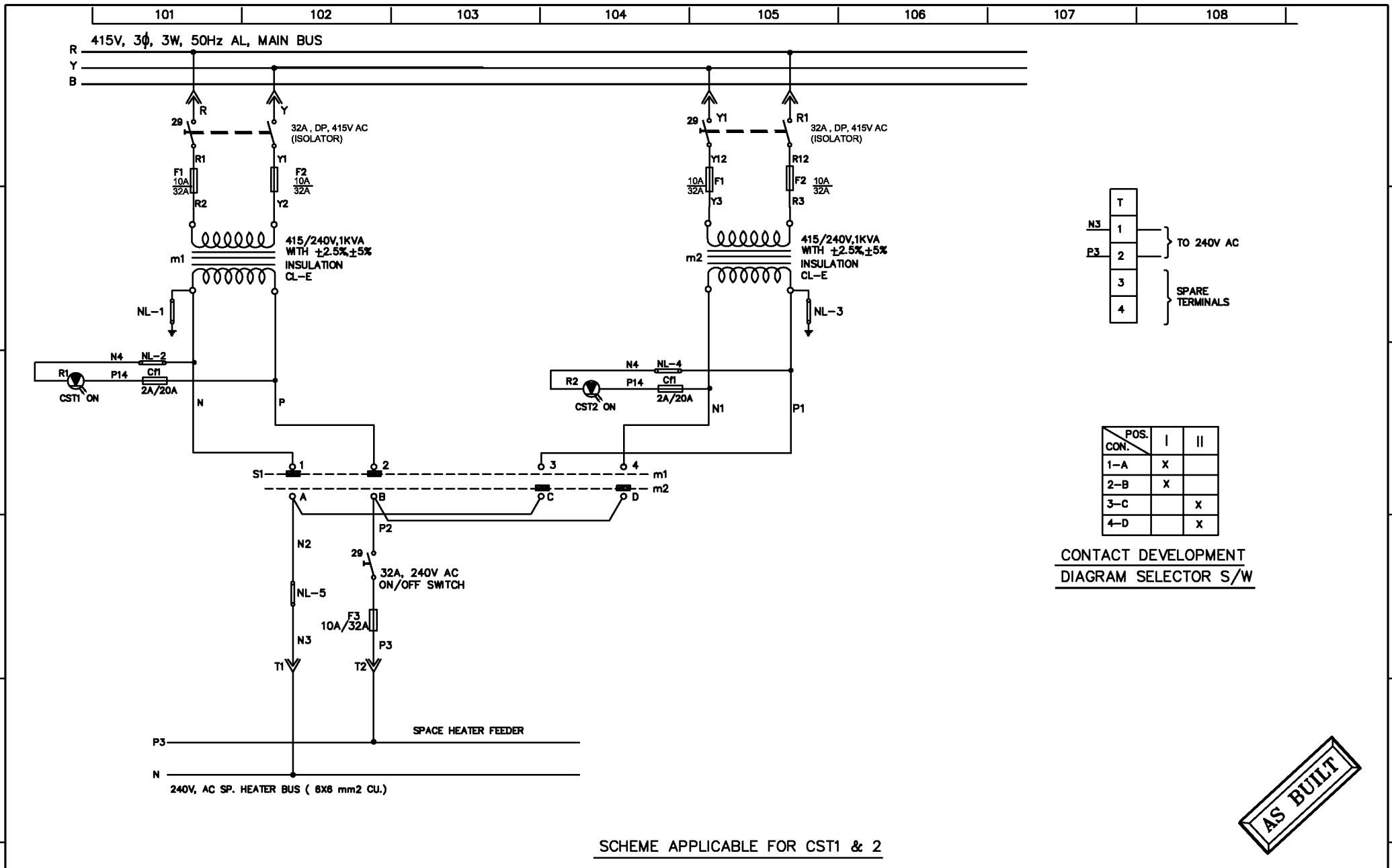
**AS BUILT**

**NOTE :-**  
 1 CASTLE KEY LOCK (2L+1K)  
 SHALL BE PROVIDED FOR I/C-1&2  
 TO AVOID PARALLING OF SUPPLY.

**SCHEME APPLICABLE FOR INCOMER FEEDER (I/C-1&2)**

REV.	I- REVISED AS PER COMMENTS RECD. VIDE BHEL LTR. DT. ON 14.06.08	II- REVISED AS PER BHEL E-MAIL DTD. 13.07.08	III-	IV-
F	Date	Name	PROJECT:- GUJARAT INDUSTRIES POWER CO. LTD. SLPP-II (UNIT 3&4), 2X125 MW	
	Drawn	10.05.08	PRADEEP	CONTROLS & SWITCHGEAR COMPANY LTD. C-59 NOIDA PHASE-II, NOIDA-201305 DIST. GAUTAM BUDDH NAGAR (U.P.) FORMAT No. : QAF-04/04
	Checked			
	Approved			
		DRG. NO. BHEL/J2435/501		REV. 2
		ITEM	SHEET NO. NO. OF SHEET	02 02

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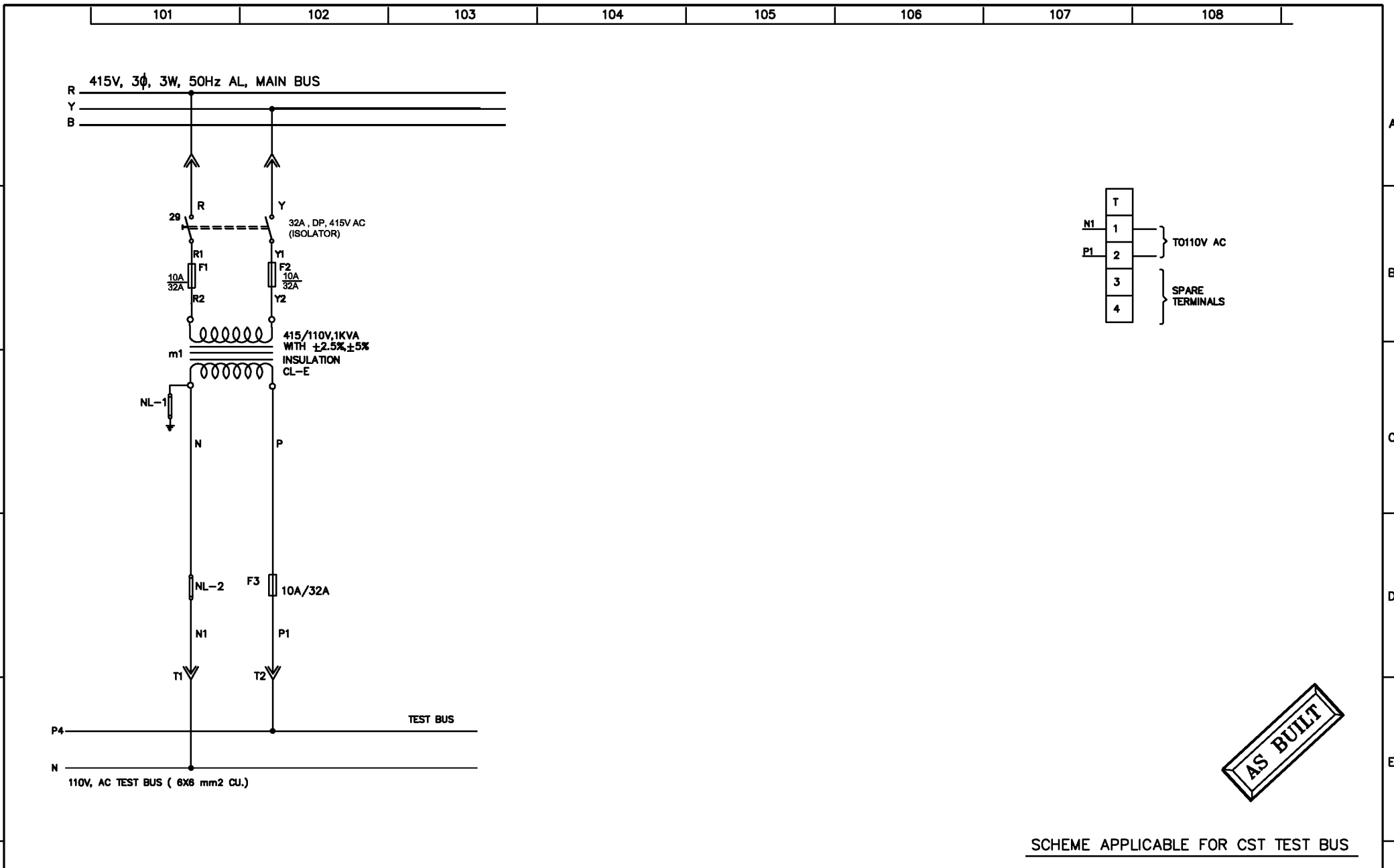


CONTACT DEVELOPMENT  
DIAGRAM SELECTOR S/W

**AS BUILT**

<b>REV.</b>	I- REVISED AS PER COMMENTS RECD. VIDE BHEL LTR. DT. ON 14.06.08	II- REVISED AS PER BHEL E-MAIL DTD. 13.07.08	III-	IV-
<b>Date</b>	<b>Name</b>	<b>PROJECT:-</b> GUJARAT INDUSTRIES POWER CO. LTD. SLPP-II (UNIT 3&4), 2X125 MW	<b>CONTROLS &amp; SWITCHGEAR COMPANY LTD.</b> C-59 NOIDA PHASE-II, NOIDA-201305 DISTT. GAUTAM BUDH NAGAR(U.P) FORMAT No. : QAF-04/04	<b>Client:-</b> BHEL-RANIPET
<b>Drawn</b>	12.05.08	PRADEEP	 <b>Controls &amp; Switchgear</b>	<b>Work:-</b> AUXILIARY CONTROL PANEL
<b>Checked</b>				<b>Details:-</b> SCHEMATIC/WIRING DIAGRAM
<b>Approved</b>				<b>Order No.:-</b> 4281057 DT. 11/04/08
		<b>CONSULTANT:-</b> TATA CONSULTING ENGINEERING (BANGALORE)		<b>DRG. NO.</b> BHEL/J2435/502
				<b>REV.</b> 2
				<b>SCALE:</b> NTS
				<b>SHEET NO.</b> NO. OF SHEET
				01 01

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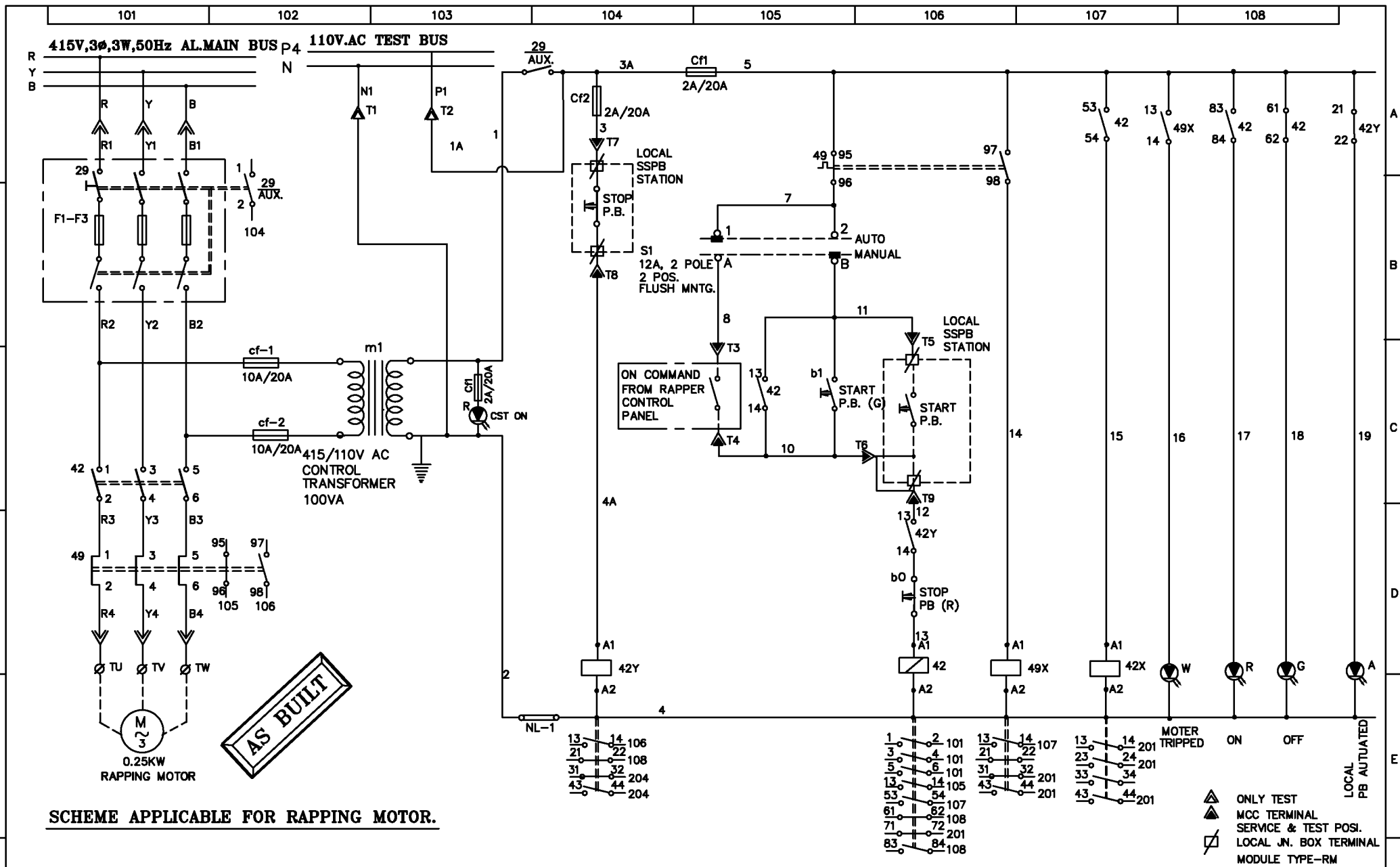


**AS BUILT**

SCHEME APPLICABLE FOR CST TEST BUS

REV.	I- REVISED AS PER COMMENTS RECD. VIDE BHEL LTR. DT. ON 14.06.08	II- REVISED AS PER BHEL E-MAIL DTD. 13.07.08	III-	IV-
Drawn	Date: 12.05.08 Name: PRADEEP	<b>PROJECT:-</b> GUJARAT INDUSTRIES POWER CO. LTD. SLPP-II (UNIT 3&4), 2X125 MW <b>CONSULTANT:-</b> TATA CONSULTING ENGINEERING (BANGALORE)		Client: - <b>BHEL-RANIPET</b> Work: - <b>AUXILIARY CONTROL PANEL</b> Details: - <b>SCHEMATIC/WIRING DIAGRAM</b> Order No.: - <b>4281057 DT. 11/04/08</b>
Checked		CONTROLS & SWITCHGEAR COMPANY LTD. C-59 NOIDA PHASE-II, NOIDA-201305 DISTT. GAUTAM BUDH NAGAR(U.P) FORMAT No. : QAF-04/04		DRG. NO. <b>BHEL/J2435/503</b>
Approved				SCALE: NTS
				REV. <b>2</b> 01 01

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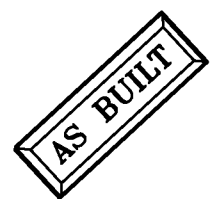
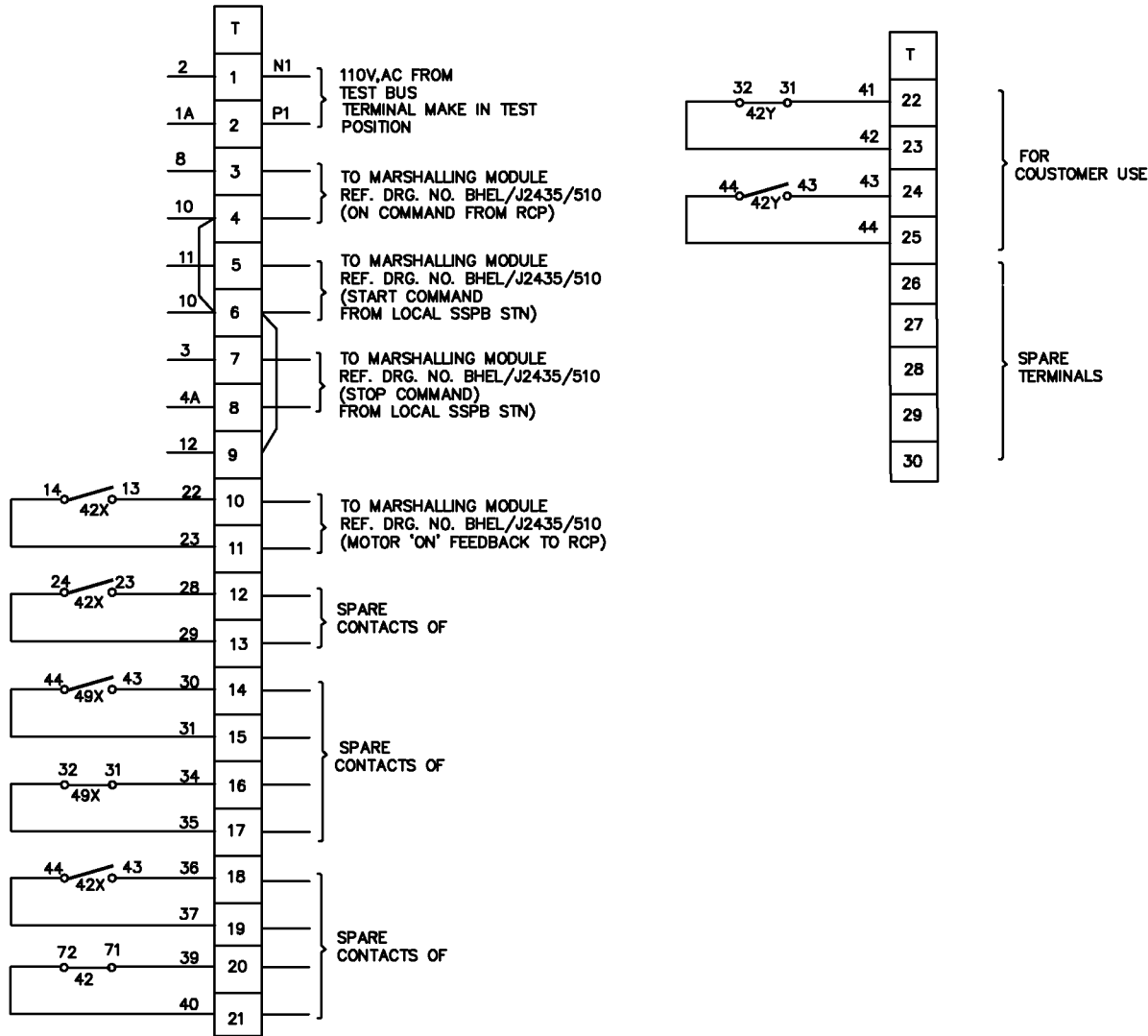


**SCHEME APPLICABLE FOR RAPPING MOTOR.**

▲ ONLY TEST  
 ▲ MCC TERMINAL  
 ▲ SERVICE & TEST POSI.  
 ▫ LOCAL JN. BOX TERMINAL  
 MODULE TYPE-RM

REV.	I- REVISED AS PER COMMENTS RECD. VIDE BHEL LTR. DT. ON 14.06.08		II- REVISED AS PER BHEL E-MAIL DTD. 13.07.08		III-		IV-			
F	Date	Name	PROJECT:- GUJARAT INDUSTRIES POWER CO. LTD. SLPP-II (UNIT 3&4), 2X125 MW			Client - BHEL-RANIPET		DRG. NO.	REV.	
	Drawn	12.05.08	PRADEEP	CONSULTANT:- TATA CONSULTING ENGINEERING (BANGALORE)			Work - SCHEMATIC/WIRING DIAGRAM		BHEL/J2435/504	2
	Checked						Details- AUXILIARY CONTROL PANEL			
	Approved						C-59 NODA PHASE-II, NODA-201305 DISTT. GAUTAM BUDH NAGAR(U.P) FORMAT No. : QAF-04/04		BHEL P.O. NO.- 4281057 DT. 11/04/08	

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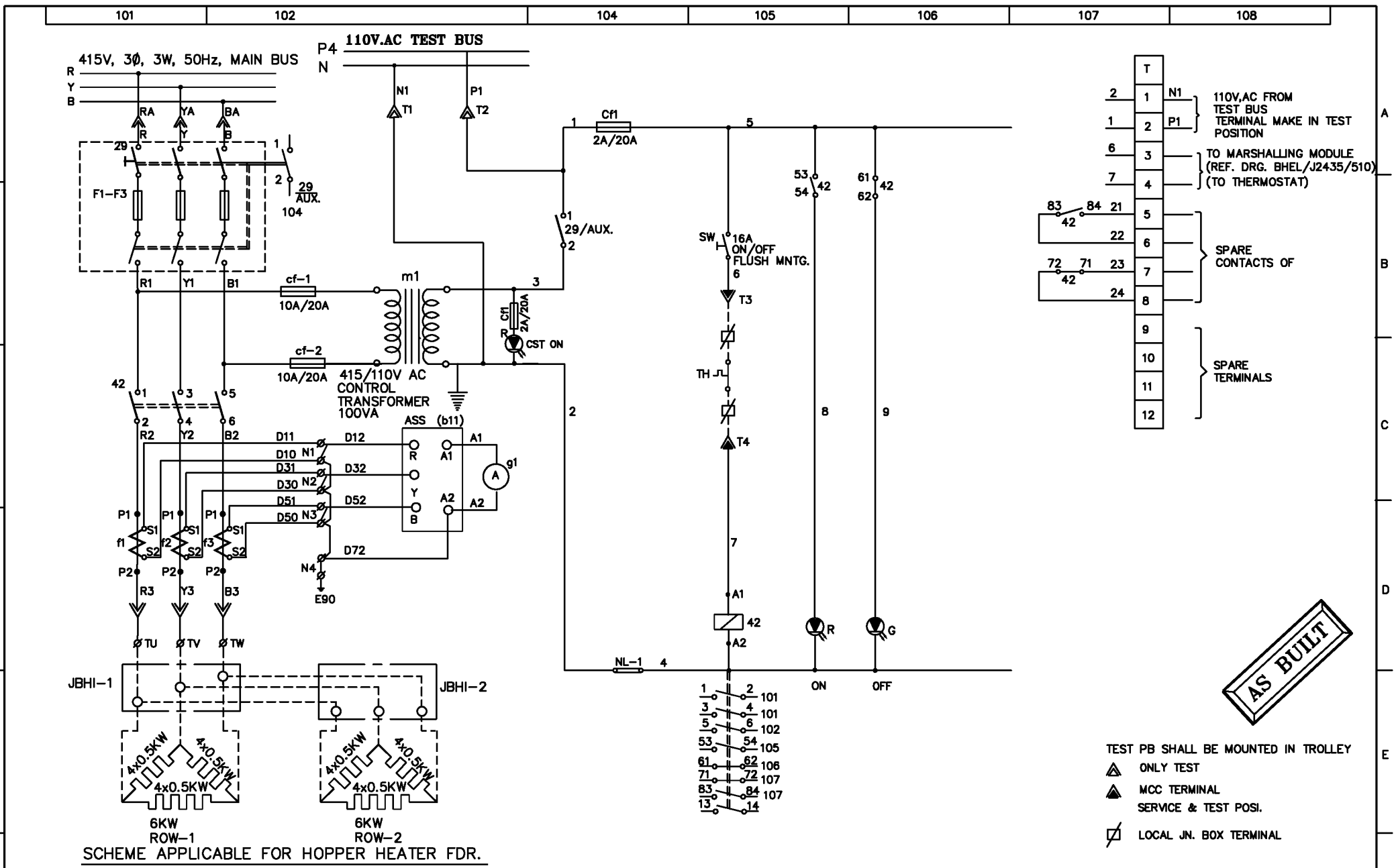
MODULE TYPE-RM

REV.	I- REVISED AS PER COMMENTS RECD. VIDE BHEL LTR. DT. ON 14.06.08	II- REVISED AS PER BHEL E-MAIL DTD. 13.07.08	III-	IV-				
F	Date	Name	<b>PROJECT:-</b> GUJARAT INDUSTRIES POWER CO. LTD. SLPP-II (UNIT 3&4), 2X125 MW  <b>CONSULTANT:-</b> TATA CONSULTING ENGINEERING (BANGALORE)	Client - BHEL-RANIPET	DRG. NO. <b>BHEL/J2435/504</b>	REV. <b>2</b>		
	Drawn	12.05.08		PRADEEP			Work - SCHEMATIC/WIRING DIAGRAM	
	Checked				Details- AUXILIARY CONTROL PANEL	ITEM	SHEET NO.	02
	Approved				BHEL P.O. NO.- 4281057 DT. 11/04/08		NO. OF SHEET	02



**CONTROLS & SWITCHGEAR COMPANY LTD.**  
 C-59 NOIDA PHASE-II, NOIDA-201305  
 DISTT. GAUTAM BUDH NAGAR (U.P)  
 FORMAT No. : QAF-04/04

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**AS BUILT**

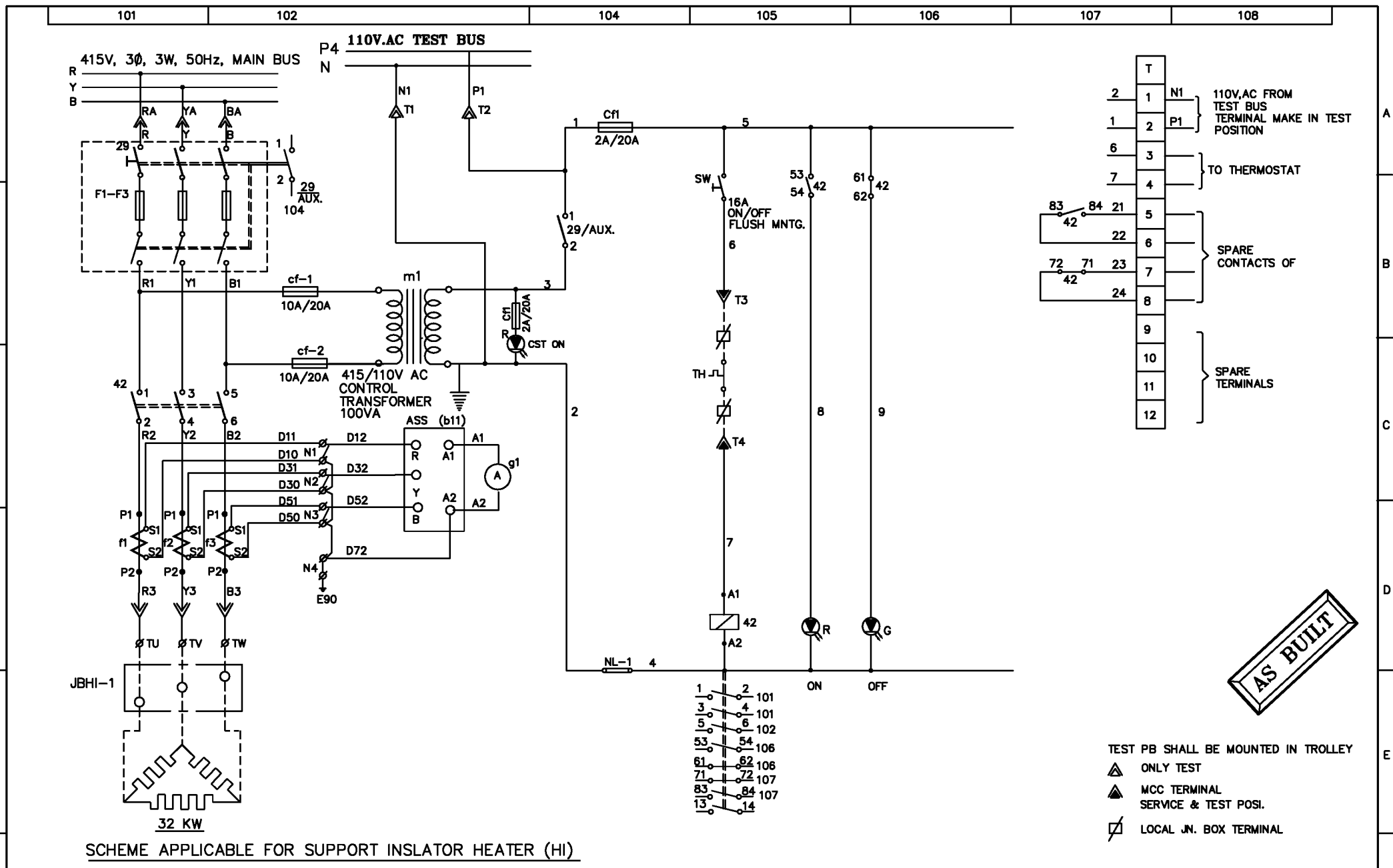
TEST PB SHALL BE MOUNTED IN TROLLEY

- ▲ ONLY TEST
- ▲ MCC TERMINAL SERVICE & TEST POSI.
- ⊠ LOCAL JN. BOX TERMINAL

REV.	I- REVISED AS PER COMMENTS RECD. VIDE BHEL LTR. DT. ON 14.06.08	II- REVISED AS PER BHEL E-MAIL DTD. 13.07.08	III-	IV-
F	Date	Name	PROJECT:-	
	12.05.08	PRADEEP	GUJARAT INDUSTRIES POWER CO. LTD. SLPP-II (UNIT 3&4), 2X125 MW	
	Checked		CONSULTANT:-	
	Approved		TATA CONSULTING ENGINEERING (BANGALORE)	
			<b>CONTROLS &amp; SWITCHGEAR COMPANY LTD.</b> C-59 NOIDA PHASE-II, NOIDA-201305 DISTT. GAUTAM BUDDH NAGAR (U.P.) FORMAT No. : QAF-04/04	
			Client - BHEL-RANIPET	
			Work - SCHEMATIC/WIRING DIAGRAM	
			Details- AUXILIARY CONTROL PANEL	
			BHEL P.O. NO.- 4281057 DT. 11/04/08	
		DRG. NO.		REV.
		BHEL/J2435/505		2
		ITEM	SHEET NO.	01
			NO. OF SHEET	01




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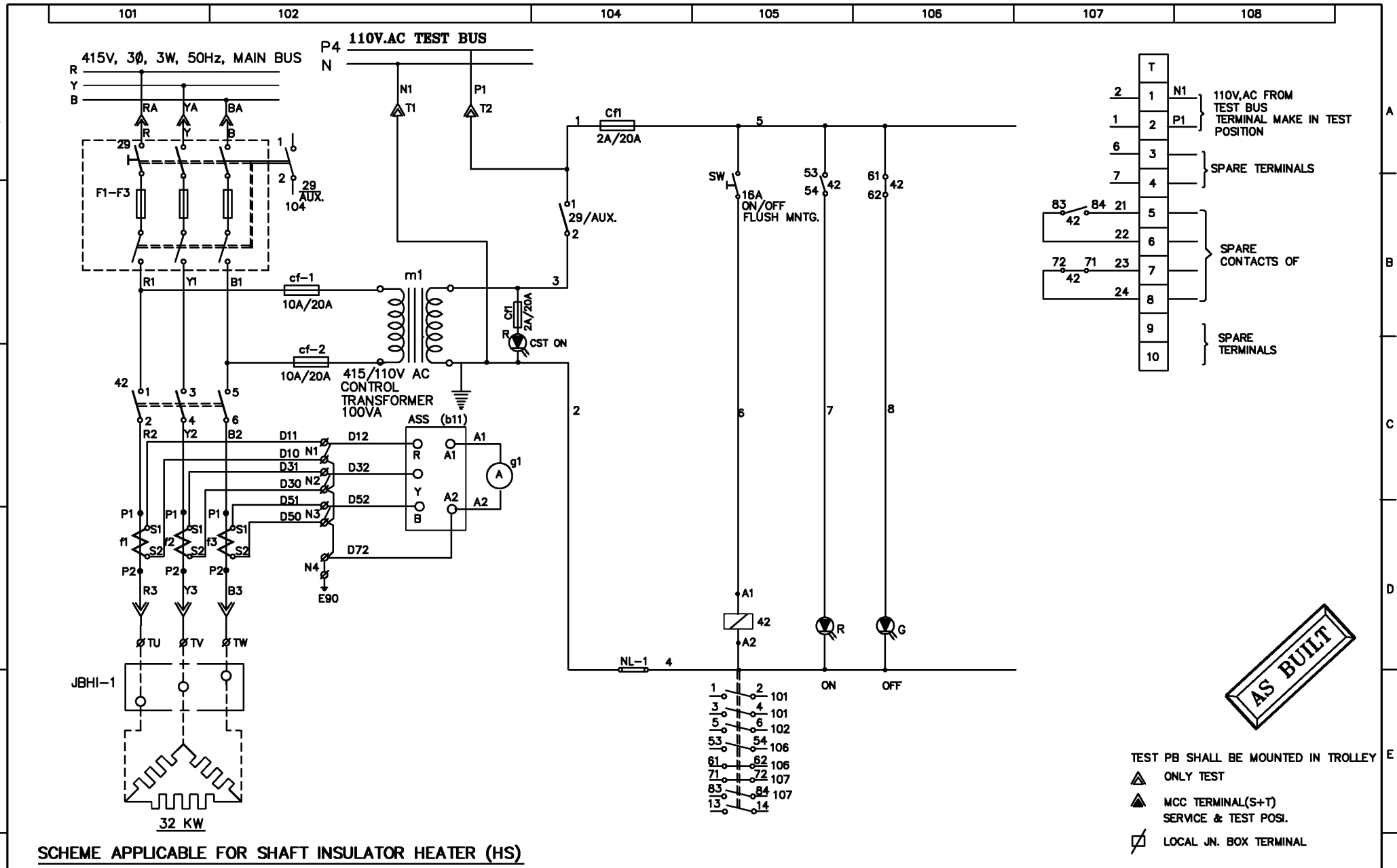
**AS BUILT**

- TEST PB SHALL BE MOUNTED IN TROLLEY
- ▲ ONLY TEST
  - ▲ MCC TERMINAL SERVICE & TEST POSI.
  - ⊠ LOCAL J.N. BOX TERMINAL

**SCHEME APPLICABLE FOR SUPPORT INSLATOR HEATER (HI)**

<b>REV.</b>	I- REVISED AS PER COMMENTS RECD. VIDE BHEL LTR. DT. ON 14.06.08	II- REVISED AS PER BHEL E-MAIL DTD. 13.07.08	IV-
<b>Date</b>	<b>Name</b>	 <p><b>CONTROLS &amp; SWITCHGEAR COMPANY LTD.</b> C-59 NOIDA PHASE-II, NOIDA-201305 DISTT. GAUTAM BUDH NAGAR (U.P.) FORMAT No. : QAF-04/04</p>	<b>Client -</b> BHEL-RANIPET
<b>Drawn</b>	<b>12.05.08</b>		<b>Work -</b> SCHEMATIC/WIRING DIAGRAM
<b>Checked</b>			<b>Details -</b> AUXILIARY CONTROL PANEL
<b>Approved</b>			<b>BHEL P.O. NO. -</b> 4281057 DT. 11/04/08
		<b>DRG. NO.</b>	<b>REV.</b>
		<b>BHEL/J2435/506</b>	<b>2</b>
		<b>ITEM</b>	<b>SHEET NO.</b>
			<b>01</b>
		<b>NO. OF SHEET</b>	<b>01</b>

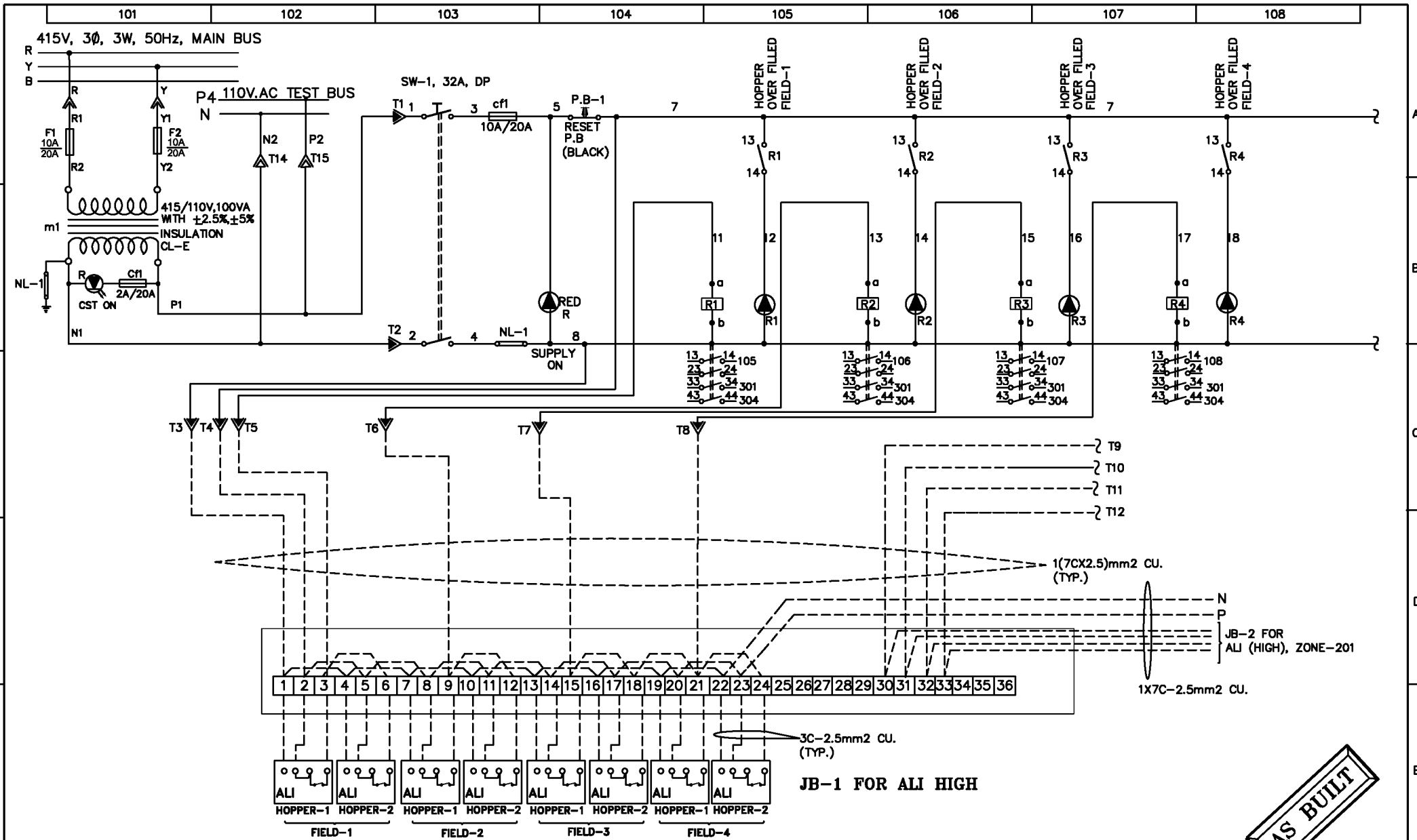
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**SCHEME APPLICABLE FOR SHAFT INSULATOR HEATER (HS)**


REV.	I- REVISED AS PER COMMENTS RECD. VIDE BHEL LTR. DT. ON 14.06.08	II- REVISED AS PER BHEL E-MAIL DTD. 13.07.08	III-	IV-
Date	12.05.08	Name	PRADDEEP	PROJECT:-
Drawn	12.05.08	Name	PRADDEEP	GUJARAT INDUSTRIES POWER CO. LTD. SLPP-II (UNIT 3&4), 2X125 MW
Checked		CONSULTANT:- TATA CONSULTING ENGINEERING (BANGALORE)		
Approved				
Client - BHEL-RANIPET		DRG. NO. BHEL/J2435/507		REV. 2
Work - SCHEMATIC/WIRING DIAGRAM		SHEET NO. 01		NO. OF SHEET 01
Details- AUXILIARY CONTROL PANEL		NO. OF SHEET 01		
BHEL P.O. NO.- 4281057 DT. 11/04/08				

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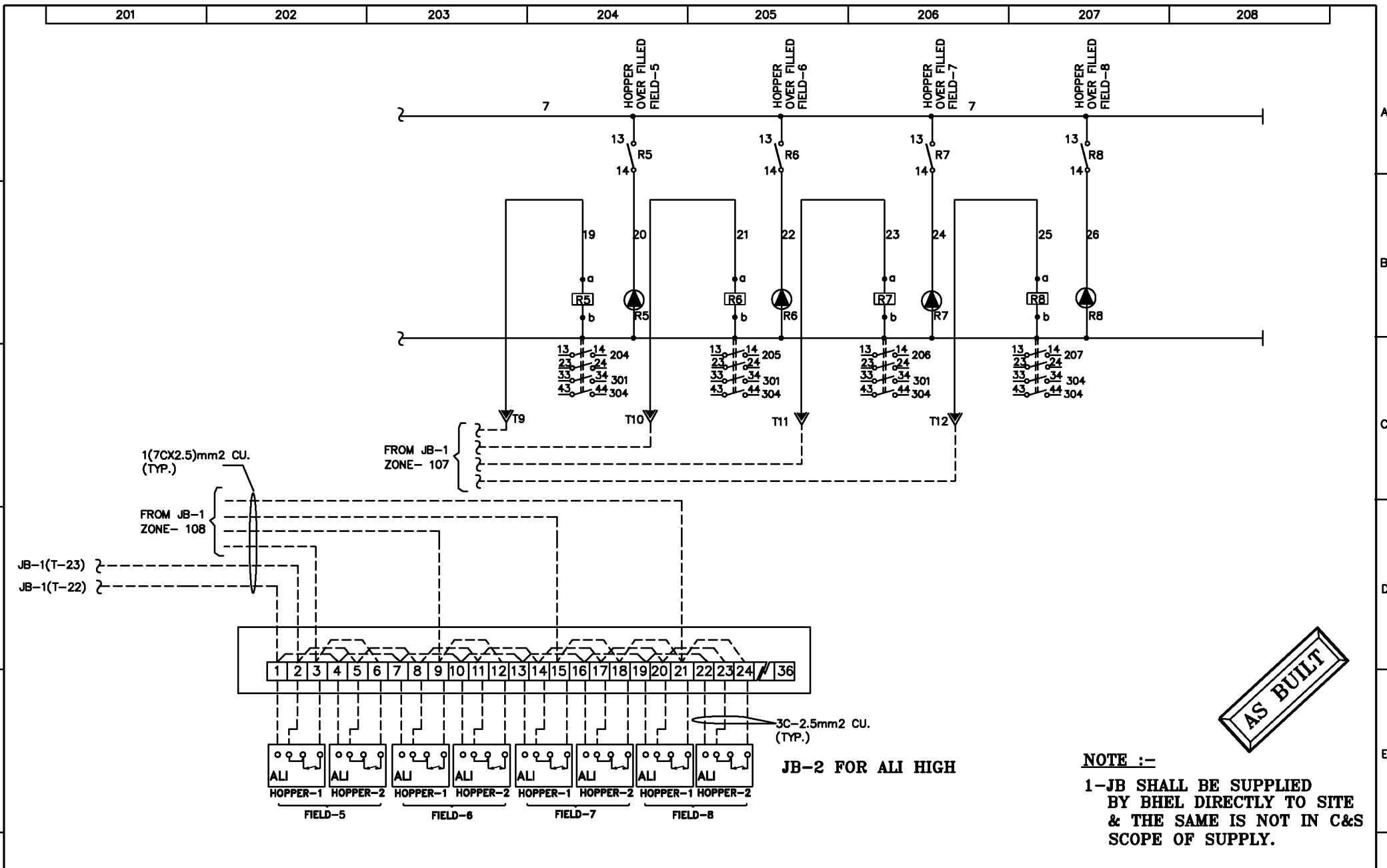


**AS BUILT**

**SCHEME APPLICABLE FOR ASH LEVEL INDICATOR CIRCUIT (HIGH LEVEL)**

REV.	I- REVISED AS PER COMMENTS RECD. VIDE BHEL LTR. DT. ON 14.06.08	II- REVISED AS PER BHEL E-MAIL DTD. 13.07.08	IV-
Drawn	Date: 13.05.08 Name: PRADEEP	 <p><b>CONTROLS &amp; SWITCHGEAR COMPANY LTD.</b> C-59 NOIDA PHASE-II, NOIDA-201305 DISTT. GAUTAM BUDDH NAGAR (U.P.) FORMAT No. : QAF-04/04</p>	CLIENT: BHEL-RANIPET
Checked			Work: AUXILIARY CONTROL PANEL
Approved			Details: SCHEMATIC / WIRING DIAGRAM
			DRG. NO. BHEL/J2435/508
			REV. 2
			SCALE: NTS
			SHEET NO. 01
			NO. OF SHEET 03

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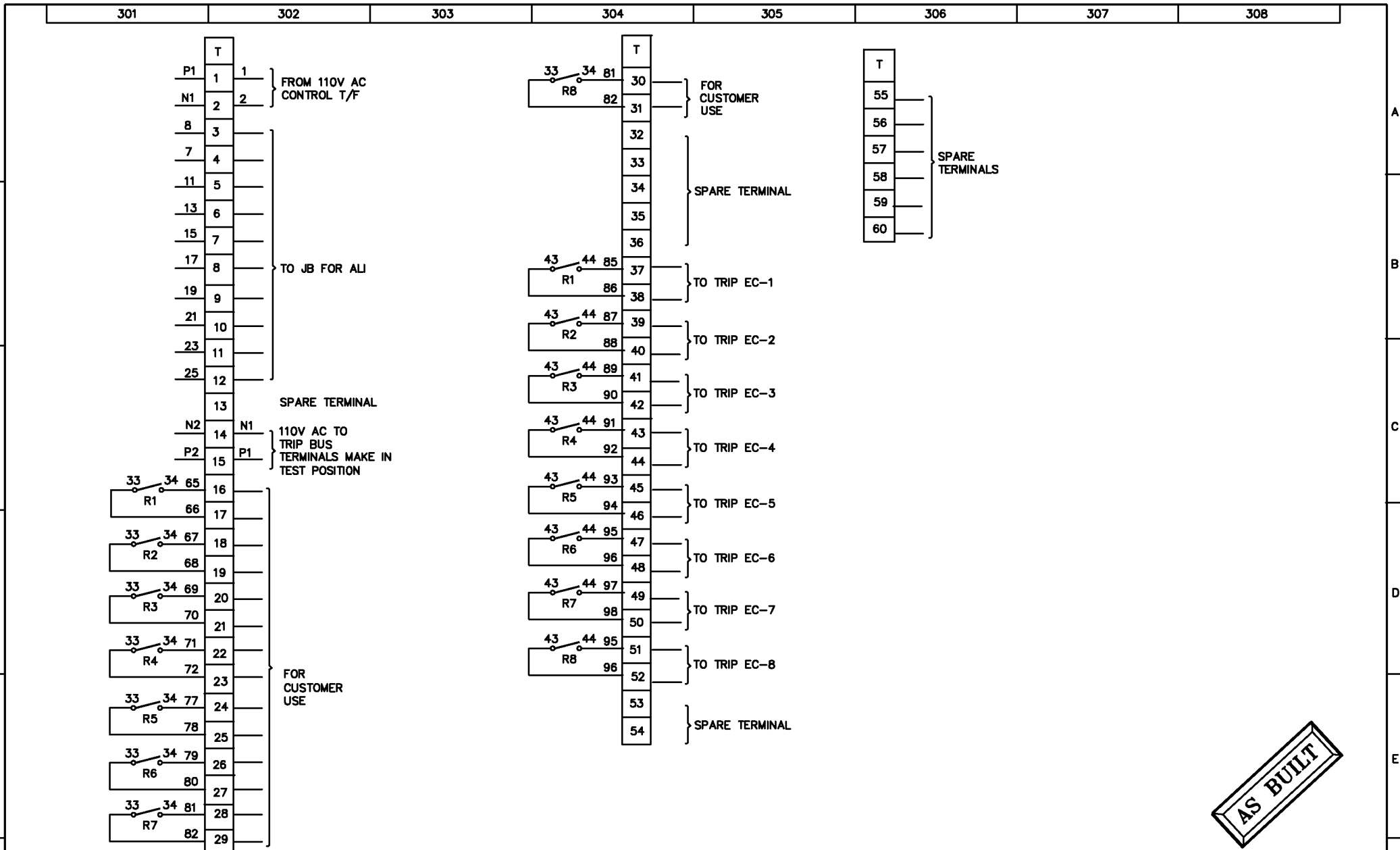


**AS BUILT**

**NOTE :-**  
 1-JB SHALL BE SUPPLIED BY BHEL DIRECTLY TO SITE & THE SAME IS NOT IN C&S SCOPE OF SUPPLY.

REV.	I- REVISED AS PER COMMENTS RECD. VIDE BHEL LTR. DT. ON 14.06.08	II- REVISED AS PER BHEL E-MAIL DTD. 13.07.08	III-	IV-				
F	Date	Name	<b>PROJECT:-</b> GUJARAT INDUSTRIES POWER CO. LTD. SLPP-II (UNIT 3&4), 2X125 MW  <b>CONSULTANT:-</b> TATA CONSULTING ENGINEERING (BANGALORE)	<b>CONTROLS &amp; SWITCHGEAR COMPANY LTD.</b> C-59 NOIDA PHASE-II, NOIDA-201305 DIST. GAUTAM BUDH NAGAR (U.P.) FORMAT No. : QAF-04/04	CLIENT: BHEL-RANIPET	DRG. NO. BHEL/J2435/508	REV. 2	
	Drawn	13.05.08			PRADEEP			Work: AUXILIARY CONTROL PANEL
	Checked					Details: SCHEMATIC / WIRING DIAGRAM	SCALE: NTS	SHEET NO. 02
	Approved					Order No.: 4281057 DT. 11/04/08	NO. OF SHEET 03	

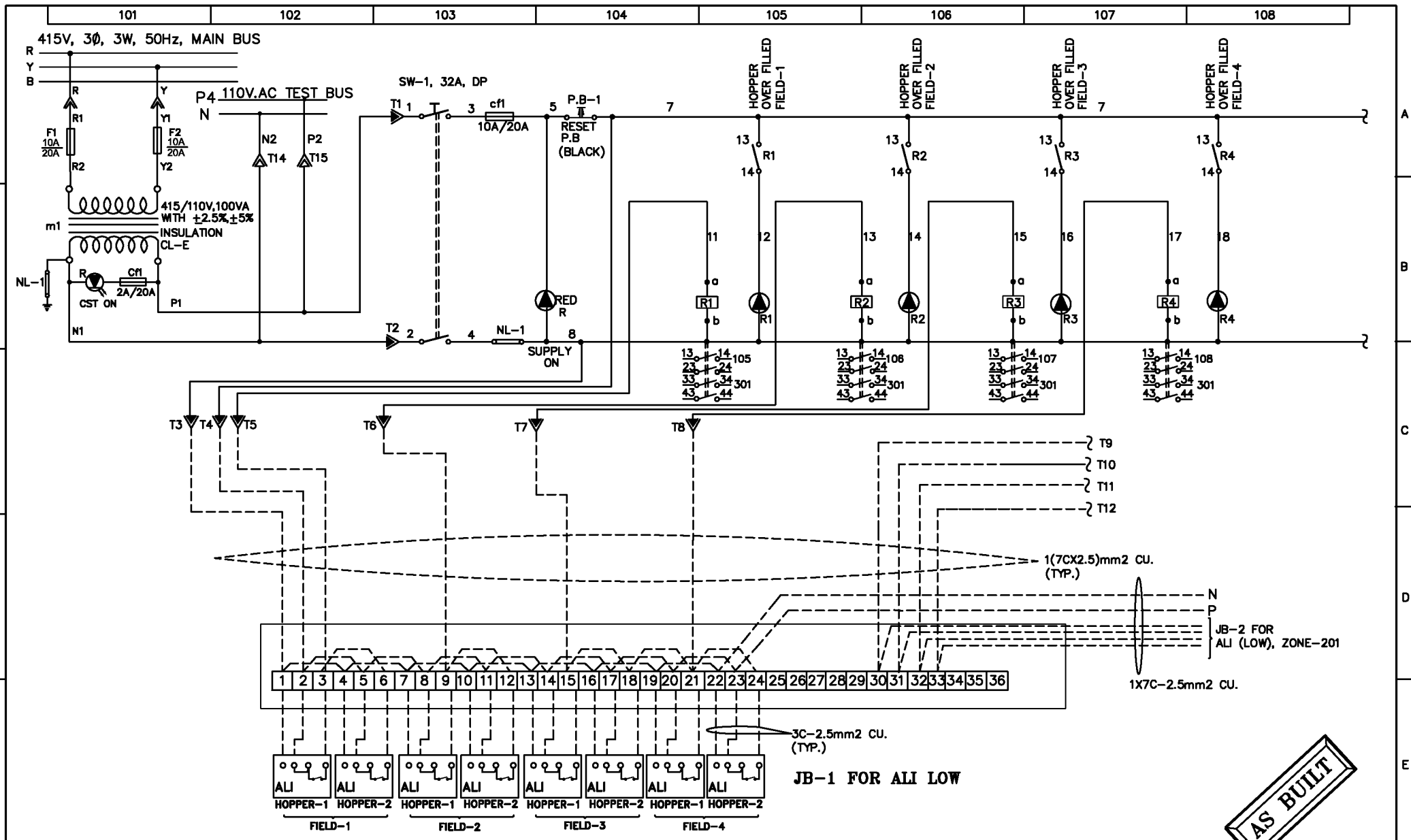
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**AS BUILT**

REV.	I- REVISED AS PER COMMENTS RECD. VIDE BHEL LTR. DT. ON 14.06.08	II- REVISED AS PER BHEL E-MAIL DTD. 13.07.08	III-	IV-			
F	Date	Name	<b>PROJECT:-</b> GUJARAT INDUSTRIES POWER CO. LTD. SLPP-II (UNIT 3&4), 2X125 MW <b>CONSULTANT:-</b> TATA CONSULTING ENGINEERING (BANGALORE)	<b>CONTROLS &amp; SWITCHGEAR COMPANY LTD.</b> C-59 NOIDA PHASE-II, NOIDA-201305 DIST. GAUTAM BUDDH NAGAR (U.P.) FORMAT No. : QAF-04/04	CLIENT: <b>BHEL-RANIPET</b>	DRG. NO. <b>BHEL/J2435/508</b>	REV. <b>2</b>
	Drawn	13.05.08			PRADEEP		
	Checked						Details: <b>SCHEMATIC / WIRING DIAGRAM</b>
Approved					Order No.: <b>4281057 DT. 11/04/08</b>		

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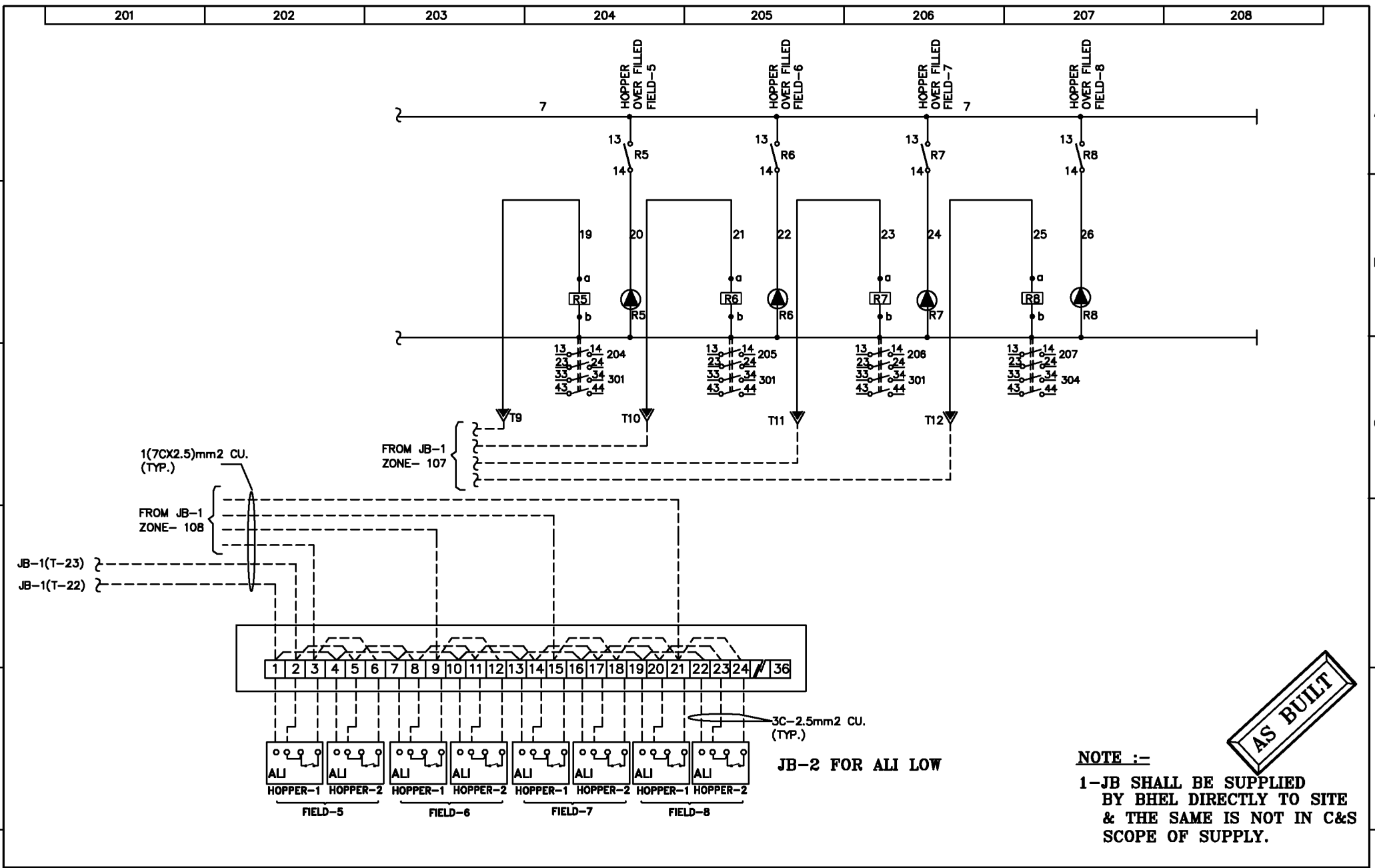


**SCHEME APPLICABLE FOR ASH LEVEL INDICATOR CIRCUIT (LOW LEVEL)**

**AS BUILT**

REV.	I- REVISED AS PER COMMENTS RECD. VIDE BHEL LTR. DT. ON 14.06.08	II- REVISED AS PER BHEL E-MAIL DTD. 13.07.08	III-	IV-		
Drawn	Date: 13.05.08 Name: PRADEEP	<b>PROJECT:-</b> GUJARAT INDUSTRIES POWER CO. LTD. SLPP-II (UNIT 3&4), 2X125 MW <b>CONSULTANT:-</b> TATA CONSULTING ENGINEERING (BANGALORE)	 <b>CONTROLS &amp; SWITCHGEAR COMPANY LTD.</b> C-59 NOIDA PHASE-II, NOIDA-201305 DISTT. GAUTAM BUDDH NAGAR (U.P.) FORMAT No. : QAF-04/04	CLIENT: BHEL-RANIPET	DRG. NO.	REV.
Checked				Work: AUXILIARY CONTROL PANEL	BHEL/J2435/509	2
Approved				Details: SCHEMATIC / WIRING DIAGRAM	Order No.: 4281057 DT. 11/04/08	SCALE: NTS

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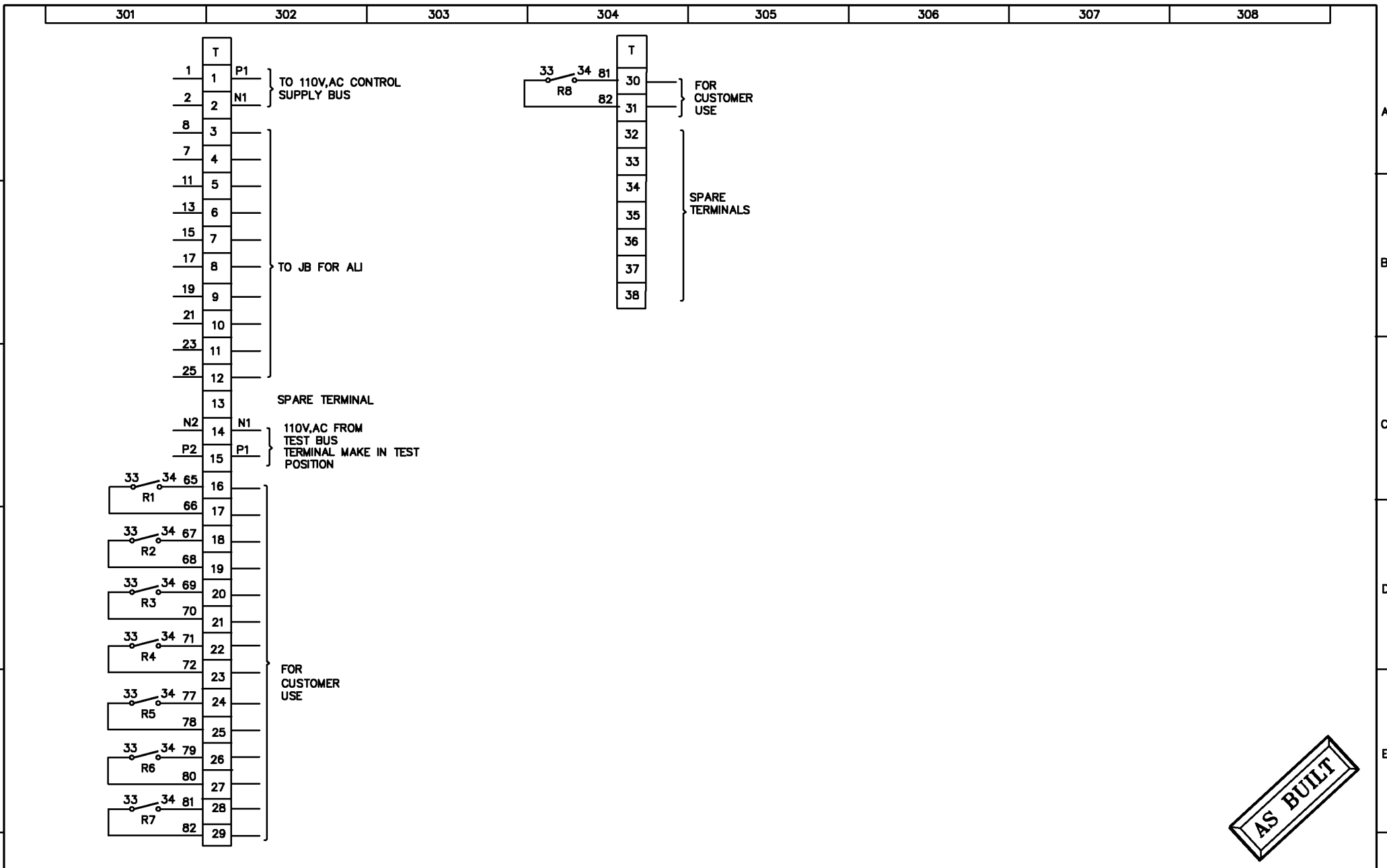


**AS BUILT**


**NOTE :-**  
 1-JB SHALL BE SUPPLIED BY BHEL DIRECTLY TO SITE & THE SAME IS NOT IN C&S SCOPE OF SUPPLY.

REV.	I- REVISED AS PER COMMENTS RECD. VIDE BHEL LTR. DT. ON 14.06.08	II- REVISED AS PER BHEL E-MAIL DTD. 13.07.08	IV-
Date	Name	<b>PROJECT:-</b> GUJARAT INDUSTRIES POWER CO. LTD. SLPP-II (UNIT 3&4), 2X125 MW	
Drawn	13.05.08	PRADEEP	<b>CONSULTANT:-</b> TATA CONSULTING ENGINEERING (BANGALORE)
Checked			
Approved			
		<b>CONTROLS &amp; SWITCHGEAR COMPANY LTD.</b> C-59 NODA PHASE-II, NODA-201305 DISTT. GAUTAM BUDH NAGAR (U.P.) FORMAT No. : QAF-04/04	
		CLIENT: BHEL-RANIPET	DRG. NO.
		Work: AUXILIARY CONTROL PANEL	BHEL/J2435/509
		Details: SCHEMATIC / WIRING DIAGRAM	REV. 2
		Order No.: 4281057 DT. 11/04/08	SCALE: NTS
			SHEET NO. 02
			NO. OF SHEET 03

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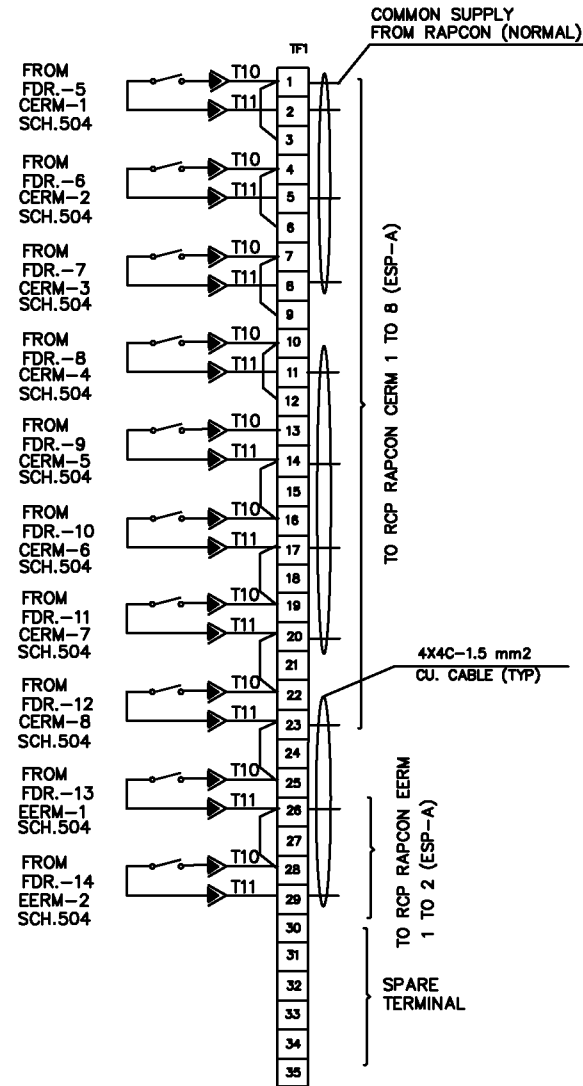
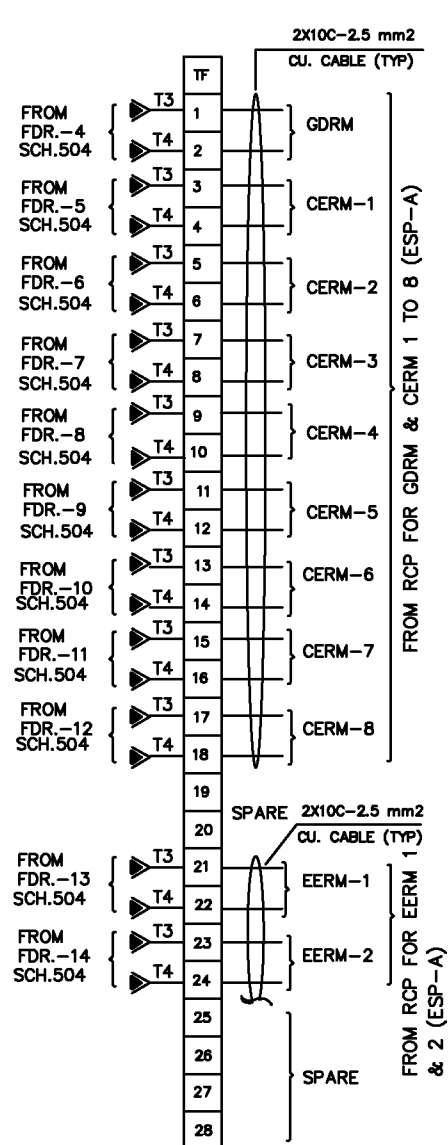
**AS BUILT**

REV.	I- REVISED AS PER COMMENTS RECD. VIDE BHEL LTR. DT. ON 14.06.08	II- REVISED AS PER BHEL E-MAIL DTD. 13.07.08	III-	IV-			
F	Date	Name	 <p><b>PROJECT:-</b> GUJARAT INDUSTRIES POWER CO. LTD. SLPP-II (UNIT 3&amp;4), 2X125 MW</p> <p><b>CONSULTANT:-</b> TATA CONSULTING ENGINEERING (BANGALORE)</p> <p><b>CONTROLS &amp; SWITCHGEAR COMPANY LTD.</b> C-59 NODA PHASE-II, NODA-201305 DISTT. GAUTAM BUDH NAGAR(U.P) FORMAT No. : QAF-04/04</p>	CLIENT: BHEL-RANIPET	DRG. NO.	REV.	
	Drawn	13.05.08		PRADEEP	Work: AUXILIARY CONTROL PANEL	BHEL/J2435/509	2
	Checked				Details: SCHEMATIC / WIRING DIAGRAM	SCALE:	SHEET NO.
	Approved				Order No.: 4281057 DT. 11/04/08	NTS	NO. OF SHEET
						03	
						03	




## RAPPING MOTOR 'ON' COMMAND FROM RCP

## RAPPING MOTOR 'ON' FEED BACK TO RCP



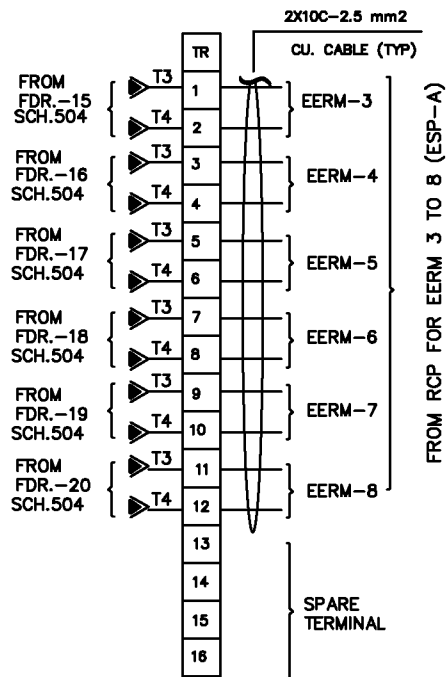
MARSHALING COMPARTMENT FOR FRONT MODULE

AS BUILT

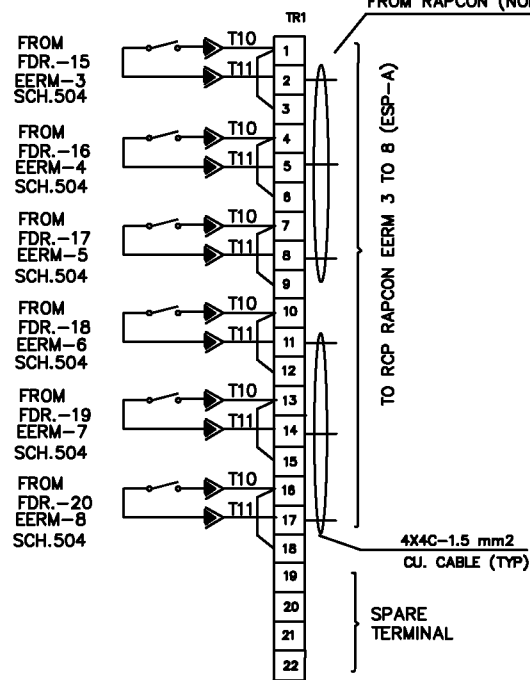
REV.	I- REVISED AS PER COMMENTS RECD. VIDE BHEL LTR. DT. ON 14.06.08		II- REVISED AS PER BHEL E-MAIL DTD. 13.07.08		III-		IV-			
Drawn	Date	Name	PROJECT:- GUJARAT INDUSTRIES POWER CO. LTD. SLPP-II (UNIT 3&4), 2X125 MW		CLIENT: BHEL-RANIPET		DRG. NO.		REV.	
Checked			CONSULTANT:- TATA CONSULTING ENGINEERING (BANGALORE)		Work: AUXILIARY CONTROL PANEL		BHEL/J2435/510		2	
Approved			 CONTROLS & SWITCHGEAR COMPANY LTD. C-59 NOIDA PHASE-IL,NOIDA-201305 DISTT. GAUTAM BUDH NAGAR(U.P) FORMAT No. : QAF-04/04		Details: SCHEMATIC / WIRING DIAGRAM		SCALE: NTS		SHEET NO. NO. OF SHEET	01 04
					Order No.: 4281057 DT. 11/04/08					

**RAPPING MOTOR 'ON' COMMAND FROM RCP**

**RAPPING MOTOR 'ON' FEED BACK TO RCP**



FROM RCP FOR EERM 3 TO 8 (ESP-A)




COMMON SUPPLY FROM RAPCON (NORMAL)

TO RCP RAPCON EERM 3 TO 8 (ESP-A)

**AS BUILT**

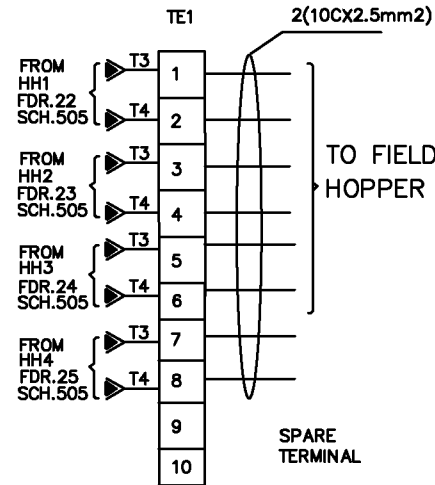
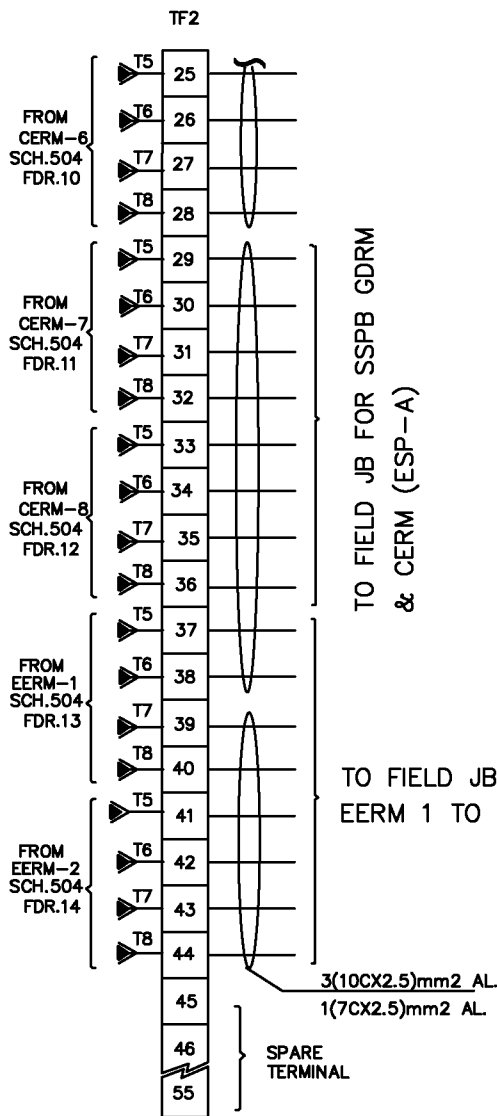
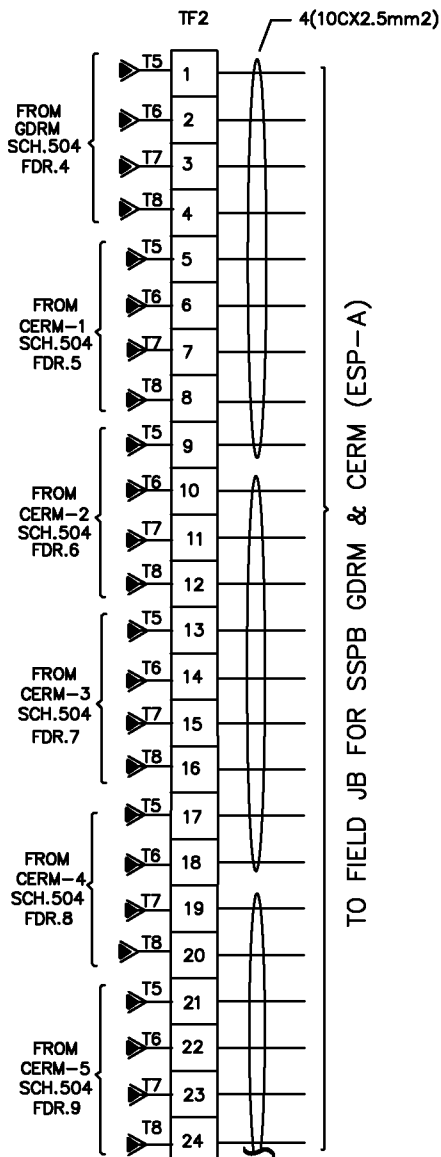
**MARSHALING COMPARTMENT FOR REAR MODULE**

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REV.	I- REVISED AS PER COMMENTS RECD. VIDE BHEL LTR. DT. ON 14.06.08	II- REVISED AS PER BHEL E-MAIL DTD. 13.07.08	III-	IV-
Drawn	Date: 13.05.08 Name: PRADEEP	<b>PROJECT:-</b> GUJARAT INDUSTRIES POWER CO. LTD. SLPP-II (UNIT 3&4), 2X125 MW		CLIENT: BHEL-RANIPET Work: AUXILIARY CONTROL PANEL Details: SCHEMATIC / WIRING DIAGRAM Order No.: 4281057 DT. 11/04/08
Checked		<b>CONSULTANT:-</b> TATA CONSULTING ENGINEERING (BANGALORE)		DRG. NO. BHEL/J2435/510
Approved		 CONTROLS & SWITCHGEAR COMPANY LTD. C-59 NOIDA PHASE-II, NOIDA-201305 DISTT. GAUTAM BUDH NAGAR (U.P.) FORMAT No. : QAF-04/04		REV. 2 SCALE: NTS SHEET NO. 02 NO. OF SHEET 04

TO FIELD JB FOR SSPB START/STOP COMMAND

TO FIELD JB FOR HH THEROSTT

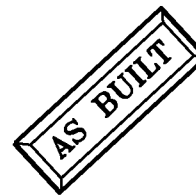


TO FIELD JB FOR SSPB GDRM & CERM (ESP-A)

TO FIELD JB FOR SSPB GDRM & CERM (ESP-A)

TO FIELD JB FOR SSPB EERM 1 TO 2 (ESP-A)

TO FIELD JB FOR HOPPER THERMOSTAT



MARSHALING COMPARTMENT FOR FRONT MODULE

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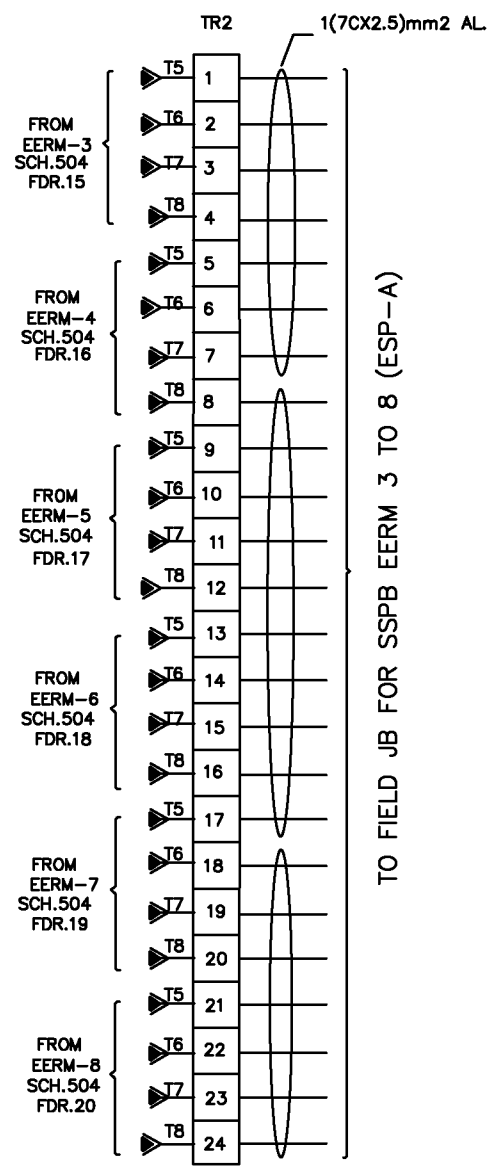
REV.	I- REVISED AS PER COMMENTS RECD. VIDE BHEL LTR. DT. ON 14.06.08	II- REVISED AS PER BHEL E-MAIL DTD. 13.07.08	III-	IV-		
F	Date	Name	PROJECT:- GUJARAT INDUSTRIES POWER CO. LTD. SLPP-II (UNIT 3&4), 2X125 MW	CLIENT: BHEL-RANIPET	DRG. NO.	REV.
	Drawn	13.05.08	PRADEEP	Work: AUXILIARY CONTROL PANEL	BHEL/J2435/510	2
	Checked			Details: SCHEMATIC / WIRING DIAGRAM	SCALE: NTS	SHEET NO. 03
	Approved			Order No.: 4281057 DT. 11/04/08	NO. OF SHEET	04
			CONSULTANT:- TATA CONSULTING ENGINEERING (BANGALORE)	FORMAT No. : QAF-04/04		



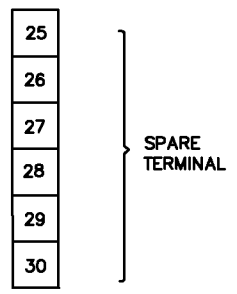
CONTROLS & SWITCHGEAR COMPANY LTD.  
C-59 NOIDA PHASE-II, NOIDA-201305  
DIST. GAUTAM BUDH NAGAR(U.P)  
FORMAT No. : QAF-04/04

**TO FIELD JB FOR SSPB START/STOP COMMAND**

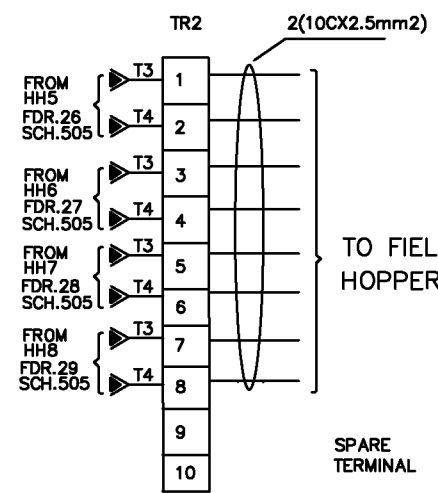
**TO FIELD JB FOR HH THEROSTST**



TO FIELD JB FOR SSPB EERM 3 TO 8 (ESP-A)



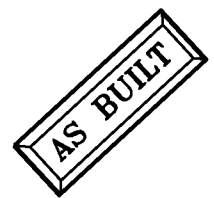
SPARE TERMINAL



TO FIELD JB FOR HOPPER THERMOSTAT

SPARE TERMINAL

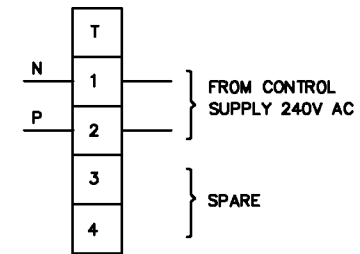
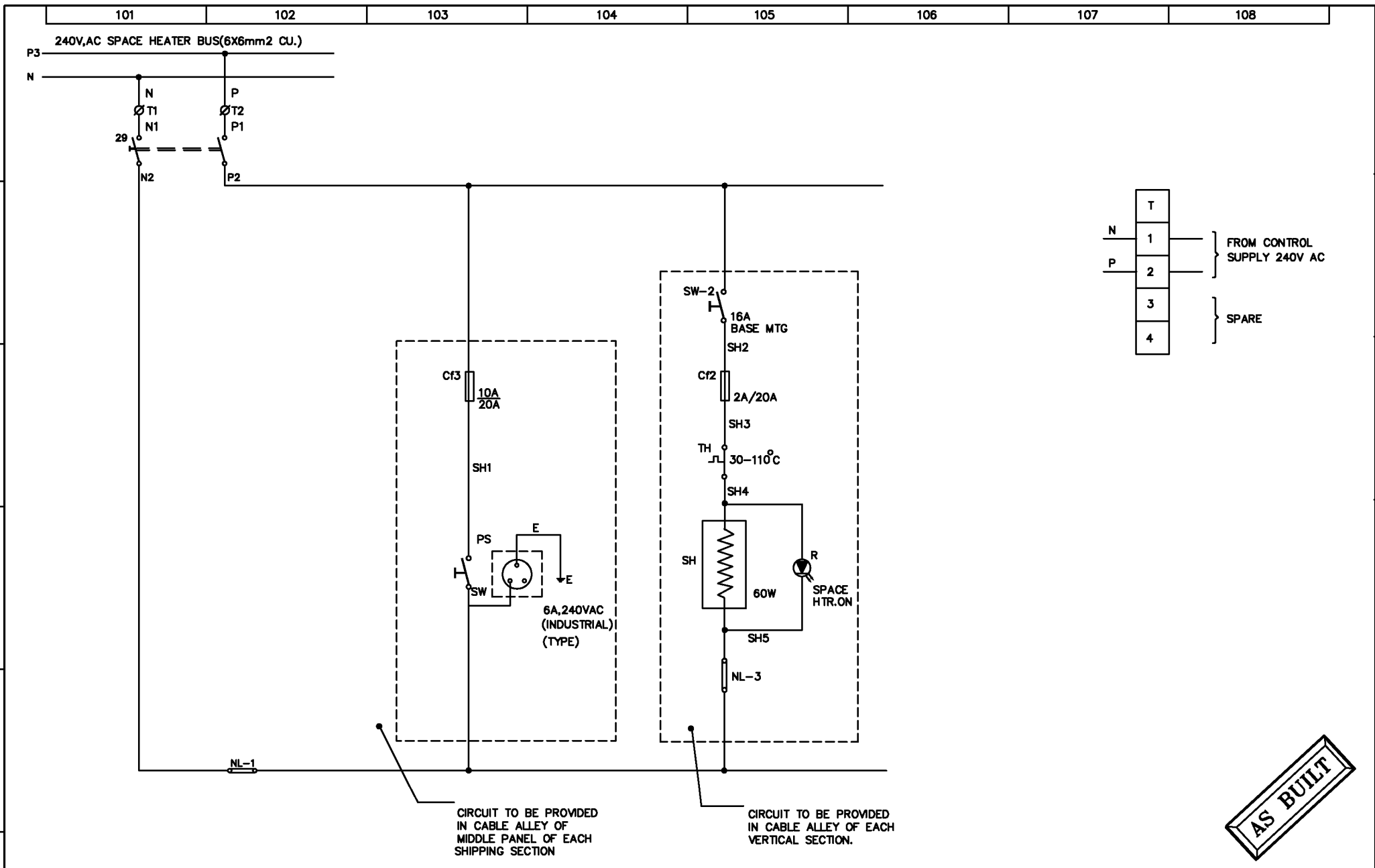
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**MARSHALING COMPARTMENT FOR REAR MODULE**

REV.	I- REVISED AS PER COMMENTS RECD. VIDE BHEL LTR. DT. ON 14.06.08	II- REVISED AS PER BHEL E-MAIL DTD. 13.07.08	III-	IV-						
F	Date	Name	<b>PROJECT:-</b> GUJARAT INDUSTRIES POWER CO. LTD. SLPP-II (UNIT 3&4), 2X125 MW  <b>CONSULTANT:-</b> TATA CONSULTING ENGINEERING (BANGALORE)		CLIENT:	BHEL-RANIPET	DRG. NO.	REV.		
	Drawn	13.05.08			PRADEEP	Work:			AUXILIARY CONTROL PANEL	BHEL/J2435/510
	Checked					Details:	SCHEMATIC / WIRING DIAGRAM	SCALE:	SHEET NO.	04
	Approved					Order No.:	4281057 DT. 11/04/08	NTS	NO. OF SHEET	04

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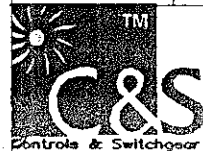
**AS BUILT**

REV.	I- REVISED AS PER COMMENTS RECD. VIDE BHEL LTR. DT. ON 14.06.06	II- REVISED AS PER BHEL E-MAIL DTD. 13.07.08	IV-
Drawn	Date: 12.05.08 Name: PRADEEP	 <b>CONTROLS &amp; SWITCHGEAR COMPANY LTD.</b> C-59 NOIDA PHASE-II, NOIDA-201305 DIST. GAUTAM BUDH NAGAR (U.P.) FORMAT No. : QAF-04/04	Client - BHEL-RANIPET
Checked			Work - AUXILIARY CONTROL PANEL
Approved			Details- SCHEMATIC/WIRING DIAGRAM
	PROJECT:- GUJARAT INDUSTRIES POWER CO. LTD. SLPP-II (UNIT 3&4), 2X125 MW		DRG. NO. <b>BHEL/J2435/511</b>
	CONSULTANT:- TATA CONSULTING ENGINEERING (BANGALORE)		REV. <b>2</b>
			ITEM SHEET NO. NO. OF SHEET
			01 01

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM

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OWNER:	<b>GUJRAT INDIUSTRIES POWER CO. LTD.</b> SLPP-II (UNIT 3&4),2X125MW
OWNER'S CONSULTANT:	 <b>TCE CONSULTING ENGINEERS LIMITED</b> BANGALORE
	 <b>BHARAT HEAVY ELECTRICALS LTD.</b> BOILER AUXILIARIES PLANT RANIPET-632 406
	 <b>CONTROLS &amp; SWITCHGEAR COMPANY LTD.</b>
TITLE:-	<b>GENERAL NOTES FOR LTMSB</b>

REV.	I-	II-	III-	IV-
Drawn	Date 03.05.08	Name SHAHID	PROJECT:- GIPCL-SLPP-II (UNIT 3&4),2X125MW	Client:- BHEL-RANIPET
Checked			CONSULTANT:- PATA CONSULTING ENGINEERING	Work:- LTMSB
Approved				Details:- GENERAL NOTES & LEGENDS
				Order No.:- 4281049 DT. 09.04.08
				DRG. NO. BHEL/J2434/001
				REV. 0
				SCALE: NTS
				SHEET NO. NO. OF SHEET
				01 04



**GENERAL NOTES FOR LTMSB**

1. ALL DIMENSIONS ARE IN mm UNLESS SPECIFIED OTHERWISE.
2. PANELS SHALL BE FABRICATED OUT OF SHEET STEEL HAVING THICKNESS AS FOLLOWS:-
  - A) SHEET SECTION OF LOAD : 2.0 mm C.R.C.A. BEARING MEMBER/FRAME
  - B) DOORS & COVERS : 2.0 mm C.R.C.A.
  - C) GLAND PLATE (FOR SINGLE CORE CABLES) : 4.0 mm AL
  - D) GLAND PLATE (FOR MULTI-CORE CABLES) : 3.0 mm HR.
3. LTMSB SHALL BE INDOOR, DOUBLE FRONT, FLOOR MOUNTING DRAWOUT TYPE COMPARTMENTALISED ~~(EXCEPT SPACE HEATER CIRCUIT, CST & D.C CONTROL CIRCUIT WHICH SHALL BE FIXED TYPE.)~~ X
4. DEGREE OF PROTECTION SHALL BE AS UNDER:
  - i) FOR COMPARTMENTS & BUSBAR CHAMBERS UPTO 1600A:IP52 AS PER IS 13947.
  - ii) FOR COMPARTMENTS & BUSBAR CHAMBERS ABOVE 1600A:IP42 AS PER IS 13947.
5. INTEGRAL BASE FRAME OF ISMC-75 SHALL BE PROVIDED.
6. MINIMUM CLEARANCE IN AIR BETWEEN PHASES, PHASE TO EARTH FOR THE ENTIRE RUN OF HORIZONTAL & VERTICAL BUS BARS SHALL BE 25 mm. FOR ALL OTHER COMPONENTS, THE CLEARANCE BETWEEN TWO LIVE PARTS AND LIVE & EARTH PART SHALL BE AT LEAST 10 mm THROUGH OUT. WHEREVER IT IS NOT POSSIBLE TO MAINTAIN THESE CLEARANCES, INSULATION SHALL BE PROVIDED BY SLEEVE / BARRIER. HOWEVER FOR HORIZONTAL AND VERTICAL MAIN BUS BARS MINIMUM 25 mm CLEARANCE SHALL BE MAINTAINED EVEN WHEN BUS BARS ARE SLEEVED OR INSULATED.
7. LIVE CONNECTIONS FROM BUSBAR UP TO SWITCHES SHALL BE SHROUDED IN ORDER TO AVOID ACCIDENTAL TOUCH
8. BUS BARS INCLUDING I/C & O/G STUBS SHALL BE PROVIDED WITH HEAT SHRINKABLE PVC SLEEVE OF BLACK COLOUR WITH COLOUR CODING AT SUITABLE INTERVALS.(R,Y,B FOR PHASES; GREEN FOR EARTH BUS). ACCESSIBLE BUSBAR JOINTS SHALL BE PROVIDED WITH REMOVABLE SHROUDS.
9. ALL CABLE ENTRIES SHALL BE FROM BOTTOM.
10. PANELS SHALL BE PAINTED WITH POWDER COATING AS FOLLOWS USING POWDER PAINT (EPOXY BASED) AND MIN THICKNESS OF PAINT SHALL BE 50 MICRONS.
  - a) EXTERIOR & INTERIOR : 631 AS PER IS 5
  - b) MOUNTING PLATES & TROLLIES : ELECTROPLATED ZINC YELLOW PASSIVATED.
11. EARTH BUS OF 50X10 mm<sup>2</sup> GI SHALL BE PROVIDED THROUGH OUT THE LENGTH OF PANELS. THE HORIZONTAL EARTH BUS SHALL PROJECT OUT OF THE PANEL AT BOTH ENDS AND SHALL HAVE AT LEAST TWO HOLES FOR CUSTOMER'S EARTH CONNECTIONS. DOOR EARTHING SHALL BE DONE USING 2.5mm<sup>2</sup> PVC STRANDED COPPER WIRE.
12. THE MINIMUM & MAXIMUM OPERATING HEIGHT OF SWITCH HANDLE & PUSH BUTTONS SHALL BE 200mm. & 2000MM RESPECTIVELY FROM FLOOR LEVEL.
13. NAME PLATE SHALL BE OF 3PLY LAMICOID/1.5mm THICK ANODISED AL. HAVING WHITE LETTER ENGRAVED ON BLACK BACKGROUND. LETTER SIZE SHALL BE 4mm MINIMUM.
14. CONTROL WIRING SHALL BE DONE USING 1100V GRADE PVC STRANDED COPPER WIRE SIZE OF WIRE SHALL BE AS FOLLOWS:-
  - A) C.T. & PT CIRCUITS : 2.5 mm<sup>2</sup> STRANDED COPPER - R, Y, B&BLACK
  - B) AC CONTROL CKT. : 2.5 mm<sup>2</sup> STRANDED COPPER - BLACK.
  - C) DC CONTROL CKT. : 2.5 mm<sup>2</sup> STRANDED COPPER - GREY
  - D) SPACE HEATER CKT. : 2.5 mm<sup>2</sup> STRANDED COPPER - BLACK.
  - E) EARTH WIRES : 4.0 mm<sup>2</sup> STRANDED COPPER - GREEN
15. PANEL SPACE HEATER SHALL BE PROVIDED IN CABLE ALLEY OF EACH VERTICAL PANEL BOTH FRONT & REAR OF DOUBLE FRONT LTMSB.
16. MINIMUM WIRE SIZE FOR POWER WIRING SHALL BE 4mm<sup>2</sup> CU.
17. CONTROL TERMINALS SHALL BE SELF ALIGNING TYPE FOR DRAWOUT TYPE MODULES & CAGE CLAMP FIXED TYPE FOR NON DRAWOUT MODULES.
18. ALL POWER SWITCHES SHALL BE DOOR INTERLOCKED AND SHALL HAVE PAD LOCKING FACILITY IN OFF POSITION. DOOR DEFEAT INTERLOCKING FACILITY SHALL BE PROVIDED.
19. REMOVABLE DRILLED GLAND PLATE SHALL BE PROVIDED. DOUBLE COMPRESSION HEAVY DUTY NICKLE CROMIUM PLATED BRASS CABLE GLANDS SHALL BE FITTED.
20. ANNEALED TINNED COPPER (ATC) LUGS FOR POWER CABLE SHALL BE FITTED IN LTMSB.
21. CAUTION NAME PLATE "LIVE TERMINALS" SHALL BE PROVIDED AT ALL POINTS WHERE THE TERMINALS ARE LIKELY TO REMAIN LIVE & ISOLATION IS POSSIBLE ONLY AT REMOTE END. SUITABLE CAUTION NAME PLATE SHALL BE AFFIXED BOTH AT THE FRONT AND REAR OF EACH VERTICAL PANEL.
22. SYSTEM PARTICULARS
  - a) SYSTEM VOLTAGE (AC) : 415V±10%, 50Hz±5% AC, 3 PH, 3W
  - b) AUX. SUPPLY VOLTAGE
    - i) DC CONTROL SUPPLY : 220V, DC, FOR ACB CIRCUIT & RELAYS (CUSTOMER SCOPE) *epc control*
    - ii) SPACE HEATER : 240V, AC, SUPPLY FROM SP. HTR. TRANSFORMER
    - c) AMBIENT TEMP. : 50 DEG. C.
    - d) FAULT LEVELS: : 50KA FOR 1 SEC.

*only Bsebar Panels above 1600A are 2P-42 all other panels shall be 2P-52.*

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REV.	I-	II-	III-	IV-
Drawn	Date: 03.05.08	Name: SHAHID	<b>PROJECT:-</b> GIPCL-SLPP-II (UNIT 3&4), 2X125MW <b>CONSULTANT:-</b> TATA CONSULTING ENGINEERING	
Checked			CONTROLS & SWITCHGEAR COMPANY LTD. C-59 NOKIA PHASE-II, NOKIA-201305 DISTT. GAUTAM BUDDH NAGAR (U.P.) FORMAT No. : QAF-04/04	
Approved			Client:- <b>BHEL-RANIPET</b> Work:- <b>LTMSB</b> Details:- <b>GENERAL NOTES &amp; LEGENDS</b> Order No.:- <b>4281049 DT. 09.04.08</b>	DRG. NO. <b>BHEL/J2434/001</b> SCALE: NTS
				REV. <b>0</b> SHEET NO. <b>02</b> NO. OF SHEET <b>04</b>

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22. INDICATION LAMP SHALL BE LED TYPE.
23. ALL CT'S SHALL BE CAST RESIN TYPE & METERS SHALL BE 96X96 mm2 HAVING 240° DIFFLECTION, ACC. CLASS FOR METER SHALL BE MIN. 1.0 .

**24. MAKE OF COMPONENTS SHALL BE AS UNDER:**

ACB	CONTROLS & SWITCHGEAR CO. LTD.
SWITCH/ SWITCH FUSE UNIT/ISOLATOR	CONTROLS & SWITCHGEAR CO. LTD.
HRC FUSE LINK & FUSE BASE	CONTROLS & SWITCHGEAR CO. LTD.
CONTACTOR & OVER LOAD RELAYS	CONTROLS & SWITCHGEAR CONTACTORS LTD.(TC)
INDICATING/MEASURING INSTRUMENT	MECO/AE/RISHAB/IMP
CURRENT TRANSFORMER	CONTROLS & SWITCHGEAR CO. LTD.
PROTECTION RELAY/AUX RELAY	<del>CSPC/ABB/AREVA</del> <b>SIEMENS</b>
NUMERICAL RELAY	ABB/AREVA
POTENTIAL TRANSFORMER	AE/KAPPA/PRAYOG/PRAKATI/PRECISE
SELECTOR SWITCH	L&T (SALZER)/SIEMENS/KAYCEE/CONTROLS&SWITCHGEAR/ABB/SWITRON DEVICES
INDICATING LAMP & PUSH BUTTON	CSC (RAAS CONTROL)
CABLE GLAND	CONTROLS & SWITCHGEAR CO. LTD.
TERMINAL BLOCK	C&S(WAGO)/ELEMEX/CONNECTWELL
CABLE LUGS	DOWELLS/3D/LDTS
MULTI FUNCTION METER (MFM)	L&T/SIEMENS/RISHAB/CONZERV
BREAKER CONTROL SWITCH	ALSTOM/KAYCEE/L&T/SIEMENS/SWITRON
SPACE HEATER	CONTROLS & SWITCHGEAR CO. LTD.
THERMOSTAT	ANCO
3 PIN SOCKET	CROMPTON GREAVES/ANCHOR/BEST & CROMPTON/BCH
CONTROL TRANSFORMER	AE/KAPPA/INDCOIL/PRECISE
NEUTRAL LINK	CONTROLS & SWITCHGEAR CO. LTD.
COUPLING RELAY	QIEN/JYOTI/OMRON/PLA

REV.	I-	II-	III-	IV-				
Drawn	Date: 03.05.08	Name: SILAHD	PROJECT:- GIPCL-SLPP-II (UNIT 3&4),ZI125MW	CONSULTANT:- TATA CONSULTING ENGINEERING	 <b>CONTROLS &amp; SWITCHGEAR COMPANY LTD.</b> C-59 NOIDA PHASE-ILNOIDA-201305 DISTT. GAUTAM BUDDH NAGAR(U.P.) FORMAT No. : QAF-04/04	Client:- BHEL-RANIPET	DRG. NO. BHEL/J2434/001	REV. 0
Checked						Work:- LTMSB	Details:- GENERAL NOTES & LEGENDS	SCALE: NTS
Approved						Order No.:- 4281049 DT. 09.04.08	NO.OF SHEET 04	



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52	DRAWOUT TYPE MANUALLY OPERATED AIR CIRCUIT BREAKER WITH OVERLOAD AND SHORT CIRCUIT RELEASE.	29 F1-F3 *	SWITCH/ISOLATOR		ON DELAY TIMER OPERATING COIL	AS *	AMMETER SELECTOR SWITCH
		29 F1-F3 *	FUSE SWITCH WITH THREE FUSE LINK		OFF DELAY TIMER OPERATING COIL	VS *	VOLTMETER SELECTOR SWITCH
		F1-F3	FUSE LINK WITH BASE/FITTING		POWER CONTACTOR COIL	R	INDICATING LAMP WITH SERIES RESISTANCE
52	FIXED TYPE AIR CIRCUIT BREAKER WITH SHORT CIRCUIT AND OVER LOAD RELEASES / MODULATED CASE CIRCUIT BREAKER	f 11-13	CURRENT TRANSFORMER		AUXILIARY CONTACTOR COIL	CC/TC	BREAKER CLOSING COIL / TRIPPING COIL
			NORMALLY OPEN CONTACT	TC	ON DELAY TIMER TIME CLOSING CONTACT.		DRAWOUT POWER TERMINALS
			NORMALLY CLOSE CONTACT	TO	ON DELAY TIMER TIMED OPENING CONTACT.		DRAWOUT CONTROL TERMINALS
52	MINIATURE CKT. BREAKER WITHOUT RELEASES.		POTENTIAL / CONTROL TRANSFORMER	INST.C TO	OFF DELAY TIMER INSTANTANEOUS CLOSE DELAYED OPENING CONT.		OUTGOING TERMINALS INTER PANEL WIRING TERMINALS FIXED.
		49	OVERLOAD RELAY AUX. CHANGE OVER CONTACT.	INST.O TC	OFF DELAY TIMER INSTANTANEOUS OPEN DELAYED CLOSING CONT.		EARTHING
52	ELECTRICALLY OPERATED DRAWOUT TYPE AIR CIRCUIT BREAKER WITHOUT RELEASES.	A	AMMETER		START/OPEN/ON PUSH BUTTON		TRANSDUCER
		V	VOLTMETER		STOP/CLOSE/OFF PUSH BUTTON		SHORTING LINK
42	3POLE POWER CONTACTOR	49	THERMOSTAT	LO	LIMIT SWITCH NORMALLY CLOSE		SELECTOR SWITCH
		SH	SPACE HEATER	L1	LIMIT SWITCH NORMALLY OPEN		DP MCB
49	OVER LOAD RELAY				RESET/TRIP P.B.		3 PHASE MOTOR
		NL or T	NEUTRAL LINK	R,Y,B & N	THREE POLE AND NEUTRAL BUSBAR		3 PIN SOCKET



NOTES  
1 SYMBOL MARKED  
\* THIS SHALL BE SHOWN ON DOOR

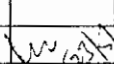

REV.	I-	II-	III-	IV-
Drawn	Date 03.05.08	Name SHAHID	PROJECT:- GIPCL-SLPP-II (UNIT 3&4),2X125MW	Client BHEL-RANIPET
Checked			CONSULTANT:- TATA CONSULTING ENGINEERING	Work LTMSB
Approved			CONTROL & SWITCHGEAR COMPANY LTD. C-59, PHASE -II NOIDA-201305	Details GENERAL NOTES & LEGENDS
			FORMAT NO. QAF- 04/04	DRG. NO. BHEL/J2434/001
				SCALE: NTS
				SHEET NO. NO. OF SHEET
				REV. 0
				04 04

FIRST ANGLE PROJECTION

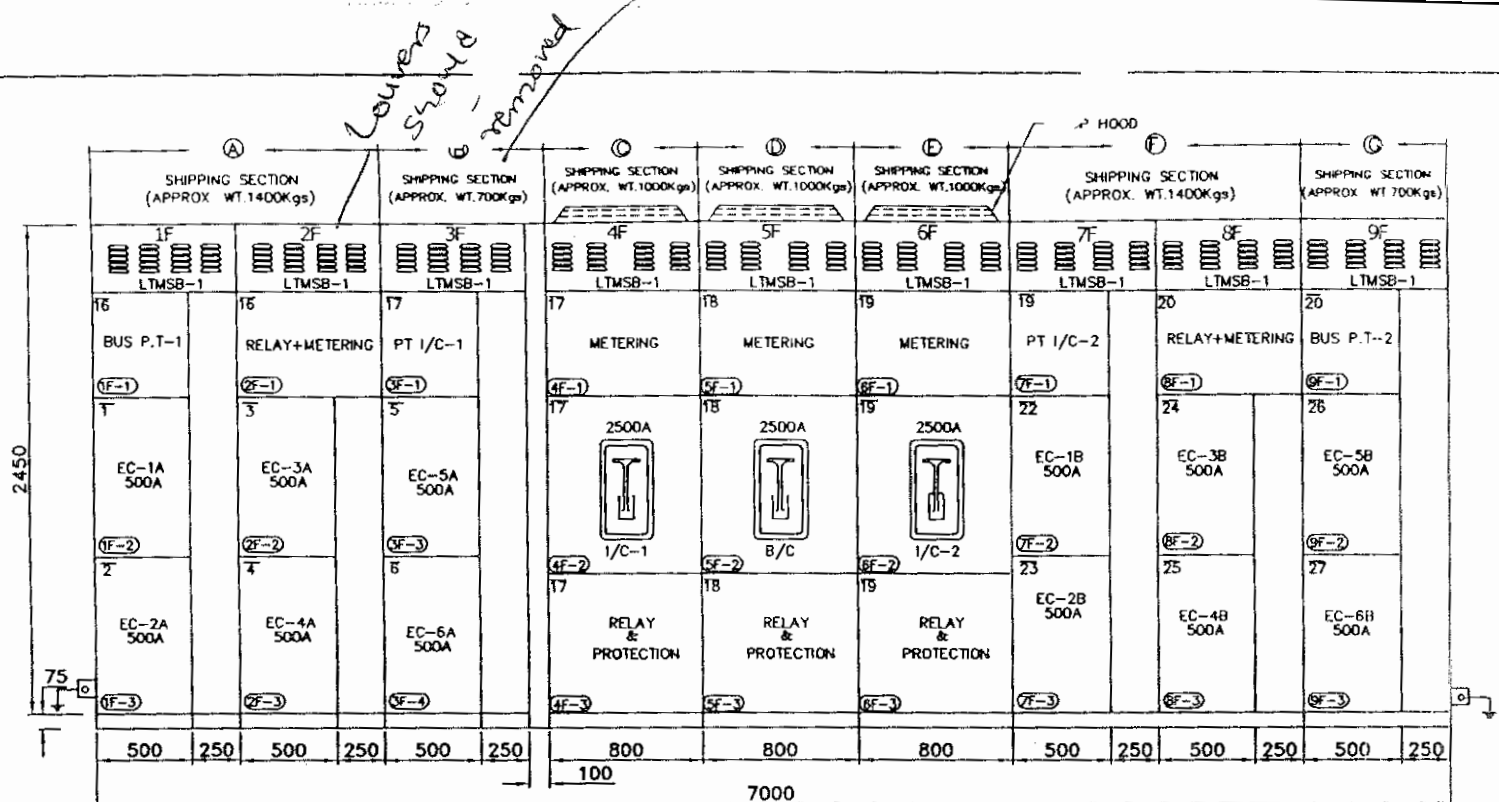
ALL DIMENSIONS ARE IN MM

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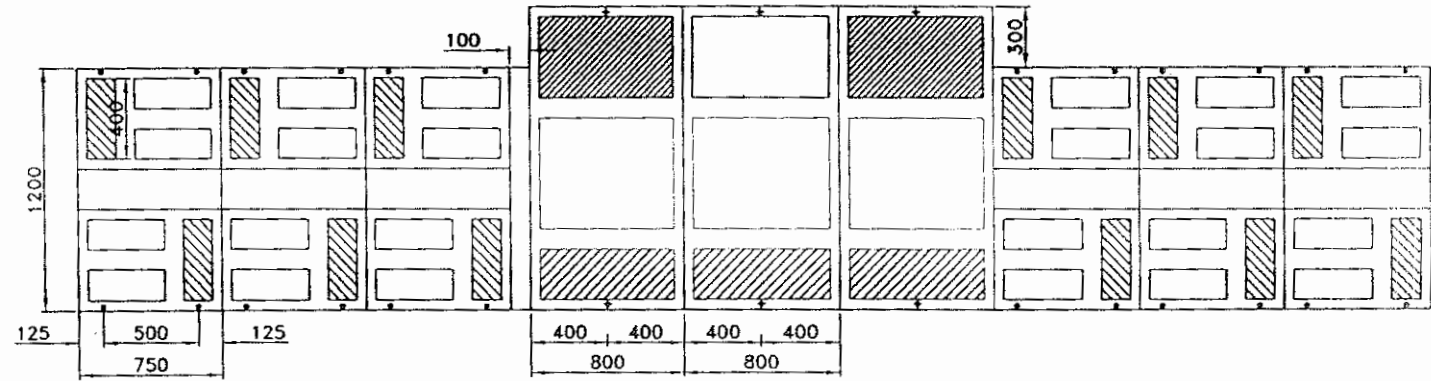
OWNER:	GUJRAT INDUSTRIES POWER CO. LTD. SLPP-II (UNIT 3&4), 2X125MW
OWNER'S CONSULTANT:	TCE CONSULTING ENGINEERS LIMITED BANGALORE
	BHARAT HEAVY ELECTRICALS LTD. BOILER AUXILIARIES PLANT RANIPET-632 406
	CONTROLS & SWITCHGEAR COMPANY LTD.
TITLE:- GENERAL ARRANGEMENT DRAWING	

REV.	I-	II-	III-	IV-
Drawn	Date: 03.05.08 Name: SHAHID	PROJECT:- GIPCL-SLPP-II (UNIT 3&4), 2X125MW	Client:- BHEL-RANIPET Work:- LTMSB	DRG. NO. BHEL/J2434/201
Checked		CONSULTANT:- TATA CONSULTING ENGINEERING	Details:- GENERAL ARRANGEMENT DRAWING	REV. 0
Approved			Order No:- 4281049 DT. 09.04.08	SCALE: NTS
		CONTROLS & SWITCHGEAR COMPANY LTD. C-59 NOIDA PHASE-II, NOIDA-201305 DISTT. GAUTAM BUDDH NAGAR (UP) FORMAT No. : DAF-04/04		SHEET NO. NO. OF SHEET
				01 03

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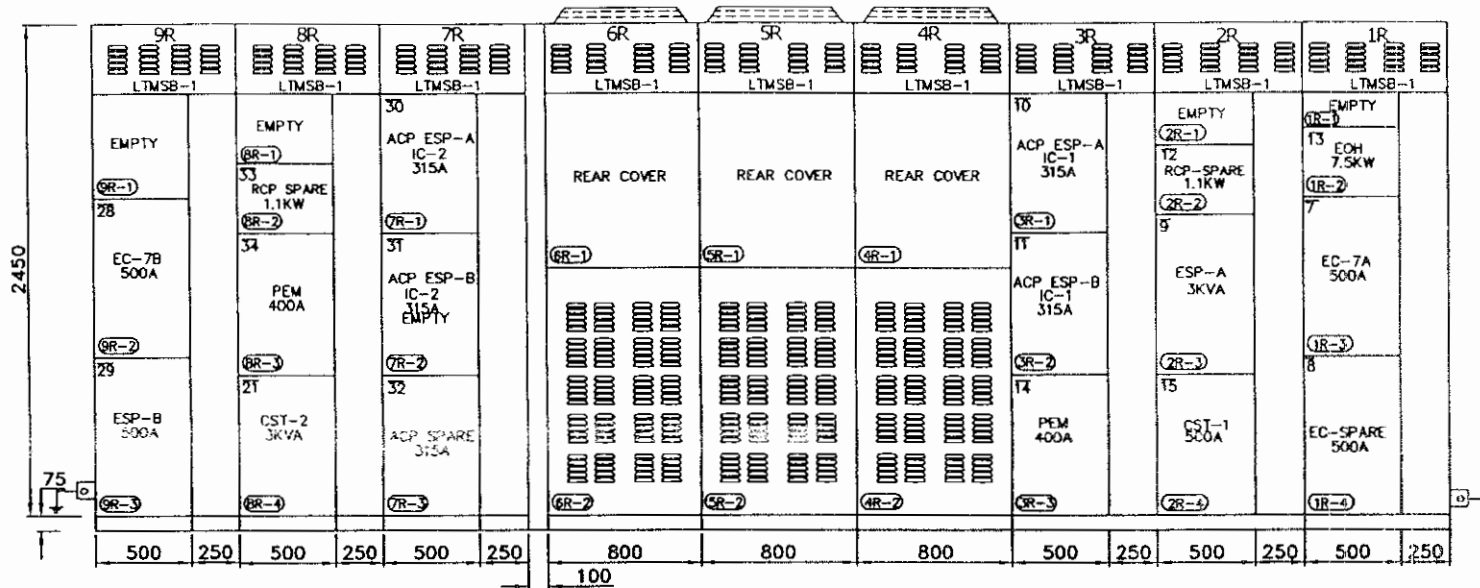


FRONT VIEW



REV.	I-	II-	III-	IV-
Drawn	Date: 03.05.08	Name: SHAHID	PROJECT:- GIPCL-SLPP-II (UNIT 3&4), 2X125MW	
Checked			CONSULTANT:- DESIN PVT. LTD - NEW DELHI.	
Approved			<b>CONTROLS &amp; SWITCHGEAR COMPANY LTD.</b> <small>C-59 NODA PHASE-II, NODA-201305          DIST. GAUTAM BUDDH NAGAR (U.P)          FORMAT No. : QAF-04/04</small>	
			CLIENT: BHEL-RANIPET	DRG. NO. BHEL/J2434/201
			Work: LTMSB	REV. 0
			Details: GENERAL ARRANGMENT DRAWING	SCALE: NTS
			Order No.: 4281049 DT. 09.04.08	SHEET NO. 02 NO. OF SHEET 03

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REAR VIEW

**NOTE:-**



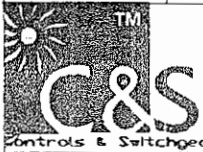
1. FOR GENERAL NOTES REF. DRG NO- BHELJ2434/001
2. FOR SINGLE LINE DIAGRAM REF. DRG NO- BHELJ2434/101
3. TOTAL LENGTH OF PANEL = 7000MM
4. CABLE ENTRY SHALL BE FROM BOTTOM
5. LIFTING ANGLE SHALL BE PROVIDED
6. NAME PLATE LTMSB1 & LTMSB2 SHALL BE FIX ON EACH PANEL OF RESPECTIVE BOARD.

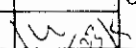

**QTY :- 2 NOS**

REV.	I--	II--	III--	IV--
Date	Name	PROJECT:- GIPCL-SLPP-II (UNIT 3&4),2X125MW		CLIENT: BHEL-RANIPET
03.05.08	SHAHID	CONSULTANT:- DESIN PVT. LTD - NEW DELHI.		Work: LTMSB
Checked				Details: GENERAL ARRANGMENT DRAWING
Approved		CONTROLS & SWITCHGEAR COMPANY LTD. C-59 NOIDA PHASE-II,NOIDA-201305 DIST. GAUTAM BUDH NAGAR(U.P) FORMAT No. : QAF-04/04		DRG. NO. BHEL/J2434/201
				Order No.: 4281049 DT. 09.04.08
				SCALE: NTS
				SHEET NO. 03
				NO. OF SHEET 03
				REV. 0

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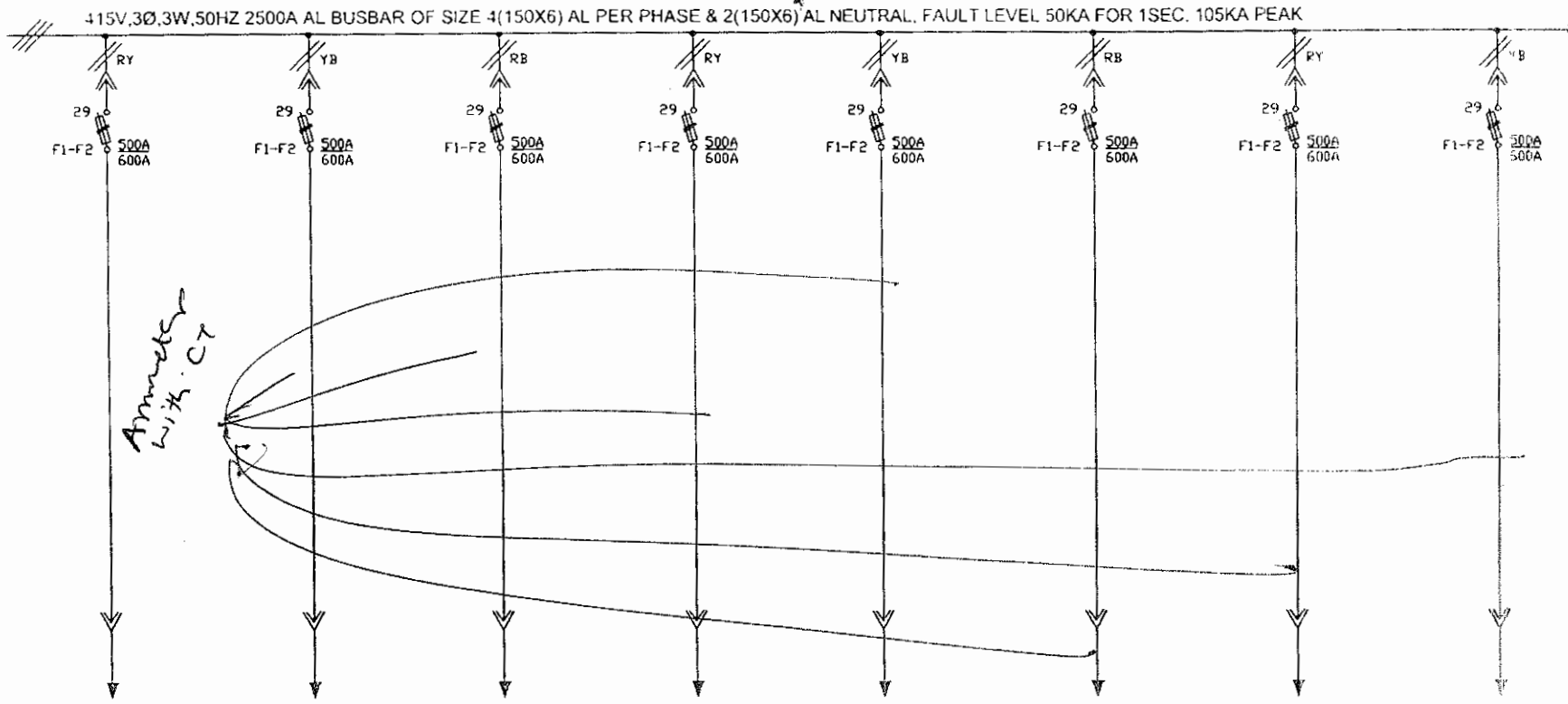
FIRST ANGLE PROJECTION ALL DIMENS. ARE IN MM

OWNER:	<b>GUJRAT INDUSTRIES POWER CO. LTD.</b> SLPP-II (UNIT 3&4), 2X125MW
OWNER'S CONSULTANT:	 <b>TCE CONSULTING ENGINEERS LIMITED</b> BANGALORE
	<b>BHARAT HEAVY ELECTRICALS LTD.</b> BOILER AUXILIARIES PLANT RANIPET-632 406
	<b>CONTROLS &amp; SWITCHGEAR COMPANY LTD.</b>
TITLE:-	<b>SINGLE LINE DIAGRAM</b>

REV.	I-	II-	III-	IV-
Drawn	Date: 03.05.08 Name: SHAHID	PROJECT:- GIPCL-SLPP-II (UNIT 3&4), 2X125MW	Client:- BHEL-RANIPET Work:- LTMSB Details:- SINGLE LINE DIAGRAM Order No:- 4281049 DT. 09.04.08	DRG. NO. BHEL/J2434/101 SCALE: NTS
Checked		CONSULTANT:- TATA CONSULTING ENGINEERING	Controls & Switchgear COMPANY LTD. C-59 NOIDA PHASE-II, NOIDA-201305 DISTT. GAUTAM BUDDH NAGAR (UP) FORMAT No. : QAF-04/04	REV. 0
Approved				SHEET NO. 01 NO. OF SHEET 07


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*Neutral  
50A  
no cable  
system*

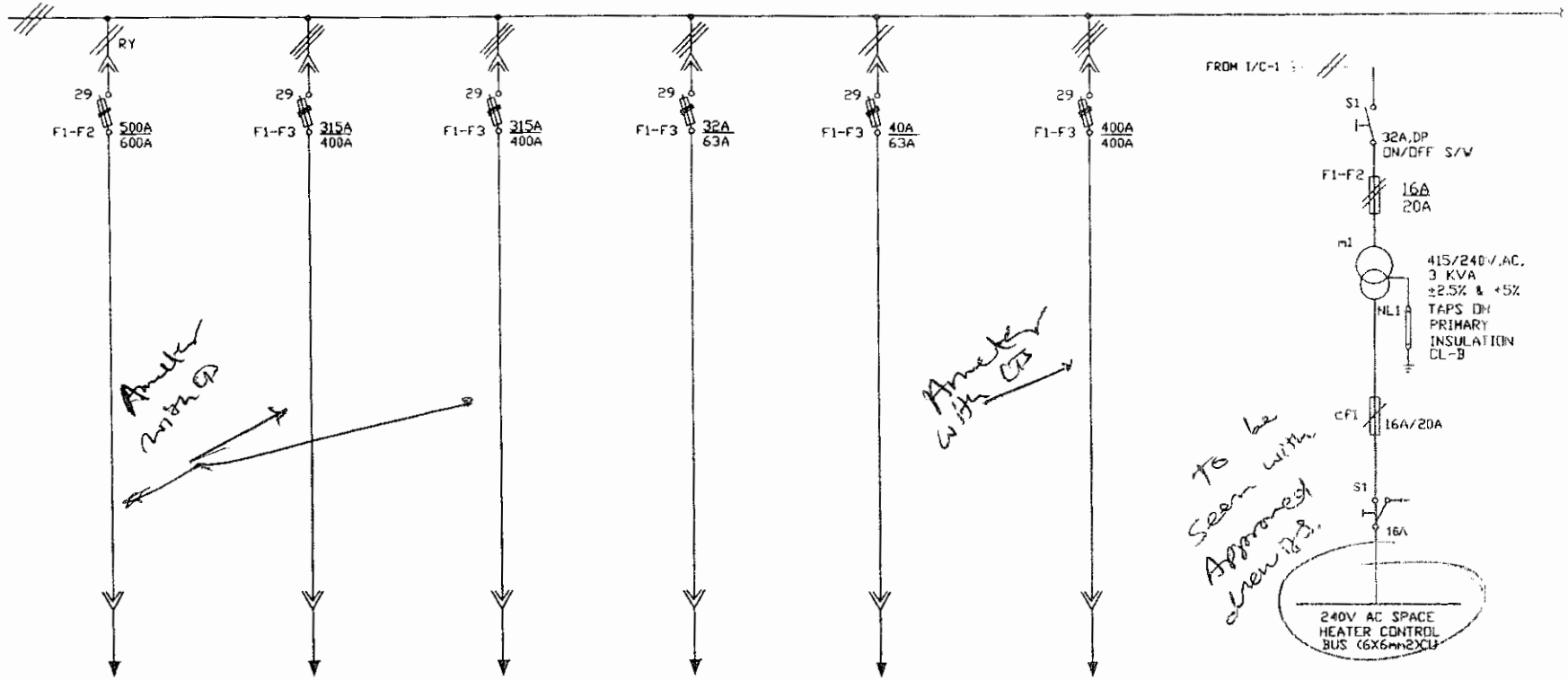


FEEDER No.	1	2	3	4	5	6	7	8
FEEDER RATING	368A	368A	368A	368A	368A	368A	368A	368A
CABLE SIZE IN mm <sup>2</sup>	3X2CX120MM <sup>2</sup> AL	3X2CX120MM <sup>2</sup> AL	3X2CX120MM <sup>2</sup> AL	3X2CX120MM <sup>2</sup> AL	3X2CX120MM <sup>2</sup> AL	3X2CX120MM <sup>2</sup> AL	3X2CX120MM <sup>2</sup> AL	3X2CX120MM <sup>2</sup> AL
PANEL No. COMPT.No.	1F-2	1F-3	2F-2	2F-3	3F-3	3F-4	1R-3	1R-4
FEEDER DESCRIPTION	EC-1A	EC-2A	EC-3A	EC-4A	EC-5A	EC-6A	EC-7A	EC-SPARE
MODULE TYPE, SCH. DRG. No.	504	504	504	504	504	504	504	504
FULL LOAD CURRENT								

BHEL DRG. NO. : 2-00-114-28714, REV. : 03

REV.	I-	II-	III-	IV-
Drawn	Date: 03.05.08 Name: SHARD	<b>PROJECT:-</b> GIPCL-SLPP-II (UNIT 3&4), 2X125MW  <b>CONTROLS &amp; SWITCHGEAR COMPANY LTD.</b> C-59 NEIDA PHASE-II, NEIDA-201305 DISTT. GAUTAM BUDDH NAGAR (UP) FORMAT No. : QAF-04/04		CLIENT: BHEL-RANIPET Work: LTMSB Details: SINGLE LINE DIAGRAM Order No.: 4281040 DT. 09.04.08
Checked		<b>CONSULTANT:-</b> DESIN PVT. LTD - NEW DELHI.		DRG. NO. BHEL/J2434/101 SCALE: NTS SHEET NO. 02 NO. OF SHEET 07
Approved				REV. 0

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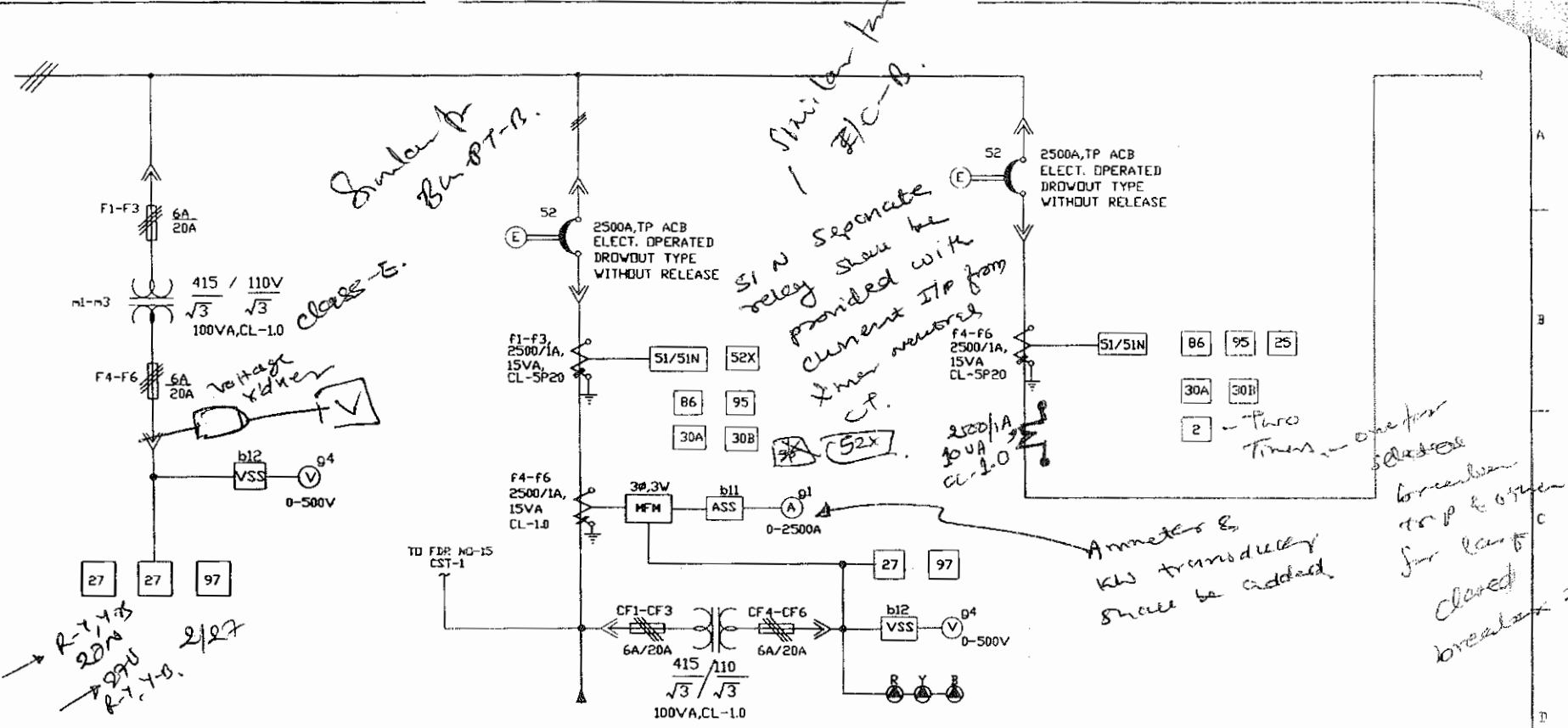


FEEDER No.	9	10	11	12	13	14	15
FEEDER RATING	368A	200A	200A	1.1KW	7.5KW	400A	3KVA
CABLE SIZE IN mm <sup>2</sup>	3X2CX120MM <sup>2</sup> AL	1X3CX400MM <sup>2</sup> AL	1X3CX400MM <sup>2</sup> AL	1X3CX2.5MM <sup>2</sup> AL	1X3CX16MM <sup>2</sup> AL	--	--
PANEL No. COMPT.No.	2R-3	3R-1	3R-2	3R-3	1R-2	3R-3	2R-4
FEEDER DESCRIPTION	ESP-A	ACP ESP-A IC-1	ACP ESP-B IC-1	RCP-SPARE	EDH	PEM	CST-1
MODULE TYPE/SCH. DRG. No.	504	504	504	504	504	504	505
FULL LOAD CURRENT							

BHEL DRG. NO. : 2-00-114-28714, REV. : 03

REV.	I-	II-	III-	IV-
Drawn	Date: 03.05.08 Name: SHAHID	<b>PROJECT:-</b> GIPCL-SLPP-II (UNIT 3&4), 2X125MW <b>CONSULTANT:-</b> DESIN PVT. LTD - NEW DELHI.		CLIENT: BHEL-RANIPET Work: LTMSB Details: SINGLE LINE DIAGRAM Order No.: 4281049 DT. 09.04.08
Checked		CONTROLS & SWITCHGEAR COMPANY LTD. C-59 NEIDA PHASE-II, NEIDA-201305 DISTT. GAUTAM BUDDH NAGAR (UP) FORMAT No. : DAF-04/04		DRG. NO.: BHEL/J2434/101 SCALE: NTS SHEET NO.: 03 NO. OF SHEET: 07
Approved				REV.: 0 07

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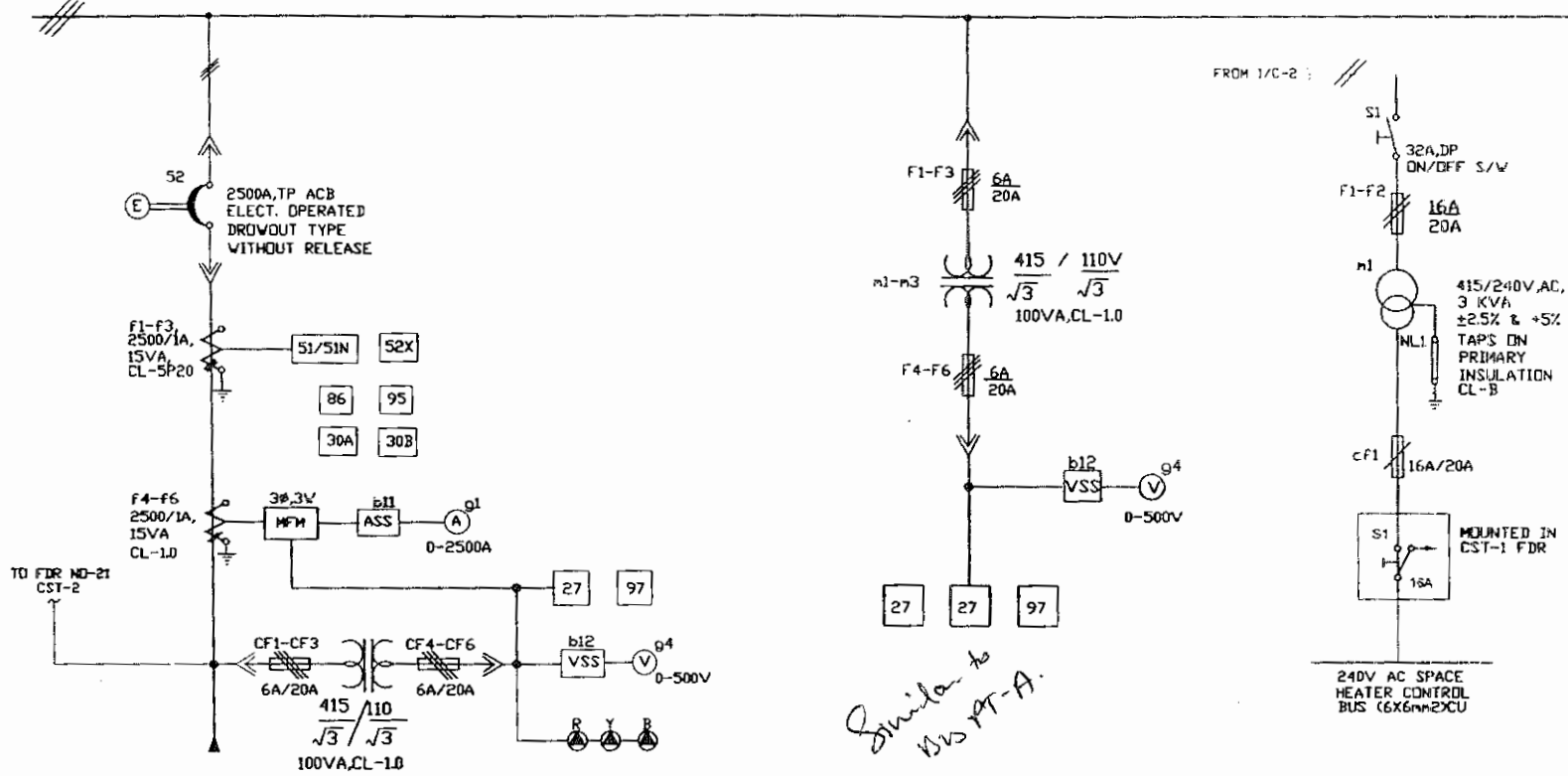
FEEDER No.	16	17	18
FEEDER RATING	100VA	2500A	2500A
CABLE SIZE IN mm <sup>2</sup>	--	10X3CX400MM <sup>2</sup>	--
PANEL No. COMPT.No.	1F-1,2F-1	4F-1,4F-2,4F-3,3F-1	5F-1,5F-2,5F-3
FEEDER DESCRIPTION	BUS PT-1	INCDCMR-1	BUS COUPLER
MODULE TYPE/ SCH. DRG. No.	506	501	501
FULL LOAD CURRENT			

BHEL DRG. NO. : 2-00-114-28714, REV. : 03

REV.	I-	II-	III-	IV-
Drawn	Date: 03.05.08 Name: SHAHID	PROJECT:- GIPCL-SLPP-II (UNIT 3&4), 2X125MW		CLIENT: BHEL--RANIPET
Checked		CONSULTANT:- DESIN PVT. LTD - NEW DELHI.		Work: LTMSB
Approved				Details: SINGLE LINE DIAGRAM
		C-59 MOIDA PHASE-II, MOIDA-201305 DISTT. GAUTAM BUDDH NAGAR (UP) FORMAT No. : QAF-04/04		Order No.: 4281049 DT. 09.04.08
				DRG. NO. BHEL/J2434/101
				REV. 0
				SCALE: NTS
				SHEET NO. 04
				NO. OF SHEET 07




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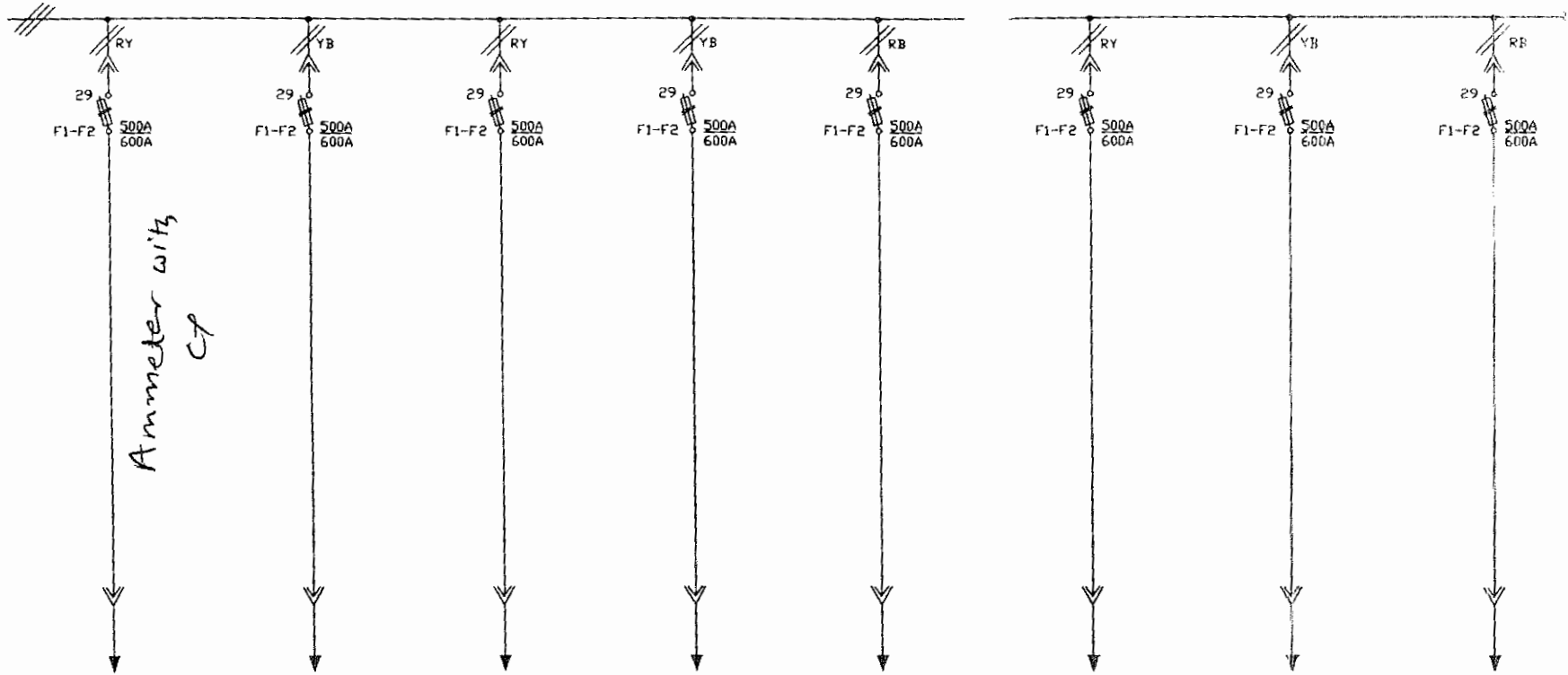
*Similar to Bus 19-A.*

FEEDER No.	19	20	21
FEEDER RATING	2500A	100VA	3KVA
CABLE SIZE IN mm2	10X3CX400MM2	--	--
PANEL No. CDMPT.No.	6F-1,6F-2,6F-3,7F-1	8F-1,9F-1	8R-4
FEEDER DESCRIPTION	INCOMER-2	BUS PT-2	CST-2
MODULE TYPE, SCH. DRG. No.	S03	S06	S05
FULL LOAD CURRENT			

BHEL DRG. NO. : 2-00-114-28714, REV. : 03


REV.	I-	II-	III-	IV-
Drawn	Date: 03.05.08 Name: SHAHID	PROJECT:- GIPCL-SLPP-II (UNIT 3&4), 2X125MW		CLIENT: BHEL-RANIPET
Checked		CONSULTANT:- DESIN PVT. LTD - NEW DELHI.		Work: LTMSB
Approved				Details: SINGLE LINE DIAGRAM
		C-39 MIDDA PHASE-II, MIDDA-201305 DISTT. GAUTAM BUDDH NAGAR (UP) FORMAT No. : QAF-04/04		Order No.: 4281049 DT. 09.04.08
				DRG. NO. BHEL/J2434/101
				REV. 0
				SCALE: NTS
				SHEET NO. 05
				NO. OF SHEET 07

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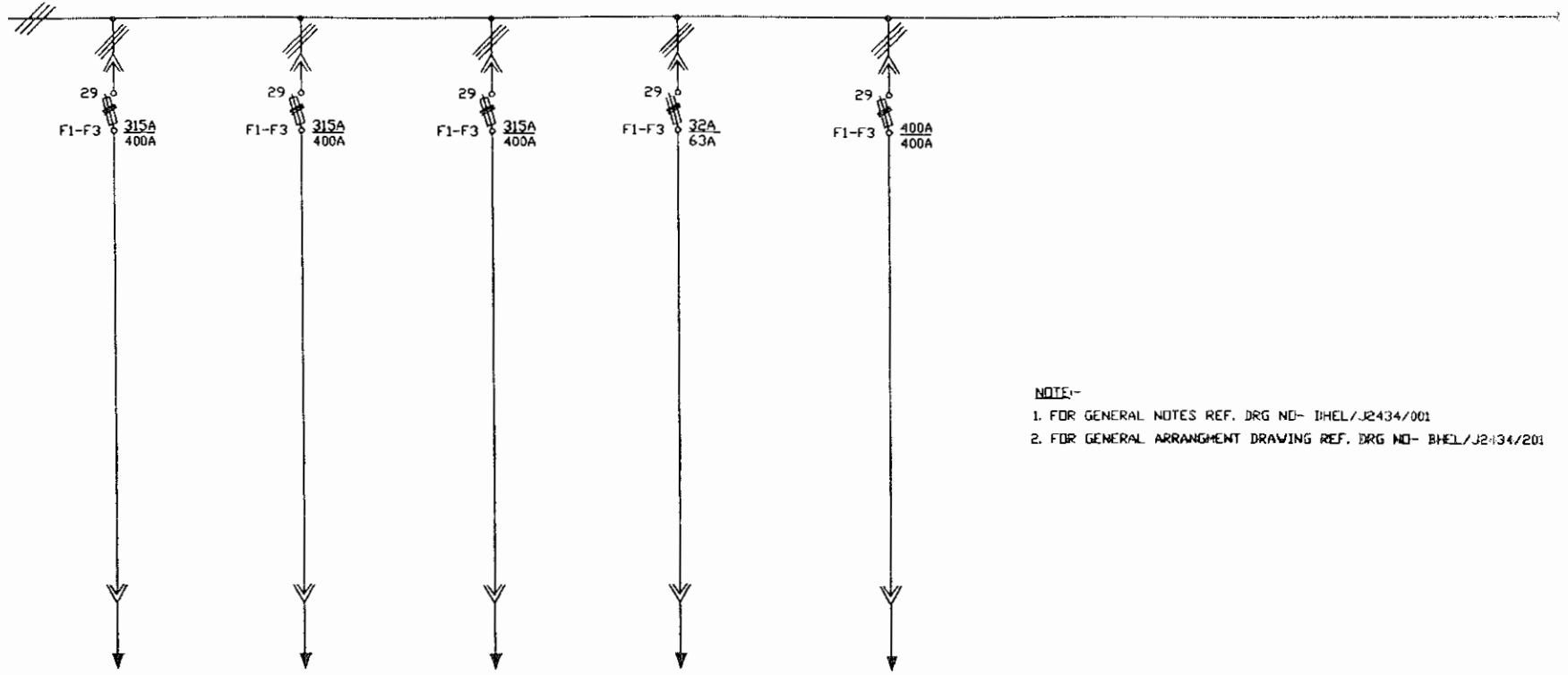


FEEDER No.	22	23	24	25	26	27	28	29
FEEDER RATING	368A	368A	368A	368A	368A	368A	368A	368A
CABLE SIZE IN mm <sup>2</sup>	3X2CX120MM <sup>2</sup> AL	3X2CX120MM <sup>2</sup> AL	3X2CX120MM <sup>2</sup> AL	3X2CX120MM <sup>2</sup> AL	3X2CX120MM <sup>2</sup> AL	3X2CX120MM <sup>2</sup> AL	3X2CX120MM <sup>2</sup> AL	3X2CX120MM <sup>2</sup> AL
PANEL No. COMPT.No.	7F-2	7F-3	8F-2	8F-3	9F-2	9F-3	9R-2	9R-3
FEEDER DESCRIPTION	EC-1B	EC-2B	EC-3B	EC-4B	EC-5B	EC-6B	EC-7B	ESP-B
MODULE TYPE SCH. DRG. No.	504	504	504	504	504	504	504	504
FULL LOAD CURRENT								

BHEL DRG. NO. : 2-00-114-28714, REV. : 03

REV.	I-	II-	III-	IV-
Drawn	Date: 03.05.08 Name: SHAHID	PROJECT:- GIPCL-SLPP-II (UNIT 3&4), 2X125MW		CLIENT: BHEL-RANIPET
Checked		CONSULTANT:- DESIN PVT. LTD - NEW DELHI		Work: LTMSB
Approved				DRG. NO. BHEL/J2434/101
		C-59 NOIDA PHASE-II, NOIDA-201305 DISTT. GAUTAM BUDDH NAGAR (UP) FORMAT No. : QAF-04/04		REV. 0
		Order No.: 4281049 DT. 09.04.08		SCALE: NTS SHEET NO. 06 NO. OF SHEET 07

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**NOTE:-**

1. FOR GENERAL NOTES REF. DRG NO- BHEL/J2434/001
2. FOR GENERAL ARRANGMENT DRAWING REF. DRG NO- BHEL/J2434/201




FEEDER No.	30	31	32	33	34		
FEEDER RATING	200A	200A	200A	1.1KV	400A		
CABLE SIZE IN mm2	1X3CX400MM2 AL	1X3CX400MM2 AL	1X3CX400MM2 AL	1X3CX2.5MM2AL	---		
PANEL No. COMPT.No.	7R-1	7R-2	7R-3	8R-2	8R-3		
FEEDER DESCRIPTION	ACP ESP-A IC-2	ACP ESP-B IC-2	ACP SPARE	RCP-SPARE	PCM		
MODULE TYPE/SCH. DRG. No.	504	504	504	504	504		
FULL LOAD CURRENT							


BHEL DRG. NO. : 2-00-114-28714, REV. : 03

REV.	I-	II-	III-	IV-
Drawn	Date: 03.05.08 Name: SHAHID	<b>PROJECT:-</b> GIPCL-SLPP-II (UNIT 3&4), 2X125MW <b>CONSULTANT:-</b> DESIN PVT. LTD - NEW DELHI.		CLIENT: BHEL-RANIPET Work: LTMSB Details: SINGLE LINE DIAGRAM Order No.: 4281049 DT. 09.04.08
Checked		 CONTROLS & SWITCHGEAR COMPANY LTD. C-59 NOIDA PHASE-II, NOIDA-201305 DISTT. GAUTAM BUDDH NAGAR (UP) FORMAT No. : QAF-04/04		DRG. NO. BHEL/J2434/101 REV. 0 SCALE: NTS SHEET NO. 07 NO. OF SHEET 07
Approved	<i>W. Shahid</i>			

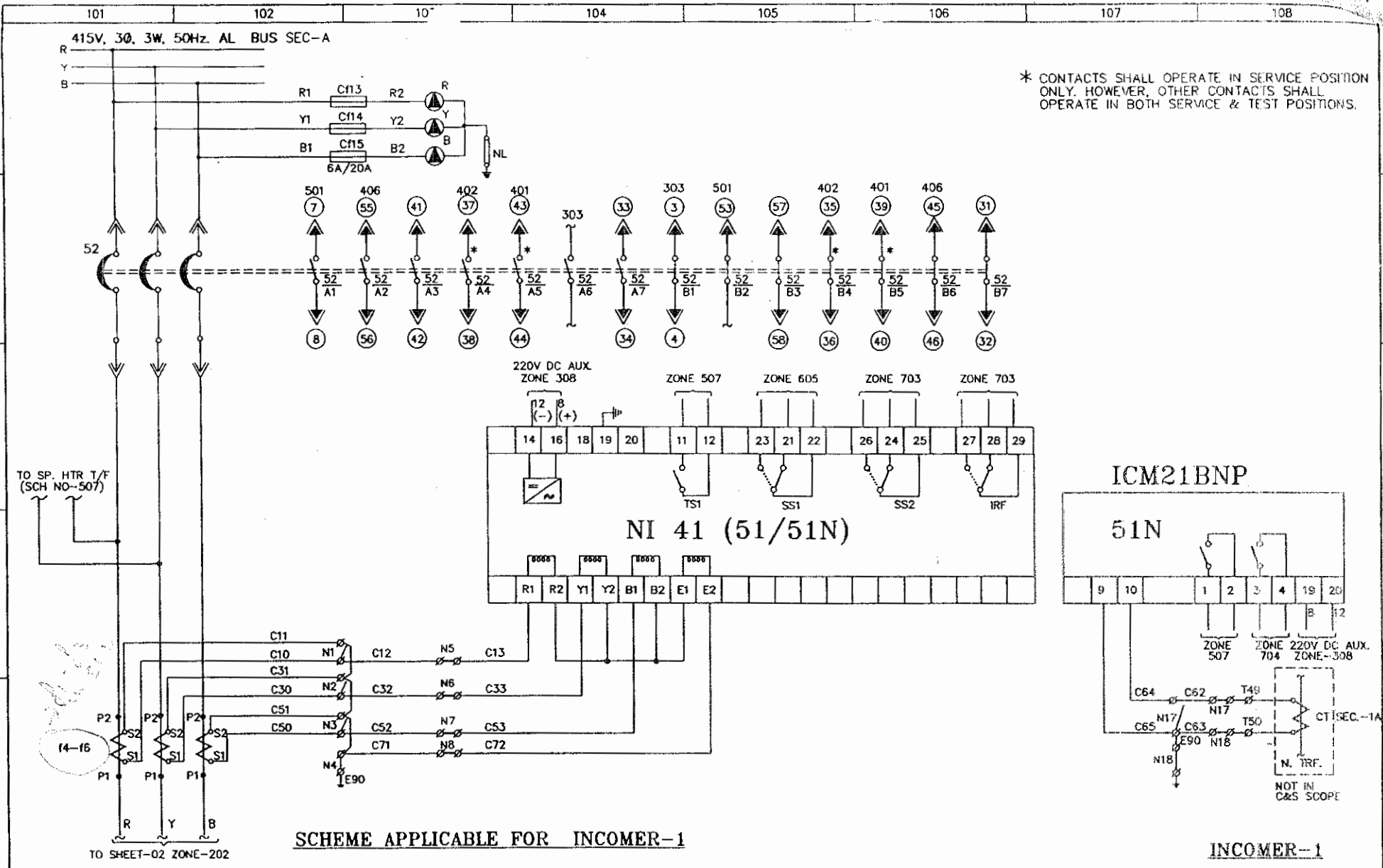
FIRST ANGLE PROJECTION ALL DIMENSIONS IN MM

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OWNER:	<b>GUJRAT INDUSTRIES POWER CO. LTD.</b> SLPP-II (UNIT 3&4),2X125MW
OWNER'S CONSULTANT:	 <b>TCE CONSULTING ENGINEERS LIMITED</b> BANGALORE
	<b>BHARAT HEAVY ELECTRICALS LTD.</b> BOILER AUXILIARIES PLANT RANIPET-632 406
	<b>CONTROLS &amp; SWITCHGEAR COMPANY LTD.</b>
TITLE:-	<b>SCHEMATIC/WIRING DIAGRAM</b> <b>INCOMER-1</b>

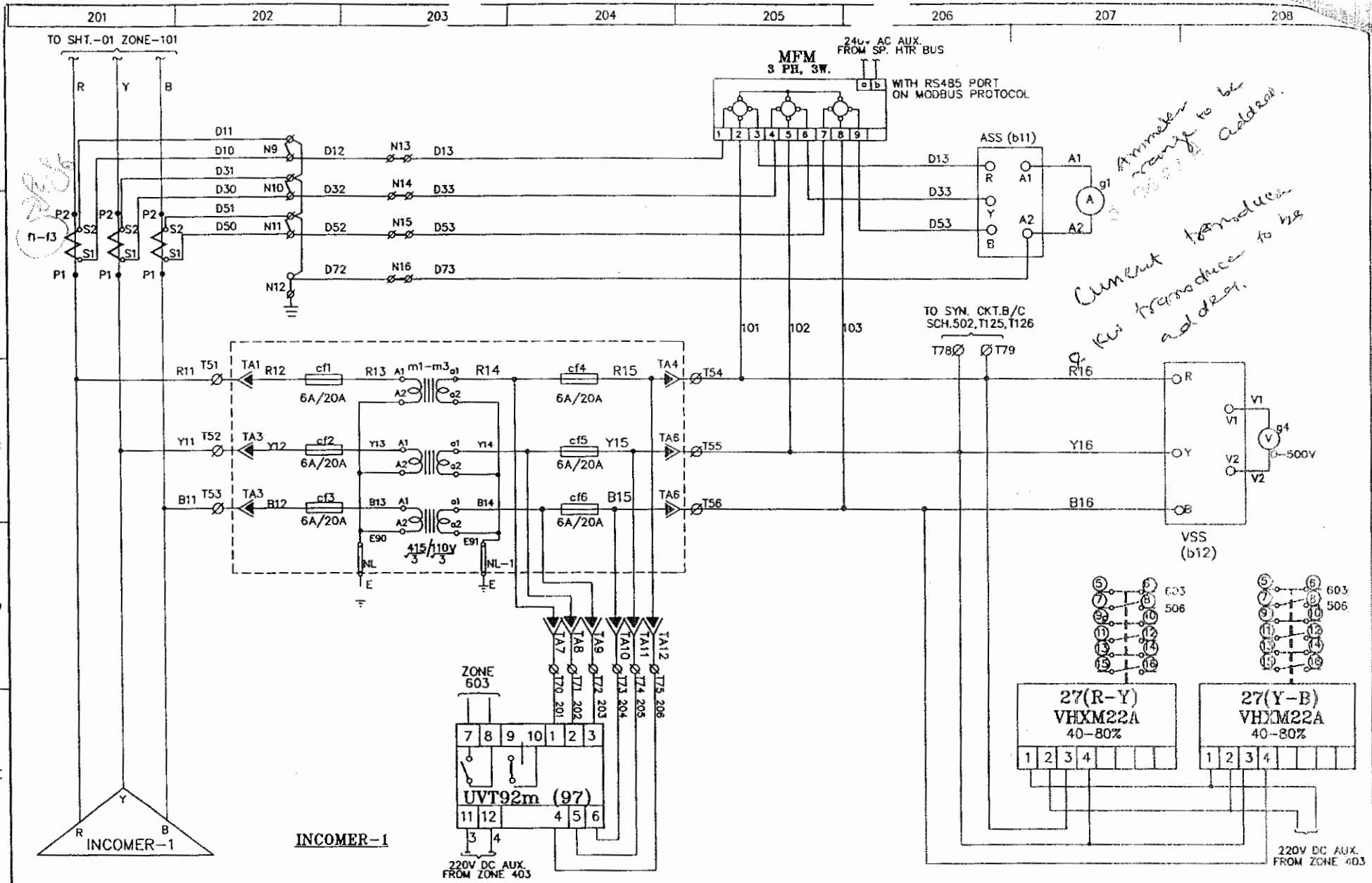
REV.	I-	II-	III-	IV-						
Drawn	03.05.08	SHAHID	 <b>CONTROLS &amp; SWITCHGEAR COMPANY LTD.</b> C-59 NODA PHASE-II, NODA-201305 DIST. GAUTAM BUDDH NAGAR (U.P.) FORMAT No. : QAF-04/04		Client:-	BHEL-RANIPET	DRG. NO.	BHEL/J2434/501	REV.	0
Checked					Work:-	INCOMER-1				
Approved					Details:-	SCHEMATIC/WIRING DIAGRAM	SCALE:	NTS	SHEET NO.	01
					Order No.:-	4281049 DT. 09.04.08			NO. OF SHEET	08
					CONSULTANT:-	TATA CONSULTING ENGINEERING				

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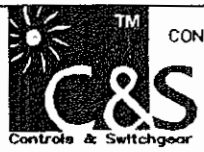
REV.	I-	II-	III-	IV-
Drawn	Date: 03.05.08	Name: SHAHID	<b>PROJECT:</b> GIPCL SLPP-11 (UNIT 3&4), 2X125MW	
Checked			<b>CONSULTANT:-</b> TATA CONSULTING ENGINEERING	
Approved			CONTROLS & SWITCHGEAR COMPANY LTD. C-59 NOIDA PHASE-II, NOIDA-201305 DISTT. GAUTAM BUDDH NAGAR (U.P.) FORMAT No. : QAF-04/04	
			Client: - BHEL-RANIPET	DRG. NO. BHEL/J2434/501
			Work: - INCOMER-1	REV. 0
			Details: SCHEMATIC/WIRING DIAGRAM	SCALE: NTS
			Order No.: 4281049 DT. 09.04.08	SHEET NO. 02 NO. OF SHEET 08

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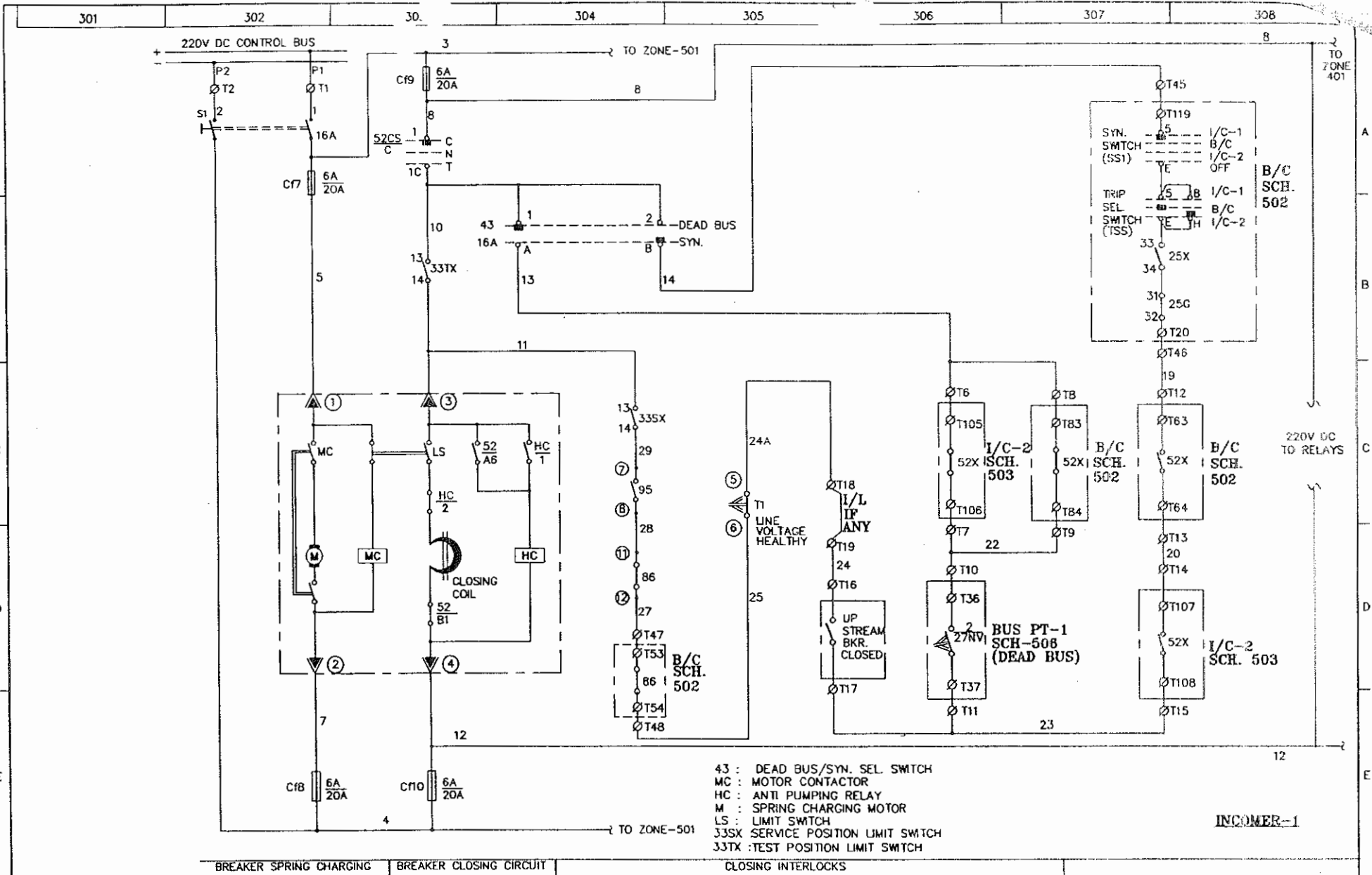
*Ammeter range to be 0-200A address.*  
*Current transformer to be 9.6A transducer to be address.*

REV.	I-	II-	III-	IV-
REV.	Date	Name	PROJECT:	Client: - BHEL-RANIPET
Drawn	03.05.08	SHAHD	GIPCL SLPP-11 (UNIT 3&4), 2X125MW	Work: - INCOMER-1
Checked			CONSULTANT:- TATA CONSULTING ENGINEERING	Details: SCHEMATIC/WIRING DIAGRAM
Approved				DRG. NO. BHEL/J2434/501
				REV. 0
				SCALE: NTS
				SHEET NO. 03
				NO. OF SHEET 08
				Order No.: 4281049 DT. 09.04.08



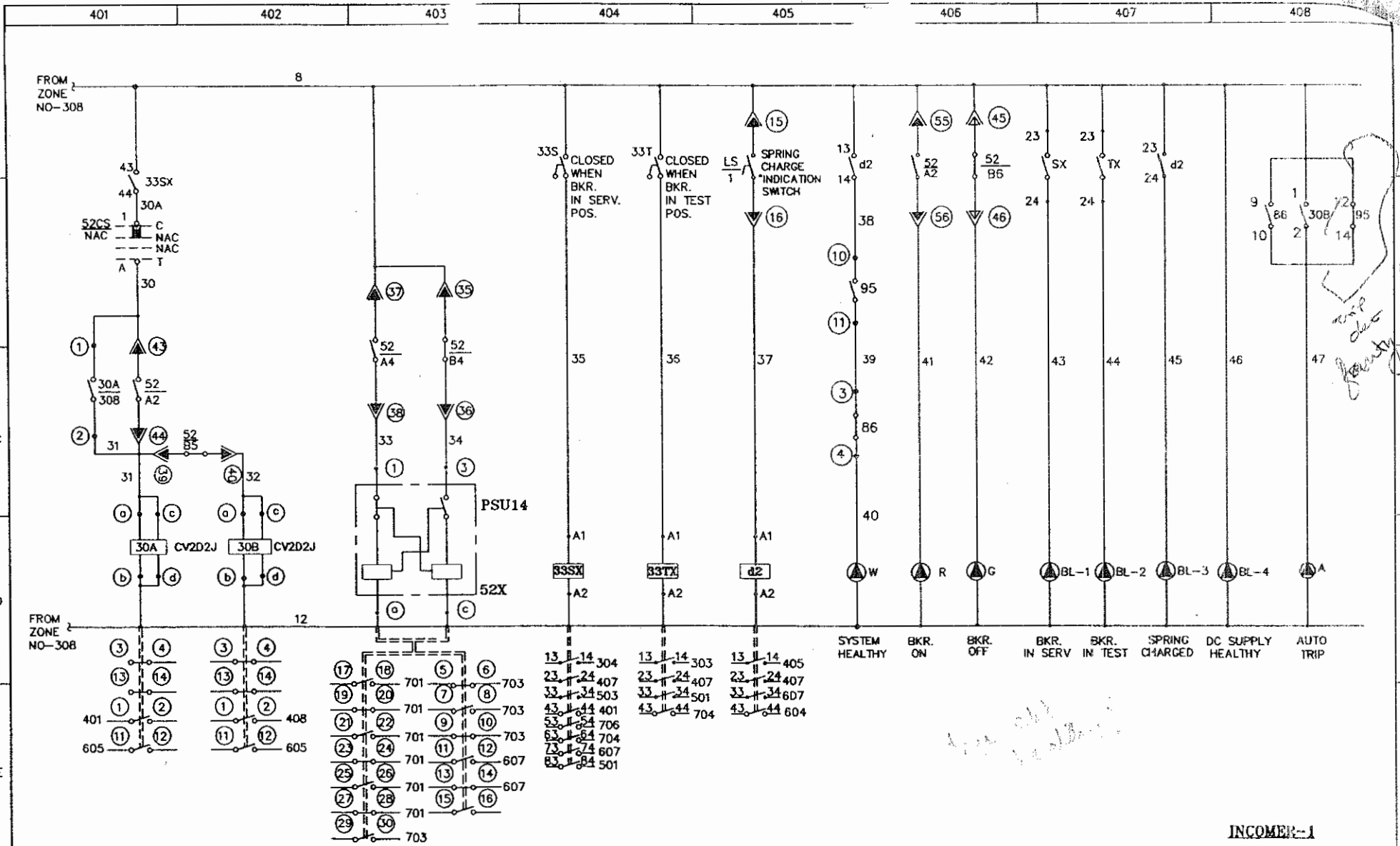
CONTROLS & SWITCHGEAR COMPANY LTD.  
 C-58 NODA PHASE-II, NODA-201305  
 DISTT. GAUTAM BUDDH NAGAR (U.P.)  
 FORMAT No. : QAF-04/04

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REV.	I-	II-	III-	IV-
Drawn	Date: 03.05.08 Name: SHAHID	<b>PROJECT:</b> GIPCL 5LPP-11 (UNIT 3&4), 2X125MW		<b>Client:</b> - BHEL-RANIPET <b>Work:</b> - INCOMER-1
Checked		<b>CONSULTANT:-</b> TATA CONSULTING ENGINEERING		<b>Details:</b> SCHEMATIC/WIRING DIAGRAM
Approved		CONTROLS & SWITCHGEAR COMPANY LTD. C-59 NOIDA PHASE-II, NOIDA-201305 DIST. GAUTAM BUDDH NAGAR (U.P.) FORMAT No. : QAF-04/04		<b>DRG. NO.</b> BHEL/J2434/501 <b>REV.</b> 0
				<b>Order No.:</b> 4281049 DT. 09.04.08
				<b>SCALE:</b> NTS <b>SHEET NO.</b> 04 <b>NO. OF SHEET</b> 08

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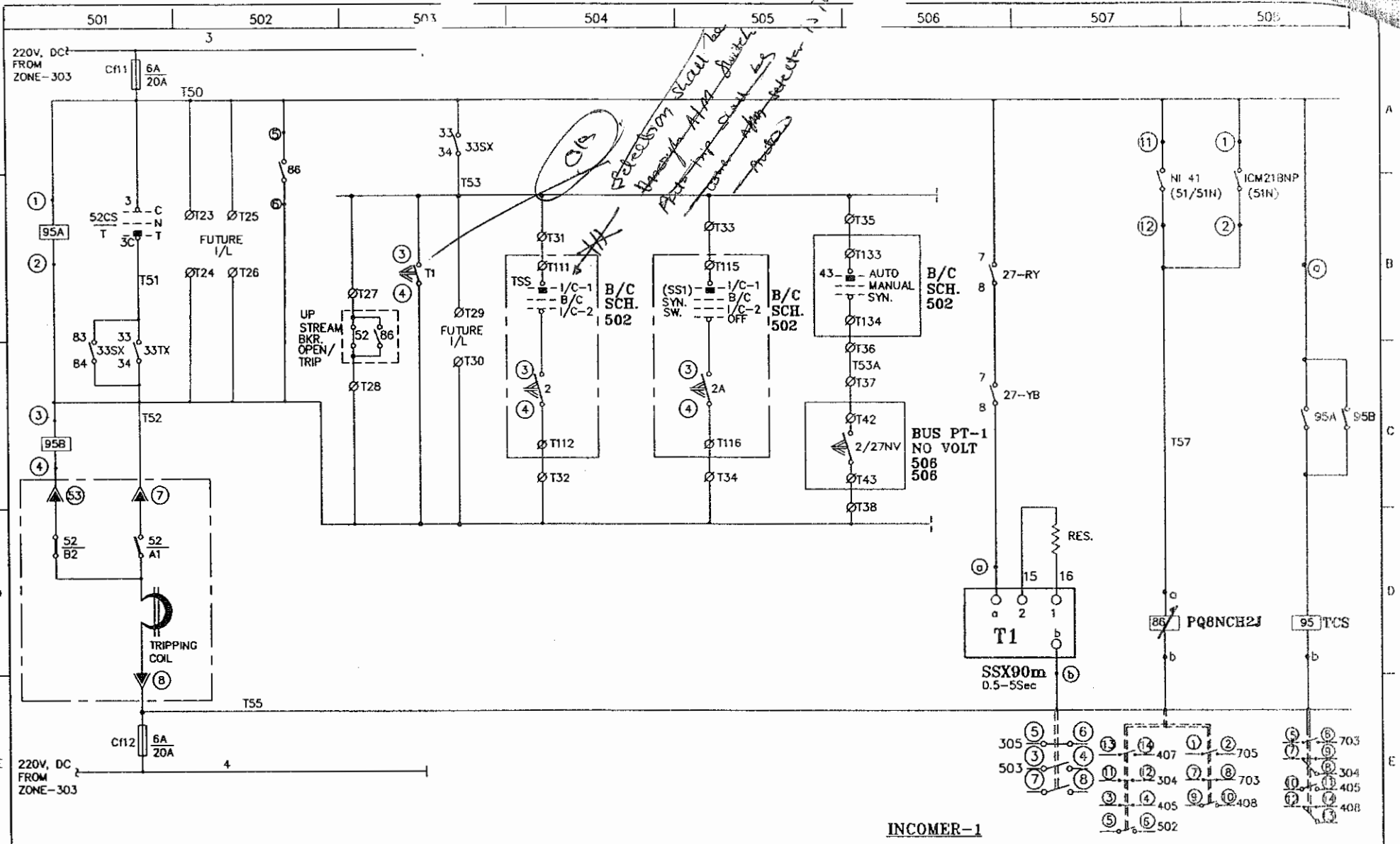


INCOMER-1

BREAKER CONTACT MULTIPLICATION			INDICATION		
REV.	I-	II-	III-	IV-	
Drawn	Date: 03.05.08 Name: SHAHID	PROJECT: GIPCL SLPP-11 (UNIT 3&4), 2X125MW		Client: - BHEL-RANIPET	DRG. NO. BHEL/J2434/501
Checked		CONSULTANT:- TATA CONSULTING ENGINEERING		Work: - INCOMER-1	REV. 0
Approved		 CONTROLS & SWITCHGEAR COMPANY LTD. C-59 NODA PHASE-II, NODA-201305 DIST. GAUTAM BUDDH NAGAR (U.P.) FORMAT No. : QAF-04/04		Details: SCHEMATIC/WIRING DIAGRAM	SCALE: NTS
				Order No.: 4281049 DT. 09.04.08	SHEET NO. 05 NO. OF SHEET 08

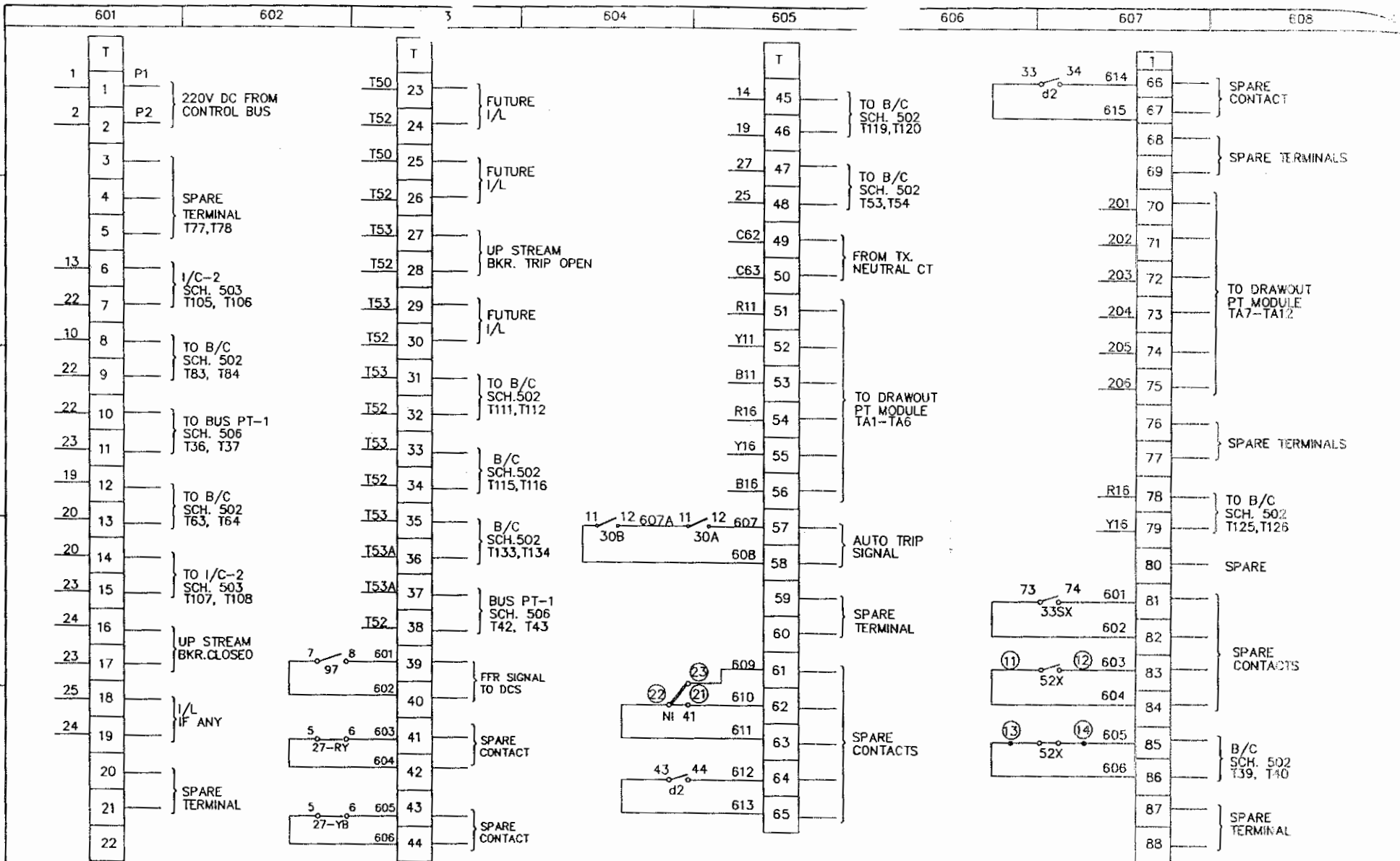


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REV.		I-	II-	III-	IV-
Drawn	Date	Name	PROJECT:		Client: -
Checked	03.05.08	SHAHID	GIPCL SLPP-11 (UNIT 3&4), 2X125MW		BHEL-RANIPET
Approved			CONSULTANT:-		Work: -
			TATA CONSULTING ENGINEERING		INCOMER-1
					DRG. NO.
			CONTROLS & SWITCHGEAR COMPANY LTD. C-59 NOIDA PHASE-II, NOIDA-201305 DISTT. GAUTAM BUDDH NAGAR (U.P.) FORMAT No. : QAF-04/04		BHEL/J2434/501
			Details: SCHEMATIC/WIRING DIAGRAM Order No.: 4281049 DT. 09.04.08		REV.
			SCALE: NTS SHEET NO. 08 NO. OF SHEET 08		0

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**TERMINAL DETAIL**

**INCOMER-1**

REV.	I-	II-	III-	IV-
Drawn	Date: 03.05.08	Name: SHAHID	PROJECT: GIPCL SLPP-11 (UNIT 3&4), 2X125MW	Client: - BHEL-RANIPET
Checked			CONSULTANT:- TATA CONSULTING ENGINEERING	Work: - INCOMER-1
Approved				Details: SCHEMATIC/WIRING DIAGRAM
				Order No.: 4281049 DT. 09.04.08
				DRG. NO. BHEL/J2434/501
				REV. 0
				SCALE: NTS
				SHEET NO. 07
				NO. OF SHEET 08

