Grid Solutions
A GE and Alstom joint venture

220kV/132kV GIS SUBSTATION GHAZI ROAD , LAHORE

132kV LINE CONTROL PANEL SCHEMATIC DRAWINGS

REFERENCE DRAWINGS		
SR. NO.	DRAWING TITLE	DOCUMENT NO.
1.	220kV / 132kV Metering & Protection SLD	P60194-E-SLMP-001

REVISION HISTORY					
REV	DATE	DRW. BY	CHK. BY	APR. BY	REVISION DESCRIPTION
0	19-10-2018	ASJ	MFT	NAH	AS BUILT

Scale: NOT-TO-SCALE	Sheet size: A3

Client: NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)

Contractor: Grid Solutions, A GE and Alstom joint venture	Manufacturer: EPESOL, 71-B Garden Block, New Garden Town, Lahore, Pakistan

Project: 220kV / 132kV GIS SUBSTATION GHAZI ROAD , LAHORE

Title: 132kV LINE CONTROL PANEL (=E06+CP31) SCHEMATIC DRAWINGS

Order no: P-60194	Document no: P60194-E-ELC-SC-004

Sheet type: A	Total sheets: 27	Sheet no: 1

DOC / DWG REVIEW CODE

- ☐ A Approved, Issue IFC.
- ☐ B Approved with comments as noted, Issue IFC after incorporation of these comments.
- ☐ C Revise and re-submit for approval.
- ☐ D Rejected.

Signed ..... Date .....

Permission to proceed does not constitute acceptance of approval of design details, analysers, test methods or materials/ selected by the CONTRACTOR and does not relieve the CONTRACTOR from full compliance with AGREEMENT obligations.

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PAGE NO.	SHEET NAME	SHEET DESCRIPTION	ISSUE / REVISION										
			A	B	C	D	E	F	01	02	03	04	05
01	A	COVER SHEET	X										
02	AA	LIST OF CONTENTS	X										
03	AB	SYMBOL AND LEGENDS	X										
04	AC1	COMPONENT LIST	X										
05	AC2	COMPONENT LIST	X										
06	AD	PANEL VIEW	X										
07	AE	SINGLE LINE DIAGRAM	X										
08	D	AC SUPPLY DISTRIBUTION CIRCUIT	X										
09	E	DC SUPPLY DISTRIBUTION CIRCUIT	X										
10	F	DC SUPPLY FAILURE ALARM CIRCUIT	X										
11	G	METERING	X										
12	H1	CB CONTROL CIRCUIT	X										
13	H2	CB CONTROL CIRCUIT	X										
14	I1	DISCONNECTOR & EARTH SWITCH CONTROL	X										
15	I2	DISCONNECTOR & EARTH SWITCH CONTROL	X										
16	K1	DISCONNECTOR CONTACT MULTIPLICATION	X										
17	NA1	ALARM MULTIPLICATION	X										
18	NA2	DISCREPANCY INITIATION	X										
19	NA3	DISCREPANCY INITIATION	X										
20	NA4	DISCREPANCY INITIATION	X										
21	NA5	DISCREPANCY INDICATIONS	X										
22	RA1	ANNUNCIATOR-1 CIRCUIT	X										
23	RA2	ANNUNCIATOR-2 CIRCUIT	X										
24	RA3	ANNUNCIATOR-3 CIRCUIT	X										
25	RA4	ANNUNCIATOR-4 CIRCUIT	X										
26	RA5	SCADA & ER SIGNALS	X										
27	Z1	COMPONENT DIAGRAM	X										

REV.	DESCRIPTION	DATE	DRAWER
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Client: NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)

Project: 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE

Title: 132kV LINE CONTROL PANEL (=E06+CP31) LIST OF CONTANTS

Drawing no. P60194-E-ELC-SC-004

Project no.	Sheet type	Sheet no.
P-60194	AA	02

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	CIRCUIT BREAKER		MINIATURE CIRCUIT BREAKER		AUXILIARY CONTACTOR NO+NC	21	DISTANCE
	SWITCH/ISOLATOR		SELECTOR SWITCH	A	AMMETER	24	OVEREXCITATION
	EARTHING		LIMITED SWITCH	V	VOLTMETER	25	SYCHROCHECK
	GIS TERMINATION	A1 <& A2	HUMIDITY & TEMPERATURE CONTROLLER	PF	POWER FACTOR METER	49	THERMAL OVERLOAD
	SF6 TO AIR BUSHING		PANEL HEATER	DPM	DIGITAL PANEL METER	50/51	PHASE OVERCURRENT
	LINE TRAP	PH N	THREE PIN SOCKET	MW	ACTIVE POWER METER	50N/51N	EARTH FAULT
	SURGE ARRESTOR		INDICATION LIGHT	MVAR	REACTIVE POWER METER	50BF	CIRCUIT BREAKER FAILURE
	CURRENT TRANSFORMER		PUSH BUTTON	KWH	ENERGY METER	64	RESTRICTED EARTH FAULT
W1 W2	COUPLING CAPACITOR VOLTAGE TRANSFORMER		AUXILIARY CONTACTOR COIL			67N	DIRECTIONAL EARTH FAULT
	POWER TRANSFORMER	~ =	POWER SUPPLY AC/DC			68	POWER SWING BLOCKING
	AUTO TRANSFORMER		TERMINAL			78	OUT OF STEP
			OPTO CONTACTS			79	AUTO-RECLOSING
			RELAY CONTACTS			85	COMMUNICATION FAILURE
			HOOTER			87T	TRAFO DIFFERENTIAL
			AC BELL			87C	LOW IMPEDANCE DIFFERENTIAL CONNECTION
						87BB	LOW IMPEDANCE DIFFERENTIAL BUSBAR

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Title: 132kV LINE CONTROL PANEL (=E06+CP31) SYMBOL AND LEGENDS

Drawing no. P60194-E-ELC-SC-004

Project no.	Sheet type	Sheet no.
P-60194	AB	03

QTY.	DEVICE DESCRIPTION	DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS	DEVICE DESIGNITION	MANUFACTURER
01	MWH+MVARH METER	THREE PHASE FOUR WIRE STATIC ENERGY METER, CLASS 0.2, PT RATIO: 132/0.11 kV (L-L),	-P11	ISKRAEMECO
		CT RATIO 400:800:1600/1A , MODEL: MT860S-A22R36S33-E12-L21-M3K03-Z7		
02	ANALOG AMMETER	METER: TRANSDUCER OPERATED DIGITAL AMPERE METER, INPUT 0...20/30 mA, ACCURACY CLASS 1,	-Q1 , -Q3	FRER
		SCALE_1: 0...400/600A, SCALE_2: 0...800/1200A, SCALE_3: 0...1600/2400A. , AUX. VOLTAGE 110 VDC.		
02	CURRENT TRANSDUCER	CURRENT TRANSDUCER: 1-INPUT, 2-OUTPUT, NOMINAL INPUT CURRENT 1/1.5A, OUTPUT1: 0...20/30mA,	-U1, -U3	FRER
		OUTPUT2: 0...20/30mA, AUXILIARY VOLTAGE 110 VDC, ACCURACY CLASS 1, CT RATIO 400:800:1600/1A		
		ORD: A96MMA + MCOEAQ		
01	DIGITAL AMMETER	METER: TRANSDUCER OPERATED DIGITAL AMPERE METER, INPUT 0...20/30 mA, ACCURACY CLASS 1,	-Q2	FRER
		SCALE_1: 0...400/600A, SCALE_2: 0...800/1200A, SCALE_3: 0...1600/2400A. , AUX. VOLTAGE 110 VDC.		
02	CURRENT TRANSDUCER	CURRENT TRANSDUCER: 1-INPUT, 2-OUTPUT, NOMINAL INPUT CURRENT 1/1.5A, OUTPUT1: 0...20/30mA,	-U2, -U12	FRER
		OUTPUT2: 0...20/30mA, AUXILIARY VOLTAGE 110 VDC, ACCURACY CLASS 1, CT RATIO 400:800:1600/1A		
		ORD: D96MMA + MCOEAQ		
01	ANALOG REAL POWER (MW) METER	METER: 240 DEGREE TRANSDUCER OPERATED ANALOGUE MW METER, INPUT -12.5/10...0...+10/12.5 mA,	-Q5	FRER
	Application: 3PH+4W Balanced System	ACCURACY CLASS 1, SCALE_1: 125/100-0-100/125 MW (91.5 MW at 20mA),		
		SCALE_2: 250/200-0-200/250 MW (183 MW at 20mA), SCALE_3: 500/400-0-400/500 MW (366 MW at 20mA).		
		ORD: A96MMA		
01	ANALOG REACTIVE POWER (MVAR) METER	METER: 240 DEGREE TRANSDUCER OPERATED ANALOGUE MVAR METER, INPUT -12.5/10...0...+10/12.5 mA,	-Q6	FRER
	Application: 3PH+4W Balanced System	ACCURACY CLASS 1, SCALE_1: 125/100-0-100/125 MVAR (91.5 MVAR at 20mA),		
		SCALE_2: 250/200-0-200/250 MVAR (183 MVAR at 20mA), SCALE_3: 500/400-0-400/500 MVAR (366 MVAR at 20mA).		
		ORD: A96MMA		
01	PROGRAMMABLE UNIVERSAL TRANSDUCER	TRANSDUCER: 3-PHASE, 4-WIRE BALANCED LOAD, 4 PROGRAMMABLE DC mA OUTPUTS.	-U5	FRER
	(for MW and MVAR meters)	NOMINAL INPUT VOLTAGE 110/137.5 VAC(L-L), NOMINAL INPUT CURRENT 1/1.25A,		
		AUXILIARY VOLTAGE 110 VDC, ACCURACY CLASS 1, OUTPUT1 to OUTPUT4: -12.5/10...0...+10/12.5 mA,		
		PT RATIO: 132/0.11 kV (L-L), CT RATIO 400:800:1600/1A. ORD: MCOUP4		
01	DIGITAL POWER METER	THREE PHASE DIGITAL POWER METER, ACCURACY CLASS 0.5s, INPUT NOMINAL CURRENT,	-Q7	ENERDIS
		1/5A, INPUT NOMINAL VOLTAGE 110 VAC (L-L), AUXILIARY VOLTAGE 110-375 VDC.		
		ORD: ENERIUM 150		
03	ANNUNCIATOR	TWELVE WINDOW ANNUNCIATOR, RATED VOLTAGE 110 VDC, ORD: AM-101	-H101, -H102, -H103	ELABS
01	ANNUNCIATOR	TWELVE WINDOW ANNUNCIATOR, RATED VOLTAGE 240 VAC, ORD: AM-101	-H106	ELABS
01	PUSH BUTTON - LAMP TEST	TYPE: SWITCH (A TYPE:), COLOR : BLACK , SUPPLY : 120VDC, Ord: YS-AP1-2-31-B-D-W	-S21	YONGSUNG
01	PUSH BUTTON - ALARM ACKNOWLEDGMENT	TYPE: SWITCH (A TYPE:), COLOR : RED , SUPPLY : 120VDC, Ord: YS-AP1-2-31-R-D-W	-S22	YONGSUNG

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Project: 220kV/132kV GIS SUBSTATION, GHAZI ROAD, LAHORE

Title: 132kV LINE CONTROL PANEL (=E06+CP31) COMPONENT LIST

Drawing no. P60194-E-ELC-SC-004

Project no.	Sheet type	Sheet no.
P-60194	AC1	04

QTY.	DEVICE DESCRIPTION	DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS	DEVICE DESIGNITION	MANUFACTURER
01	PUSH BUTTON - ALARM RESET	TYPE: SWITCH(A TYPE:), COLOR : GREEN , SUPPLY : 120VDC, Ord: YS-AP1-2-31-G-D-W	-S23	YONGSUNG
01	SELECTOR SWITCH - OPERATION (LOCAL-OFF-SCADA)	3-POSITION (STATION-OFF-SCADA), 110VDC, KEYLOCKABLE TYPE, ORD: YS-AK-2-3-44-D	-S101	YONGSUNG
61	AUXILIARY CONTACTOR	COIL VOLTAGE: 110VDC, 4 C/O CONTACTS, ORD: PRC4M40DCJL	-K0E, -K50, -K0A, -KDC-1, -K1, -K2, -K9, -K0, -K11 TO -K21,	GE
			-K24 TO -K33, -K35, -K42 TO -K46, -K59	
			-K0OFF, -K0ON, -K0D, -K1OFF, -K1ON, -K1D,	
			-K2OFF, -K2ON, -K2D, -K9OFF, -K9ON, -K9D,	
			-K51OFF, -K51ON, -K51D, -K53OFF, -K53ON, -K53D,	
			-K8OFF, -K8ON, -K8D,-KDC-2, -KS21, -K111, -K222	
01	AUXILIARY CONTACTOR - SUPPLY CHANGEOVER	COIL VOLTAGE: 110VDC, 3 NO + 3 NC CONTACTS, ORD: MCRC022ATWJ-B+MARN211AT	-KDC	GE
03	AUXILIARY CONTACTOR	COIL VOLTAGE:: 240VAC, 4 C/O CONTACTS, ORD: PRC4M40ANL	-KAMC, -K7, -K8	GE
01	CONTROL DISCREPANCY SWITCH - CIRCUIT BREAKER	CONTROL AND DISCREPANCY SWITCH FOR ISOLATOR CONTROL AND INDICATION, SQUARE	-S0	YONGSUNG
		TYPE FOUR CONTACTS FOR COMMAND AND FOUR CONTACTS FOR INDICATION		
06	CONTROL DISCREPANCY SWITCH - ISOLATORS & EARTHING SW.	CONTROL AND DISCREPANCY SWITCH FOR ISOLATOR CONTROL AND INDICATION, ROUND	-S1, -S2, -S9, -S51, -S53, -S8	YONGSUNG
		TYPE FOUR CONTACTS FOR COMMAND AND FOUR CONTACTS FOR INDICATION		
		ORD:YS-IC-4456-R4(49)-PM-K-G-D11-G		
01	FLASHER RELAY	FLASHER RELAY, COIL VOLTAGE 110 VDC, ORD: FR-101-110	-K51	ELABS
02	TEST BLOCK	YS-CTT-04-S, YS-PTT-04-S	-XTB1, -XTB2	YONGSUNG
02	INDICATION LIGHT - AC AND DC SUPPLY	TYPE: LED , COLOR : RED , SUPPLY : 240VAC ORD: YS-PL-2-AL-22-R-W	-H7, -H8	YONGSUNG
01	OPERATION COUNTER	OPERATION COUNTER FOR CIRCUIT BREAKER, RATED VOLTAGE 110VDC	-Q10	ELABS
02	CONTROL MCB - PANEL LIGHT & HEATER	2-Pole, Ratings: 2A, 240VAC, 6kA @ 240VAC, 2 C/O Contacts, Ord: G62C02+CAH(2)	-F101, -F102	GE
01	CONTROL ELCB - PANEL SOCKET	2-Pole, Ratings: 16A, 30mA, 240VAC, 1P+N, 2 C/O Contacts, Ord: DM100C16/030+CAH(2)	-F103	GE
02	CONTROL MCB - DC DISTRIBUTION	2-Pole, Ratings: 4A, 250VDC, 10kA @ 250VDC, 2 C/O Contacts, Ord: EP102UCC04+CAH(2)	-F201,-F202	GE
01	PANEL LIGHT	230VAC @ 50Hz, 05W, Ord: YS-T8-30-5W	-H100	YONGSUNG
01	DOOR SWITCH	230VAC @ 50Hz, 1 NO Contact, Ord: YS P3315GW-B + YS MS-C	-S100	YONGSUNG
01	THREE PIN SOCKET	1N+PE, 16A, 230VAC @ 50Hz	-X100	LOCAL

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Contractor: Grid Solutions, A GE and Alstom joint venture

Client: NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)

Project: 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE

Title: 132kV LINE CONTROL PANEL (=E06+CP31) COMPONENT LIST

Drawing no. P60194-E-ELC-SC-004

Project no.	Sheet type	Sheet no.
P-60194	AC2	05

QTY.	DEVICE DESCRIPTION	DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS	DEVICE DESIGNITION	MANUFACTURER
01	PANEL HEATER	240VAC @ 50Hz, 50W	-R100	E-LABS
01	HUMIDITY & TEMPERATURE CONTROLLER	40-90%RH, 25-50 deg.C, 240VAC @ 50Hz	-B100	E-LABS
04	TERMINAL BLOCKS FOR AC SUPPLY	TYPE: CBD-4	-XAC	CABUR
02	TERMINAL BLOCKS FOR DC SUPPLY1	TYPE: CBD-4	-XDC-1	CABUR
02	TERMINAL BLOCKS FOR DC SUPPLY2	TYPE: CBD-4	-XDC-2	CABUR
16	TERMINAL BLOCKS FOR METERING	TYPE: CBD-4	-X3	CABUR
08	TERMINAL BLOCKS FOR CB CONTROL CIRCUIT	TYPE: CBD-4	-X4	CABUR
12	TERMINAL BLOCKS FOR CB CONTROL CIRCUIT	TYPE: CBD-4	-X5	CABUR
35	TERMINAL BLOCKS FOR DS+ES CONTACTOR MULTIPLICATION	TYPE: CBD-4	-X6	CABUR
08	TERMINAL BLOCKS FOR CB/DS CONTACTOR MULTIPLICATION	TYPE: CBD-4	-X7	CABUR
40	TERMINAL BLOCKS FOR AUXIALARY MULTIPLICATION	TYPE: CBD-4	-X8	CABUR
15	TERMINAL BLOCKS FOR DISCRIPANCY INICIATION	TYPE: CBD-4	-X9	
13	TERMINAL BLOCKS FOR ANNUNCIATOR-1	TYPE: CBD-4	-X11	CABUR
16	TERMINAL BLOCKS FOR ANNUNCIATOR-2	TYPE: CBD-4	-X12	CABUR
18	TERMINAL BLOCKS FOR ANNUNCIATOR-3	TYPE: CBD-4	-X13	CABUR
24	TERMINAL BLOCKS FOR ANNUNCIATOR-4	TYPE: CBD-4	-X14	CABUR
45	TERMINAL BLOCKS FOR EVENT RECORDER	TYPE: CBD-4	-XEV	CABUR
45	TERMINAL BLOCKS FOR SCADA	TYPE: CBD-4	-XSC	CABUR
30	TERMINAL BLOCKS FOR TRANSDUCER TO SCADA	TYPE: CBD-4	-XSA	CABUR
30	TERMINAL BLOCKS FOR SCADA	TYPE: CBD-4	-XSP	CABUR
08	TERMINAL BLOCKS FOR BELL AND HOOTER	TYPE: CBD-4	-XF	CABUR

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Title: 132kV LINE CONTROL PANEL (=E06+CP31) COMPONENT LIST

Drawing no. P60194-E-ELC-SC-004

Project no.	Sheet type	Sheet no.
P-60194	AC3	05a

QTY.	DEVICE DESCRIPTION	DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS	DEVICE DESIGNITION	MANUFACTURER
08	TERMINAL BLOCKS FOR METERING CT	TYPE: SCB-6	-X2	CABUR
07	TERMINAL BLOCKS WITH DIODE TYPE IN-D4007, RATED MAXIMUM VOLTAGE 350VDC, RATED BREAK DOWN VOLTAGE 430VDC	TYPE: DAS.4/6	-XD	CABUR

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Project no.	Sheet type	Sheet no.
P-60194	AC4	05b

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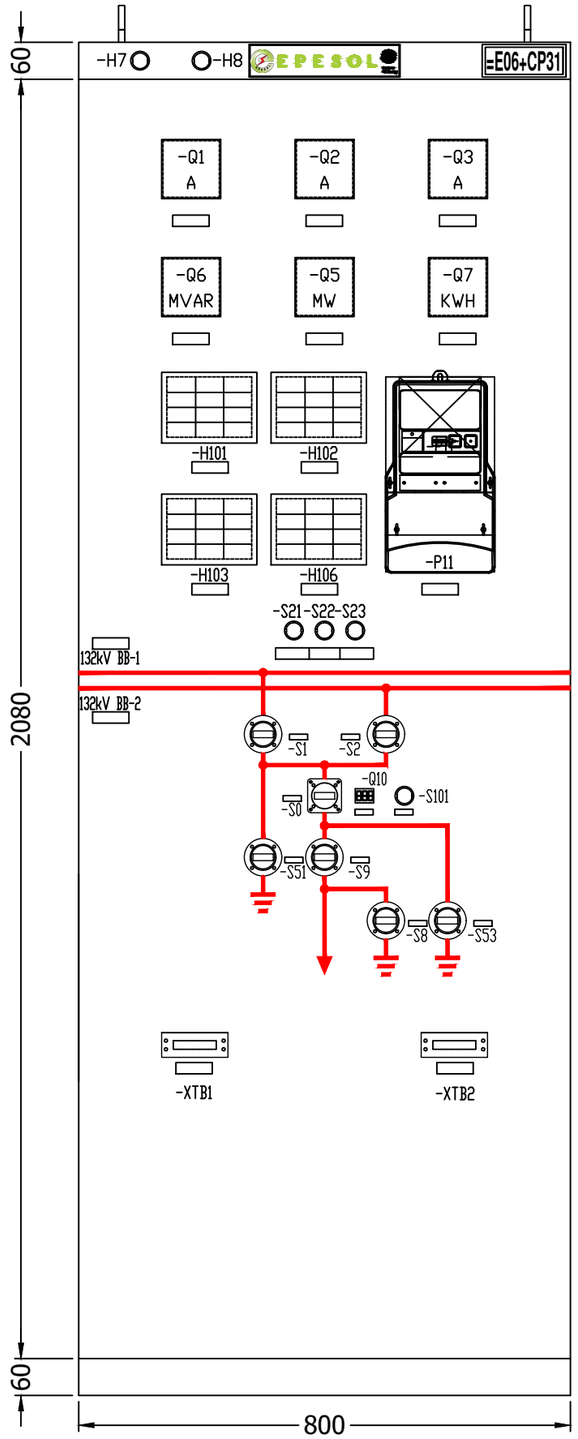
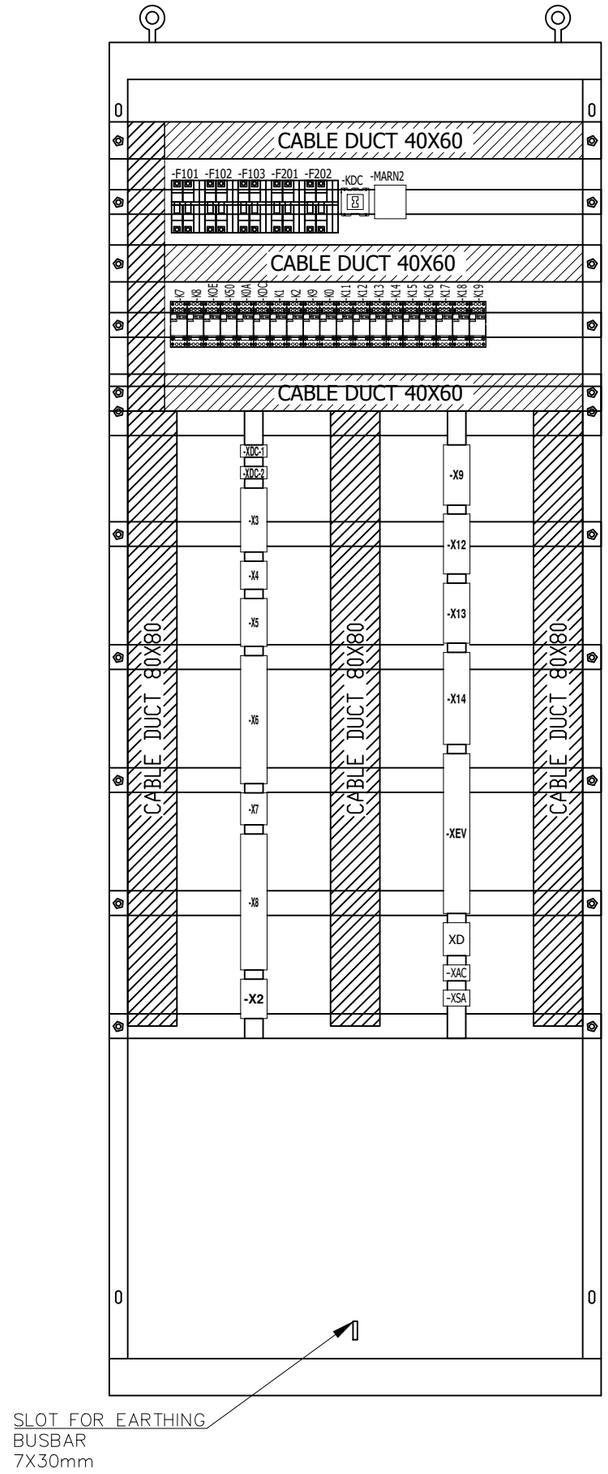
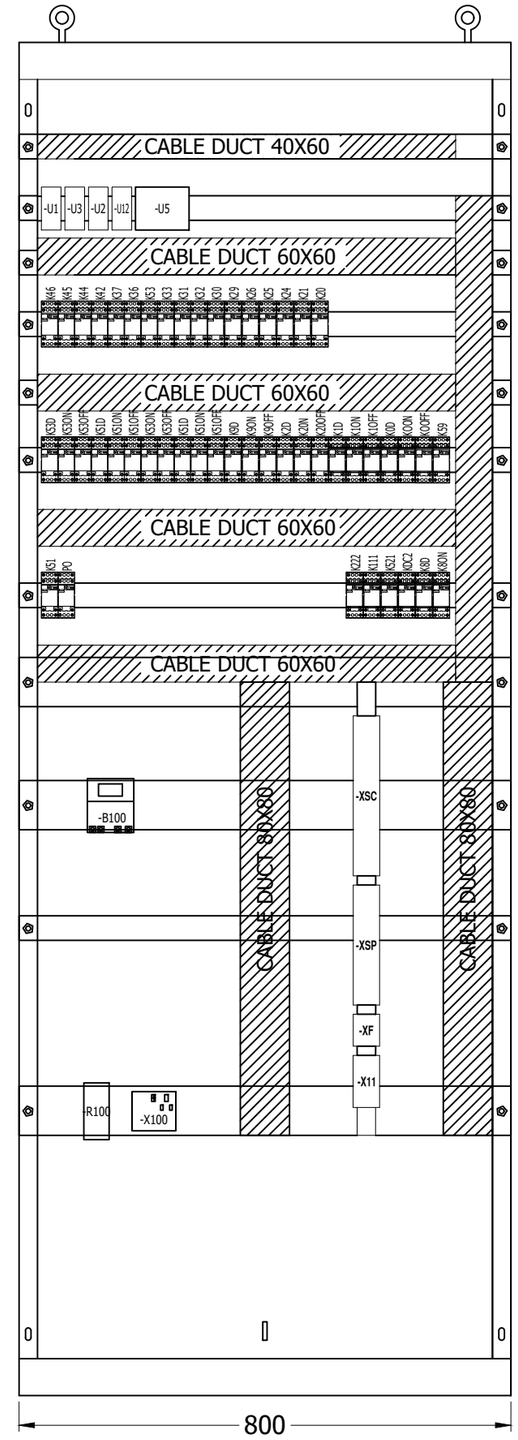
FRONT VIEW



LEFT SIDE VIEW



RIGHT SIDE VIEW



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Title: 132kV LINE CONTROL PANEL (=E06+CP31) PANEL VIEWS

Drawing no. P60194-E-ELC-SC-002

Project no.	Sheet type	Sheet no.
P-60194	AD	06

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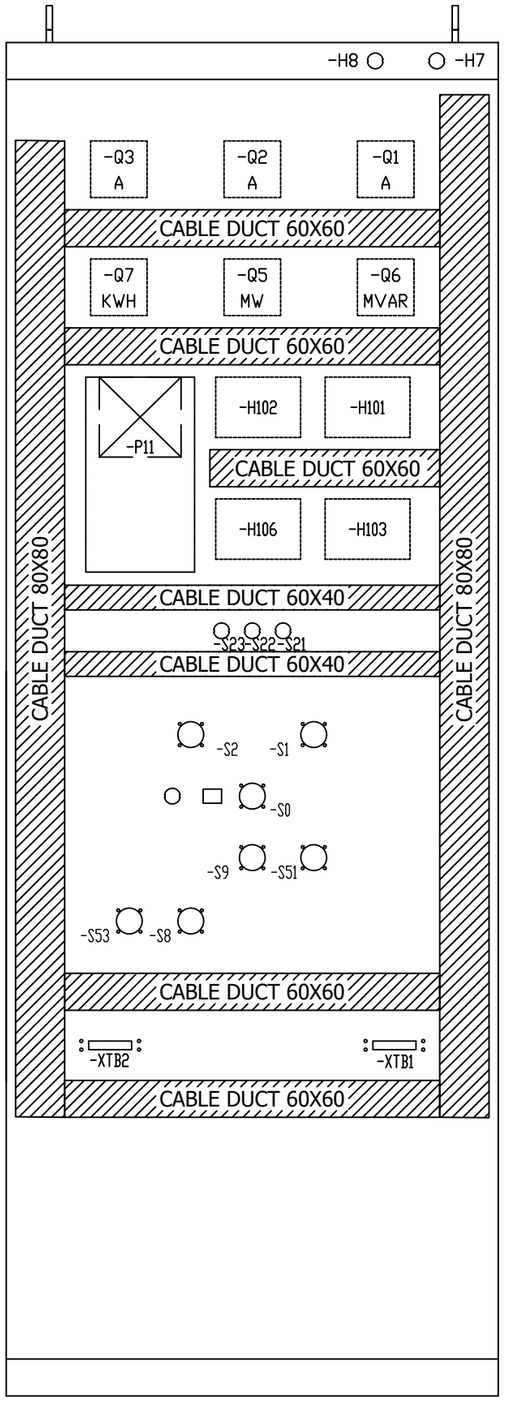
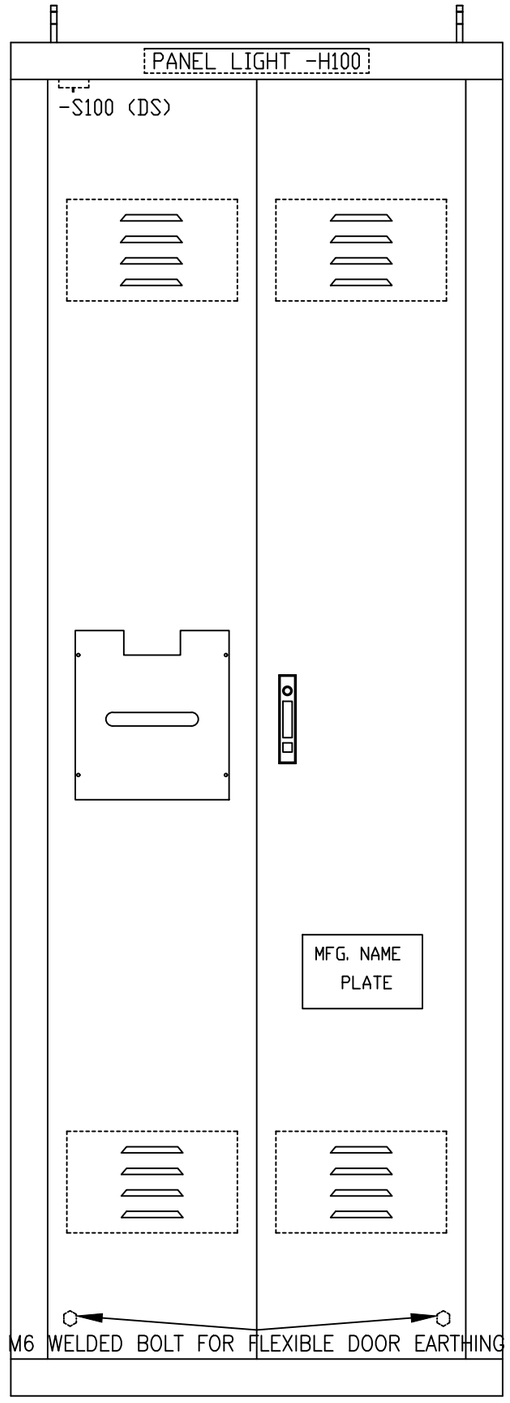
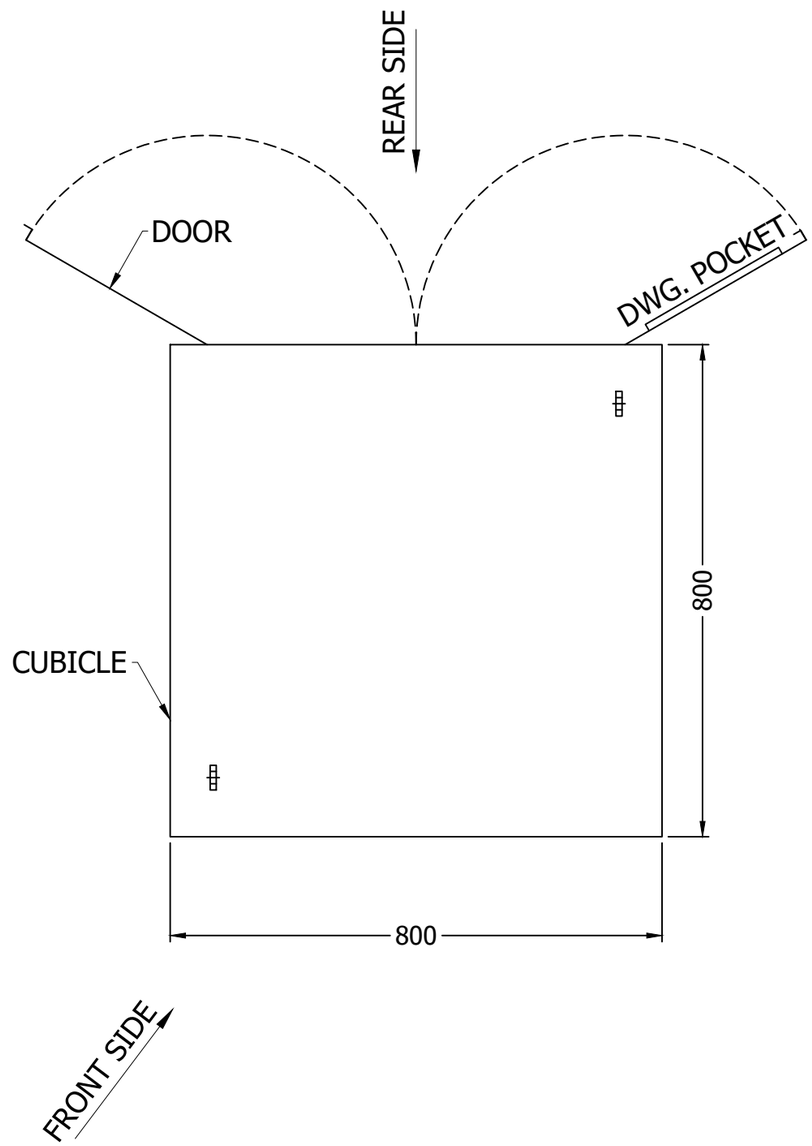
BACK VIEW WITHOUT DOOR



BACK VIEW WITH DOOR



TOP VIEW



NOTE:-

1 - PANEL DIMENSION: 800 x 800 x 2200mm (WxDxH)
2 - COLOR : RAL 7032
3 - SHEET THICKNESS : 2-2.5 mm
4- PROTECTION CLASS : IP-51 (INDOOR TYPE)
5 - ALL DOOR FITTED WITH 16mm EARTH STRAP & INSULATED WITH GREEN-YELLOW COLOUR.

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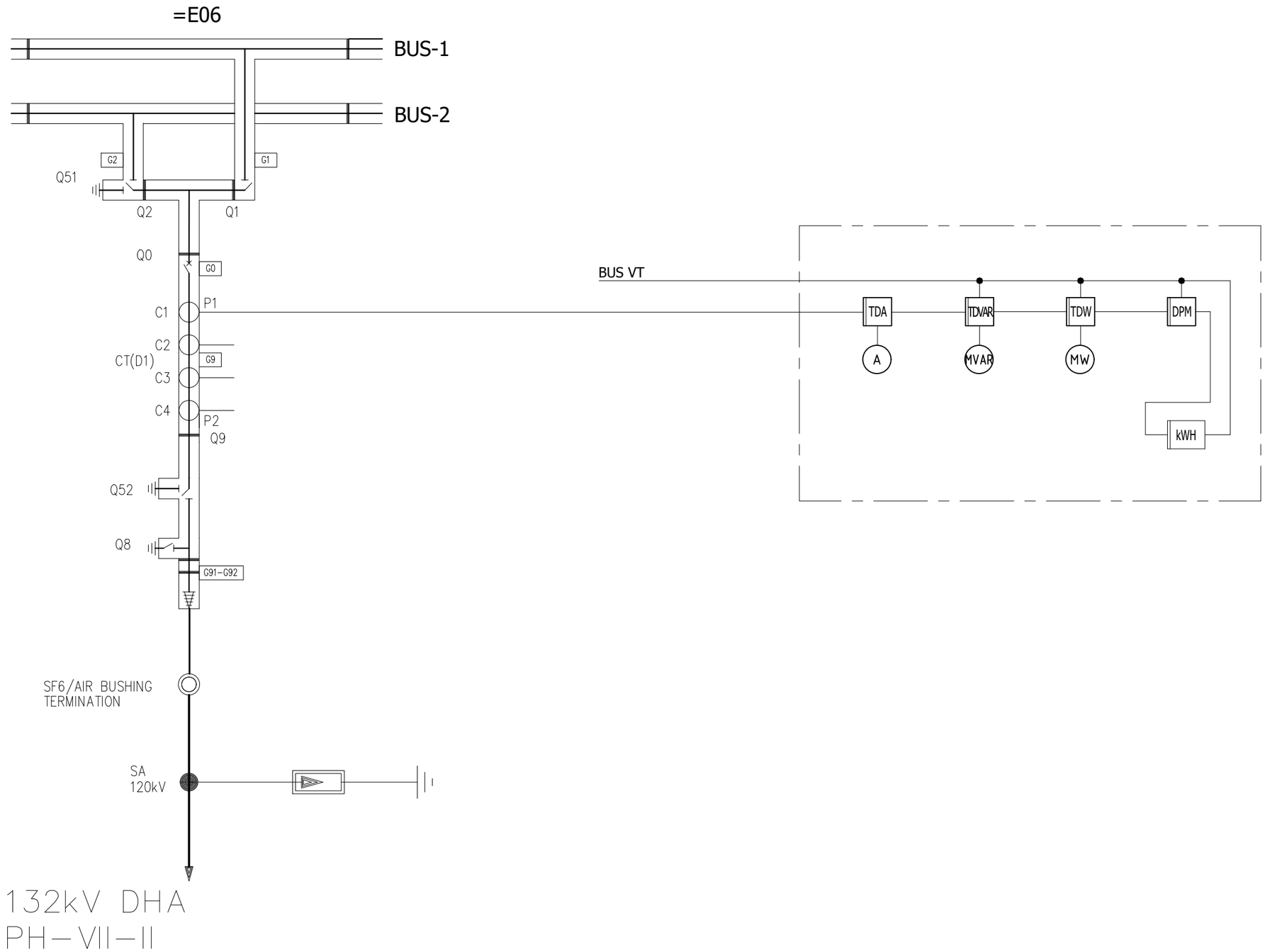
P-60194	AD	06



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Title: 132kV LINE CONTROL PANEL (=E06+CP31) SINGLE LINE DIAGRAM

Drawing no. P60194-E-ELC-SC-004

Project no.	Sheet type	Sheet no.
P-60194	AE	07

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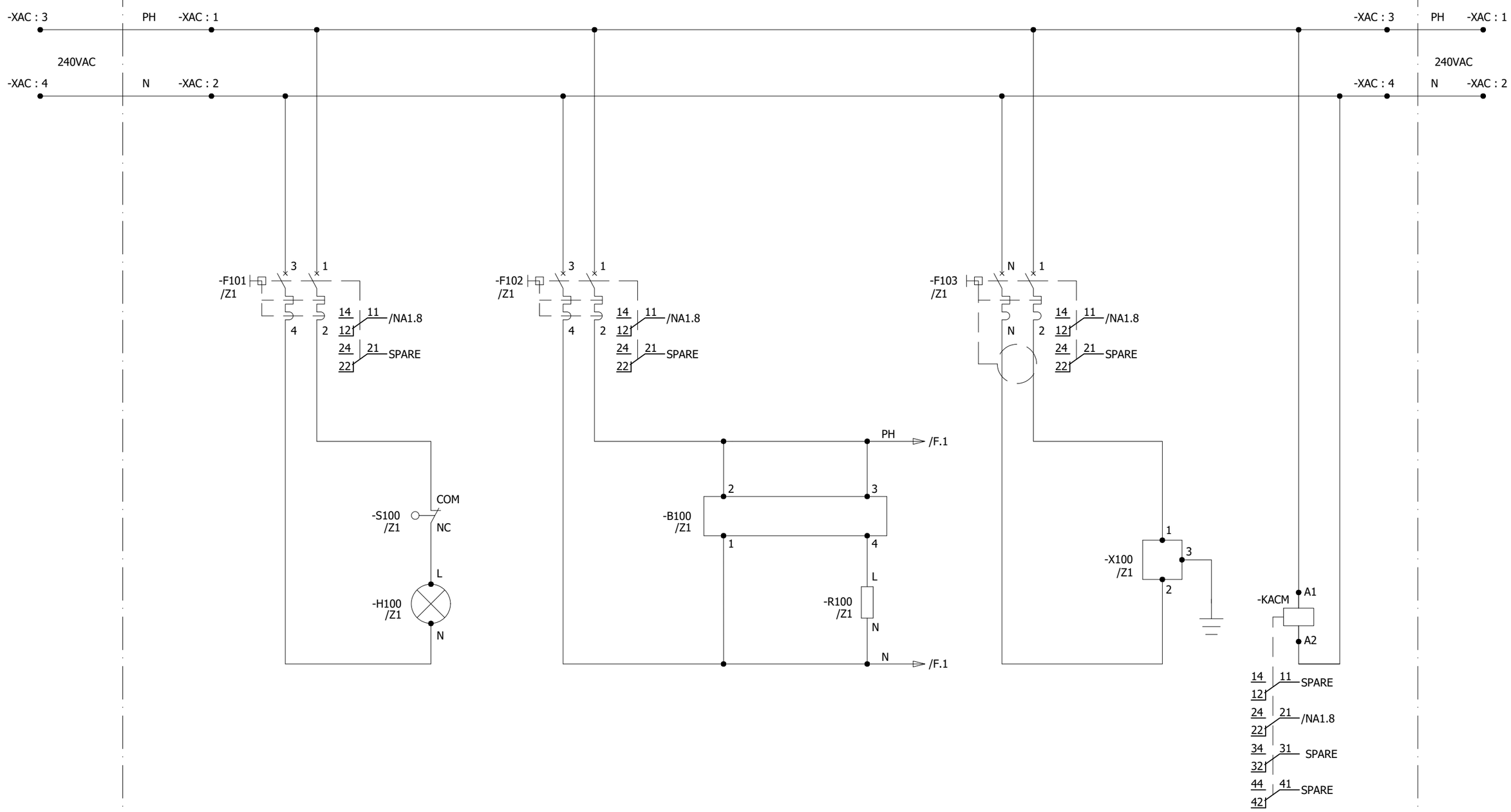
AC SUPPLY	CONTROL MCB	DOOR LIMIT SWITCH & PANEL LIGHT	CONTROL MCB	TEMPERATURE & HUMIDITY CONTROLLER	HEATING RESISTOR	CONTROL ELCB	POWER SOCKET	AC MONITORING AUXILIARY RELAY	AC SUPPLY
FROM =E04+CP31	-F101	-S100 & H100	-F102	-B100	-R100	-F103	-X100	-KACM	TO =E07+CP31



REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	19-10-2018	ASJ

Manufacturer: EPESOL, 71-B Garden Block, New Garden Town, Lahore, Pakistan

Contractor: Grid Solutions, A GE and Alstom joint venture

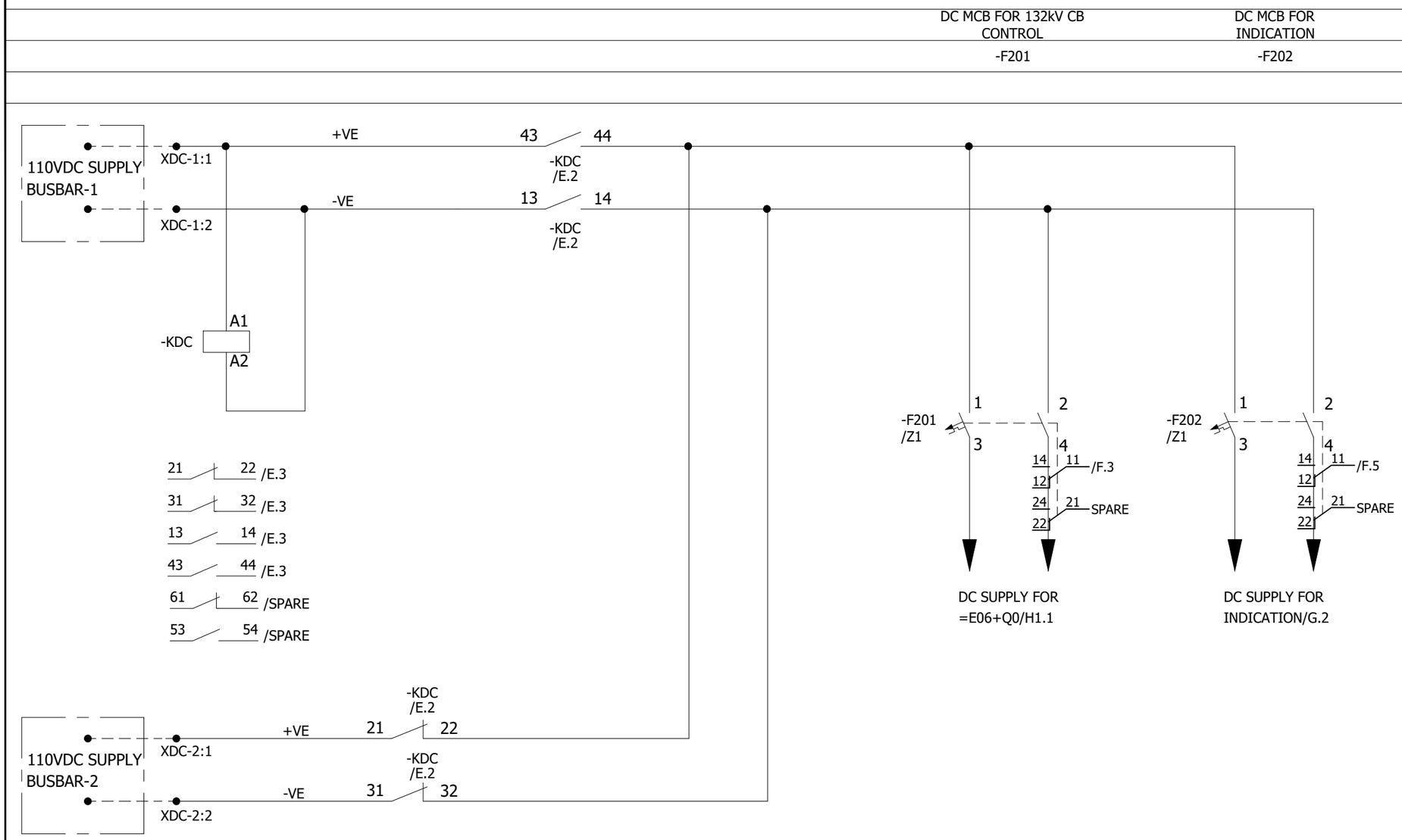
Client: NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)

Project: 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE

Title: 132kV LINE CONTROL PANEL (=E06+CP31) AC SUPPLY DISTRIBUTION CIRCUILT

Drawing no. P60194-E-ELC-SC-004

Project no.	Sheet type	Sheet no.
P-60194	D	08



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REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	19-10-2018	ASJ

Manufacturer: EPESOL, 71-B Garden Block, New Garden Town, Lahore, Pakistan

Contractor: Grid Solutions, A GE and Alstom joint venture

Client: NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)

Project: 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE

Title: 132kV LINE CONTROL PANEL (=E06+CP31) DC SUPPLY DISTRIBUTION CIRCUILT

Drawing no. P60194-E-ELC-SC-004

Project no.	Sheet type	Sheet no.
P-60194	E	09

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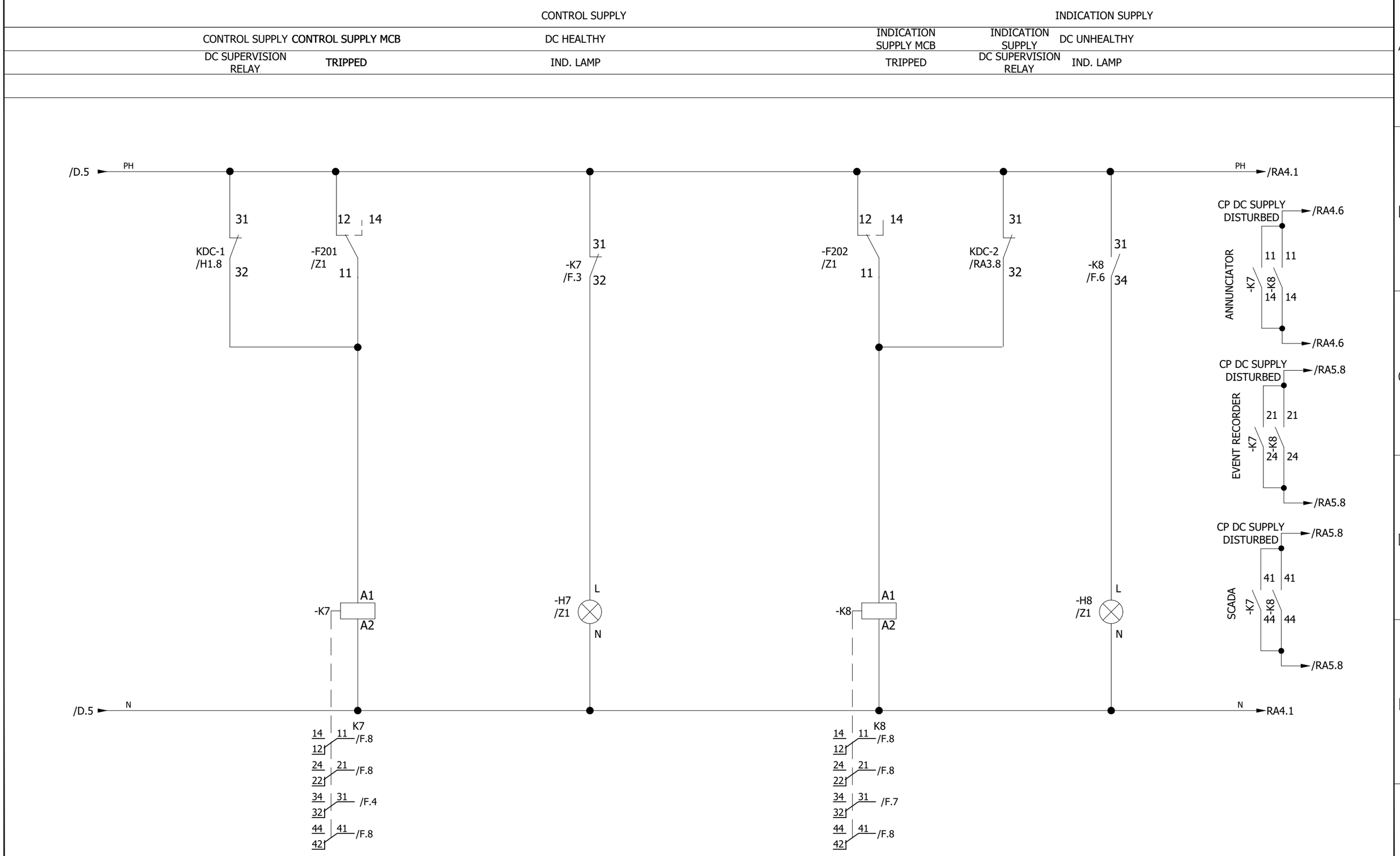

REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	19-10-2018	ASJ

Manufacturer: EPESOL, 71-B Garden Block, New Garden Town, Lahore, Pakistan

Contractor: Grid Solutions, A GE and Alstom joint venture

Client: NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)

Project: 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE

Title: 132kV LINE CONTROL PANEL (=E06+CP31) DC SUPPLY FAILURE ALARM CIRCUIT

Drawing no. P60194-E-ELC-SC-004

Project no.	Sheet type	Sheet no.
P-60194	F	10

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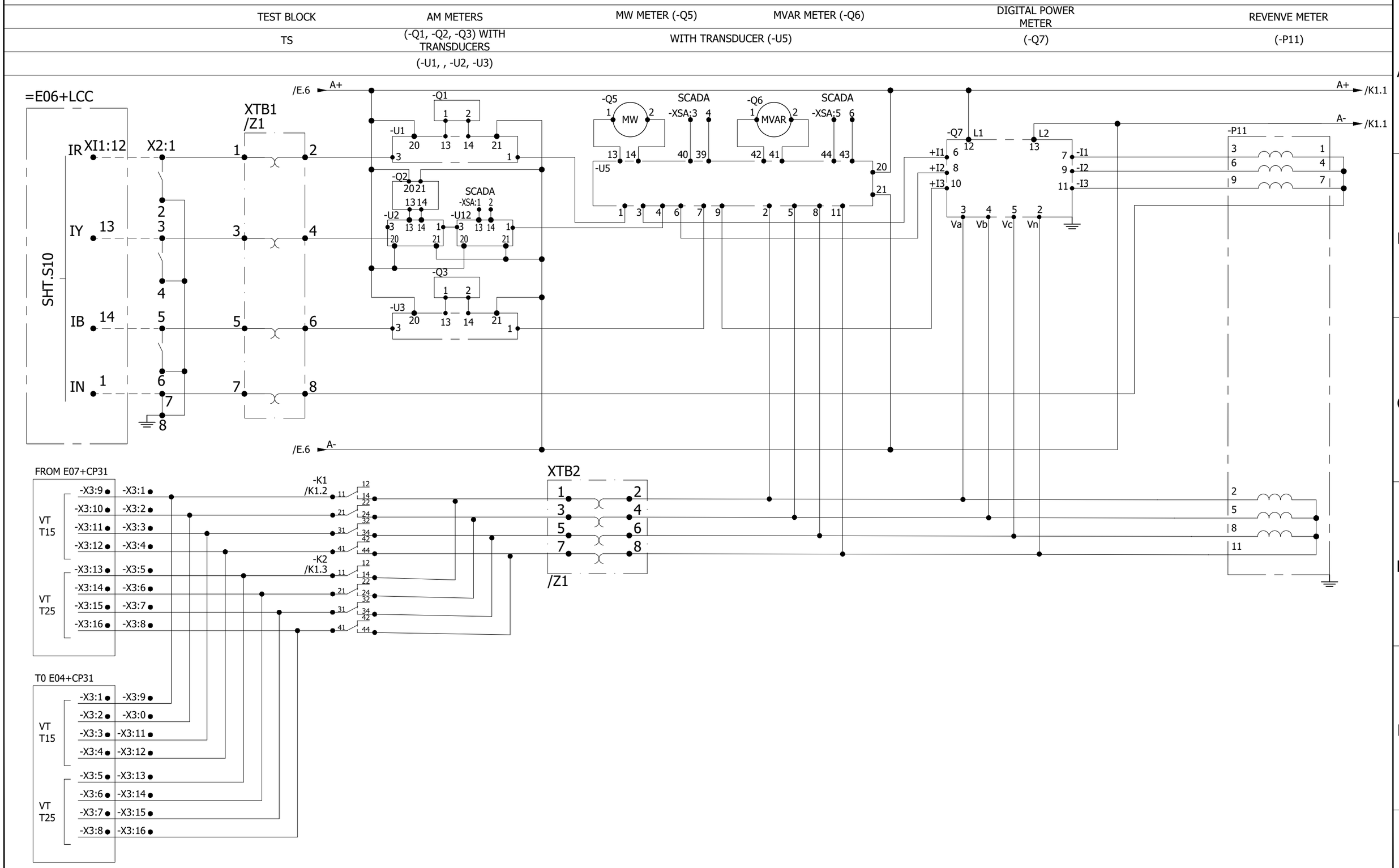

REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	19-10-2018	ASJ

Manufacturer: EPESOL, 71-B Garden Block, New Garden Town, Lahore, Pakistan

Contractor: Grid Solutions, A GE and Alstom joint venture

Client: NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)

Project: 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE

Title: 132kV LINE CONTROL PANEL (=E06+CP31) METERING

Drawing no. P60194-E-ELC-SC-004

Project no.	Sheet type	Sheet no.
P-60194	G	11

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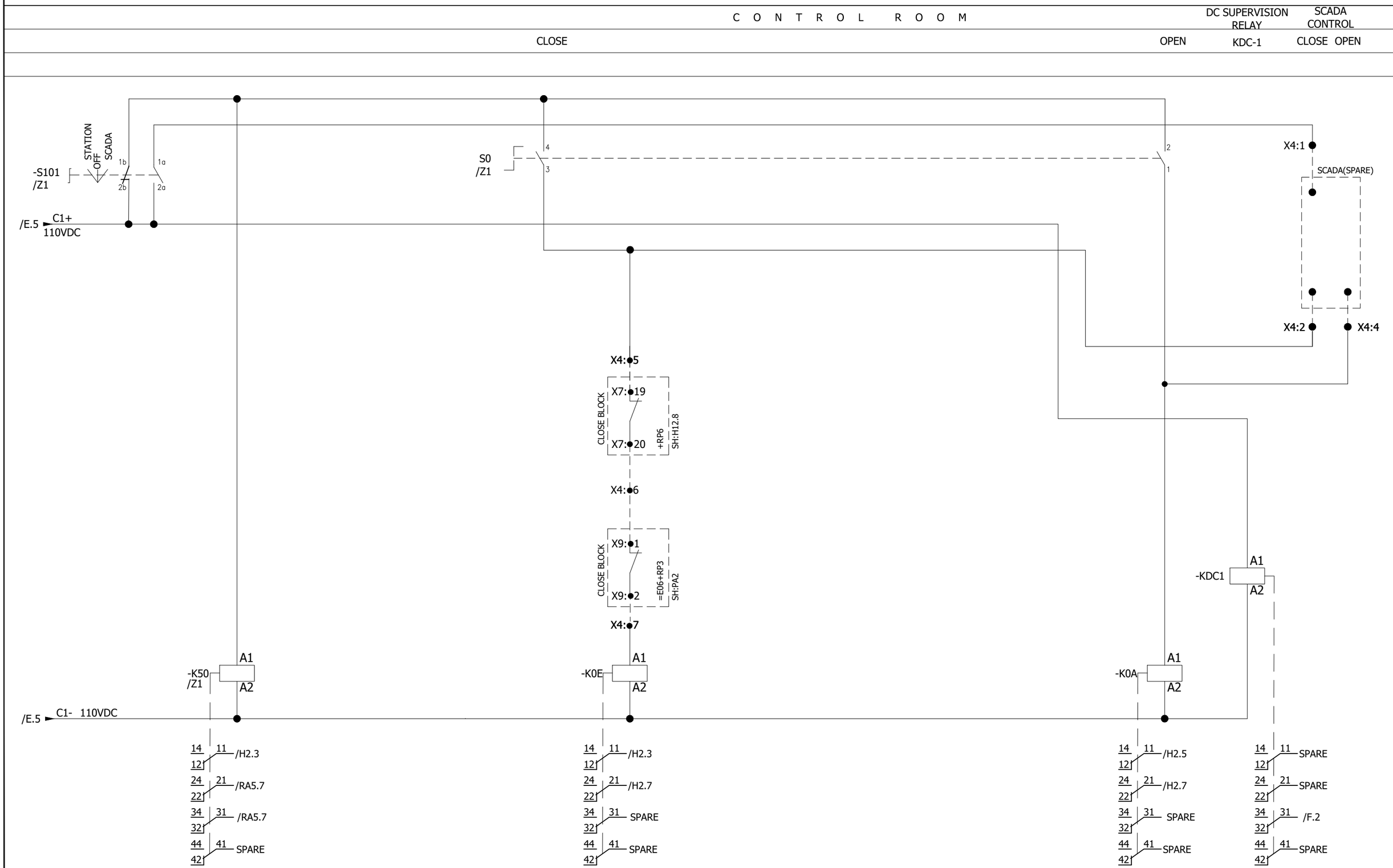

REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	19-10-2018	ASJ

Manufacturer: EPESOL, 71-B Garden Block, New Garden Town, Lahore, Pakistan

Contractor: Grid Solutions, A GE and Alstom joint venture

Client: NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)

Project: 220kV/132kV GIS SUBSTATION, GHAZI ROAD, LAHORE

Title: 132kV LINE CONTROL PANEL (=E06+CP31) CB CONTROL CIRCUIT

Drawing no. P60194-E-ELC-SC-004

Project no.	Sheet type	Sheet no.
P-60194	H1	12

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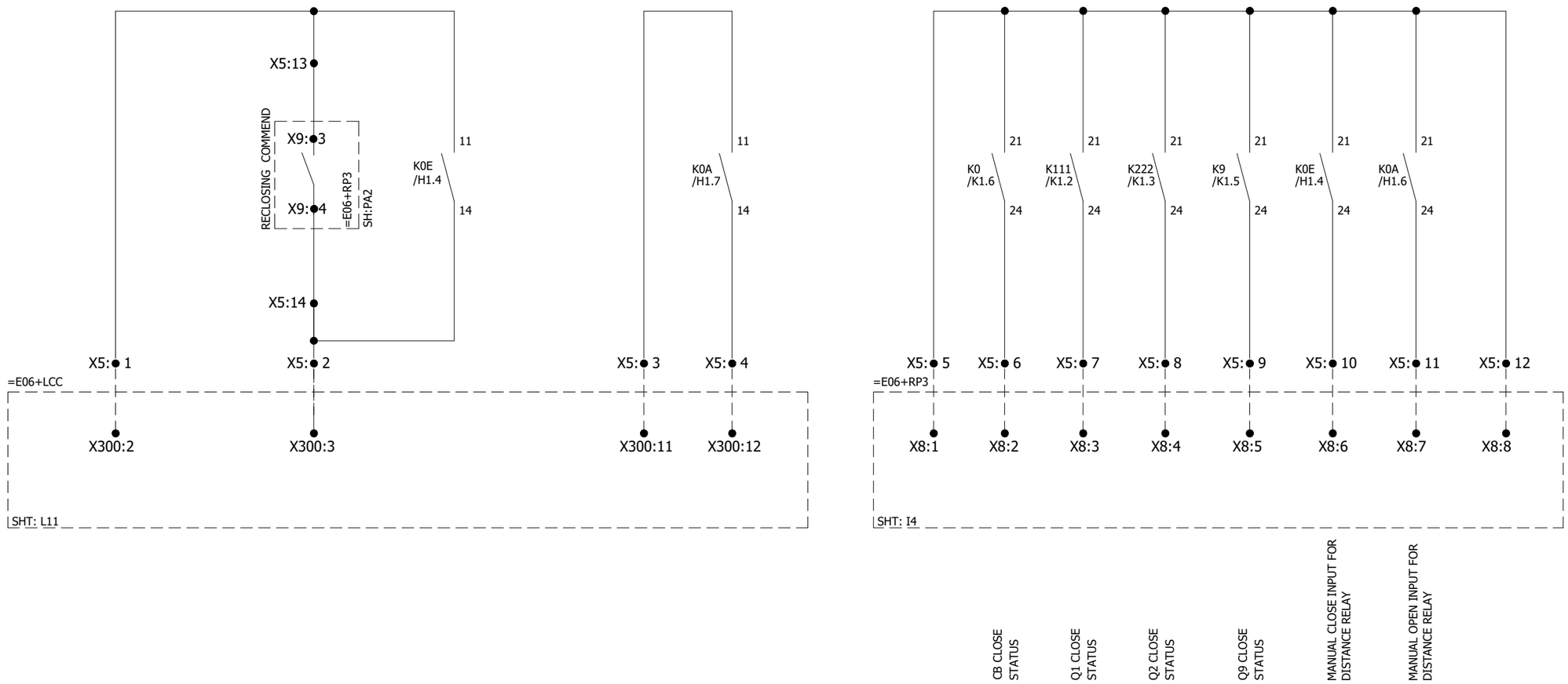
C O N T R O L R O O M C O N T R O L

AUTORECLOSE(SPARE) CLOSE OPEN



REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	19-10-2018	ASJ

Manufacturer: EPESOL, 71-B Garden Block, New Garden Town, Lahore, Pakistan

Contractor: Grid Solutions, A GE and Alstom joint venture

Client: NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)

Project: 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE

Title: 132kV LINE CONTROL PANEL (=E06+CP31) CB CONTROL CIRCUIT

Drawing no. P60194-E-ELC-SC-004

Project no.	Sheet type	Sheet no.
P-60194	H2	13

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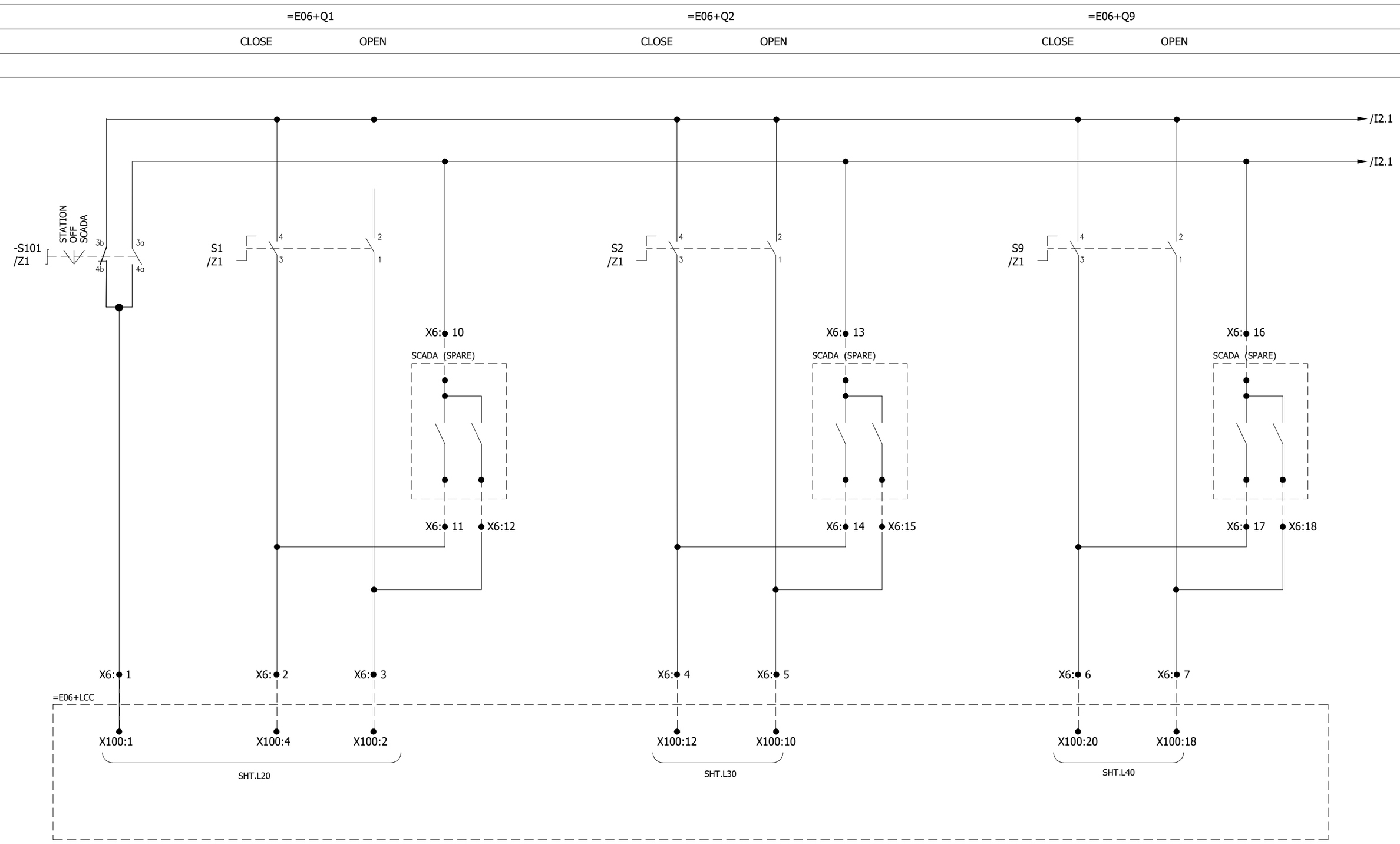

REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	19-10-2018	ASJ

Manufacturer: EPESOL, 71-B Garden Block, New Garden Town, Lahore, Pakistan

Contractor: Grid Solutions, A GE and Alstom joint venture

Client: NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)

Project: 220kV/132kV GIS SUBSTATION, GHAZI ROAD, LAHORE

Title: 132kV LINE CONTROL PANEL (=E06+CP31) DISCONNECTOR & EARTH SWITCH CONTROL

Drawing no. P60194-E-ELC-SC-004

Project no.	Sheet type	Sheet no.
P-60194	I1	14

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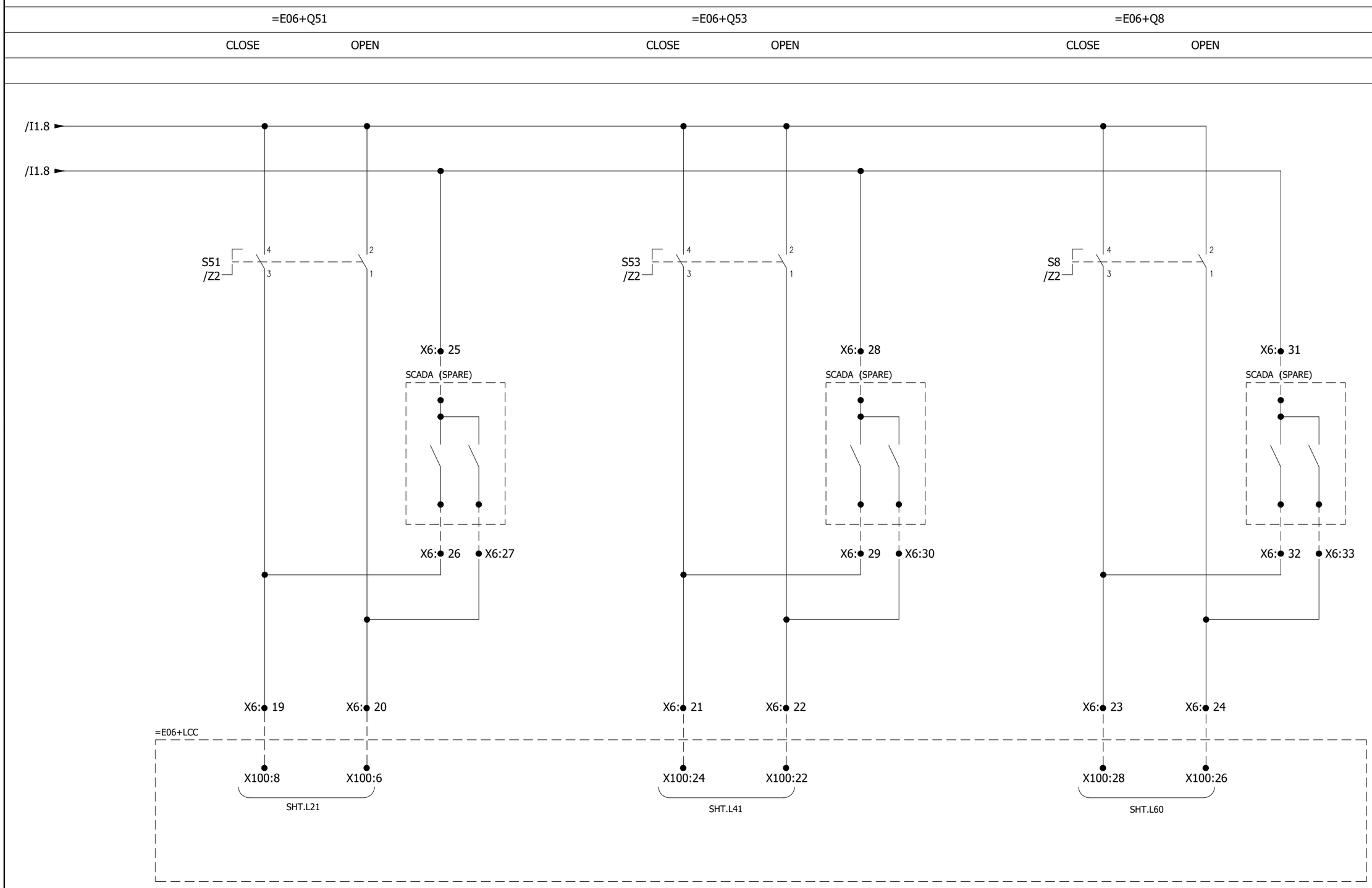

REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	19-10-2018	ASJ

Manufacturer: EPESOL, 71-B Garden Block, New Garden Town, Lahore, Pakistan

Contractor: Grid Solutions, A GE and Alstom joint venture

Client: NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)

Project: 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE

Title: 132kV LINE CONTROL PANEL (=E06+CP31) DISCONNECTOR & EARTH SWITCH CONTROL

Drawing no. P60194-E-ELC-SC-004

Project no.	Sheet type	Sheet no.
P-60194	I2	15

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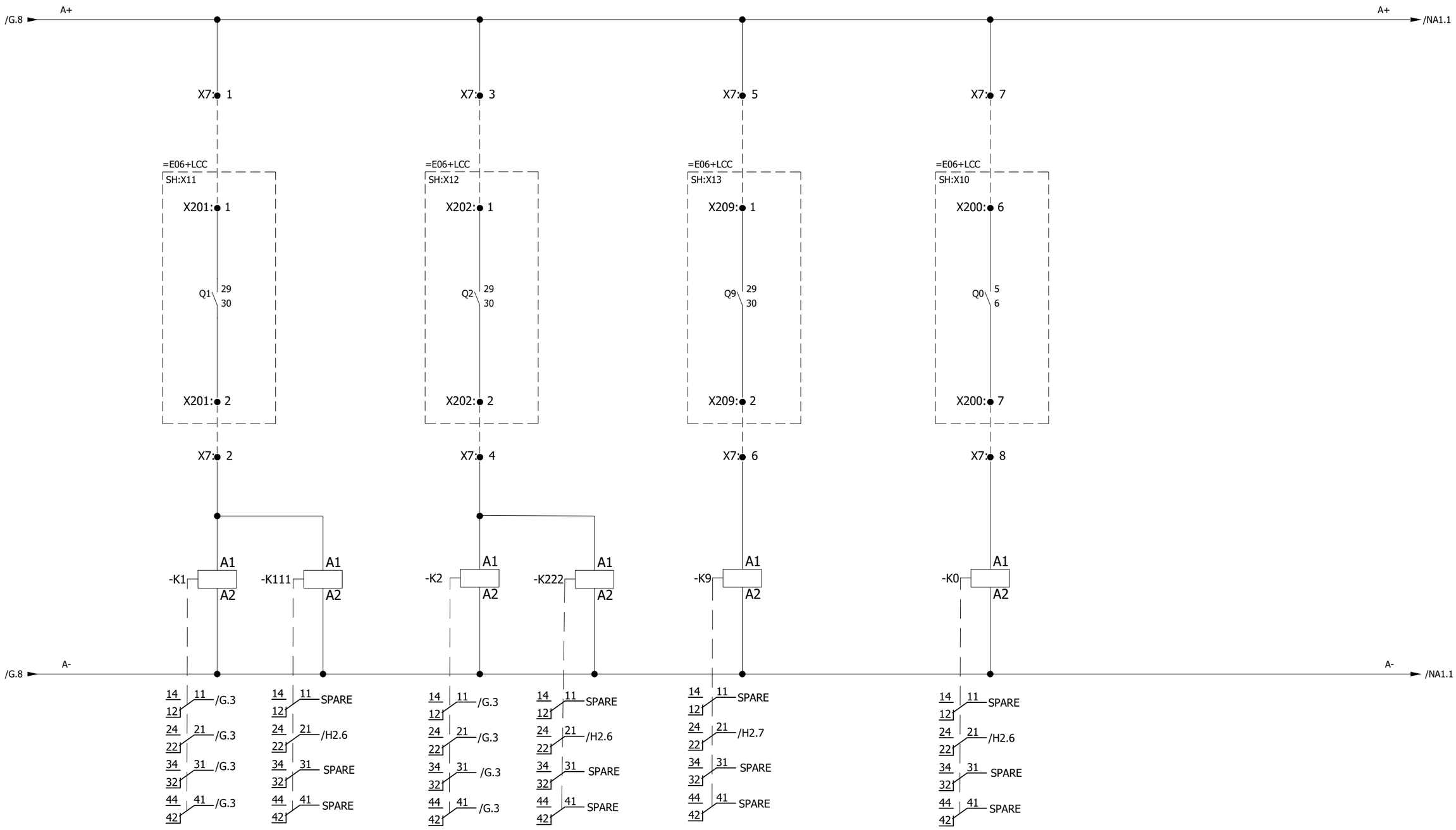
CONTACT MULTIPLICATION

BUSBAR-1 ISOLATOR	BUSBAR-2 ISOLATOR	LINE ISOLATOR	CIRCUIT BREAKER
=E06+Q1	=E06+Q2	=E06+Q9	=E06+Q0



REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	19-10-2018	ASJ

Manufacturer: EPESOL, 71-B Garden Block, New Garden Town, Lahore, Pakistan

Contractor: Grid Solutions, A GE and Alstom joint venture

Client: NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)

Project: 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE

Title: 132kV LINE CONTROL PANEL (=E06+CP31) CB/DISCONNECTOR CONTACT MULTIPLICATION

Drawing no. P60194-E-ELC-SC-004

Project no.	Sheet type	Sheet no.
P-60194	K1	16

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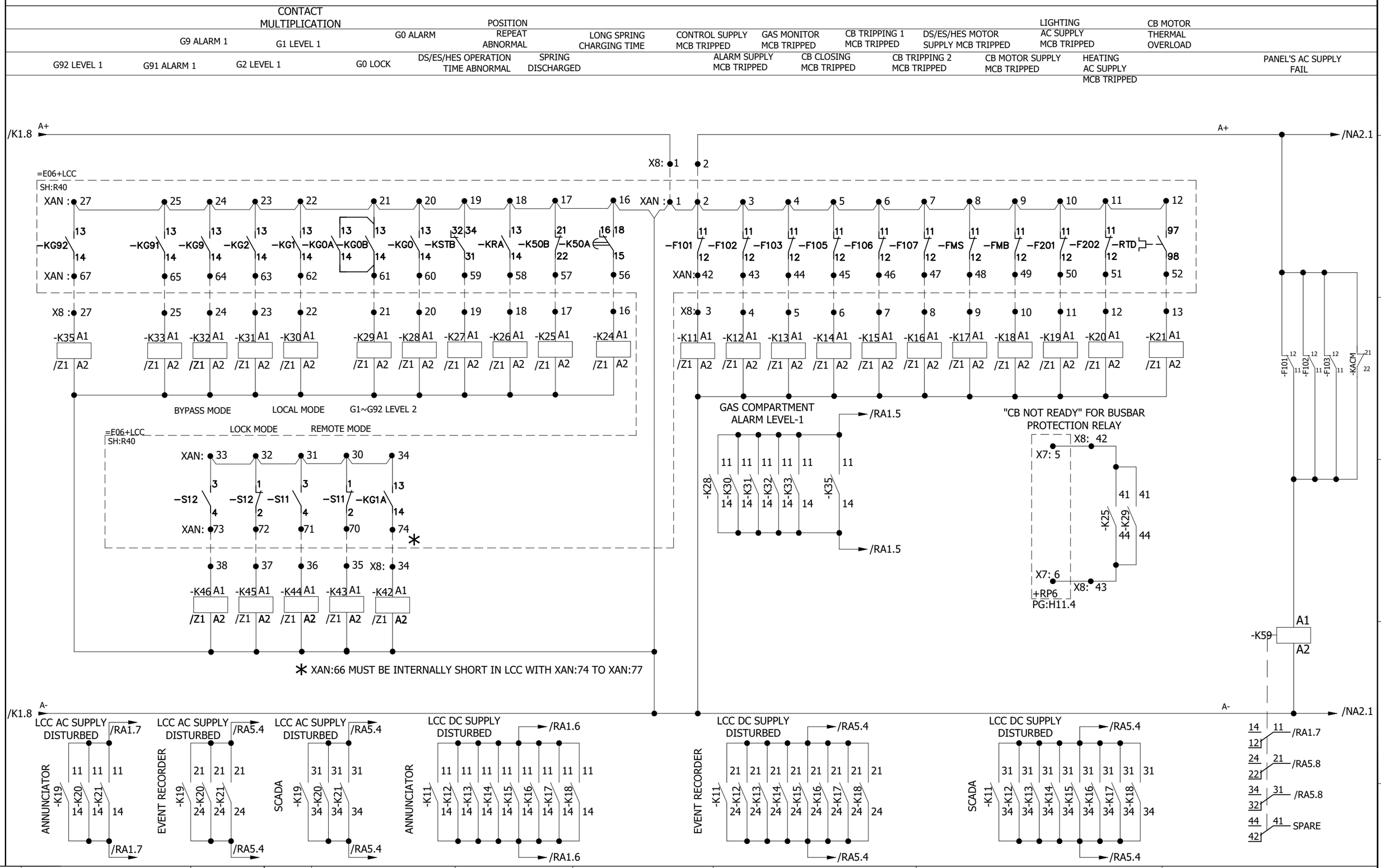

REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	19-10-2018	ASJ

Manufacturer: EPESOL, 71-B Garden Block, New Garden Town, Lahore, Pakistan

Contractor: Grid Solutions, A GE and Alstom joint venture

Client: NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)

Project: 220kV/132kV GIS SUBSTATION, GHAZI ROAD, LAHORE

Title: 132kV LINE CONTROL PANEL (=E06+CP31) ALARM MULTIPLICATION

Drawing no. P60194-E-ELC-SC-004

Project no.	Sheet type	Sheet no.
P-60194	NA1	17

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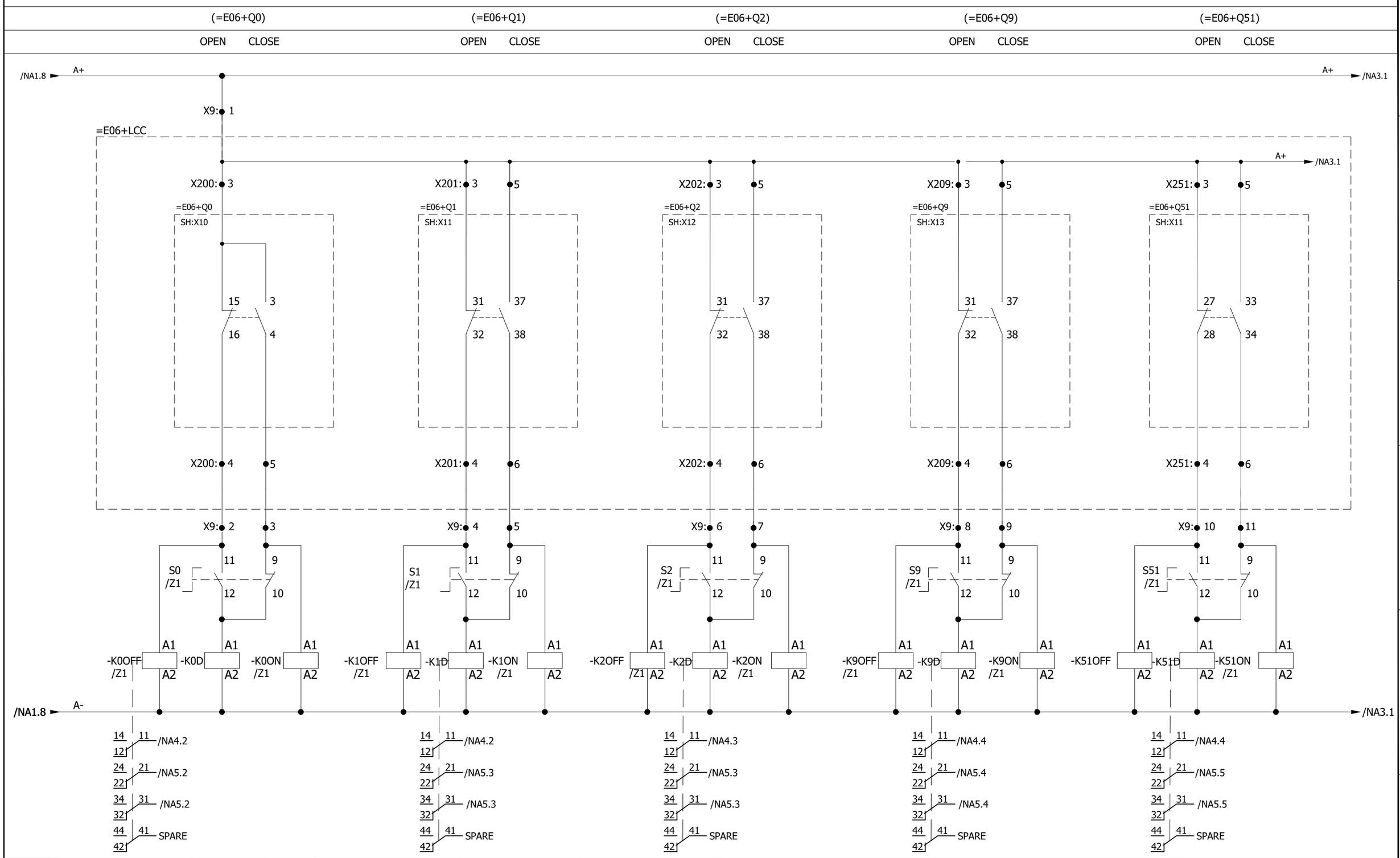


REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	19-10-2018	ASJ

Manufacturer: EPESOL, 71-B Garden Block, New Garden Town, Lahore, Pakistan

Contractor: Grid Solutions, A GE and Alstom joint venture

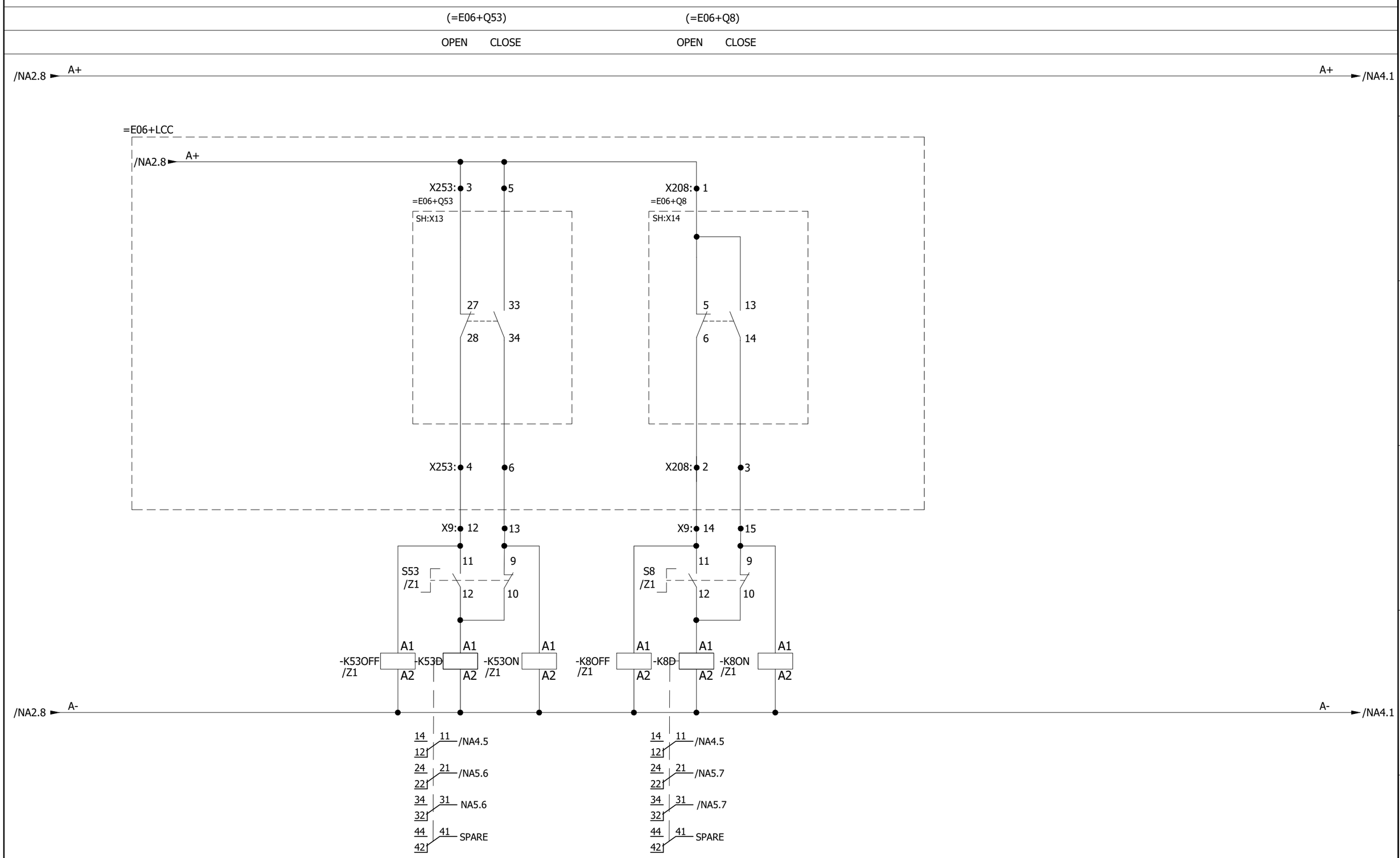
Client: NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)

Project: 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE

Title: 132kV LINE CONTROL PANEL (=E06+CP31) DISCREPANCY INITIATION

Drawing no. P60194-E-ELC-SC-004

Project no.	Sheet type	Sheet no.
P-60194	NA2	18



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REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	19-10-2018	ASJ

Manufacturer: EPESOL, 71-B Garden Block, New Garden Town, Lahore, Pakistan

Contractor: Grid Solutions, A GE and Alstom joint venture

Client: NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)

Project: 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE

Title: 132kV LINE CONTROL PANEL (=E06+CP31) DISCREPANCY INITIATION

Drawing no. P60194-E-ELC-SC-004

Project no.	Sheet type	Sheet no.
P-60194	NA3	19

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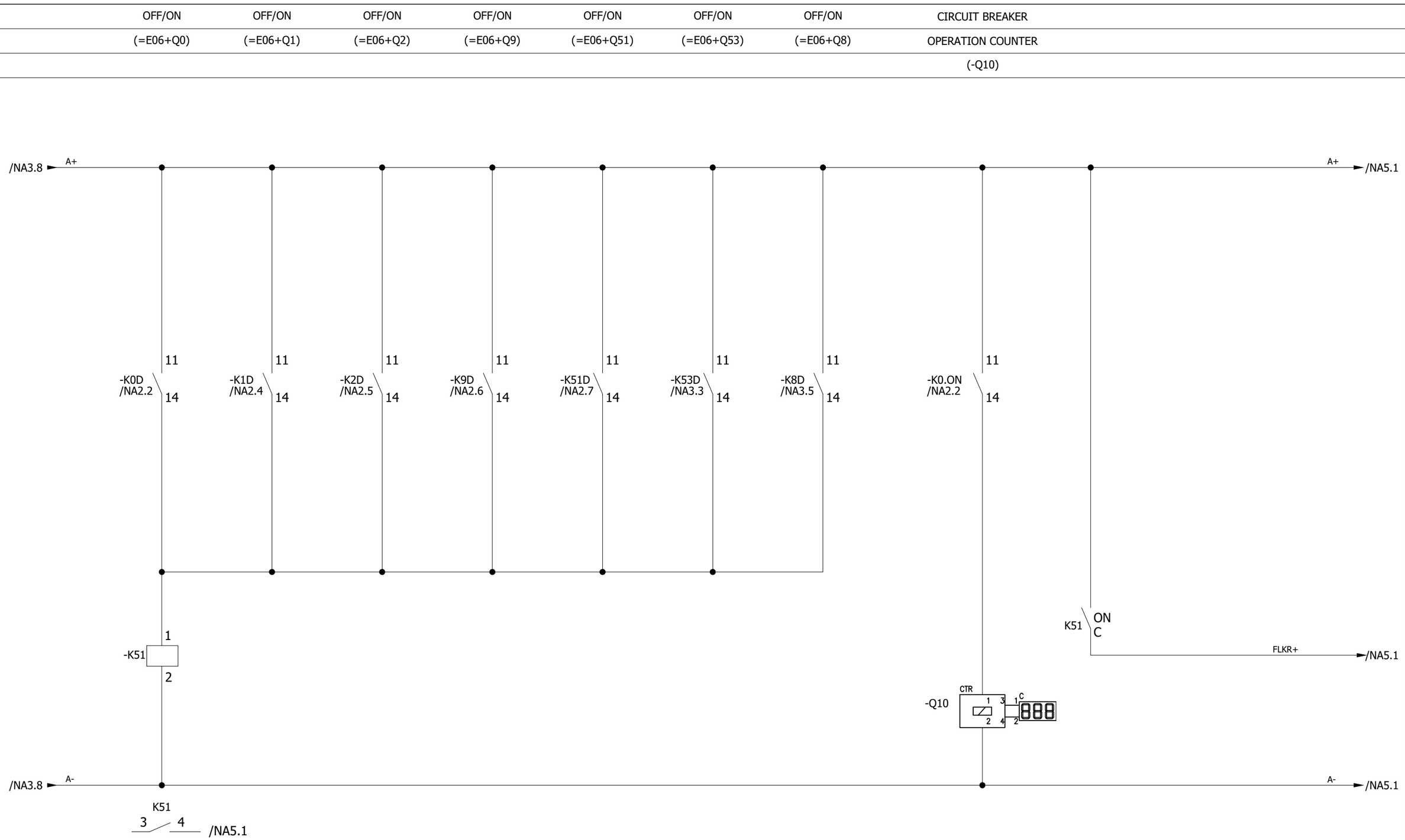

REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	19-10-2018	ASJ

Manufacturer: EPESOL, 71-B Garden Block, New Garden Town, Lahore, Pakistan

Contractor: Grid Solutions, A GE and Alstom joint venture

Client: NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)

Project: 220kV/132kV GIS SUBSTATION, GHAZI ROAD, LAHORE

Title: 132kV LINE CONTROL PANEL (=E06+CP31) DISCREPANCY INITIATION

Drawing no.		
P60194-E-ELC-SC-004		
Project no.	Sheet type	Sheet no.
P-60194	NA4	20

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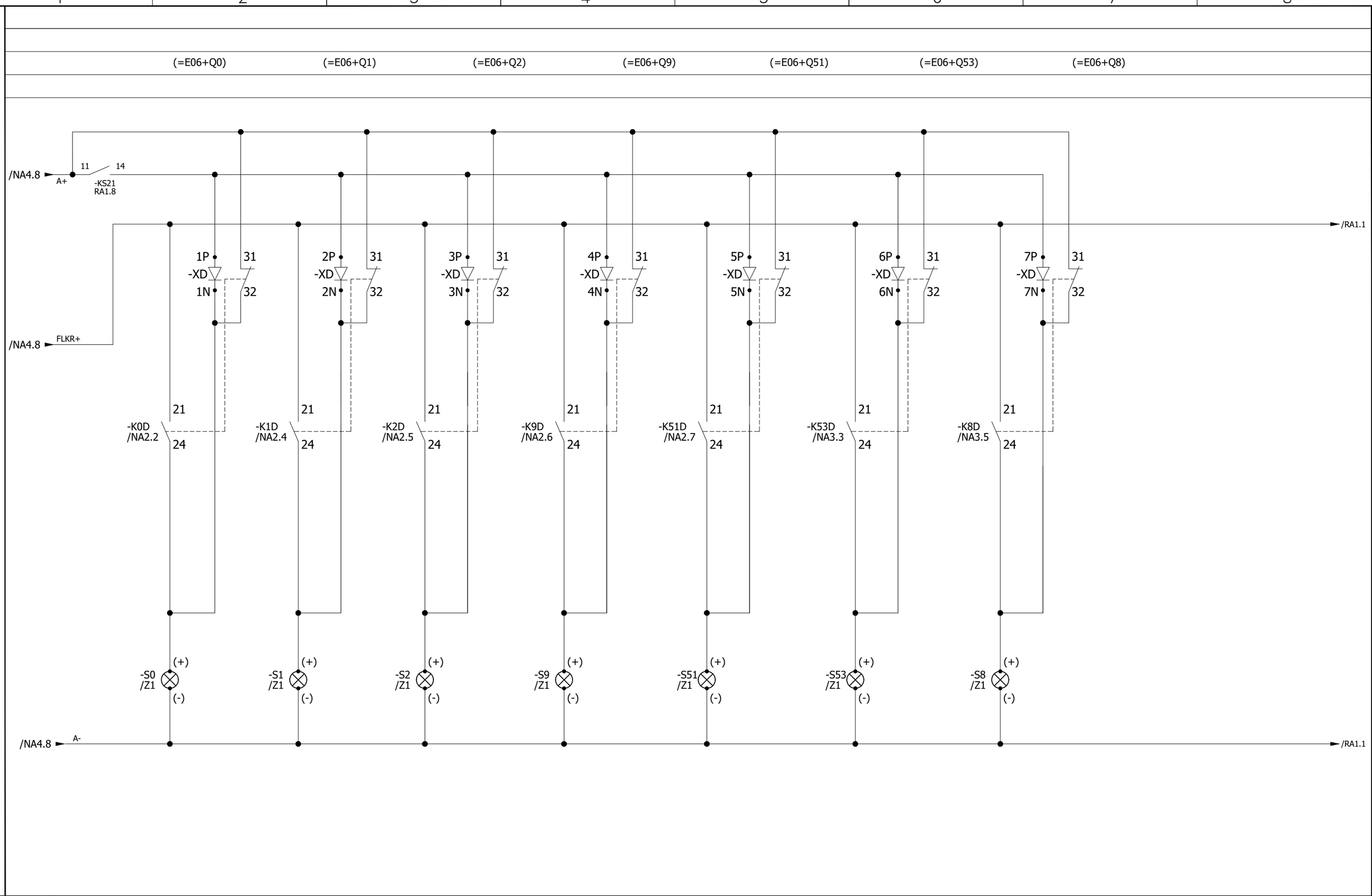

REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	19-10-2018	ASJ

Manufacturer: EPESOL, 71-B Garden Block, New Garden Town, Lahore, Pakistan

Contractor: Grid Solutions, A GE and Alstom joint venture

Client: NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)

Project: 220kV/132kV GIS SUBSTATION, GHAZI ROAD, LAHORE

Title: 132kV LINE CONTROL PANEL (=E06+CP31) DISCREPANCY INDICATIONS

Drawing no. P60194-E-ELC-SC-004

Project no.	Sheet type	Sheet no.
P-60194	NA5	21

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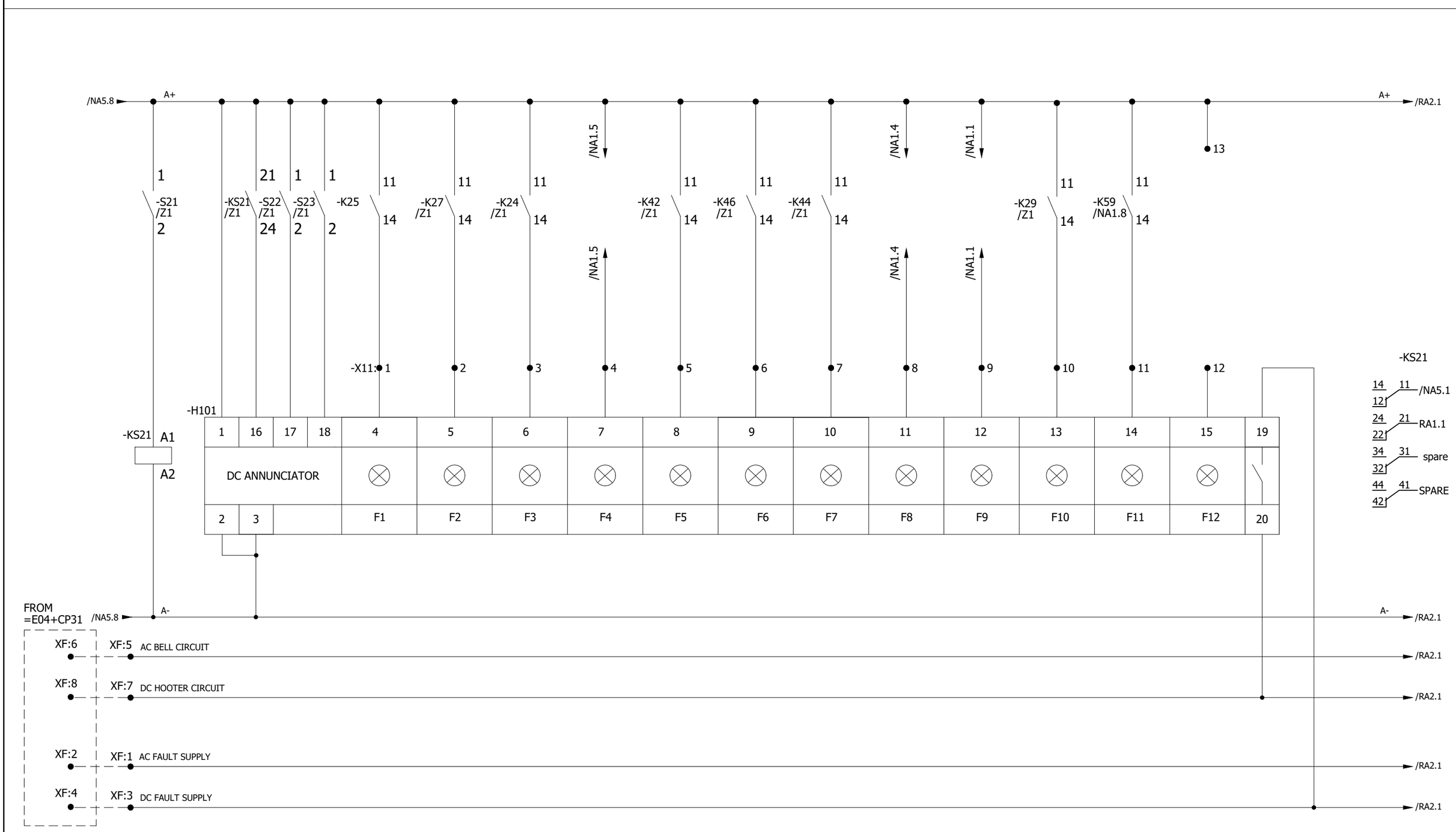

REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	19-10-2018	ASJ

Manufacturer: EPESOL, 71-B Garden Block, New Garden Town, Lahore, Pakistan

Contractor: Grid Solutions, A GE and Alstom joint venture

Client: NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)

Project: 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE

Title: 132kV LINE CONTROL PANEL (=E06+CP31) ANNUNCIATOR-1 CIRCUIT

Drawing no. P60194-E-ELC-SC-004

Project no.	Sheet type	Sheet no.
P-60194	RA1	22

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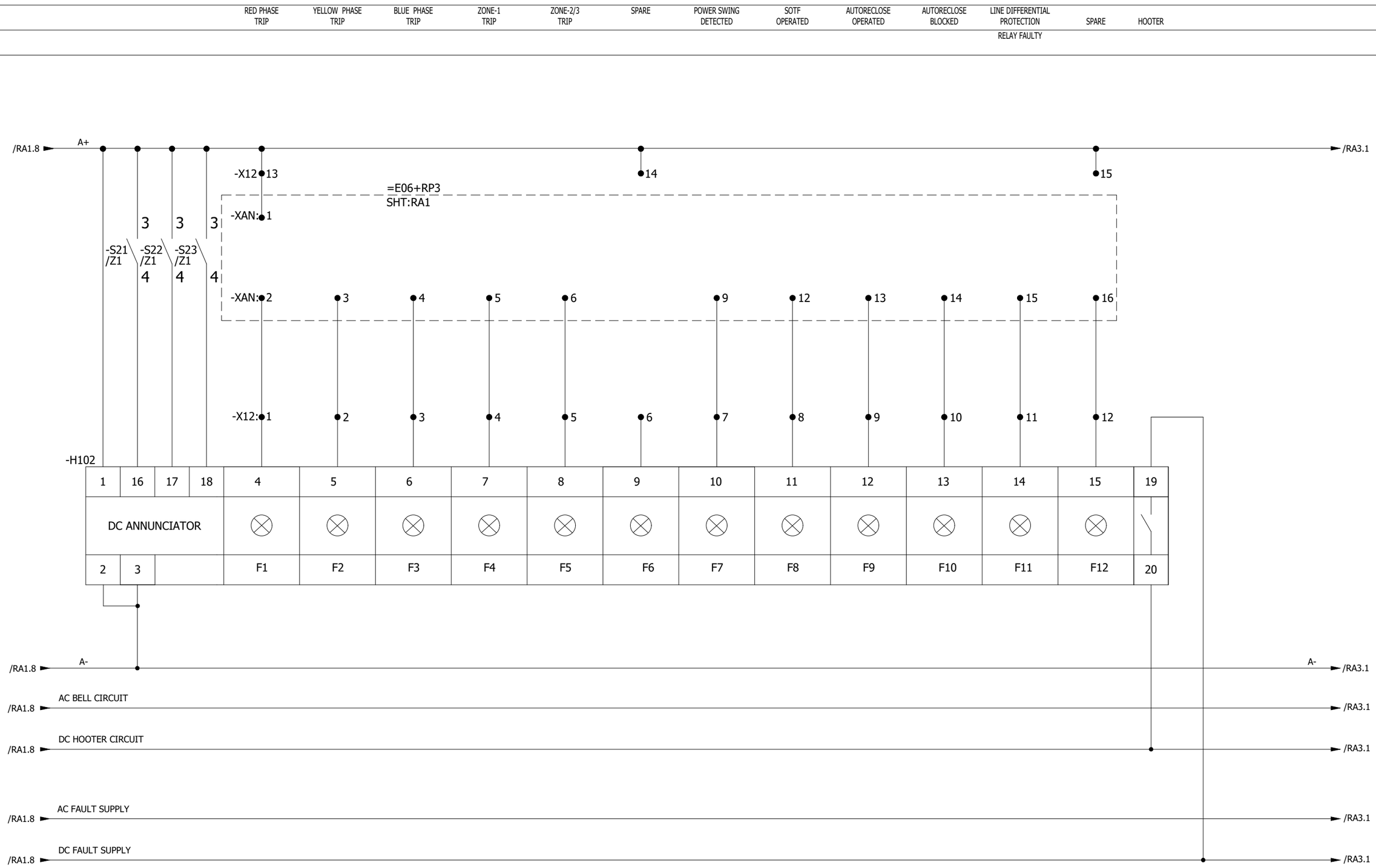

REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	19-10-2018	ASJ

Manufacturer: EPESOL, 71-B Garden Block, New Garden Town, Lahore, Pakistan

Contractor: Grid Solutions, A GE and Alstom joint venture

Client: NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA) (NTDC-WAPDA)

Project: 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE

Title: 132kV LINE CONTROL PANEL (=E06+CP31) ANNUNCIATOR-2 CIRCUIT

Drawing no. P60194-E-ELC-SC-004

Project no.	Sheet type	Sheet no.
P-60194	RA2	23

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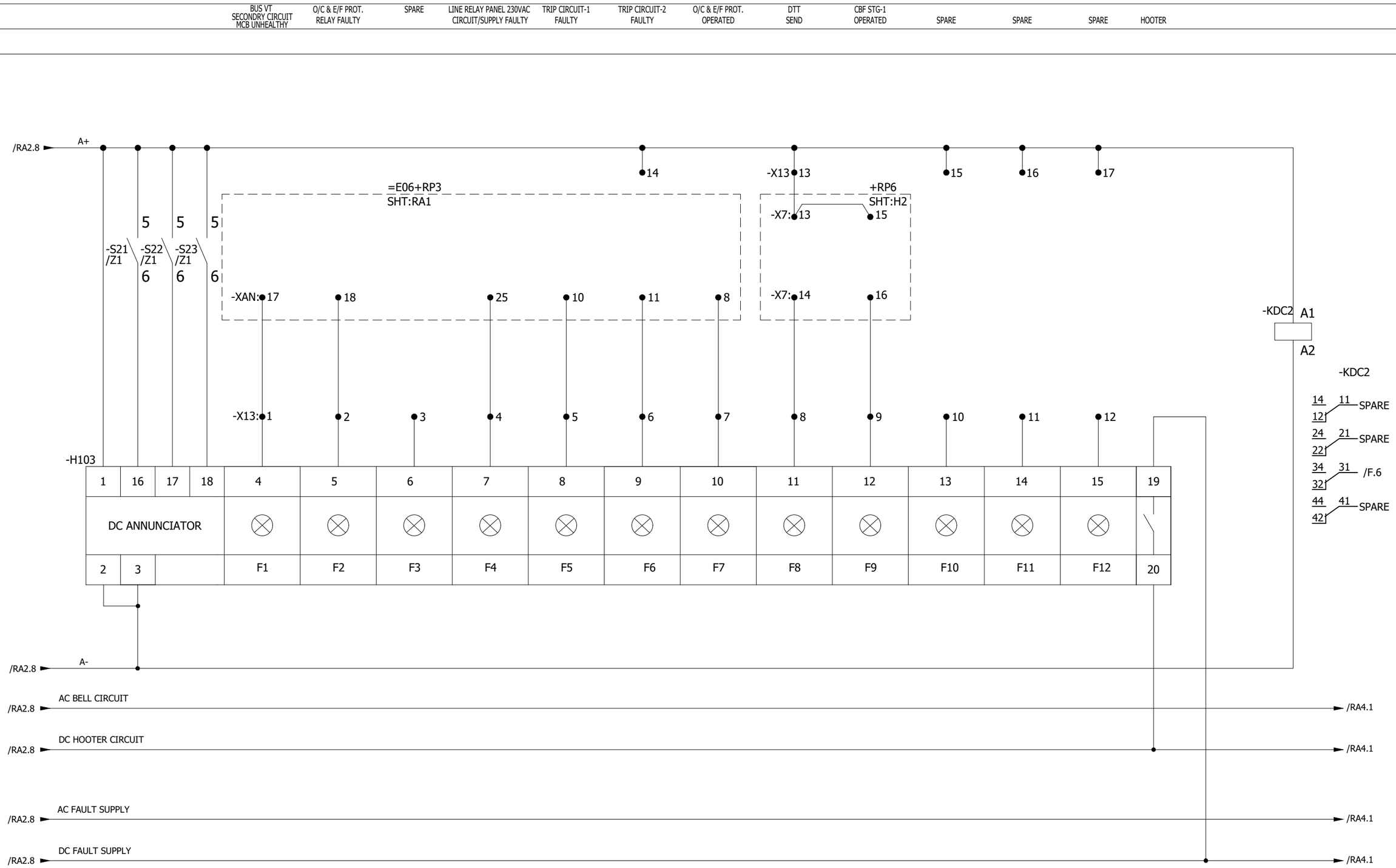

REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	19-10-2018	ASJ

Manufacturer: EPESOL, 71-B Garden Block, New Garden Town, Lahore, Pakistan

Contractor: Grid Solutions, A GE and Alstom joint venture

Client: NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)

Project: 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE

Title: 132kV LINE CONTROL PANEL (=E06+CP31) ANNUNCIATOR-3 CIRCUIT

Drawing no. P60194-E-ELC-SC-004

Project no.	Sheet type	Sheet no.
P-60194	RA3	24

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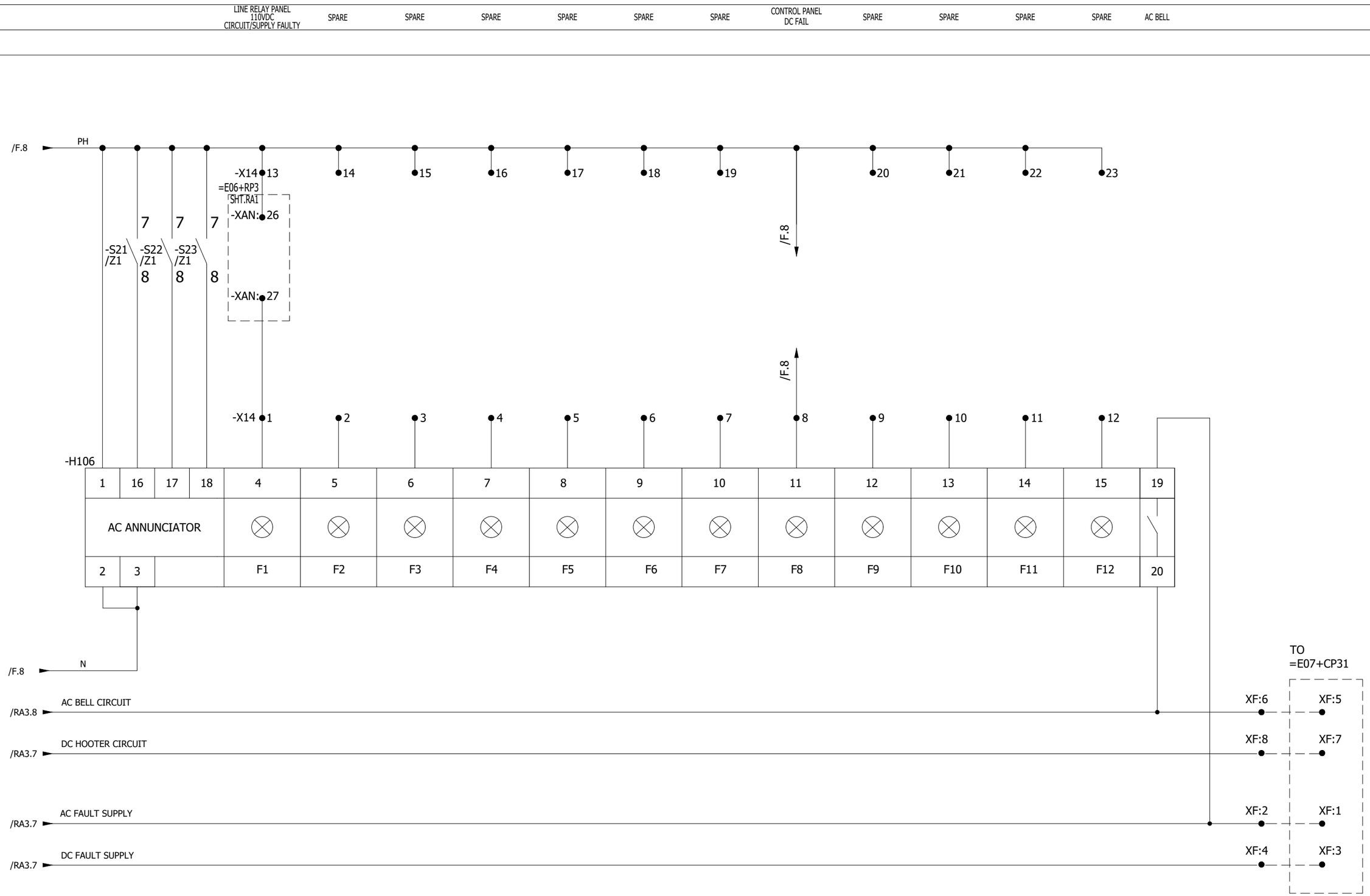

REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	19-10-2018	ASJ

Manufacturer: EPESOL, 71-B Garden Block, New Garden Town, Lahore, Pakistan

Contractor: Grid Solutions, A GE and Alstom joint venture

Client: NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)

Project: 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE

Title: 132kV LINE CONTROL PANEL (=E06+CP31) ANNUNCIATOR-4 CIRCUIT

Drawing no. P60194-E-ELC-SC-001

Project no.	Sheet type	Sheet no.
P-60194	RA4	25

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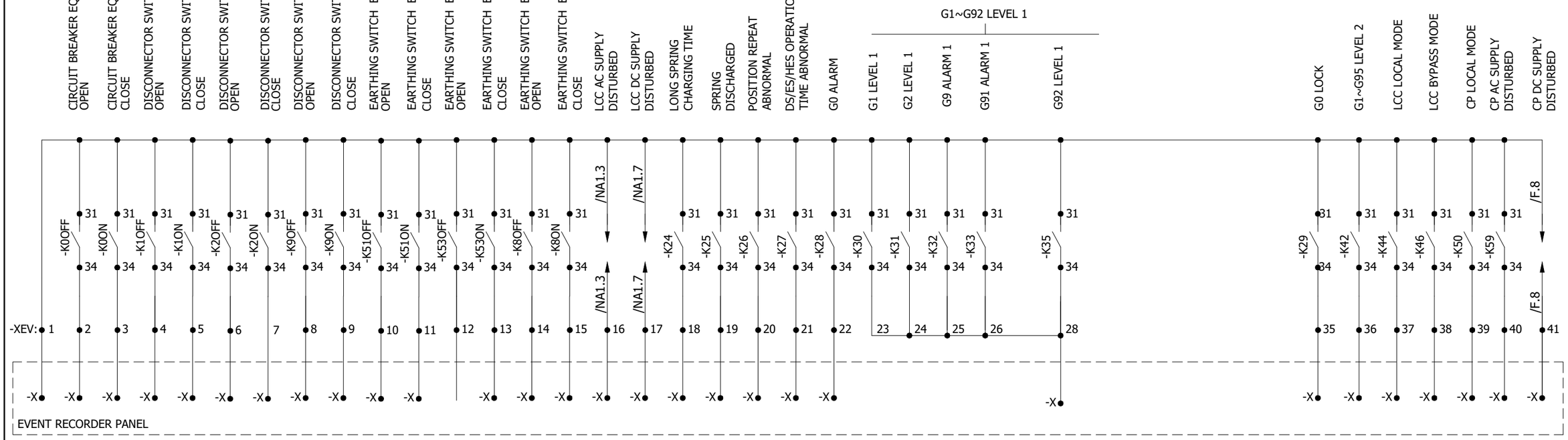

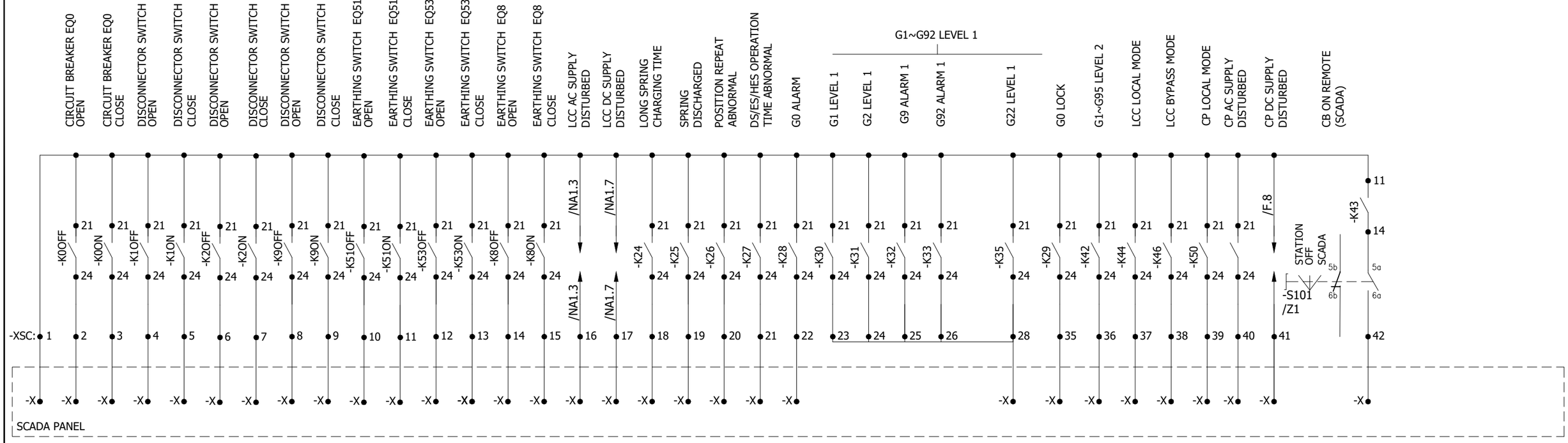

REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	19-10-2018	ASJ

Manufacturer: EPESOL, 71-B Garden Block, New Garden Town, Lahore, Pakistan

Contractor: Grid Solutions, A GE and Alstom joint venture

Client: NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)

Project: 220kV/132kV GIS SUBSTATION, GHAZI ROAD, LAHORE

Title: 132kV LINE CONTROL PANEL (=E06+CP31) SCADA & ER SIGNALS

Drawing no. P60194-E-ELC-SC-004

Project no.	Sheet type	Sheet no.
P-60194	RA5	26

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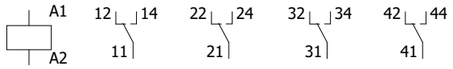

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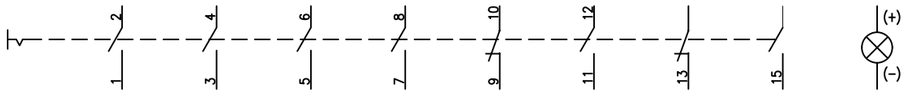
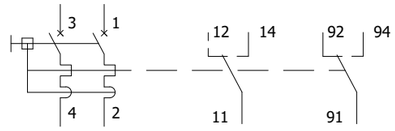
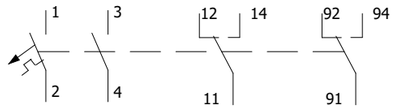
-K12	NA1.5	NA1.3	NA1.5	NA1.6	
-K13	NA1.5	NA1.3	NA1.5	NA1.7	
-K14	NA1.5	NA1.4	NA1.5	NA1.7	
-K15	NA1.6	NA1.4	NA1.5	NA1.7	
-K16	NA1.6	NA1.4	NA1.5	NA1.7	
-K17	NA1.6	NA1.4	NA1.5	NA1.7	
-K18	NA1.6	NA1.4	NA1.6	NA1.7	
-K19	NA1.7	NA1.1	NA1.2	NA1.3	
-K20	NA1.7	NA1.1	NA1.2	NA1.3	
-K21	NA1.7	NA1.1	NA1.2	NA1.3	
-K24	NA1.4	RA1.4	RA5.4	RA5.4	
-K25	NA1.4	RA1.3	RA5.4	RA5.4	NA1.7
-K26	NA1.4		RA5.4	RA5.4	
-K27	NA1.3	RA1.4	RA5.5	RA5.5	
-K28	NA1.3	NA1.5	RA5.5	RA5.5	
-K29	NA1.3	RA1.7	RA5.7	RA5.7	NA1.7
-K30	NA1.2	NA1.5	RA5.5	RA5.5	
-K31	NA1.2	NA1.5	RA5.5	RA5.5	
-K32	NA1.2	NA1.5	RA5.5	RA5.5	
-K33	NA1.1	NA1.5	RA5.6	RA5.5	
-K35	NA1.1	NA1.6	RA5.6	RA5.6	
-K36	NA1.4	NA1.6	RA5.6	RA5.6	
-K37	NA1.4	NA1.6	RA5.6	RA5.6	
-K42	NA1.3	RA1.5	RA5.7	RA5.7	
-K43	NA1.3	RA5.8			
-K44	NA1.2	RA1.6	RA5.7	RA5.7	
-K45	NA1.2				
-K46	NA1.2	RA1.5	RA5.8	RA5.7	
-K50	H1.2		RA5.8	RA5.8	
-K0OFF	NA2.2		RA5.1	RA5.1	
-K0ON	NA2.3	NA4.6	RA5.1	RA5.1	
-K1OFF	NA2.3		RA5.2	RA5.2	
-K1ON	NA2.4		RA5.2	RA5.2	
-K2OFF	NA2.5		RA5.2	RA5.2	
-K2ON	NA2.6		RA5.2	RA5.2	
-K9OFF	NA2.6		RA5.3	RA5.2	
-K9ON	NA2.7		RA5.3	RA5.3	
-K51OFF	NA2.7		RA5.3	RA5.3	
-K51ON	NA2.8		RA5.3	RA5.3	
-K53OFF	NA3.3		RA5.3	RA5.3	
-K53ON	NA3.4		RA5.4	RA5.3	
-K8OFF	NA3.4		RA5.4	RA5.3	
-K8ON	NA3.5		RA5.4	RA5.4	



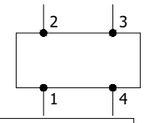
-S0	H1.7	H1.4			NA2.2	NA5.1			NA5.2
-S1	I1.2	I1.3			NA2.4	NA5.2			NA5.2
-S2	I1.4	I1.5			NA2.5	NA5.3			NA5.3
-S9	I1.7	I1.7			NA2.6	NA5.3			NA5.3
-S51	I2.2	I2.3			NA3.1	NA5.5			NA5.5
-S53	I2.4	I2.5			NA3.3	NA5.5			NA5.5
-S8	I2.6	I1.7			NA3.4	NA5.6			NA5.6



-F101	D.2	NA1.8	
-F102	D.4	NA1.8	
-F103	D.6	NA1.8	

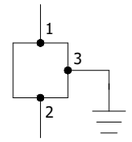


-F201	E.5	F.3	
-F202	E.6	F.5	



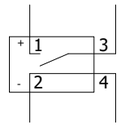
-B100	D.4

-S100	D.3

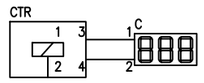


-X100	D.7

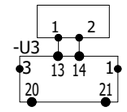
-R100	D.5



-K51	NA4.2

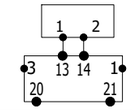


-Q10	NA4.6

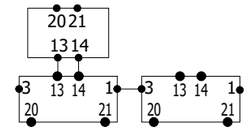


-U3/Q3	G.3

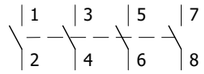
14 16



-U1/Q1	G.3

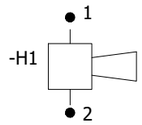


-U2/U12,Q2	G.3



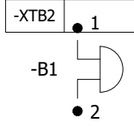
-S22	RA1.2	RA2.2	RA3.2	RA4.2
-S23	RA1.2	RA2.2	RA3.2	RA4.2
-S21	RA1.2	RA2.2	RA3.2	RA4.2

-H100	D.3
-H7	F.4
-H8	F.7



H1	RA4-1.4

-XTB1	G.2
-XTB2	G.4



B1	RA4-1.2

REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	19-10-2018	ASJ

Manufacturer: EPESOL, 71-B Garden Block, New Garden Town, Lahore, Pakistan

Contractor: Grid Solutions, A GE and Alstom joint venture

Client: NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)

Project: 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE

Title: 132kV LINE CONTROL PANEL (=E06+CP31) COMPONENT DIAGRAM

Drawing no. P60194-E-ELC-SC-004

Project no.	Sheet type	Sheet no.
P-60194	Z1	27