



Grid Solutions

A GE and Alstom joint venture

220kV/132kV GIS SUBSTATION GHAZI ROAD , LAHORE

220kV COUPLER BAY CONTROL PANEL (=D06+C8)

SCHEMATIC DRAWINGS

REFERENCE DRAWINGS

SR. NO.	DRAWING TITLE	DOCUMENT NO.
1.	220kV / 132kV Metering & Protection SLD	P60194-E-SLMP-001
2.	220kV GIS LCC Schematic Drawings	P60194-E-TDHV-119
3.	220kV GIS LCC Schematic Drawings	P60194-E-TDHV-120

REVISION HISTORY					
REV	DATE	DRW. BY	CHK. BY	APR. BY	REVISION DESCRIPTION
0	30.10.2018	ASJ	ABA	NAH	AS BUILT

Scale	NOT-TO-SCALE	Sheet size	A3
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Client	 <p>NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)</p>
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Contractor	 Grid Solutions A GE and Alstom joint venture	Manufacturer
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Project	<p>220kV / 132kV GIS SUBSTATION GHAZI ROAD , LAHORE</p>	
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Title	<p>220kV COUPLER BAY CONTROL PANEL (=D06+C8) SCHEMATIC DRAWINGS</p>	
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Order no	Document no
P-60194	P60194-E-DCC-SC-001

Sheet type	Total sheets	Sheet no
A	45	1

	1	2	3	4	5	6	7	8					
	PAGE NO.	SHEET NAME	SHEET DESCRIPTION			ISSUE / REVISION							
						A	B	C	D	E	F	01	
A	01	A	Cover Sheet			X							
	02	AA1	List Of Contents			X							
	03	AA2	List Of Contents			X							
	04	AB	Symbols and Legends			X							
	05	AC1	Component List			X							
B	06	AC2	Component List			X							
	07	AD	Panel View			X							
	08	AE	Bay Concept & Metering Logics			X							
	09	D	AC Supply Distribution Circuit			X							
	10	E	DC Supply Distribution Circuit			X							
C	11	F	AC/DC Supply Failure Circuits			X							
	12	H1	CT/VT Metering Circuit			X							
	13	H2	CT/VT Metering Circuit			X							
	14	H3	CT/VT Metering Circuit			X							
	15	I1	Power Equipment input Circuit			X							
	16	I2	Power Equipment input Circuit			X							
D	17	I3	Power Equipment input Circuit			X							
	18	I4	Power Equipment input Circuit			X							
	19	I5	Power Equipment input Circuit			X							
	20	I6	Power Equipment input Circuit			X							
	21	I7	Power Equipment input Circuit			X							
	22	I8	Power Equipment input Circuit			X							
E	23	J1	Circuit Breaker Opening/Closing Circuit			X							
	24	J2	Circuit Breaker Opening/Closing Circuit			X							
	25	J3	Isolator/Earthing SW. Opening/Closing Circuit			X							
	26	J4	Isolator/Earthing SW. Opening/Closing Circuit			X							
	27	J5	Isolator/Earthing SW. Opening/Closing Circuit			X							
	28	J6	Isolator/Earthing SW. Opening/Closing Circuit			X							
F	29	MA1	Synch Circuits			X							
	30	MA2	Synch Circuits			X							
	31	MA3	Control Circuit			X							
	32	MA4	Discrepancy Check Circuit			X							
	0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  GE 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 220KV COUPLER BAY CONTROL PANEL (=D06+C8) LIST OF CONTENTS	Drawing no. P60194-E-DCC-SC-001			
	REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type AA1	Sheet no. 02	

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	PAGE NO.	SHEET NAME	SHEET DESCRIPTION	ISSUE / REVISION										
				A	B	C	D	E	F	01	02	03	04	05
A	33													
	34	MA6	Discrepancy Check Circuit											
	35	MA7	Discrepancy Check Circuit											
	36	MA8	Discrepancy Check Circuit											
B	37	RA1	AC Annunciations Circuit											
	38	RA2	Annunciation Alarms Circuit											
	39	RA3	Annunciation Alarms Circuit											
	40	RA4	Annunciation Alarms Circuit											
	41	RA5	Annunciation Alarms Circuit											
	42	RA6	Event & Fault Recorder Circuit											
	43	RA7	Event & Fault Recorder Circuit											
C	44	RA7-1	External Signals											
	45	Z1	Component Diagram											
D														
E														
F														
	0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  GE 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 220KV COUPLER BAY CONTROL PANEL (=D06+C8) LIST OF CONTENTS	Drawing no. P60194-E-DCC-SC-001				
	REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type AA2	Sheet no. 03		

	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
A		CIRCUIT BREAKER		MINIATURE CIRCUIT BREAKER		AUXILIARY CONTACTOR NO+NC	21	DISTANCE
B		SWITCH/ISOLATOR		KEY OPERATED SELECTOR SWITCH		AMMETER	24	OVEREXCITATION
C		EARTHING		LIMITED SWITCH		VOLTmeter	25	SYNCHROCHECK
D		SF6 TO AIR BUSHING		HUMIDITY & TEMPERATURE CONTROLLER		POWER FACTOR METER	49	THERMAL OVERLOAD
E		LINE TRAP		PANEL HEATER		DIGITAL PANEL METER	50/51	PHASE INST./OVERCURRENT
F		SURGE ARRESTOR		THREE PIN SOCKET		ACTIVE POWER METER	50N/51N	EARTH INST./OVERCURRENT
G		CURRENT TRANSFORMER		INDICATION LIGHT		REACTIVE POWER METER	50BF	CIRCUIT BREAKER FAILURE
H		COUPLING CAPACITOR VOLTAGE TRANSFORMER		PUSH BUTTON		ENERGY METER	64	RESTRICTED EARTH FAULT
I		POWER TRANSFORMER		AUXILIARY CONTACTOR COIL		KWH	67N	DIRECTIONAL EARTH FAULT
J		AUTO TRANSFORMER		POWER SUPPLY AC/DC			68	POWER SWING BLOCKING
K				TERMINAL			78	OUT OF STEP
L				OPTO CONTACTS			79	AUTO-RECLOSING
M				RELAY CONTACTS			85	COMMUNICATION FAILURE
N				HOOTER			87T	TRAFO DIFFERENTIAL
O				AC BELL			87C	DIFFERENTIAL CONNECTION
P							87BB	DIFFERENTIAL BUSBAR

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0	AS BUILT	30.10.2018	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 220kV COUPLER BAY CONTROL PANEL (=D06+C8) SYMBOLS AND LEGENDS	Drawing no. P60194-E-DCC-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type AB
									Sheet no. 04

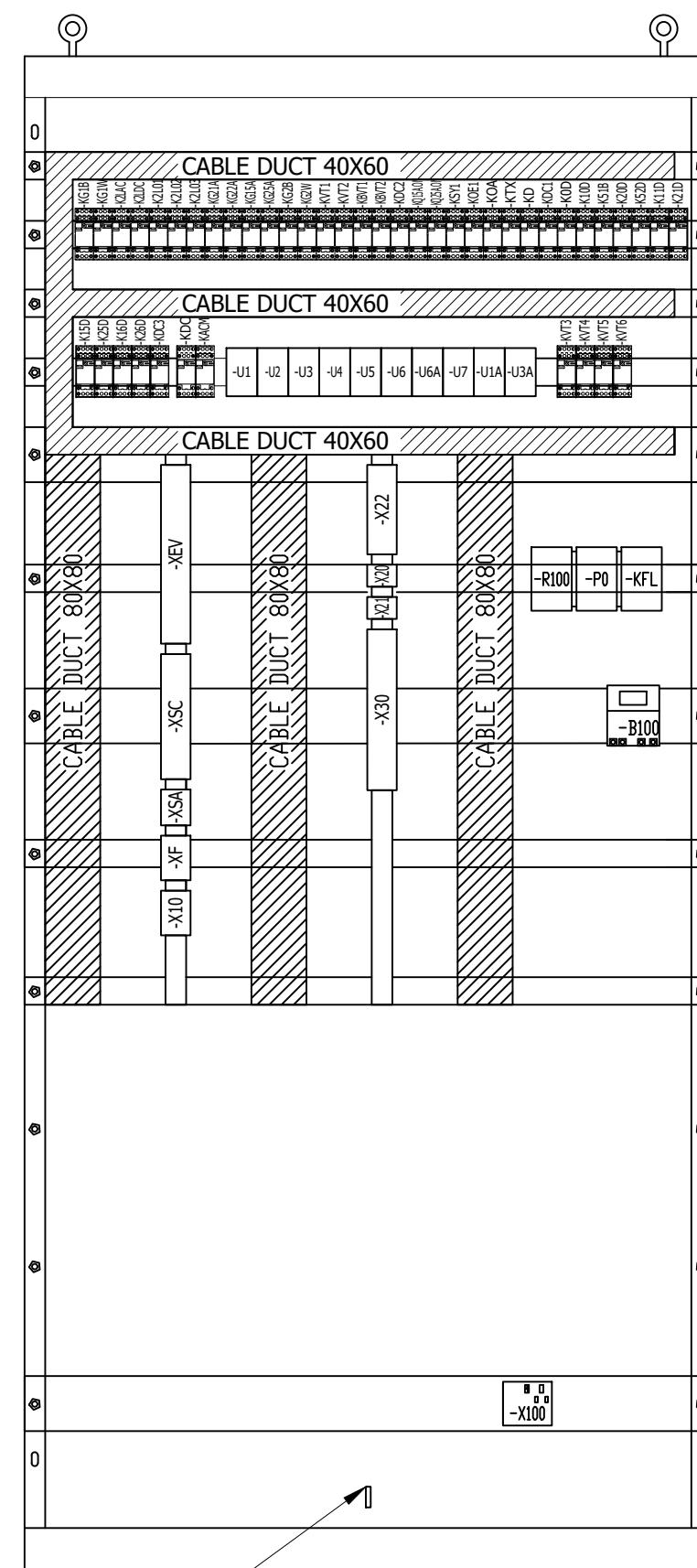
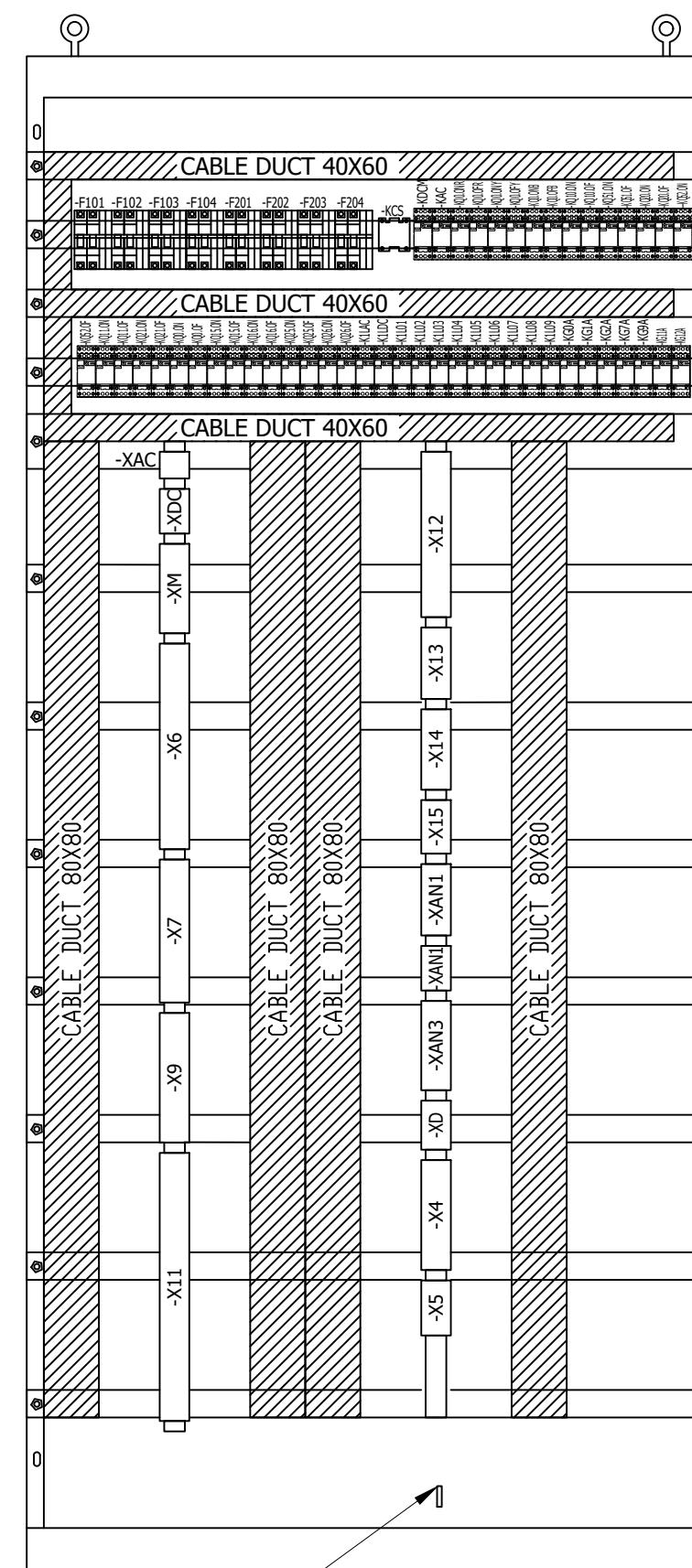
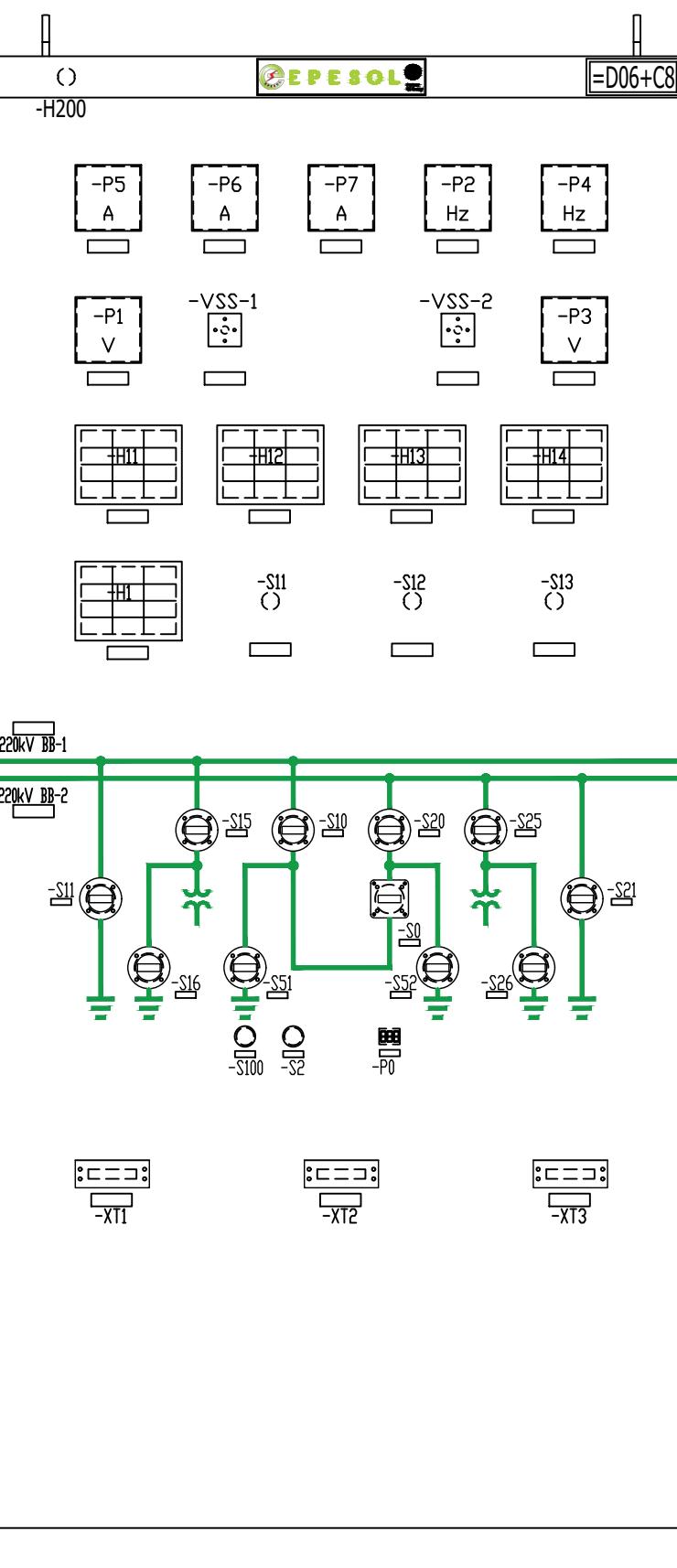
	1	2	3	4	5	6	7	8			
A	QTY.	DEVICE DESCRIPTION		DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS			DEVICE DESIGNITION		MANUFACTURER		
	02	ANALOG AMMETER		A96MMA, 240 Degree Transducer Operated Analogue Ampere Meter, Input 0...20/30mA, Accuracy Class 1, Scale1: 0...600/900A, Scale2: 0...1200/1800A, Scale3: 0...2400/3600A.			-P5,-P7		FRER		
B	01	DIGITAL AMMETER		D96MMA, Transducer Operated Digital Ampere Meter, Input 0...20/30mA, Accuracy Class 1, Scale1: 0...600/900A, Scale2: 0...1200/1800A, Scale3: 0...2400/3600A. Aux. Voltage 220VDC.			-P6		FRER		
	02	ANALOG VOLTMETER		A96MMA, 240 Degree Transducer Operated Analogue Volt Meter, Input 0...20/30mA, Accuracy Class 1, Scale: 0...220/330kV (Marked Red at 220kV).			-P1,-P3		FRER		
C	02	FREQUENCY VOLTMETER		D96MMA, Transducer Operated Digital Frequency Meter, Input 0...20/30mA, Accuracy 0.05Hz, Scale: 45-55 Hz (50 Hz at 20mA), Display Required: 4 Digits.			-P2,-P4		FRER		
	04	CURRENT TRANSDUCER		MCOEAQ, Current Transducer Nominal Input Current 1/1.5A, Output: 0...20/30mA, Aux. Voltage 220VDC, Accuracy Class 1, CT Ratio: 2400:1200:600/1A.			-U5,-U7,-U6,U6A		FRER		
D	04	VOLTAGE TRANSDUCER		MCOEVQ, Voltage Transducer Nominal Input Voltage 0...110/165VAC(L-L), Output 0...20/30mA, Aux. Voltage 220VDC, Accuracy Class 1, PT Ratio: 220/0.11kV(L-L).			-U1,-U1A,-U3,-U3A		FRER		
	02	FREQUENCY TRANSDUCER		MCOFP, Freq. Transducer Nominal Input Voltage 0...110/165VAC(L-L), Output 0...20/30mA, Aux. Voltage 220VDC, Accuracy Class 0.05Hz, PT Ratio: 220/0.11kV(L-L).			-U2,-U4		FRER		
E	01	DISCREPANCY SWITCH - CIRCUIT BREAKER		YS-IC-4456-S4(49)-PM-K-G-D22-GM, Standard-type (Push & Turn 90° after 2-position), Square Type, Rating: 220VDC			-S0		YONGSUNG		
	10	DISCREPANCY SWITCH - ISOLATOR / EARTHING SWITCHES		YS-IC-4456-R4(49)-PM-K-G-D22-GM, Standard-type (Push & Turn 90° after 2-position), Round Type, Rating: 220VDC			-S10,-S51,-S20,-S52,-S15,-S25,-S16,-S26,-S21,-S11		YONGSUNG		
F	02	SELECTOR SWITCH - VOLTMETER		PO-160023R001, 7 Position (L1-L2,L2-L3,L3-L1,OFF,L1-N,L2-N,L3-N)			-VSS-1,-VSS-2		GIOVENZANA		
	01	SELECTOR SWITCH - OPERATION (LOCAL-OFF-SCADA)		YS-AK-2-3-44-D, 2 Position with OFF, 4-Pole, Ratings: 12A, 220VDC, Keytype			-S100		YONGSUNG		
G	01	SELECTOR SWITCH - SYCHRONIZATION (ON-BYPASS)		YS-AK-2-2-44-D, 2 Position, 4-Pole, Ratings: 12A, 220VDC, Keytype			-S2		YONGSUNG		
	01	PUSHBUTTON - LAMPTEST		YS-AP1-2-31-B-D-W, 3NO+1NC contacts, Ratings: 220VDC & 12A, Black color			-S11		YONGSUNG		
H	01	PUSHBUTTON - ALARM ACKNOWLEDGEMENT		YS-AP1-2-31-R-D-W, 3NO+1NC contacts, Ratings: 220VDC & 12A, Red color			-S12		YONGSUNG		
	01	PUSHBUTTON - ALARM RESET		YS-AP1-2-31-G-D-W, 3NO+1NC contacts, Ratings: 220VDC & 12A, Green color			-S13		YONGSUNG		
I	03	CONTROL MCB - PANEL LIGHT & HEATER		G62C02+(CAH2), 2-Pole, Ratings: 2A, 230VAC, 10kA @ 230VAC, with 2 C/O Contacts			-F101,-F102,-F104		GE		
	01	CONTROL ELCB - PANEL SOCKET		DM100C16/030+(CAH2), 2-Pole, Ratings: 16A, 30mA, 230VAC, with 2 C/O Contacts			-F103		GE		
J	04	CONTROL MCB - DC DISTRIBUTION		EP102UCC04+(CAH2), 2-Pole, Ratings: 4A, 220VDC, 10kA @ 220VDC, with 2 C/O Contacts			-F201,-F202,-F203,-F204		GE		
	01	INDICATION LAMP - DC SUPPLY FAILURE		YS-PL-2-AL-22-R-W, Type: Integrated LED , Color : RED , Supply : 230VAC @ 50Hz			-H200		YONGSUNG		
0	AS BUILT		30.10.2018	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 220kV COUPLER BAY CONTROL PANEL (=D06+C8) COMPONENT LIST	Drawing no. P60194-E-DCC-SC-001	
REV.	DESCRIPTION		DATE	DRAWER					Project no. P-60194	Sheet type AC1	Sheet no. 05

	1	2	3	4	5	6	7	8			
	QTY.	DEVICE DESCRIPTION	DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS			DEVICE DESIGNITION	MANUFACTURER				
A	01	ANNUNCIATION MODULE	12-Window, Supply: 230VAC			-H1	E-LABS				
	04	ANNUNCIATION MODULE	12-Window, Supply: 220VDC			-H11,-H12,-H13,-H14	E-LABS				
	01	FLASHER RELAY	Coil Voltage: 220VDC			-KFL	E-LABS				
	01	CB OPERATION COUNTER	Supply: 220VDC			-P0	E-LABS				
B	01	PANEL LIGHT	TS-T8-30-5W+YSP3315GW-B, 230VAC @ 50Hz, 20W, with Door Limit Sw.			-S101,-H100	YONGSUNG				
	01	THREE PIN SOCKET	1N+PE, 16A, 230VAC @ 50Hz			-X100	LEAR				
	01	PANEL HEATER	230VAC @ 50Hz, 50W			-R100	E-LABS				
	01	HUMIDITY & TEMPERATURE CONTROLLER	Thermostat & Humidstat			-B100	E-LABS				
C	01	TEST BLOCK FOR CURRENT CIRCUIT	YS-CTT-04S			-XT1	YONGSUNG				
	02	TEST BLOCK FOR VOLTAGE CIRCUIT	YS-PTT-04S			-XT2,-XT3	YONGSUNG				
	01	AUXILIARY CONTACTOR FOR DC SUPPLY CHANGOVER	MCRC022ATWN-B+MARN211AT, Coil Voltage: 220VDC, 3NO+3NC Contacts			-KCS	GE				
	90	AUXILIARY CONTACTOR	PRC4M40DCML, Coil Voltage: 220VDC, 4 C/O Contacts			-KDCM,-KAC,-KQ0.ONR,-KQ0.OFR,-KQ0.ONY,-KQ0.OFY,-KQ0.ONB, -KQ0.OFB,-KQ10.ON,-KQ10.OF,-KQ51.ON,-KQ51.OF,-KQ20.ON, -KQ20.OF,-KQ52.ON,-KQ52.OF,-KQ11.ON,-KQ11.OF,-KQ21.ON, -KQ21.OF,-KQ0.ON,-KQ0.OF,-KQ15.ON,-KQ15.OF,-KQ16.ON, -KQ16.OF,-KQ25.ON,-KQ25.OF,-KQ26.ON,-KQ26.OF,-K1LAC, -K1LDC,-K1L01,-K1L02,-K1L03,-K1L04,-K1L05,-K1L06,-K1L07, -K1L08,-K1L09,-KG0A,-KG1A,-KG2A,-KG7A,-KG9A,-KG11A, -KG12A,-KG1B,-KG1W,-K2LAC,-K2LDC,-K2L01,-K2L02,-K2L03, -KG21A,-KG22A,-KG15A,-KG25A,-KG2B,-KG2W,-KVT1,-KVT2, -KBVT1,-KBVT2,-KDC2,-KQ15A.ON,-KQ25A.ON,-KSY1,-KOE1, -KOA,-KTX,-KD,-KDC1,-K0D,-K10D,-K51D,-K20D,-K52D,-K11D, -K21D,-K15D,-K25D,-K16D,-K26D,-KDC3,-KVT3,-KVT4,-KVT5,-KVT6			GE		
D	02	AUXILIARY CONTACTOR	PRC4M40ANL, Coil Voltage: 230VAC, 4 C/O Contacts			-KDC, -KACM	GE				
	06	TERMINAL BLOCK FOR AC SUPPLY DISTRIBUTION	CBD4			-XAC	CABUR				
	10	TERMINAL BLOCK FOR DC SUPPLY DISTRIBUTION	CBD4			-XDC	CABUR				
	20	TERMINAL BLOCK FOR CT WITH SHORTENING ARRANGEMNT	SCB6			-X4	CABUR				
E	20	TERMINAL BLOCK FOR METERING CIRCUIT	CBD4			-XM	CABUR				
	10	TERMINAL BLOCK FOR VT SCREW TYPE	SCB6			-X5	CABUR				
	46	TERMINAL BLOCK FOR POWER EQUIPMENT STATUS INPUT	CBD4			-X6	CABUR				
	0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  GE and Alstom joint venture Grid Solutions	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220kV COUPLER BAY CONTROL PANEL (=D06+C8) COMPONENT LIST	Drawing no. P60194-E-DCC-SC-001	
REV.		DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type AC2	Sheet no. 06

	1	2	3	4	5	6	7	8
	QTY.	DEVICE DESCRIPTION	DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS			DEVICE DESIGNITION	MANUFACTURER	
A	32	TERMINAL BLOCK FOR POWER EQUIPMENT STATUS INPUT	CBD4			-X7	CABUR	
	29	TERMINAL BLOCK FOR CB CONTROL CIRCUIT	CBD4			-X9	CABUR	
	60	TERMINAL BLOCK FOR ISO. CONTROL CIRCUIT	CBD4			-X11	CABUR	
B	37	TERMINAL BLOCK FOR SYNCH CIRCUIT	CBD4			-X12	CABUR	
	16	TERMINAL BLOCK FOR SYNCH CIRCUIT	CBD4			-X13	CABUR	
	18	TERMINAL BLOCK FOR POSITION INDICATION CIRCUIT	CBD4			-X14	CABUR	
C	12	TERMINAL BLOCK FOR POSITION INDICATION CIRCUIT	CBD4			-X15	CABUR	
	16	TERMINAL BLOCK FOR AC ANNUNCIATOR UNIT	CBD4			-XAN1	CABUR	
	10	TERMINAL BLOCK FOR DC ANNUNCIATOR UNIT-2	CBD4			-XAN2	CABUR	
D	20	TERMINAL BLOCK FOR DC ANNUNCIATOR UNIT-4	CBD4			-XAN3	CABUR	
	40	TERMINAL BLOCK FOR EVENT RECORDER SIGNALS	CBD4			-XEV	CABUR	
	28	TERMINAL BLOCK FOR SCADA SIGNALS	CBD4			-XSC	CABUR	
E	36	TERMINAL BLOCK FOR EXTERNAL SIGNALING	CBD4			-X30	CABUR	
	11	TERMINAL BLOCK WITH DIODE TYPE IN-D4007, RATED MAXIMUM VOLTAGE 350VDC, RATED BREAK DOWN VOLTAGE 430VDC	DAS.4/6			-XD	CABUR	
	08	TERMINAL BLOCK FOR SCADA CT PT SIGNALS	CBD4			-XSA	CABUR	
F	10	TERMINAL BLOCK FOR BELL & HOOTER CIRCUITS	CBD4			-XF	CABUR	
	10	TERMINAL BLOCK FOR CB OPENING / CLOSING CIRCUITS	CBD4			-X10	CABUR	
	04	TERMINAL BLOCK FOR VT SCREW TYPE	SCB6			-X20	CABUR	
G	04	TERMINAL BLOCK FOR VT SCREW TYPE	SCB6			-X21	CABUR	
	20	TERMINAL BLOCK FOR VT DISTRIBUTION	CBD4			-X22	CABUR	
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REV.	DESCRIPTION	DATE	DRAWER					

FRONT VIEWLEFT SIDE VIEWRIGHT SIDE VIEW

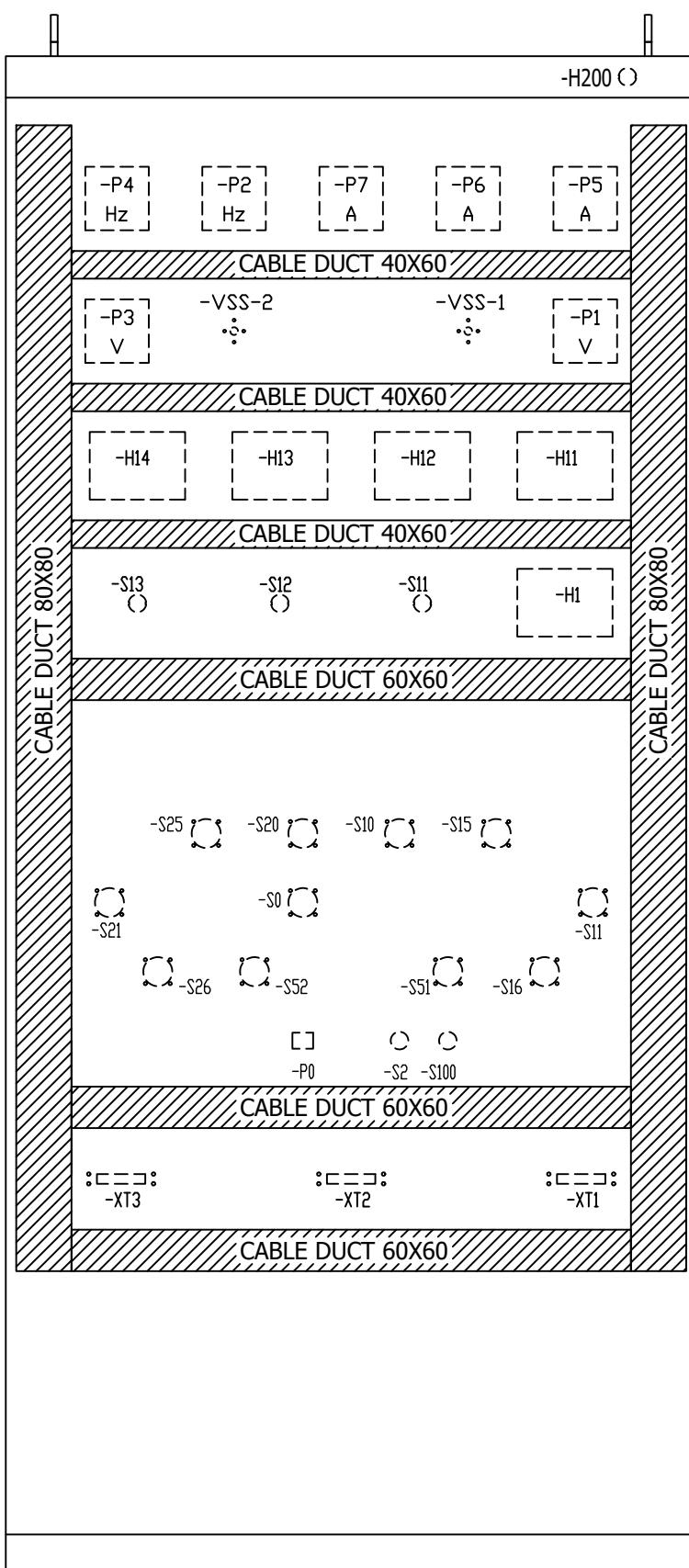
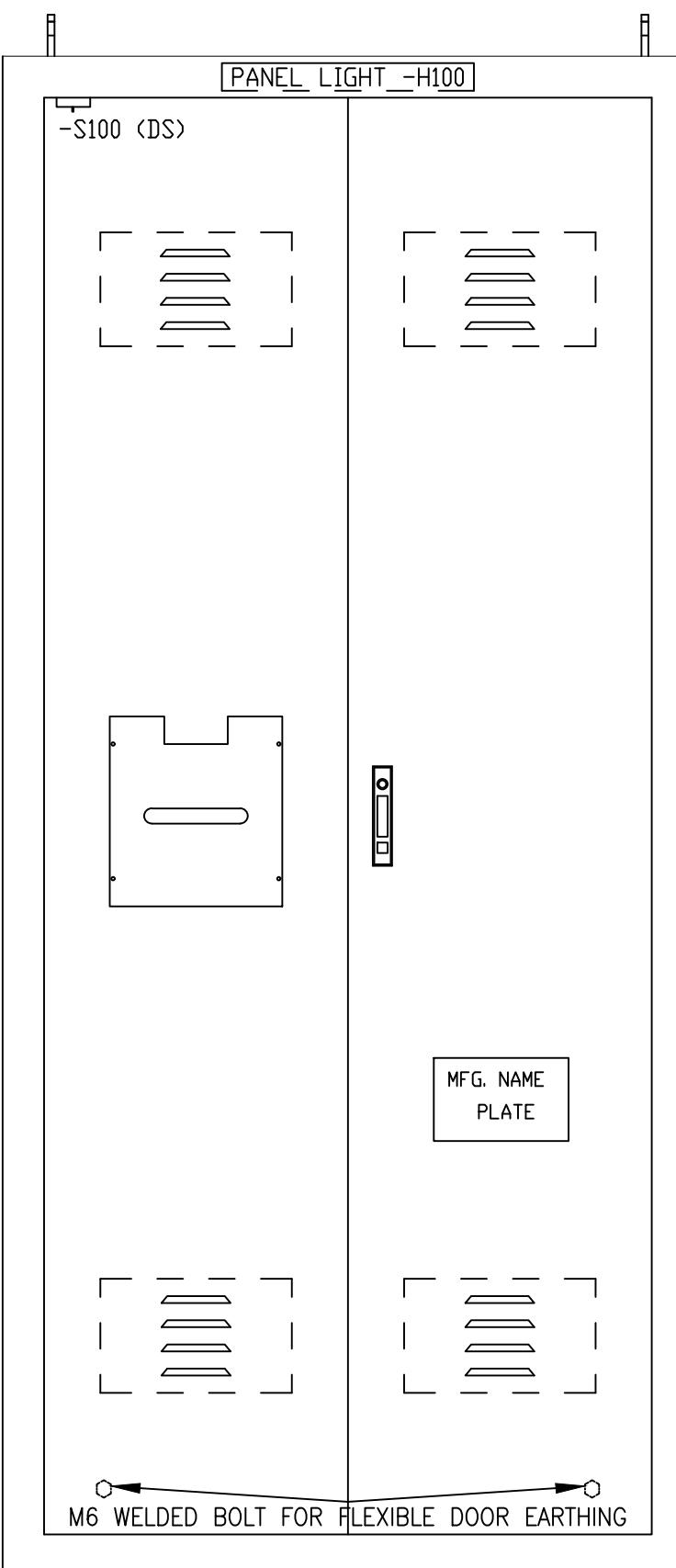
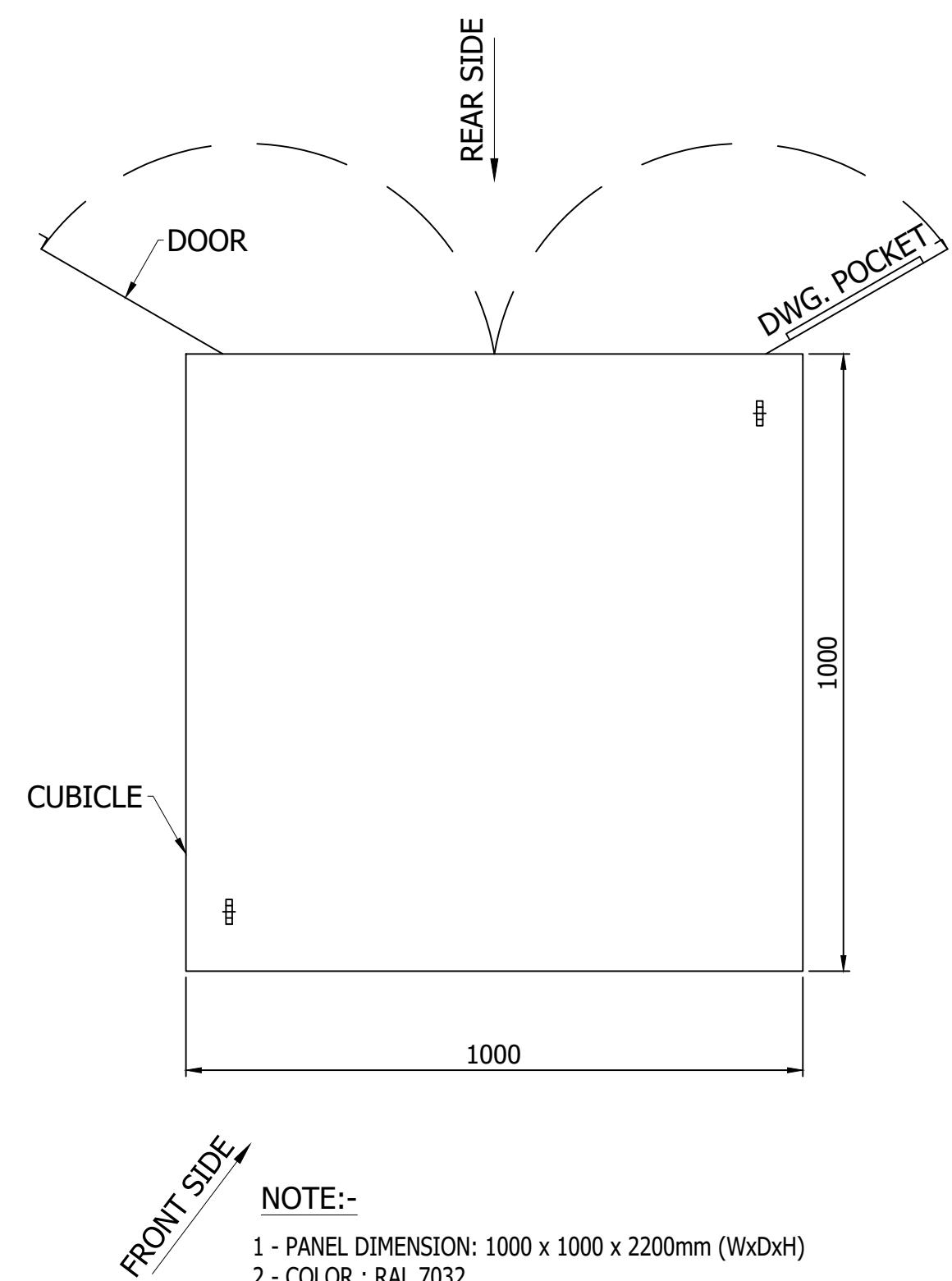
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MIMIC:

1. MIMIC COLOR: GREEN FOR 220kV

0	AS BUILT	30.10.2018	ASJ	Manufacturer  71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220kV COUPLER BAY CONTROL PANEL (=D06+C8) PANEL VIEW	Drawing no. P60194-E-DCC-SC-001
REV.	DESCRIPTION	DATE	DRAWER						
1		2	3						

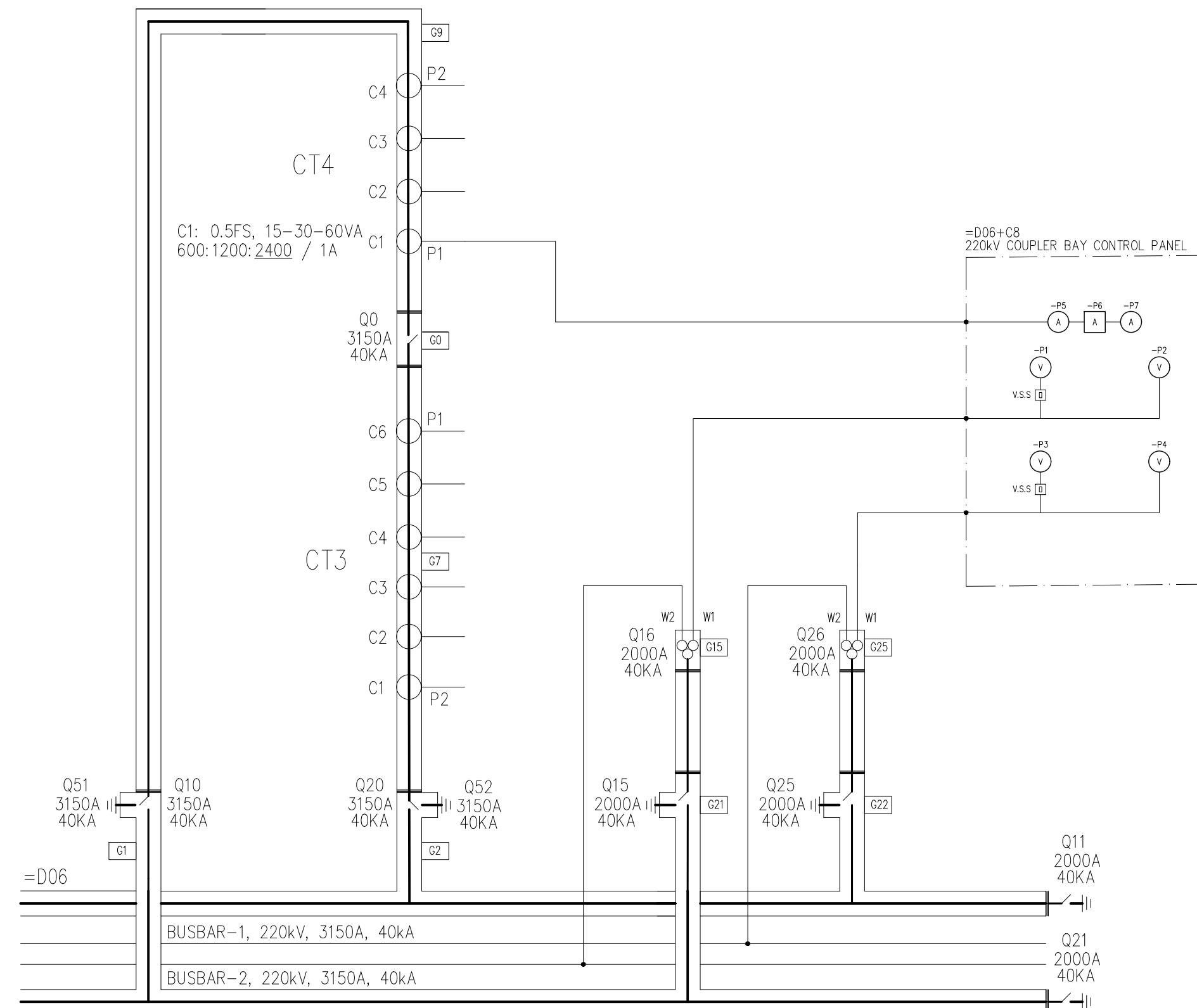
BACK VIEW WITHOUT DOORBACK VIEW WITH DOORTOP VIEW**NOTE:-**

- 1 - PANEL DIMENSION: 1000 x 1000 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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REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type AD1	Sheet no. 07a
1	2	3	4	5	6	7	8				

1 2 3 4 5 6 7 8

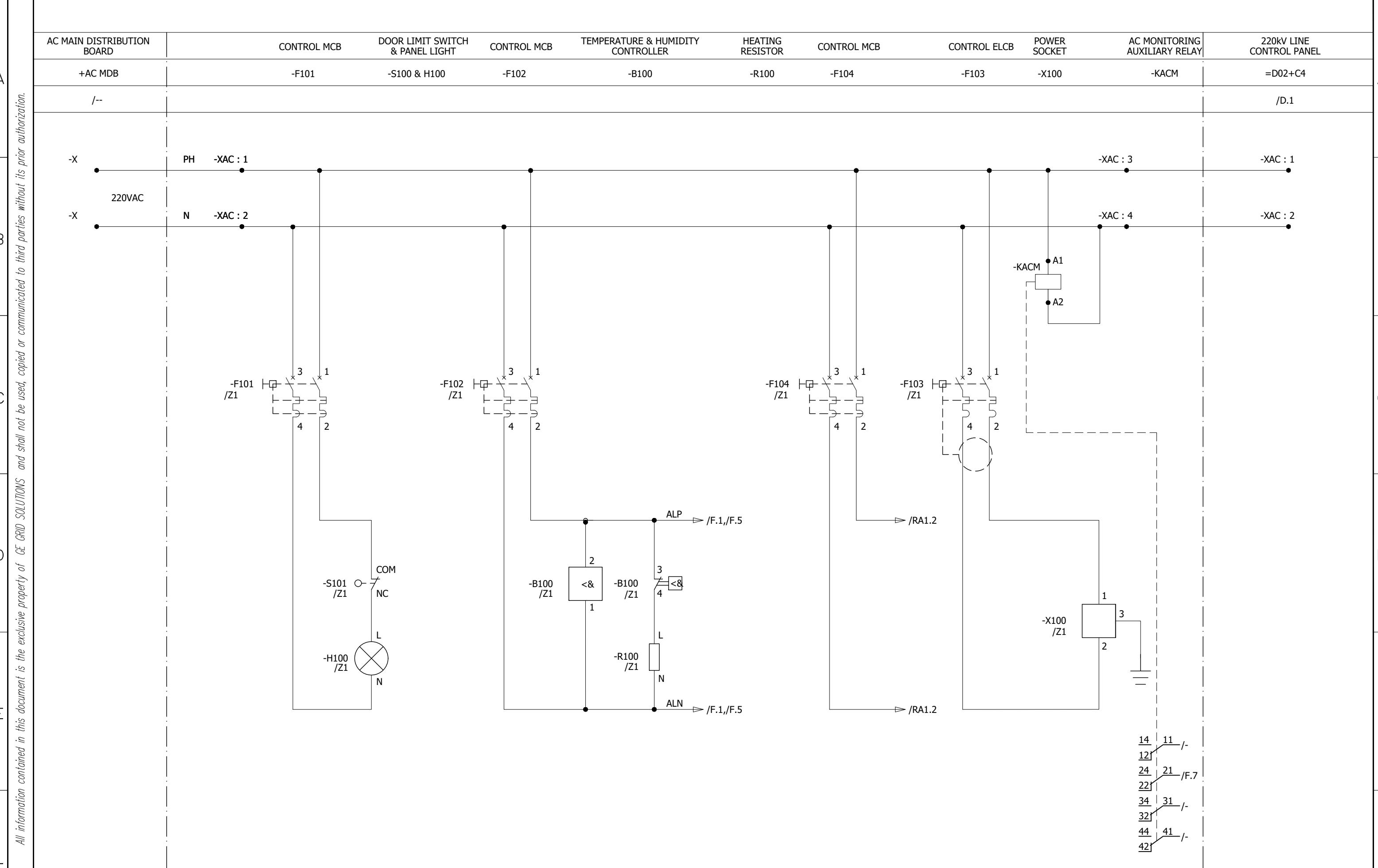
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0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 2a-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220kV COUPLER BAY CONTROL PANEL (=D06+C8) BAY CONCEPT & METERING	Drawing no. P60194-E-DCC-SC-001	
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type AE	Sheet no. 08
1		2	3							

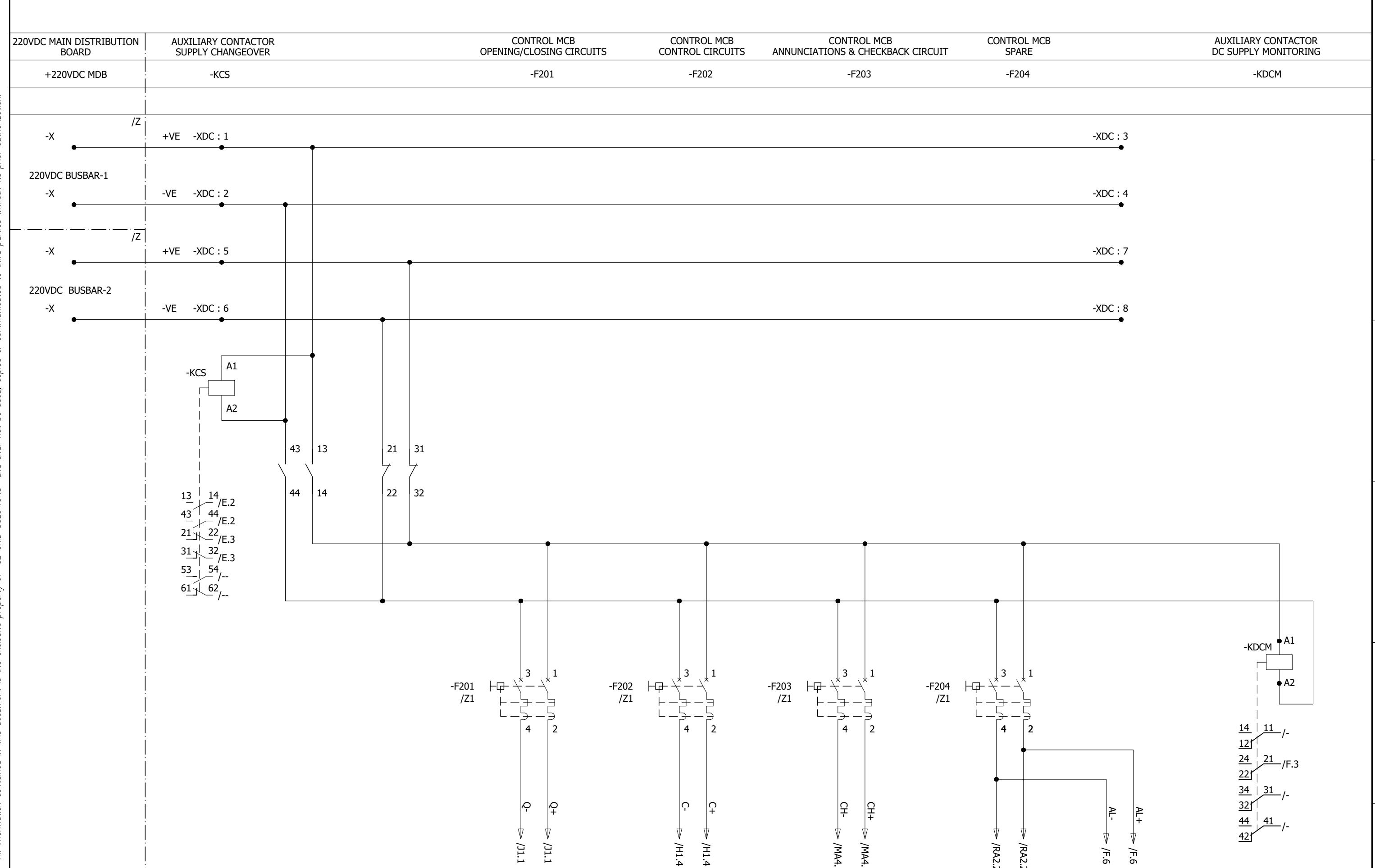
1 2 3 4 5 6 7 8

1 2 3 4 5 6 7 8



0	AS BUILT		30.10.2018	ASJ	Manufacturer	Contractor	Client	Project	Title	Drawing no.			
REV.	DESCRIPTION		DATE	DRAWER	EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Grid Solutions A GE and Alstom joint venture	NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	220KV/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	220KV COUPLER BAY CONTROL PANEL (=D06+C8) AC SUPPLY DISTRIBUTION	P-60194-E-DCC-SC-001	Project no.	Sheet type	Sheet no.
1	2	3	4	5	6	7	8			P-60194	D	09	

1 2 3 4 5 6 7 8



0	AS BUILT	30.10.2018	ASJ	Manufacturer EPE SOL 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 220kV COUPLER BAY CONTROL PANEL (=D06+C8) DC SUPPLY DISTRIBUTION	Drawing no. P60194-E-DCC-SC-001
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type E

1 2 3 4 5 6 7 8

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220V DC CIRCUIT FAULTY

220V DC CIRCUIT FAULTY INDICATION

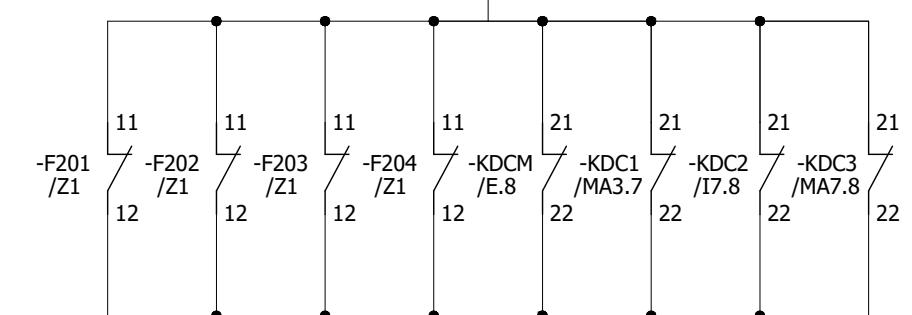
220V AC CIRCUIT FAULTY

-KDC

-H200

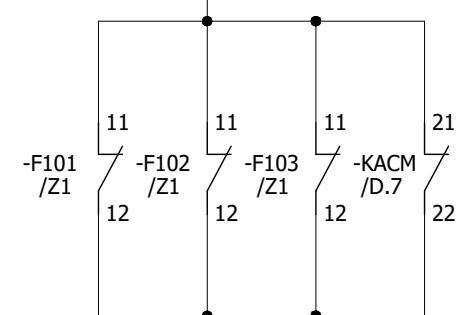
-KAC

/D.5 ➔ ALP



-KDC /F.3
31
34

/E.7 ➔ AL+



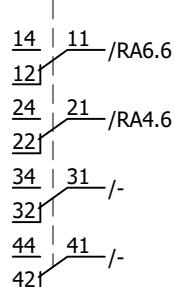
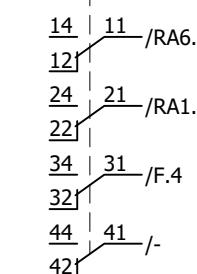
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-KDC

A1
A2

-H200 /Z1
X1
X2

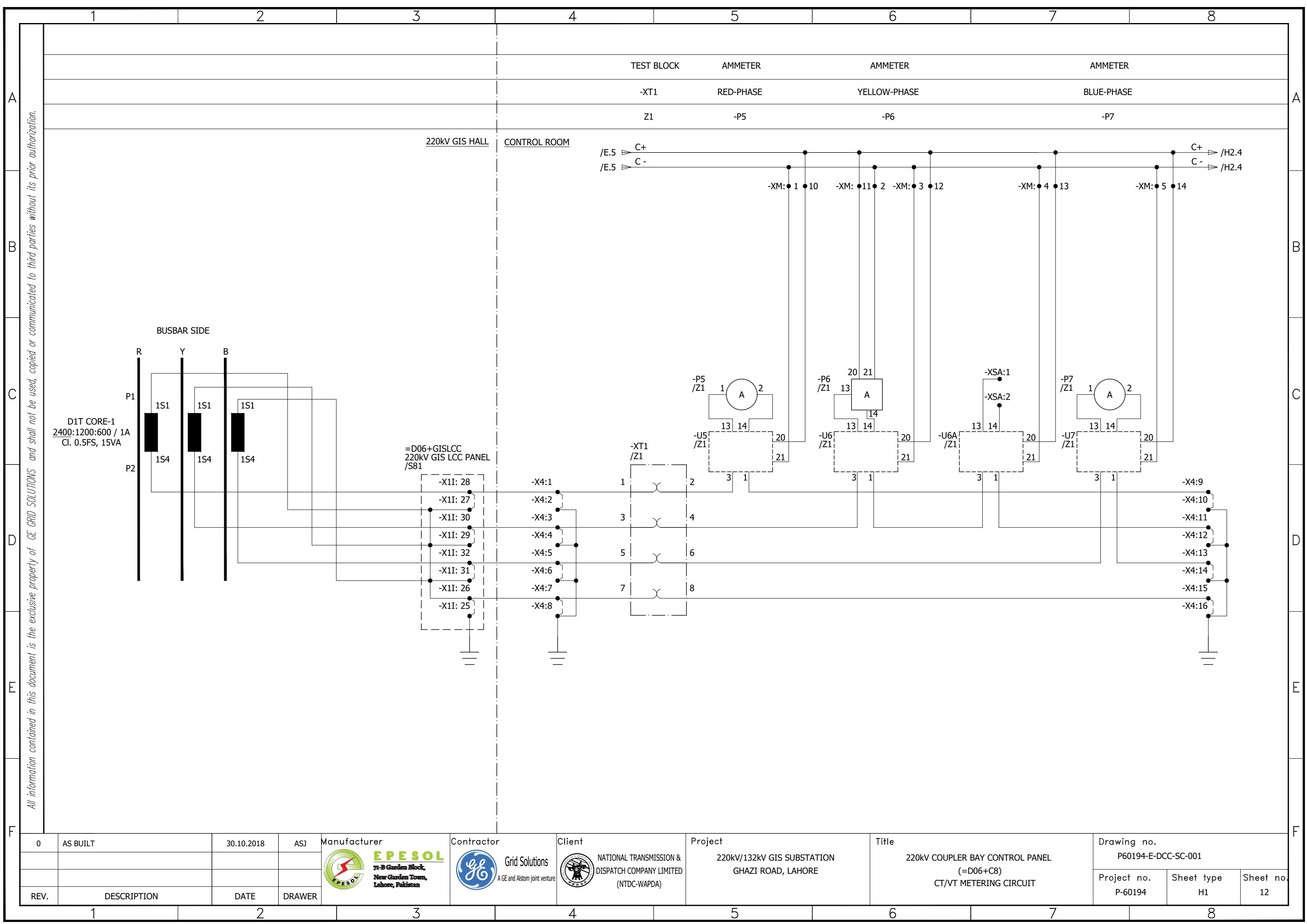
/E.7 ➔ AL-



A
B
C
D
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F

A
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E
F

0	AS BUILT	30.10.2018	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 220KV COUPLER BAY CONTROL PANEL (=D06+C8) AC/DC SUPPLY FAILURE CIRCUIT	Drawing no. P60194-E-DCC-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type F
									Sheet no. 11



1 2 3 4 5 6 7 8

TEST BLOCK

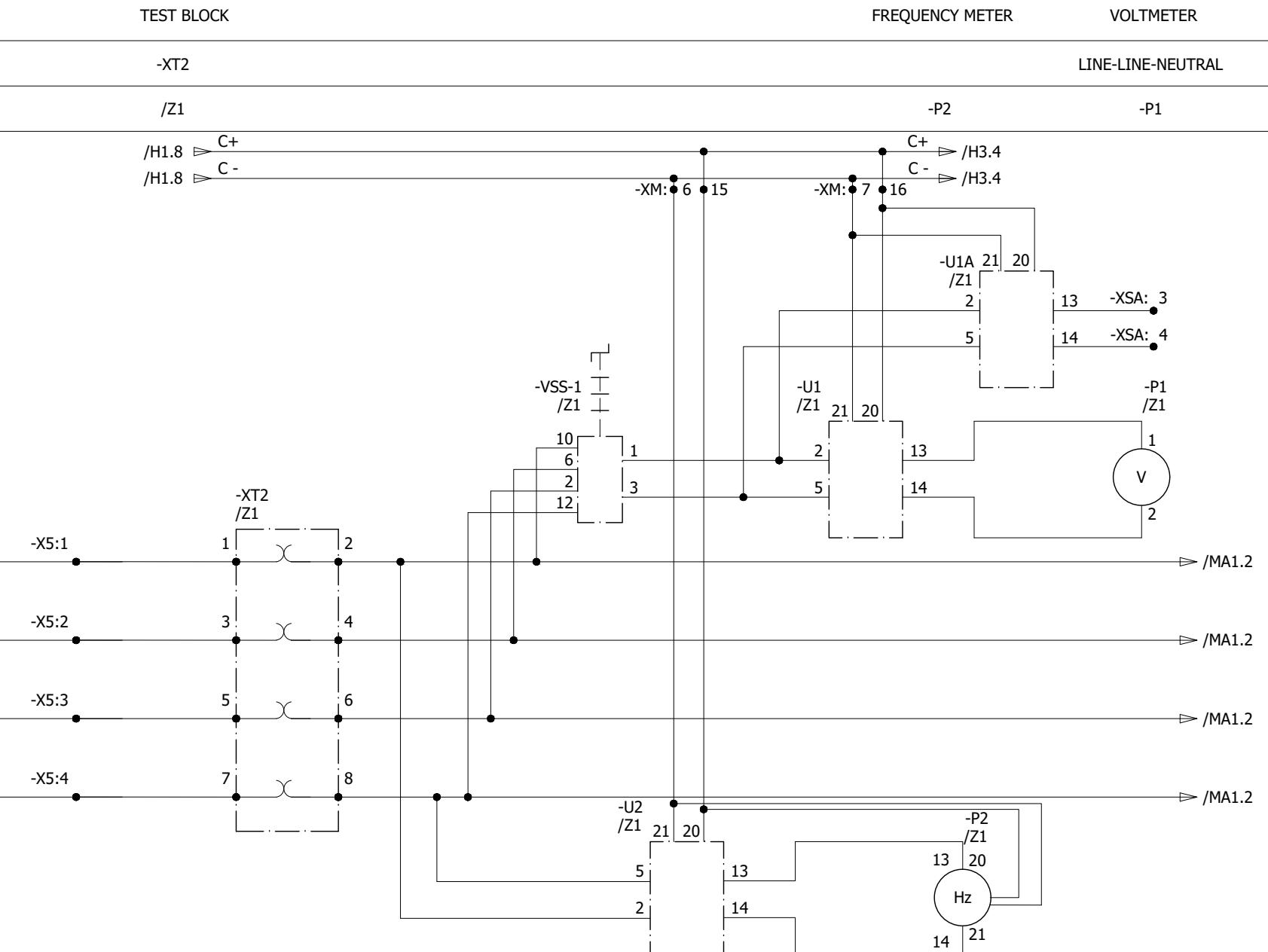
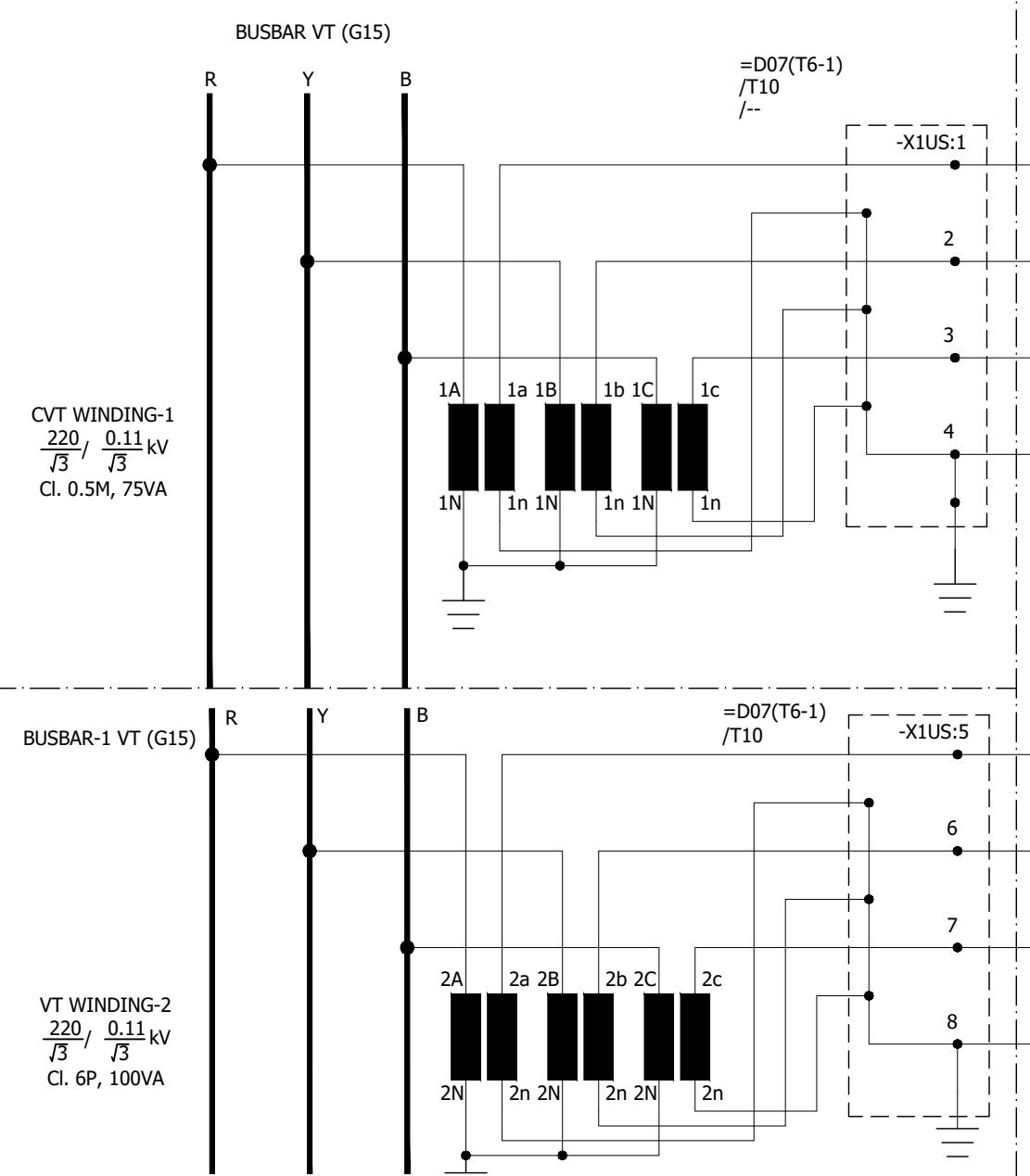
FREQUENCY METER

VOLTMETER

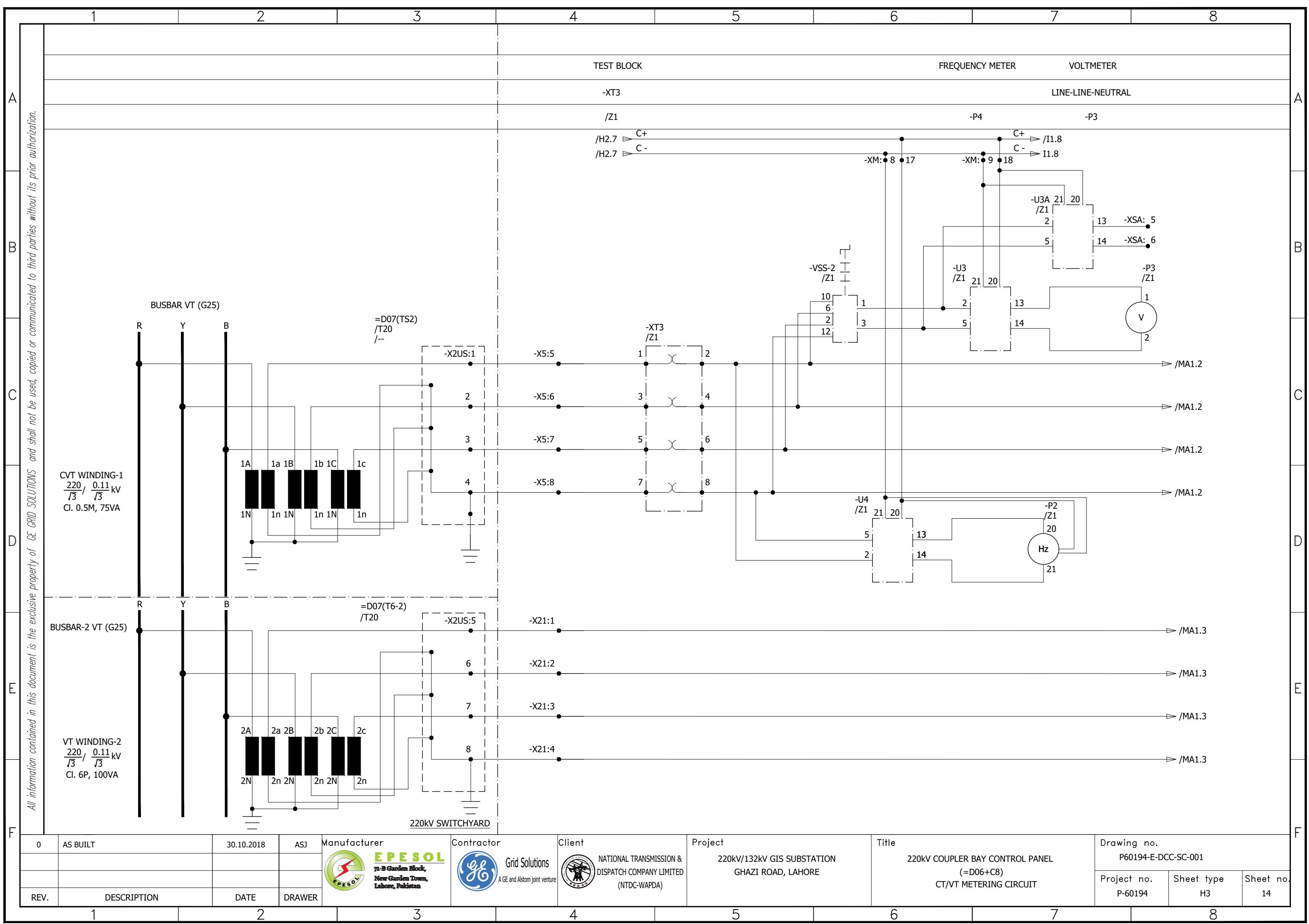
LINE-LINE-NEUTRAL

-P1

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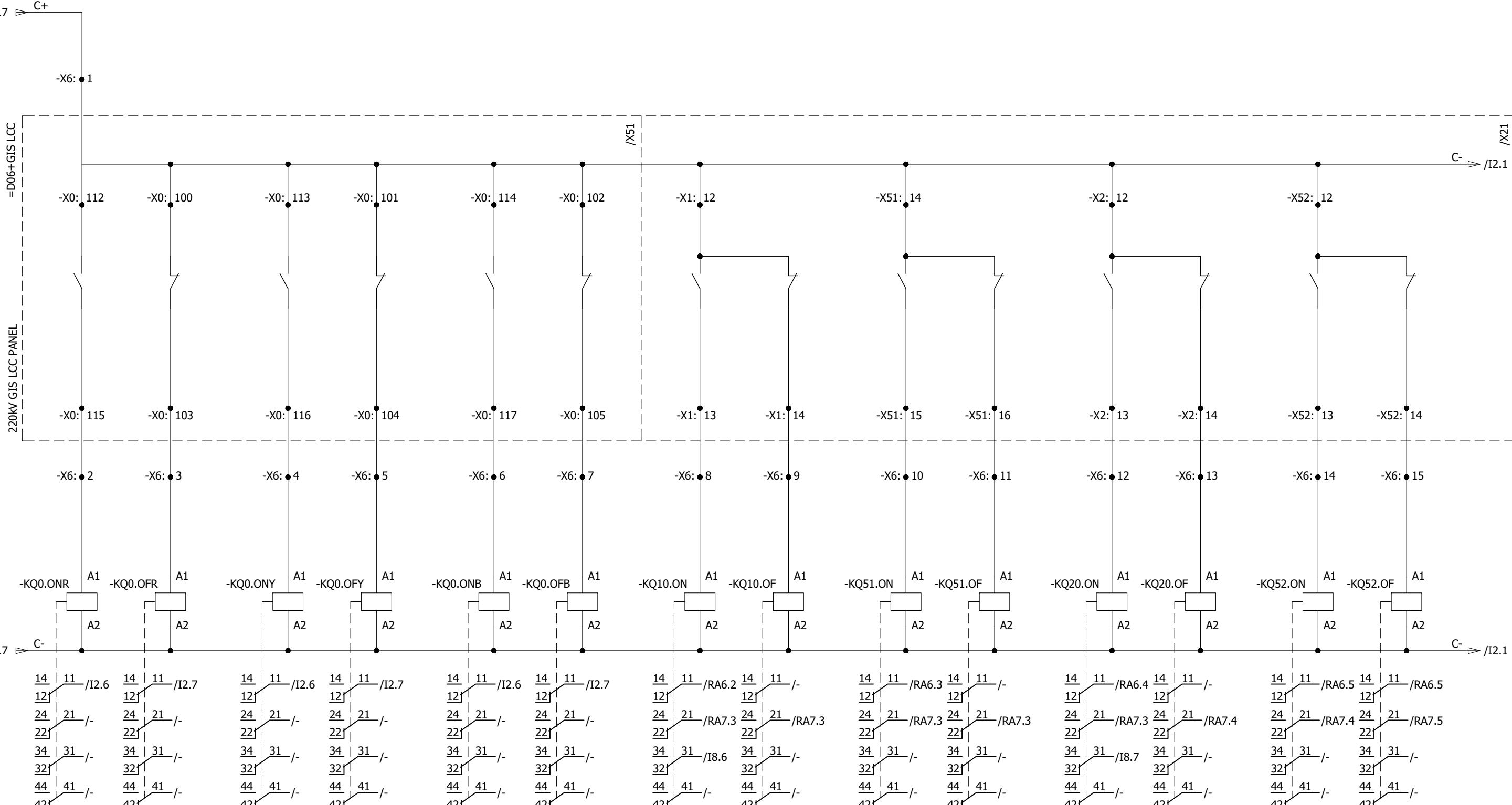


220kV SWITCHYARD											
0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 21-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions <small>A GE and Alstom joint venture</small>	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED <small>(NTDC-WAPDA)</small>	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220kV COUPLER BAY CONTROL PANEL <small>(=D06+C8)</small> CT/VT METERING CIRCUIT	Drawing no.		
			P60194-E-DCC-SC-001								
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type H2	Sheet no. 13



POWER EQUIPMENT STATUS SIGNALS

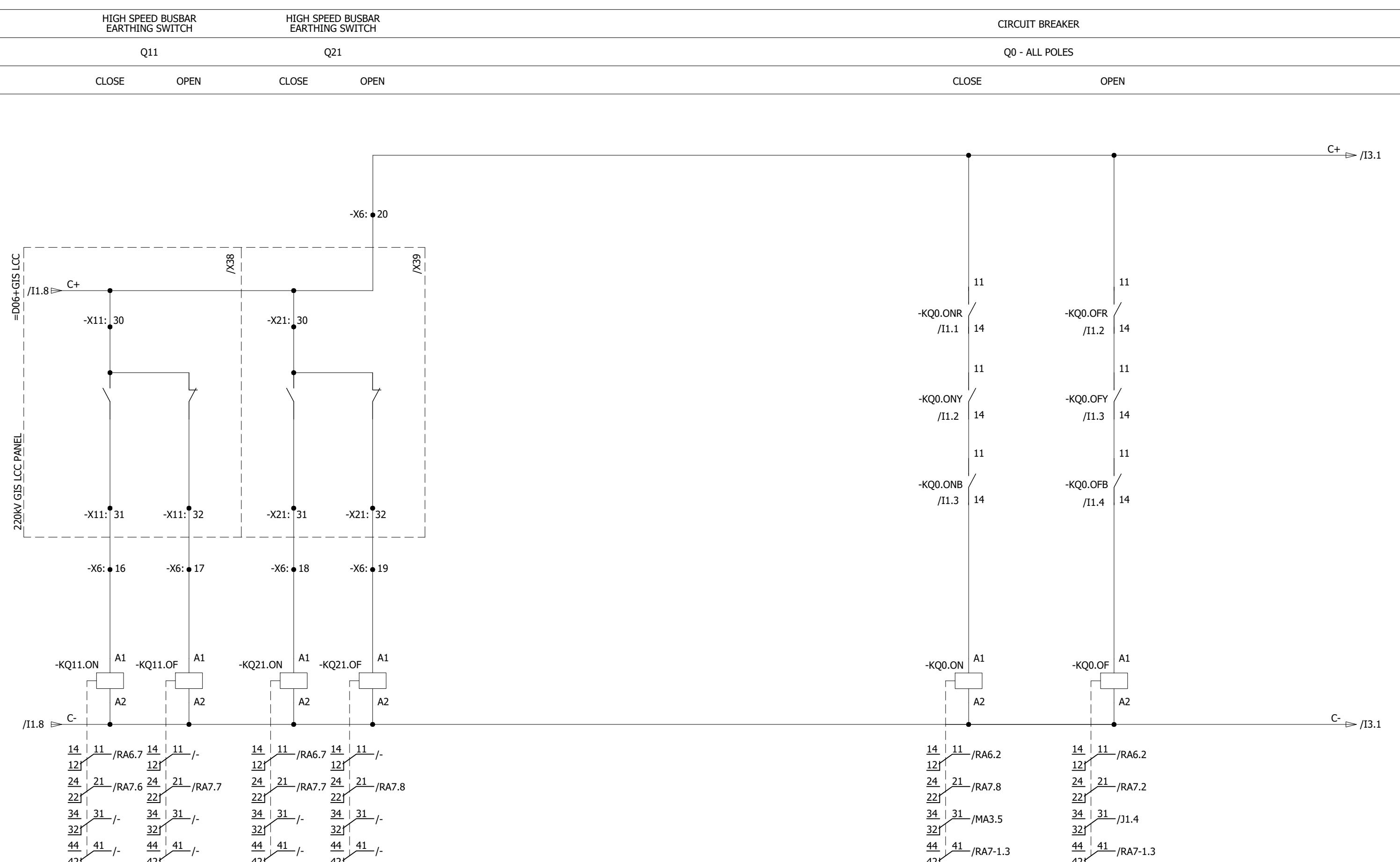
CIRCUIT BREAKER		CIRCUIT BREAKER		CIRCUIT BREAKER		BUS SIDE ISOLATOR		BUS SIDE EARTHING SWITCH		BUS SIDE ISOLATOR		BUS SIDE EARTHING SWITCH	
Q0 - RED POLE		Q0 - YELLOW POLE		Q0 - BLUE POLE		Q10		Q51		Q20		Q52	
CLOSE	OPEN	CLOSE	OPEN	CLOSE	OPEN	CLOSE	OPEN	CLOSE	OPEN	CLOSE	OPEN	CLOSE	OPEN



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0	AS BUILT	30.10.2018	ASJ	Manufacturer  71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220kV COUPLER BAY CONTROL PANEL (=D06+C8) POWER EQUIPMENT INPUTS	Drawing no. P60194-E-DCC-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type I1
									Sheet no. 15

POWER EQUIPMENT STATUS SIGNALS



0	AS BUILT	30.10.2018	ASJ	Manufacturer	Contractor	Client	Project	Title	Drawing no.
REV.	DESCRIPTION	DATE	DRAWER	EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Grid Solutions A GE and Alstom joint venture	NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	220KV/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	220kV COUPLER BAY CONTROL PANEL (=D06+C8) POWER EQUIPMENT INPUTS	P-60194-E-DCC-SC-001
									Project no. P-60194 Sheet type I2 Sheet no. 16

POWER EQUIPMENT STATUS SIGNALS

BUSBAR-1 PT
ISOLATOR SWITCHBUSBAR-1 PT
EARTHING SWITCHBUSBAR-2 PT
ISOLATOR SWITCHBUSBAR-2 PT
EARTHING SWITCH

Q15

Q16

Q25

Q26

CLOSE

OPEN

CLOSE

OPEN

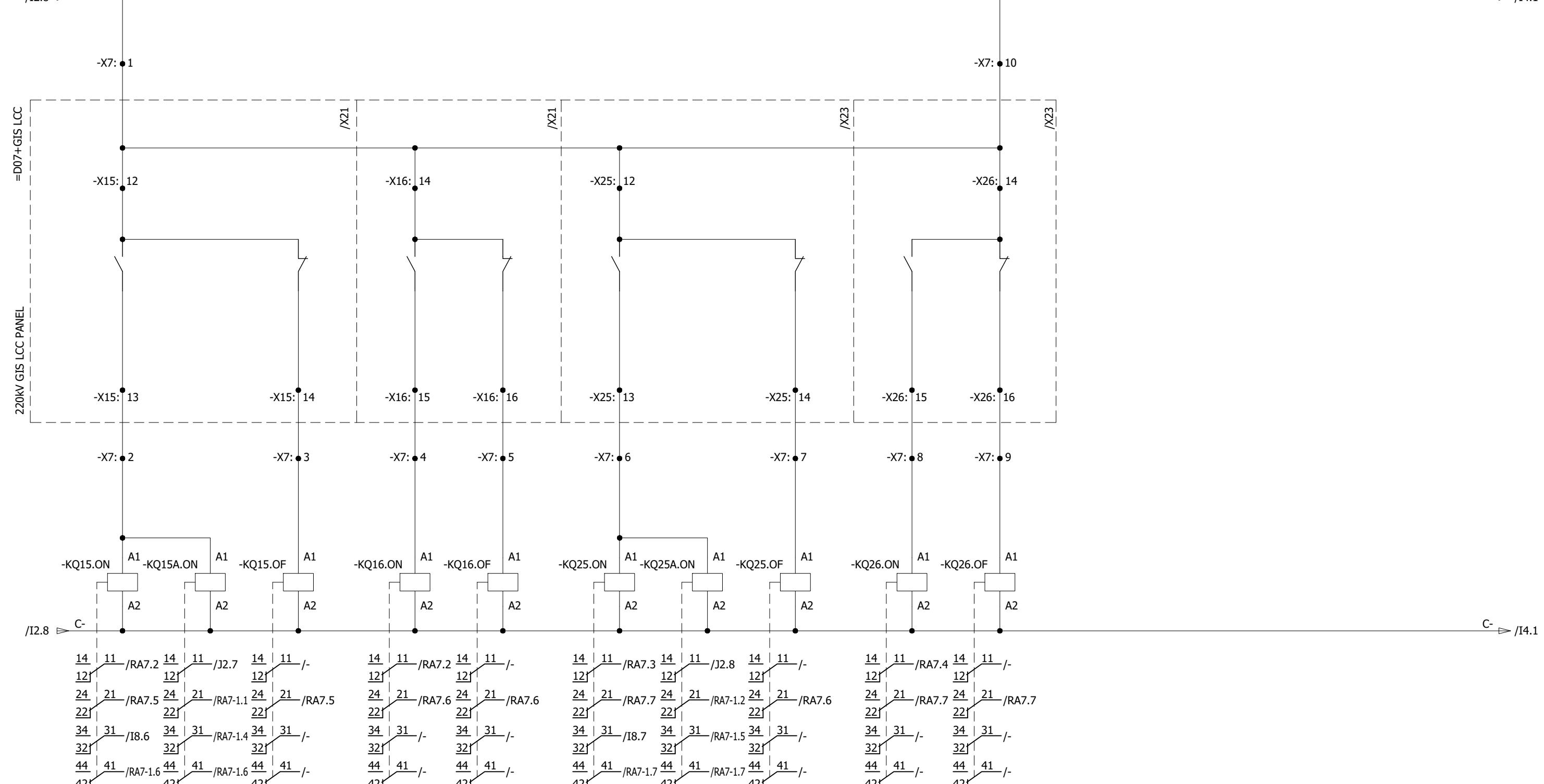
CLOSE

OPEN

CLOSE

OPEN

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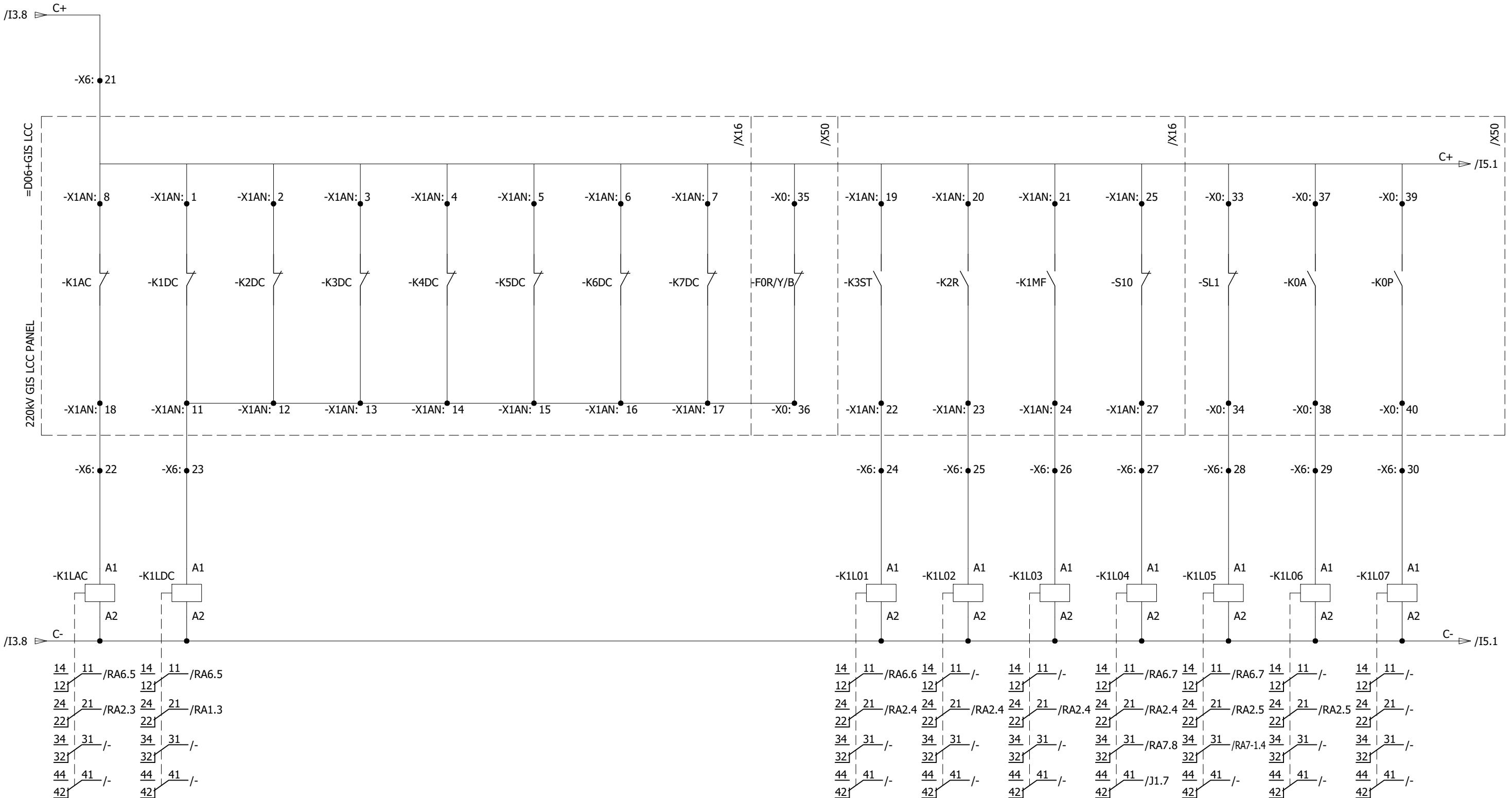


0	AS BUILT	30.10.2018	ASJ	Manufacturer EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor Grid Solutions A GE and Alstom joint venture	Client NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project	Title	Drawing no.				
							220KV COUPLER BAY CONTROL PANEL (=D06+C8) POWER EQUIPMENT INPUTS		P60194-E-DCC-SC-001				
REV.	DESCRIPTION	DATE	DRAWER					Project no.	P-60194	Sheet type	I3	Sheet no.	17

POWER EQUIPMENT INPUT SIGNALS

GIS LCC AC SUPPLY FAILURE	GIS LCC DC SUPPLY FAILURE								GIS LCC OPERATIONAL ALARMS							
	HEAT/LIGHT SUPPLY FAIL	S+/- FAIL	C+/- FAIL	T1+/- FAIL	T2+/- FAIL	GM+/- FAIL	DS/ES MOTOR MCB OPEN	M1+/- FAIL	Q0 MOTOR MCB OPEN	DS/ES ABNORMAL OPERATING TIME	REPEAT RELAY ANOMALY	DS/ES MECHANISM FAULTY	BAY IN LOCAL MODE	SPRING CHARGED	LONG SPRING CHARGING TIME	MANUAL CLOSING

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0	AS BUILT	30.10.2018	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 GAZI ROAD, LAHORE	Title 220kV COUPLER BAY CONTROL PANEL (=D06+C8) POWER EQUIPMENT INPUTS	Drawing no. P60194-E-DCC-SC-001		
									Project no. P-60194		
									Sheet type I4	Sheet no. 18	
REV.	DESCRIPTION	DATE	DRAWER	1	2	3	4	5	6	7	8

POWER EQUIPMENT INPUT SIGNALS

GIS LCC OPERATIONAL ALARMS

GIS LCC GAS COMPARTMENT ALARMS

A

A

MANUAL TRIPPING PHASE DISCREPANCY PHASE DISCREPANCY

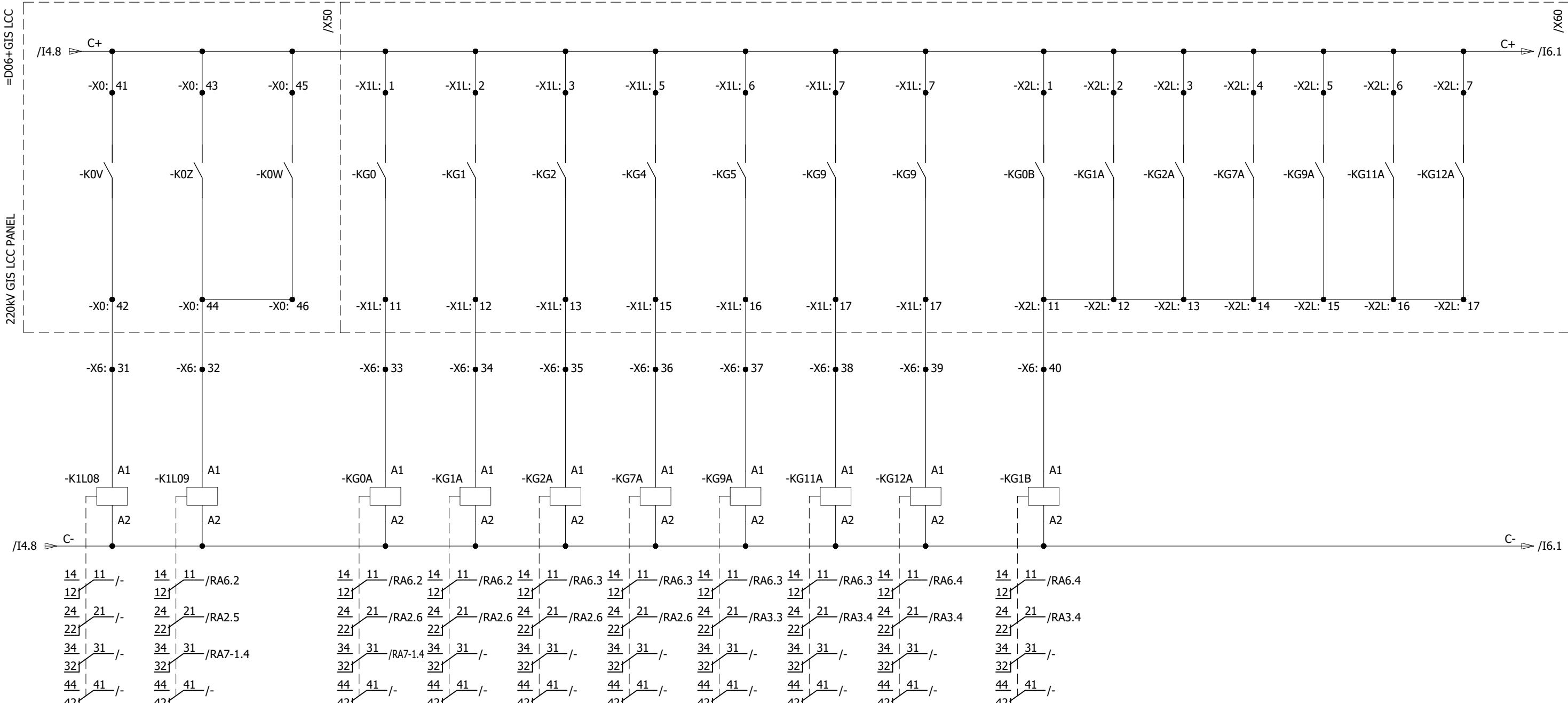
G0 LEVEL-1 G1 LEVEL-1 G2 LEVEL-1 G7 LEVEL-1 G9 LEVEL-1 G11 LEVEL-1 G12 LEVEL-1 G0 LEVEL-2 G1 LEVEL-2 G2 LEVEL-2 G7 LEVEL-2 G9 LEVEL-2 G11 LEVEL-2 G12 LEVEL-2

TRIP-1

TRIP-2

ALARM ALARM ALARM ALARM ALARM ALARM BLOCK BLOCK BLOCK BLOCK BLOCK BLOCK BLOCK

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0	AS BUILT	30.10.2018	ASJ	Manufacturer  71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220kV COUPLER BAY CONTROL PANEL (=D06+C8) POWER EQUIPMENT INPUTS	Drawing no. P60194-E-DCC-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type I5
									Sheet no. 19

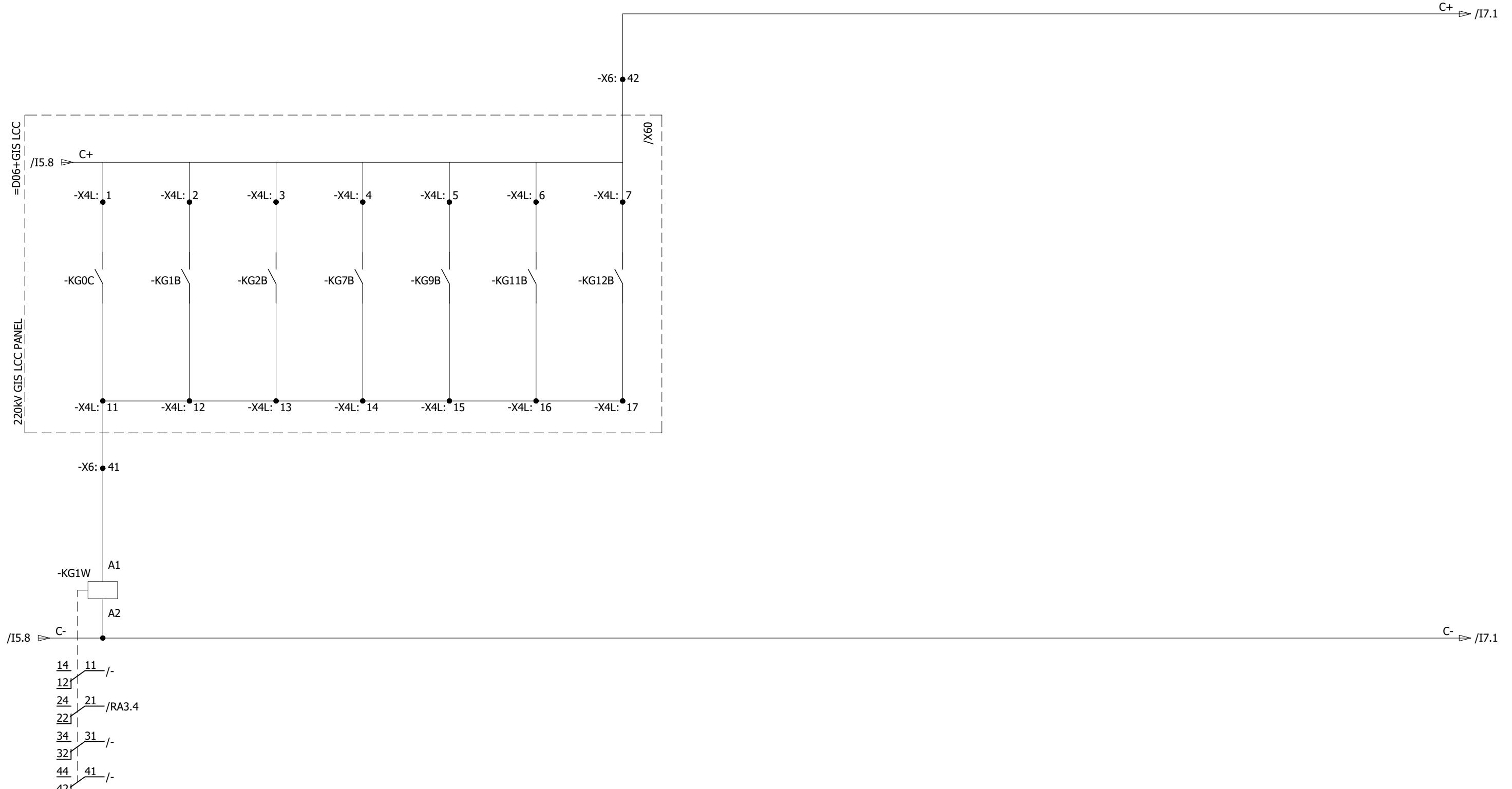
POWER EQUIPMENT INPUT SIGNALS

GIS LCC GAS COMPARTMENT ALARMS

G0 SELF WIRING	G1 SELF WIRING	G2 SELF WIRING	G7 SELF WIRING	G9 SELF WIRING	G11 SELF WIRING	G12 SELF WIRING
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CHECK						
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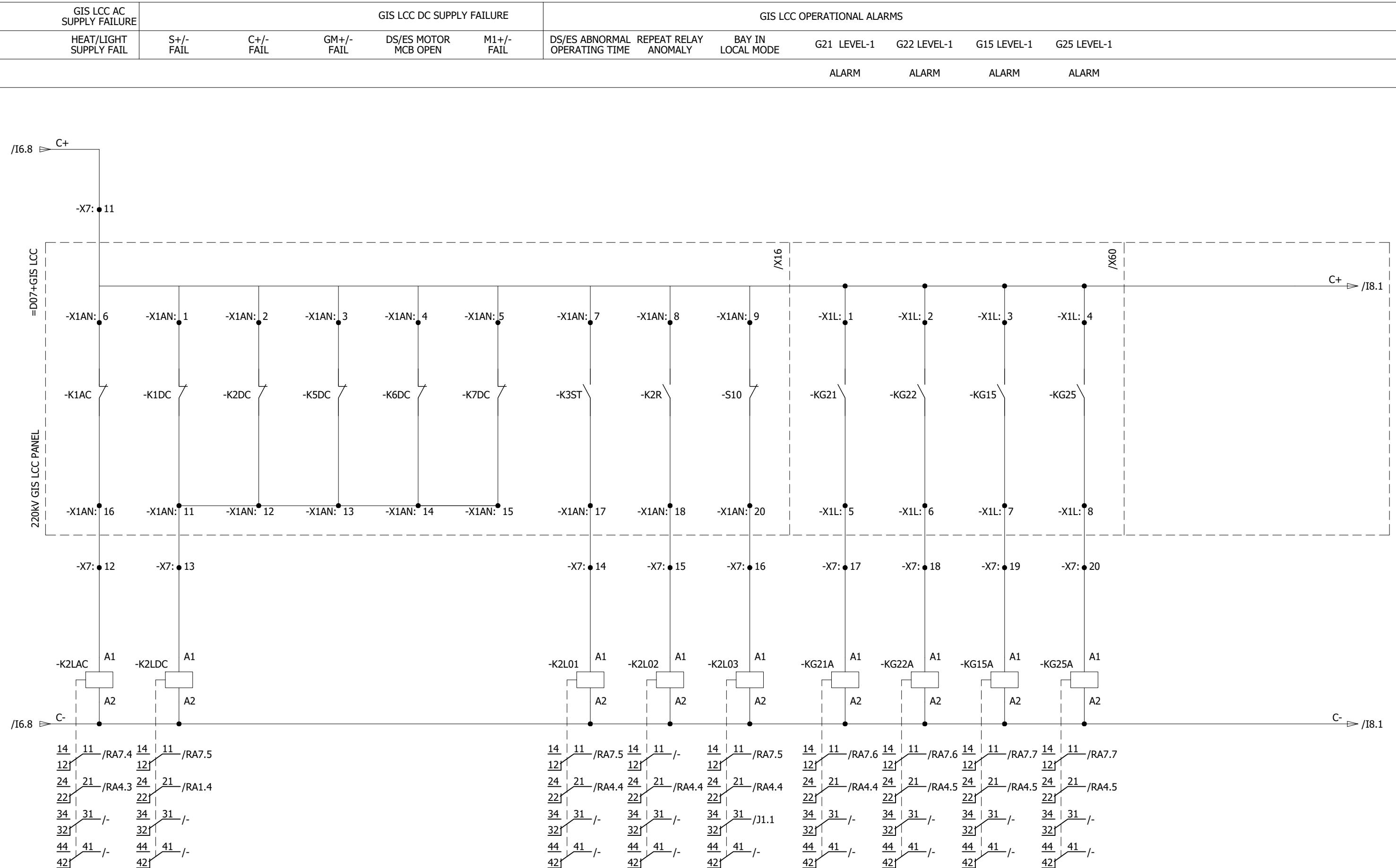
F

F

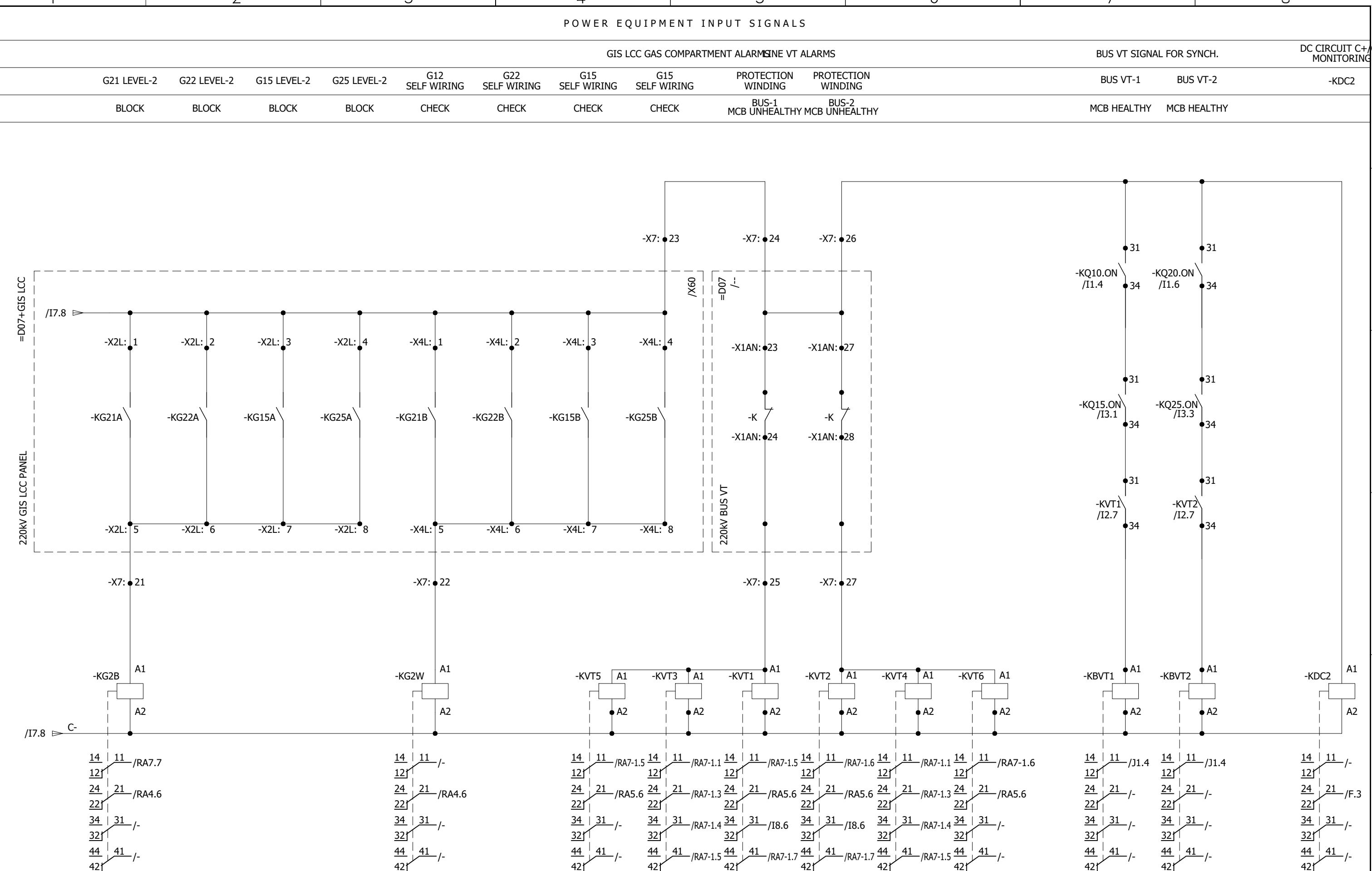
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REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194

POWER EQUIPMENT INPUT SIGNALS

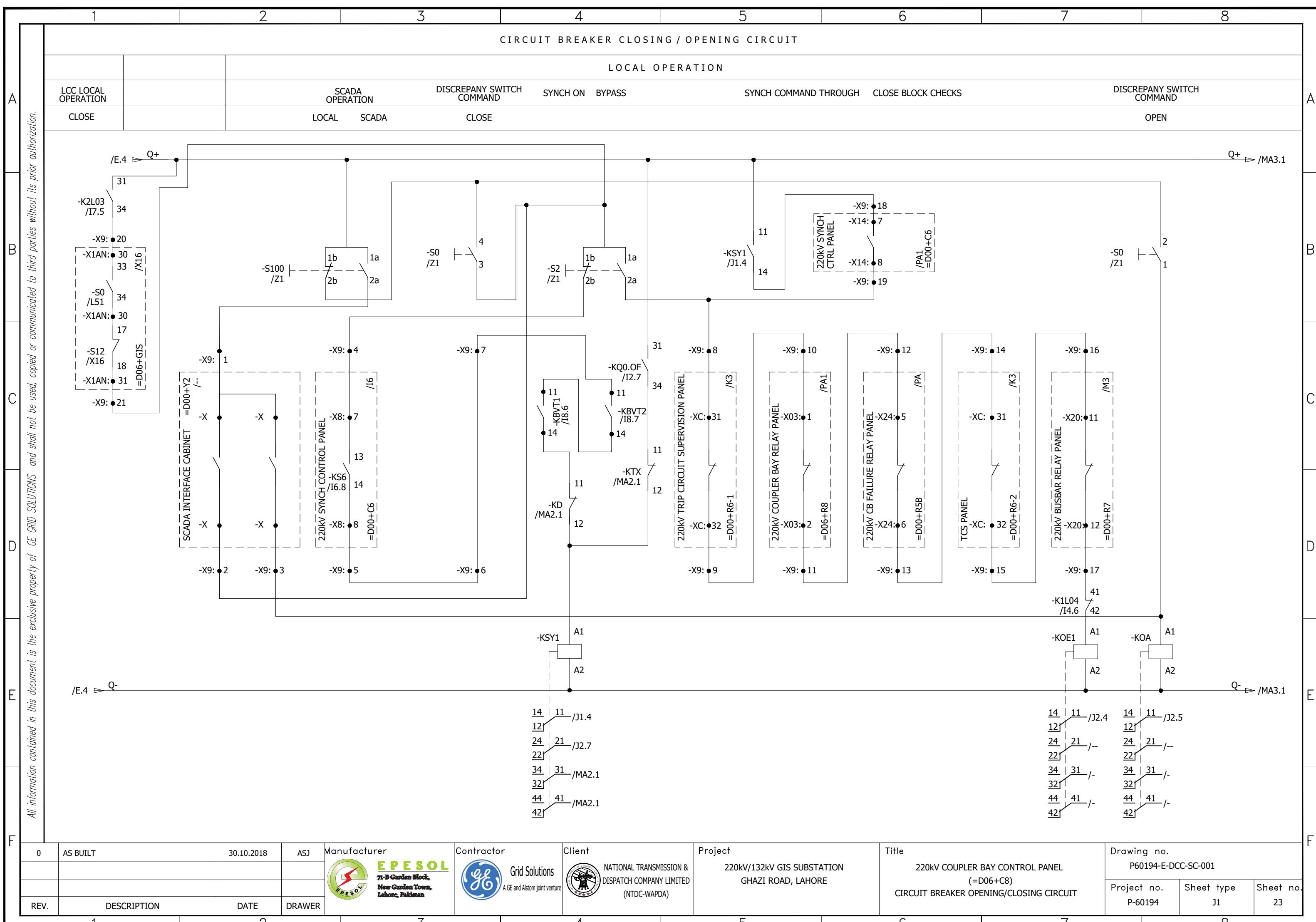
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0	AS BUILT	30.10.2018	ASJ	Manufacturer  71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220KV/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220KV COUPLER BAY CONTROL PANEL (=D06+C8) POWER EQUIPMENT INPUTS	Drawing no. P60194-E-DCC-SC-001			
REV.	DESCRIPTION	DATE	DRAWER							Project no. P-60194	Sheet type I7	Sheet no. 21
1	2	3	4	5	6	7	8					



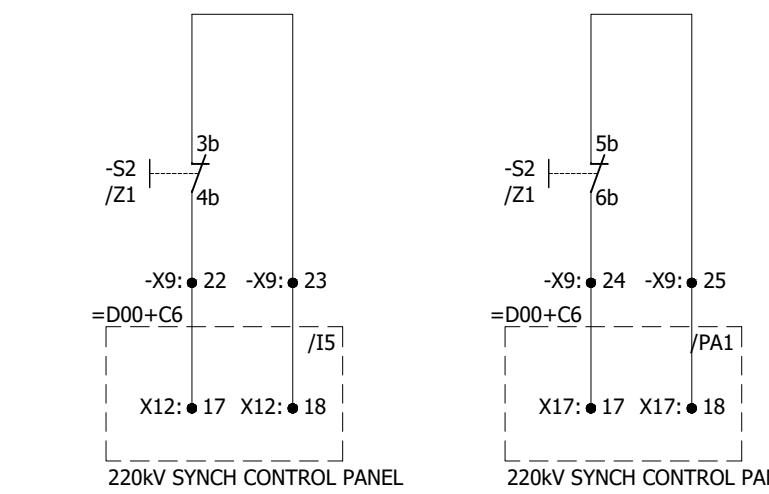
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									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type I8



CIRCUIT BREAKER CLOSING / OPENING COMMANDS TO GIS LCC

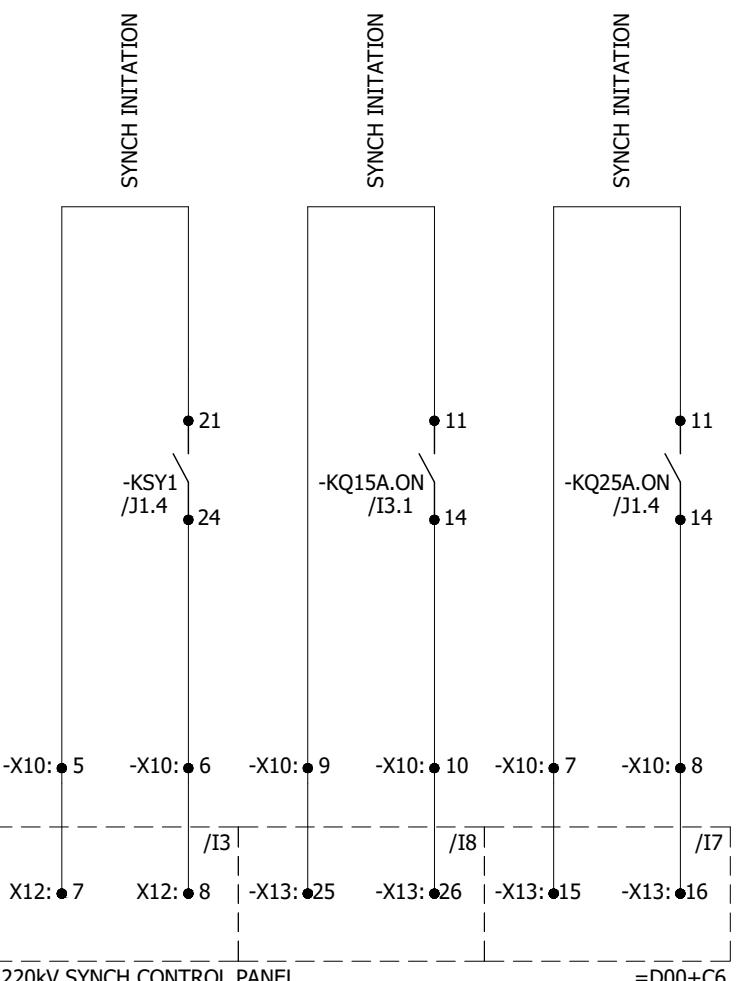
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A



CONTROL PANEL CLOSE
COMMAND TO CIRCUIT BREAKER

CONTROL PANEL OPENING
COMMAND TO ALL POLES



SYNCH INITIATION

SYNCH INITIATION

SYNCH INITIATION

D

E

F

A

B

C

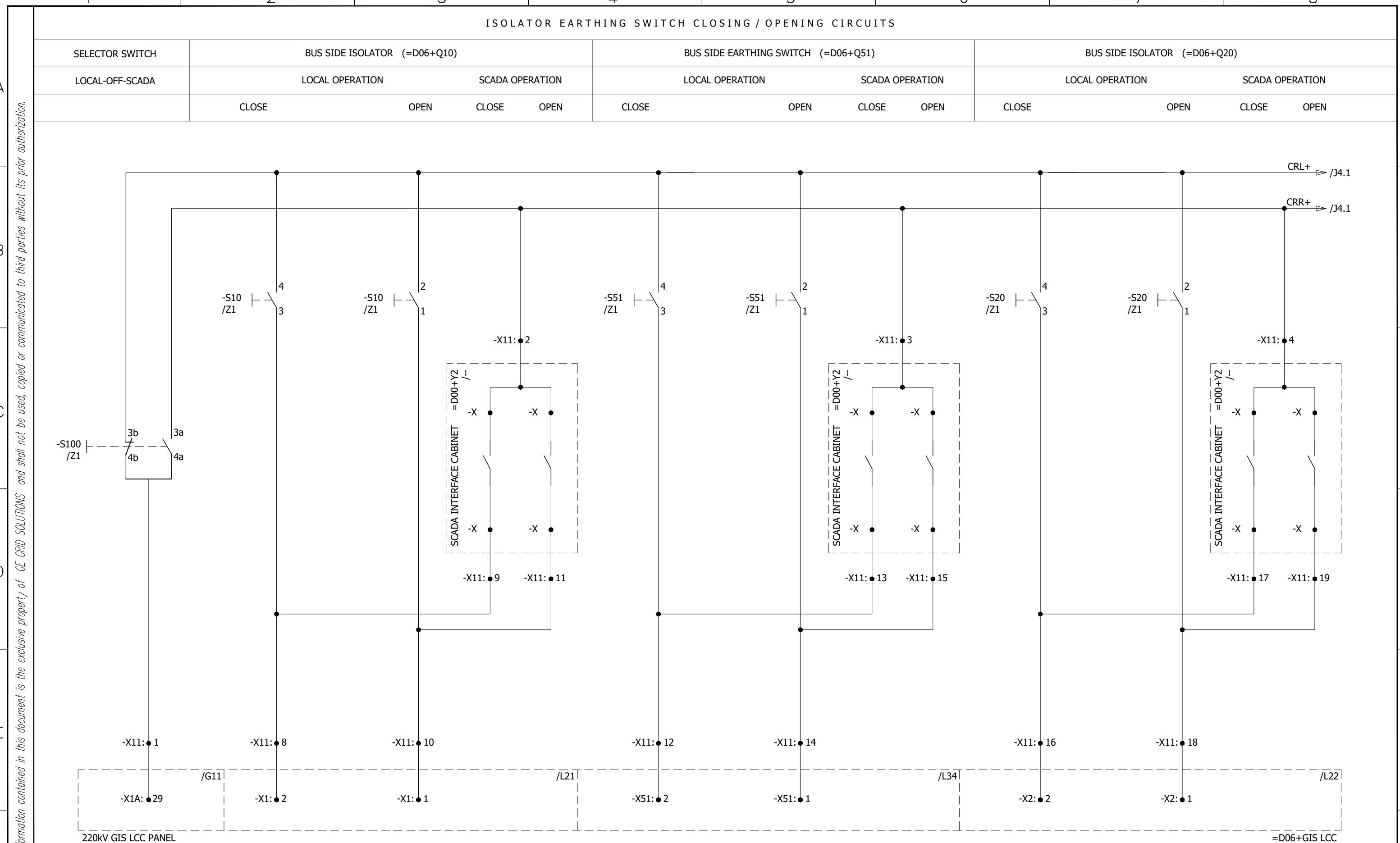
D

E

F

0	AS BUILT	30.10.2018	ASJ	Manufacturer	Contractor	Client	Project	Title	Drawing no.
REV.	DESCRIPTION	DATE	DRAWER	EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Grid Solutions A GE and Alstom joint venture	NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	220kV COUPLER BAY CONTROL PANEL (=D06+C8) CIRCUIT BREAKER OPENING/CLOSING CIRCUIT	P60194-E-DCC-SC-001
									Project no. P-60194 Sheet type J2 Sheet no. 24

ISOLATOR EARTHING SWITCH CLOSING / OPENING CIRCUITS



0	AS BUILT	30.10.2018	ASJ	Manufacturer  71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220kV COUPLER BAY CONTROL PANEL (=D06+C8) ISOLATOR/EARTHING SW. OPENING/CLOSING CIRCUIT	Drawing no. P60194-E-DCC-SC-001			
REV.	DESCRIPTION	DATE	DRAWER							Project no. P-60194	Sheet type J3	Sheet no. 25
1	2	3	4	5	6	7	8					

1 2 3 4 5 6 7 8

ISOLATOR EARTHING SWITCH CLOSING / OPENING CIRCUITS

BUS SIDE EARTHING SWITCH (=D06+Q52)

HIGH SPEED EARTHING SWITCH (=D06+Q11)

HIGH SPEED EARTHING SWITCH (=D06+Q21)

LOCAL OPERATION

SCADA OPERATION

LOCAL OPERATION

SCADA OPERATION

LOCAL OPERATION

SCADA OPERATION

CLOSE

OPEN

CLOSE

OPEN

CLOSE

OPEN

CLOSE

OPEN

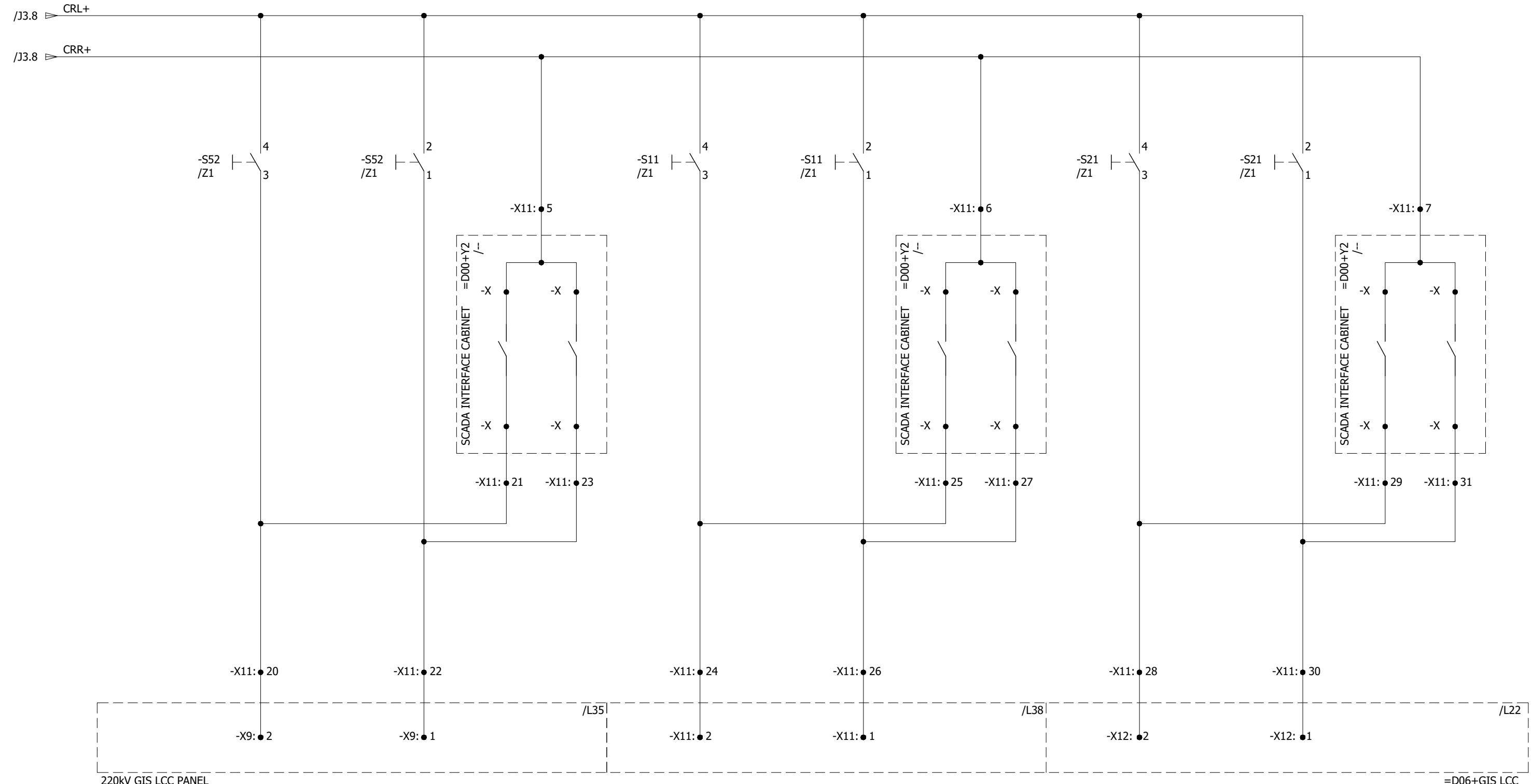
CLOSE

OPEN

CLOSE

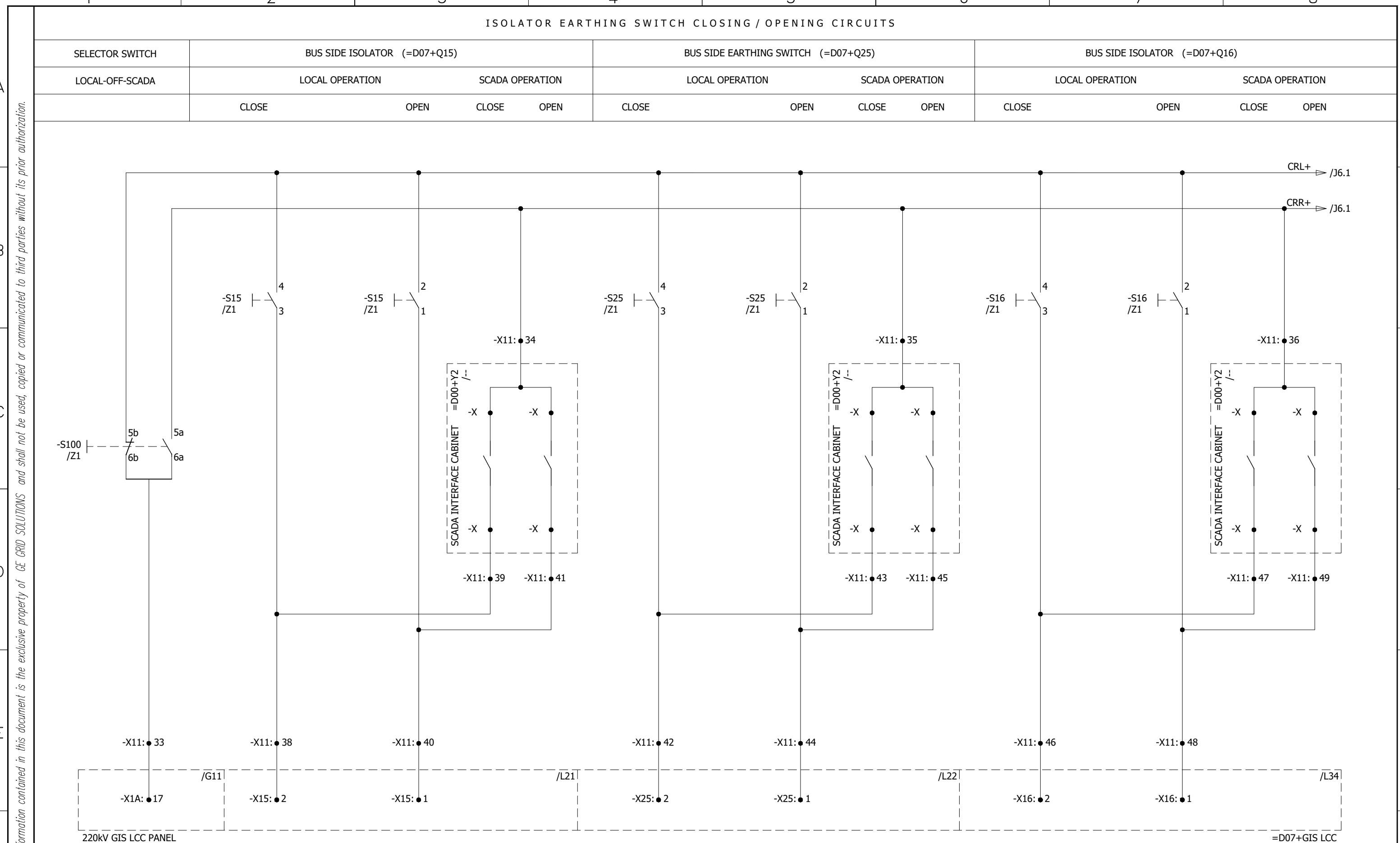
OPEN

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0	AS BUILT	30.10.2018	ASJ	Manufacturer  71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220kV COUPLER BAY CONTROL PANEL (=D06+C8) ISOLATOR/EARTHING SW. OPENING/CLOSING CIRCUIT	Drawing no. P60194-E-DCC-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type J4
									Sheet no. 26

ISOLATOR EARTHING SWITCH CLOSING / OPENING CIRCUITS



0	AS BUILT		30.10.2018	ASJ	Manufacturer  71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220kV COUPLER BAY CONTROL PANEL (=D07+C8) ISOLATOR/EARTHING SW. OPENING/CLOSING CIRCUIT	Drawing no. P60194-E-DCC-SC-001			
REV.	DESCRIPTION		DATE	DRAWER							Project no. P-60194	Sheet type J5	Sheet no. 27
1	2	3	4	5	6	7	8						

ISOLATOR EARTHING SWITCH CLOSING / OPENING CIRCUITS

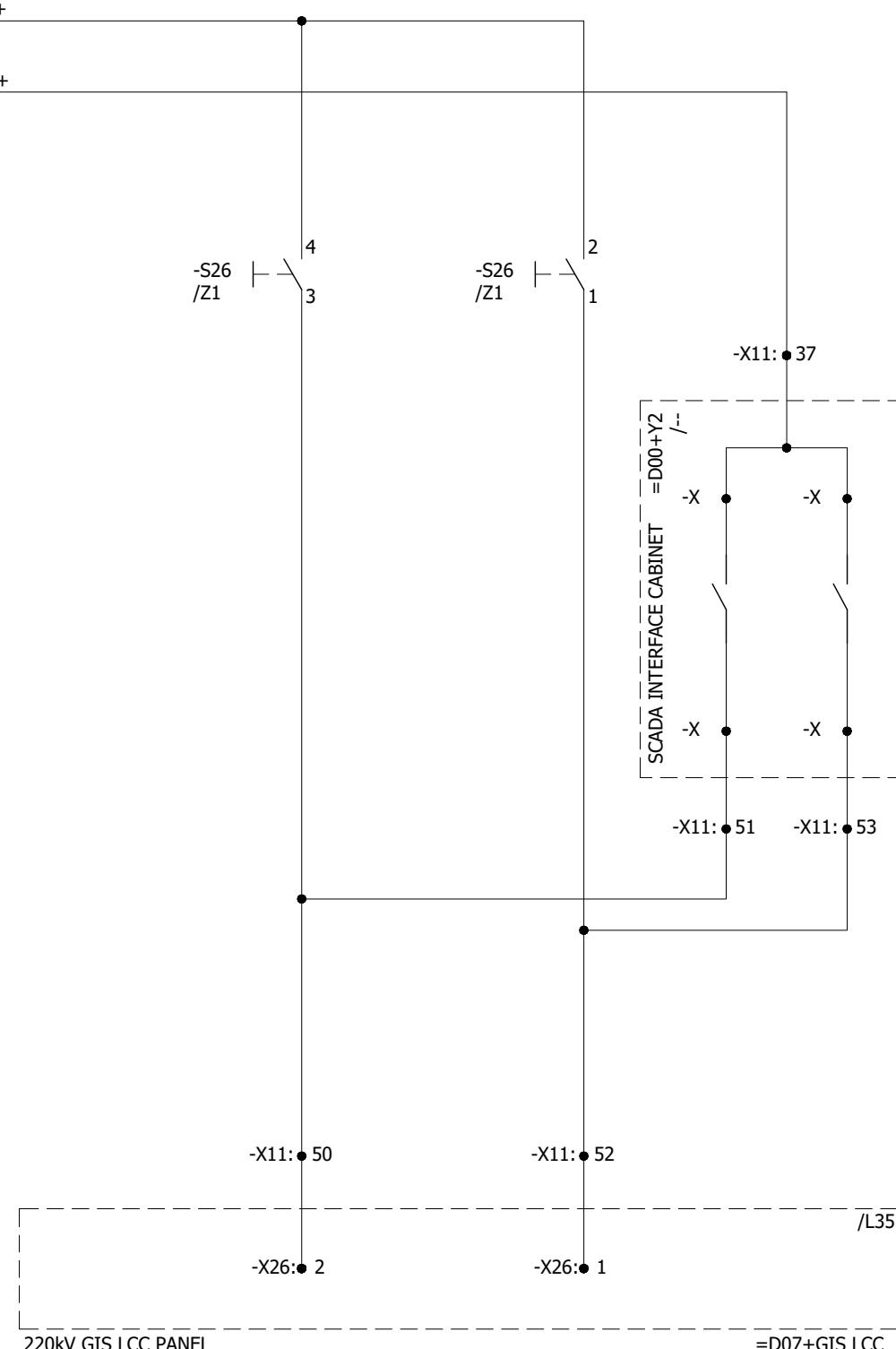
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A

BUS SIDE EARTHING SWITCH (=D07+Q26)

LOCAL OPERATION SCADA OPERATION

CLOSE OPEN CLOSE OPEN



F

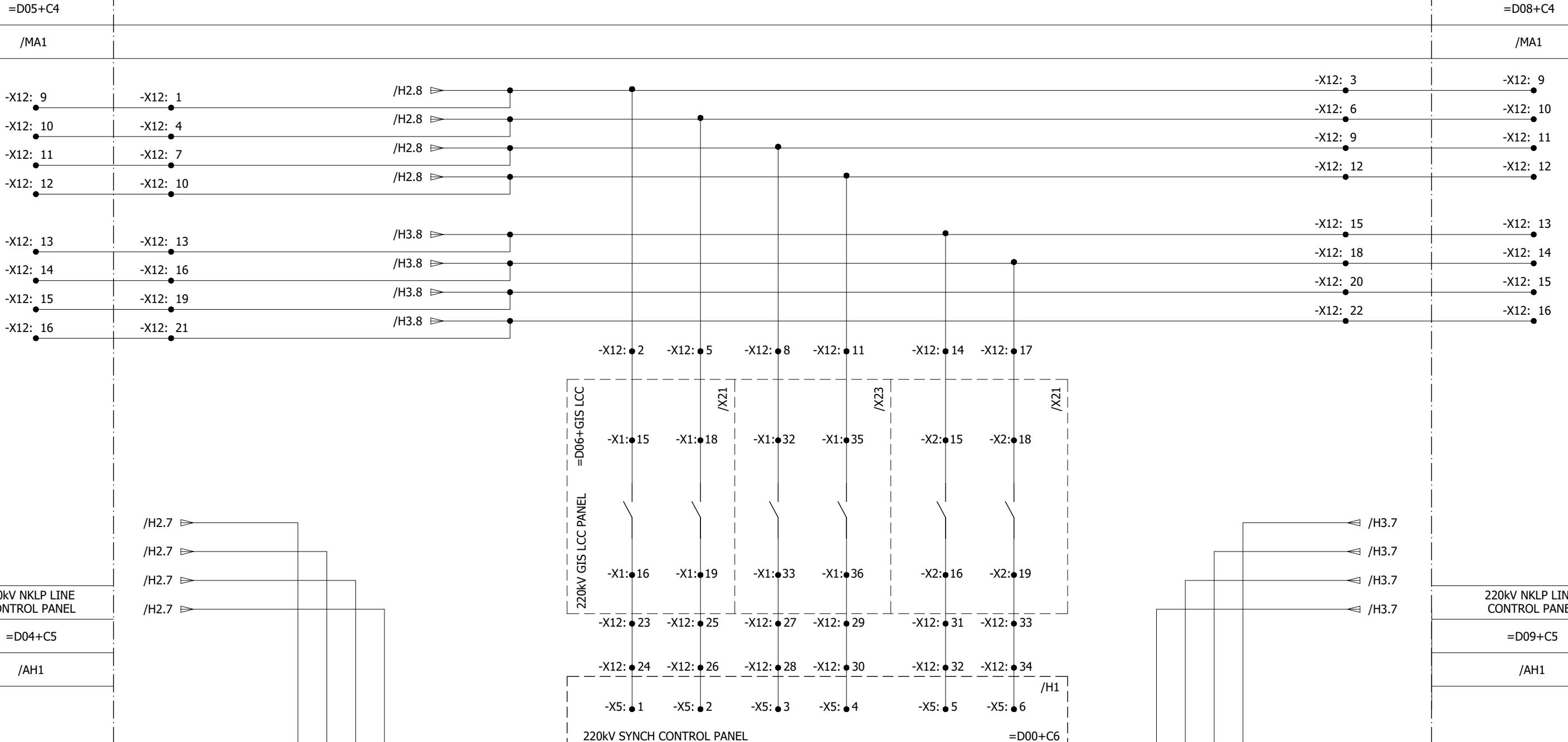
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REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type J6	Sheet no. 28

VOLTAGE SELECTION CIRCUIT FOR SYNCHRONIZATION

220KV NKLP LINE
CONTROL PANEL

=D08+C4

/MA1



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A



Grid Solutions



NATIONAL TRANSMISSION &

DISPATCH COMPANY LIMITED

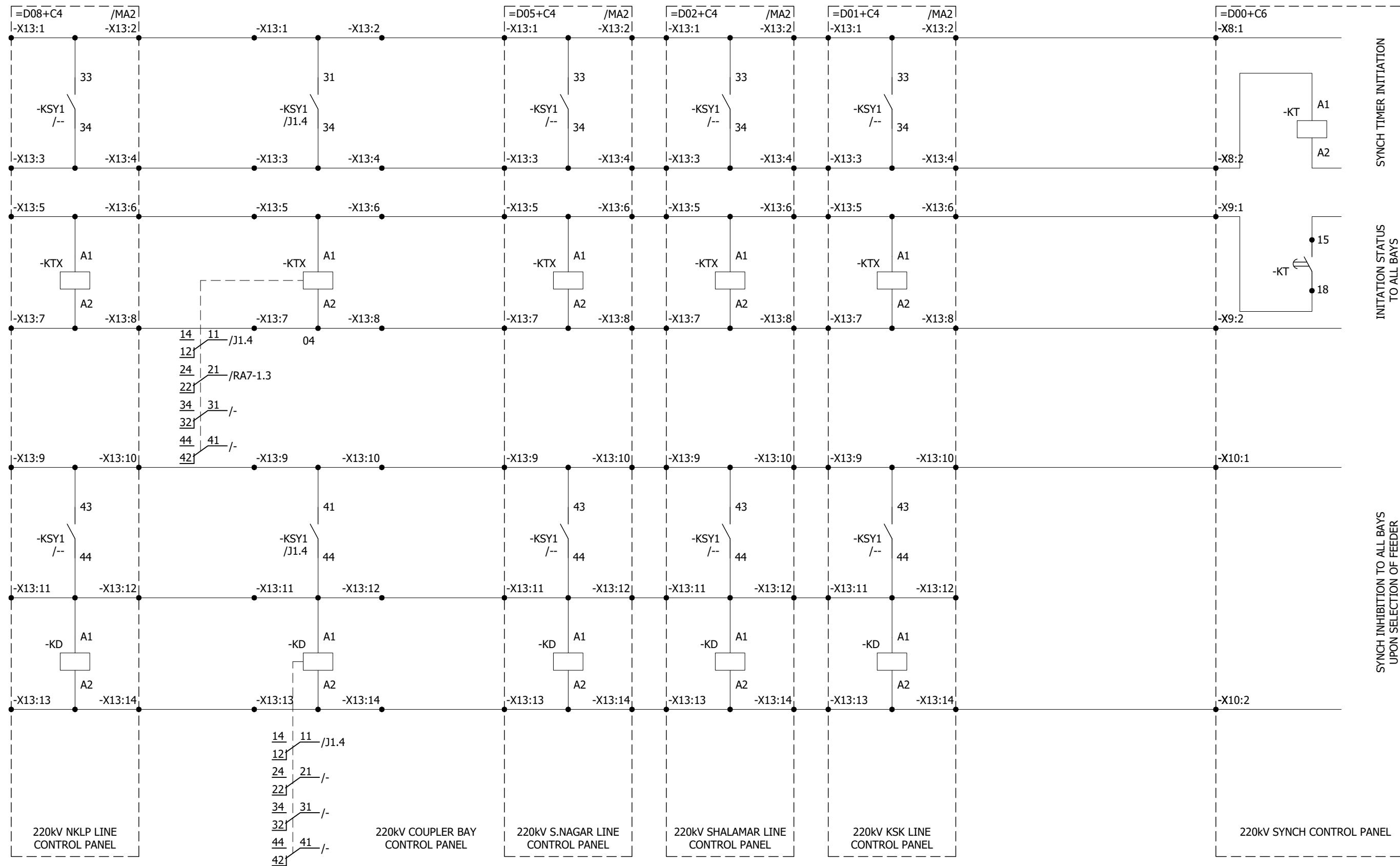
(NTDC-WAPDA)

220KV/132KV GIS SUBSTATION
GHAZI ROAD, LAHORE220KV COUPLER BAY CONTROL PANEL
(=D06+C8)
SYNCH CIRCUITDrawing no.
P60194-E-DCC-SC-001Project no.
P-60194Sheet type
MA1Sheet no.
29

0	AS BUILT		30.10.2018	ASJ	Manufacturer	Contractor	Client	Project	Title	Drawing no.
REV.	DESCRIPTION		DATE	DRAWER	EPE SOL 21-B Garden Block, New Garden Town, Lahore, Pakistan	Grid Solutions A GE and Alstom joint venture	NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	220KV/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	220KV COUPLER BAY CONTROL PANEL (=D06+C8) SYNCH CIRCUIT	P60194-E-DCC-SC-001
1	2	3	4	5	6	7	8			

SYNCHRONIZATION INITIATION & INHIBITION CIRCUIT

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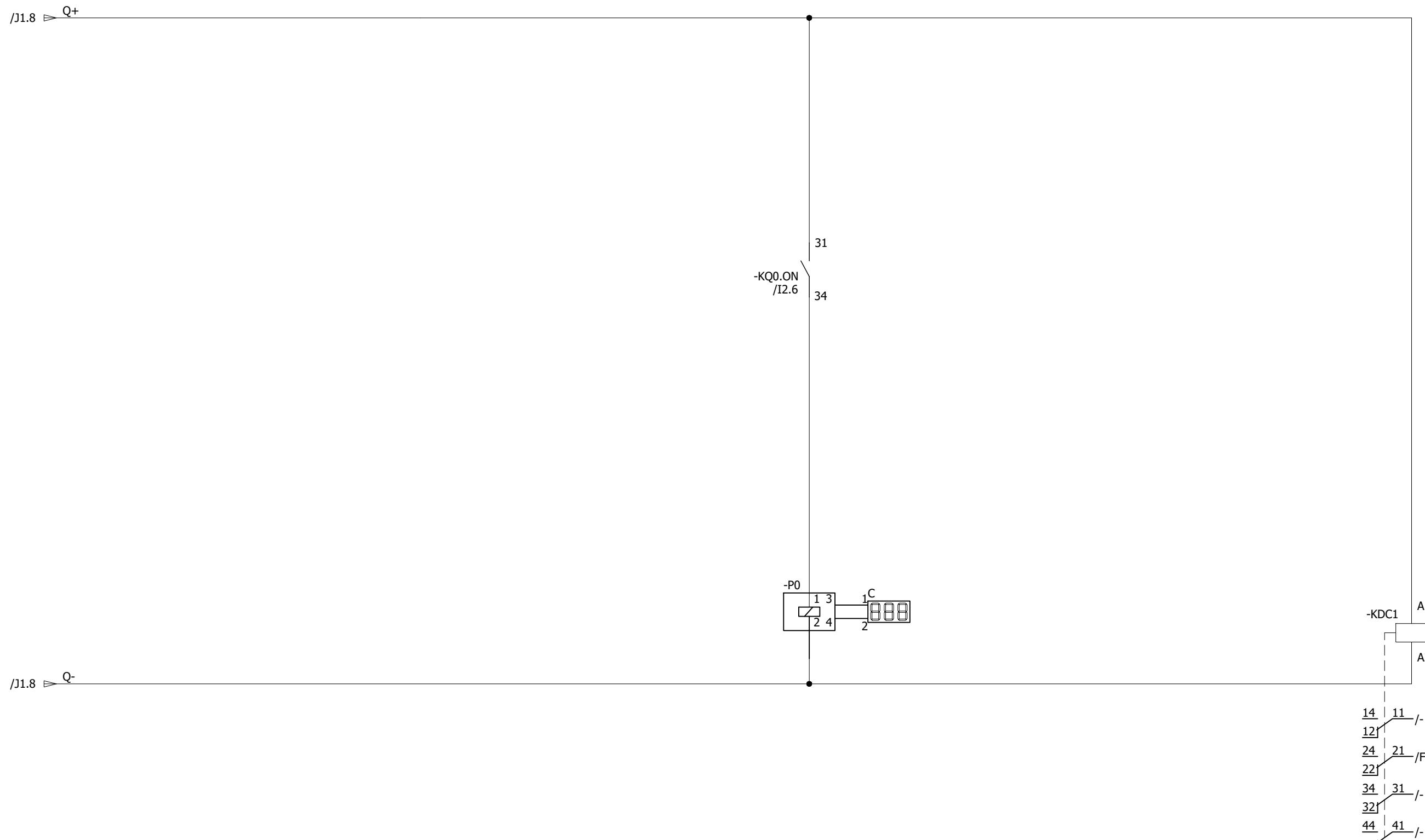
0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220kV COUPLER BAY CONTROL PANEL (=D06+C8) SYNCH CIRCUIT	Drawing no. P60194-E-DCC-SC-001		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type MA2	Sheet no. 30
1	2	3	4	5	6	7	8				

CONTROL CIRCUIT

CIRCUIT BREAKER
OPERATION COUNTERDC CIRCUIT Q+/Q-
MONITORING

-P0

-KDC1



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0	AS BUILT	30.10.2018	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 220kV COUPLER BAY CONTROL PANEL (=D06+C8) CONTROL CIRCUIT	Drawing no. P60194-E-DCC-SC-001		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type MA3	Sheet no. 31
1	2	3	4	5	6	7	8				

DISCREPANCY CHECK CIRCUIT

CIRCUIT BREAKER

BUS-1 ISOLATOR

BUS-1 EARTHING SWITCH

BUS-2 ISOLATOR

BUS-2 EARTHING SWITCH

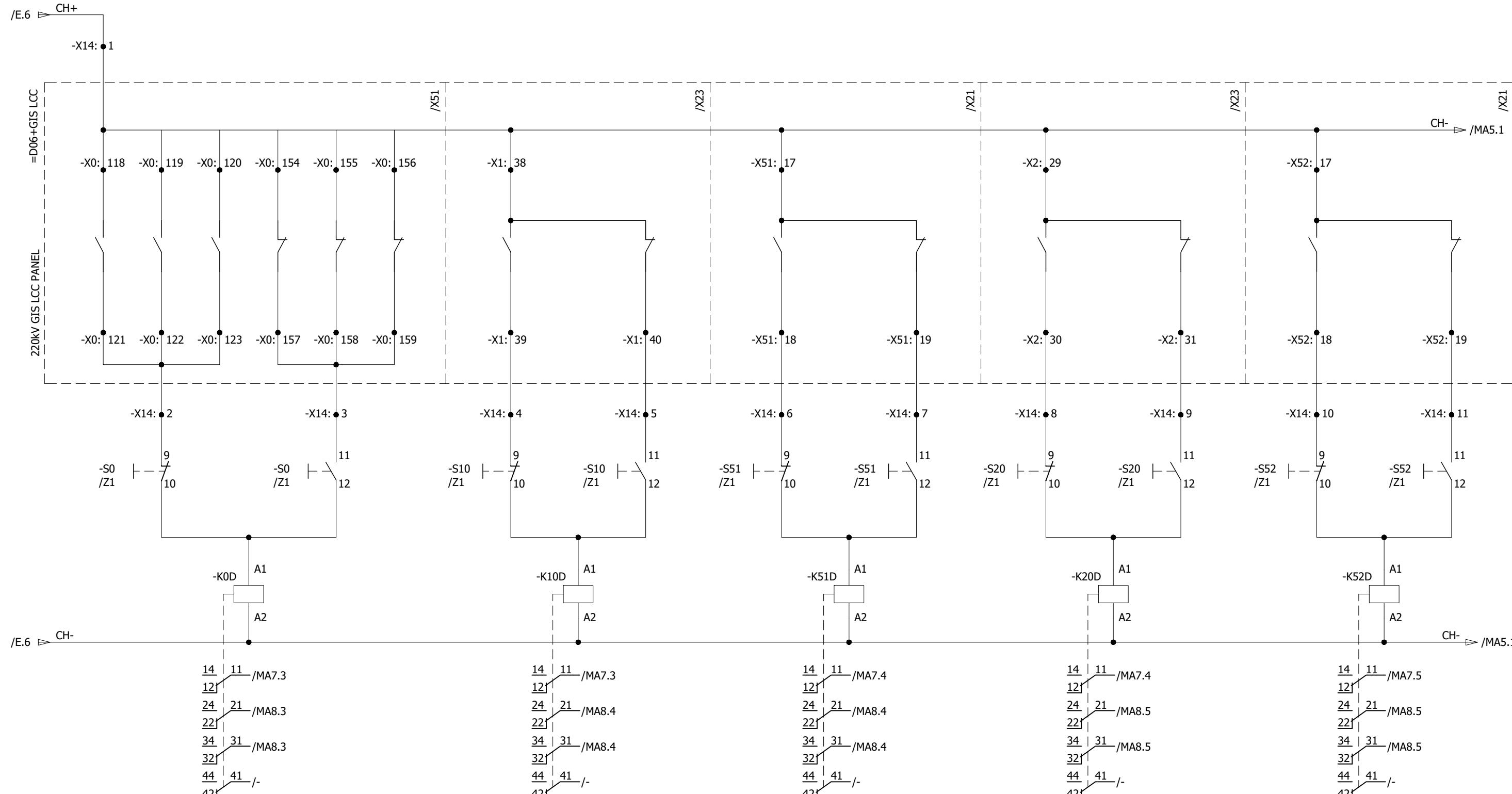
-Q0

-Q10

-Q51

-Q20

-Q52



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A

A

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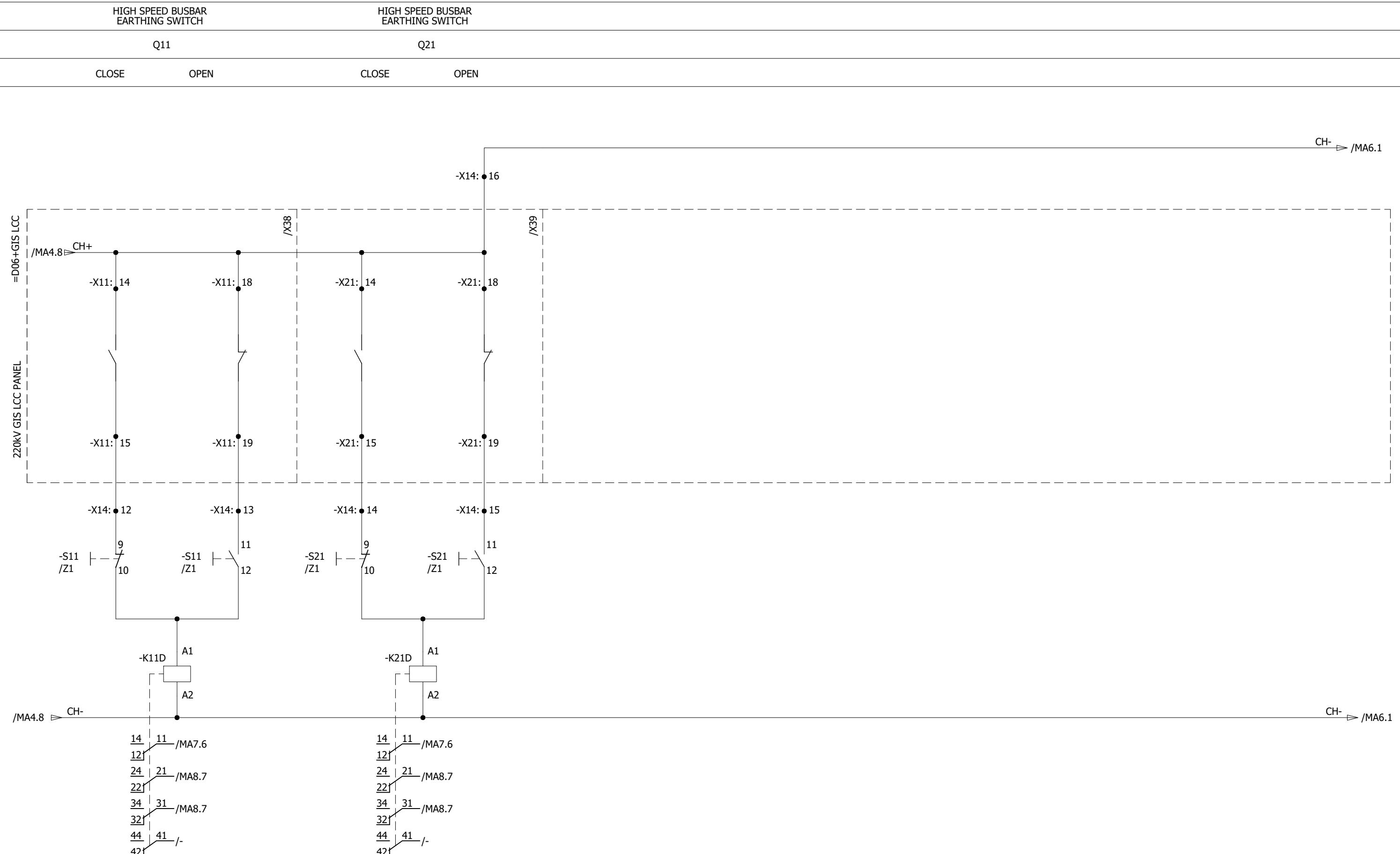
E

F

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0	AS BUILT	30.10.2018	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 220kV COUPLER BAY CONTROL PANEL (=D06+C8) DISCREPANCY CHECK CIRCUIT	Drawing no. P60194-E-DCC-SC-001
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type MA4
								Sheet no. 32	

DISCREPANCY CHECK CIRCUIT



0	AS BUILT	30.10.2018	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 220kV COUPLER BAY CONTROL PANEL (=D06+C8) DISCREPANCY CHECK CIRCUIT	Drawing no. P60194-E-DCC-SC-001
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type MA5

DISCREPANCY CHECK CIRCUIT

BUS-1 PT ISOLATOR

BUS-2 PT ISOLATOR

BUS-1 PT EARTHING SWITCH

BUS-2 PT EARTHING SWITCH

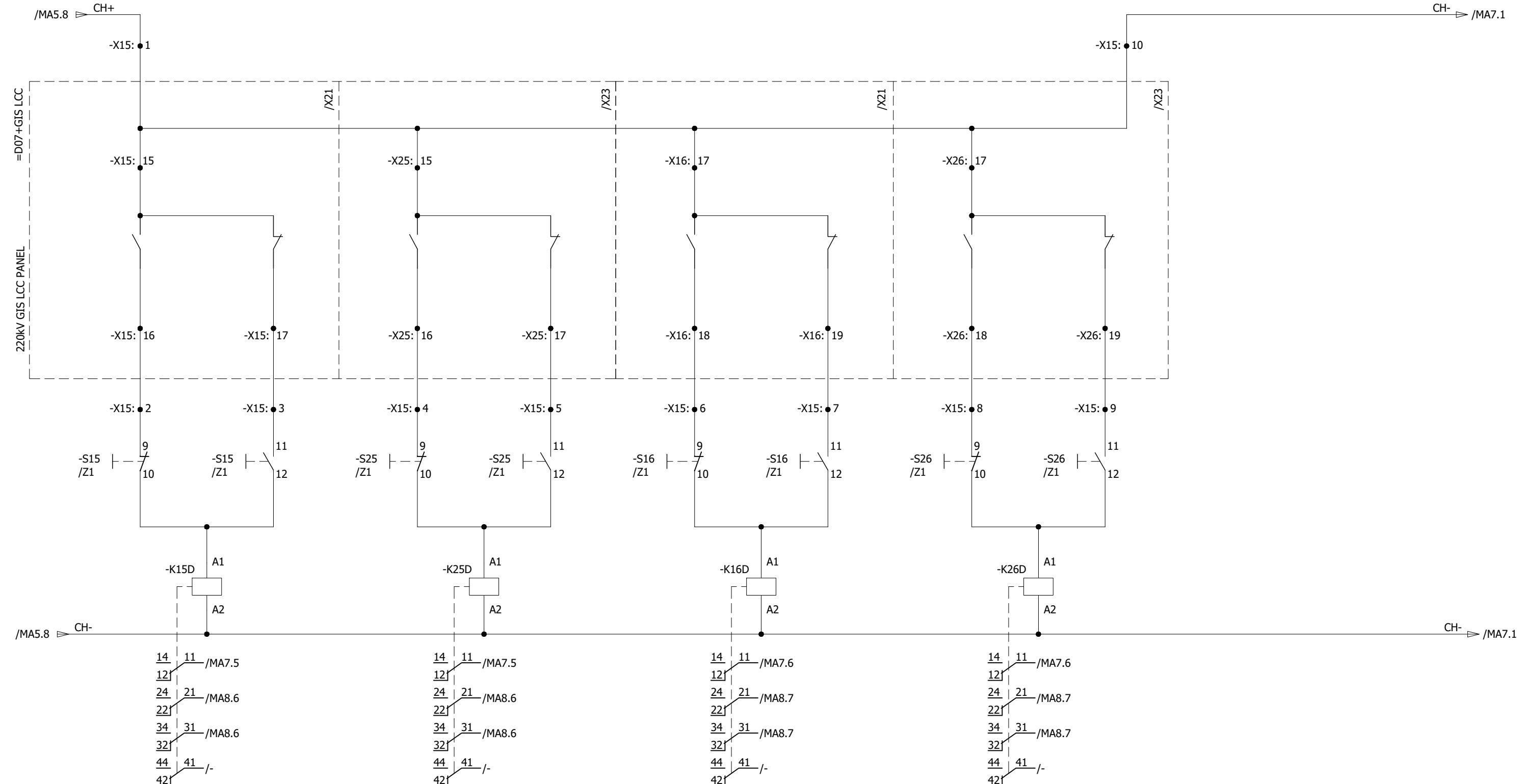
-Q15

-Q25

-Q16

-Q26

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0	AS BUILT	30.10.2018	ASJ	Manufacturer EPE SOL 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 220kV COUPLER BAY CONTROL PANEL (=D06+C8) DISCREPANCY CHECK CIRCUIT	Drawing no. P60194-E-DCC-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type MA6
									Sheet no. 34

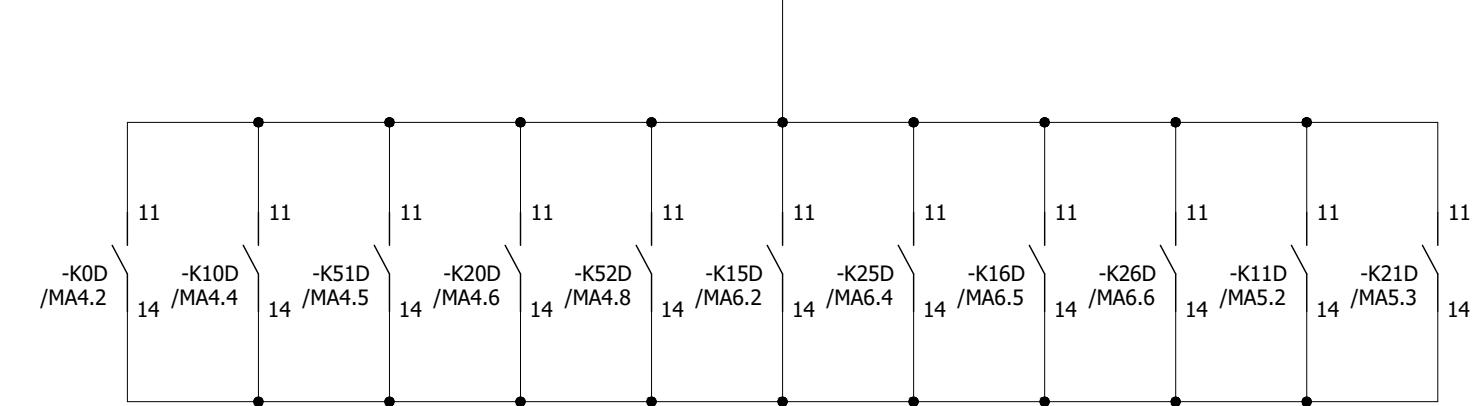
DISCREPANCY CHECK CIRCUIT

FLASHER RELAY
INITIATION

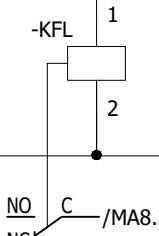
-KFL

/MA6.8 ▷ CH+

CH- ▷ /MA8.1



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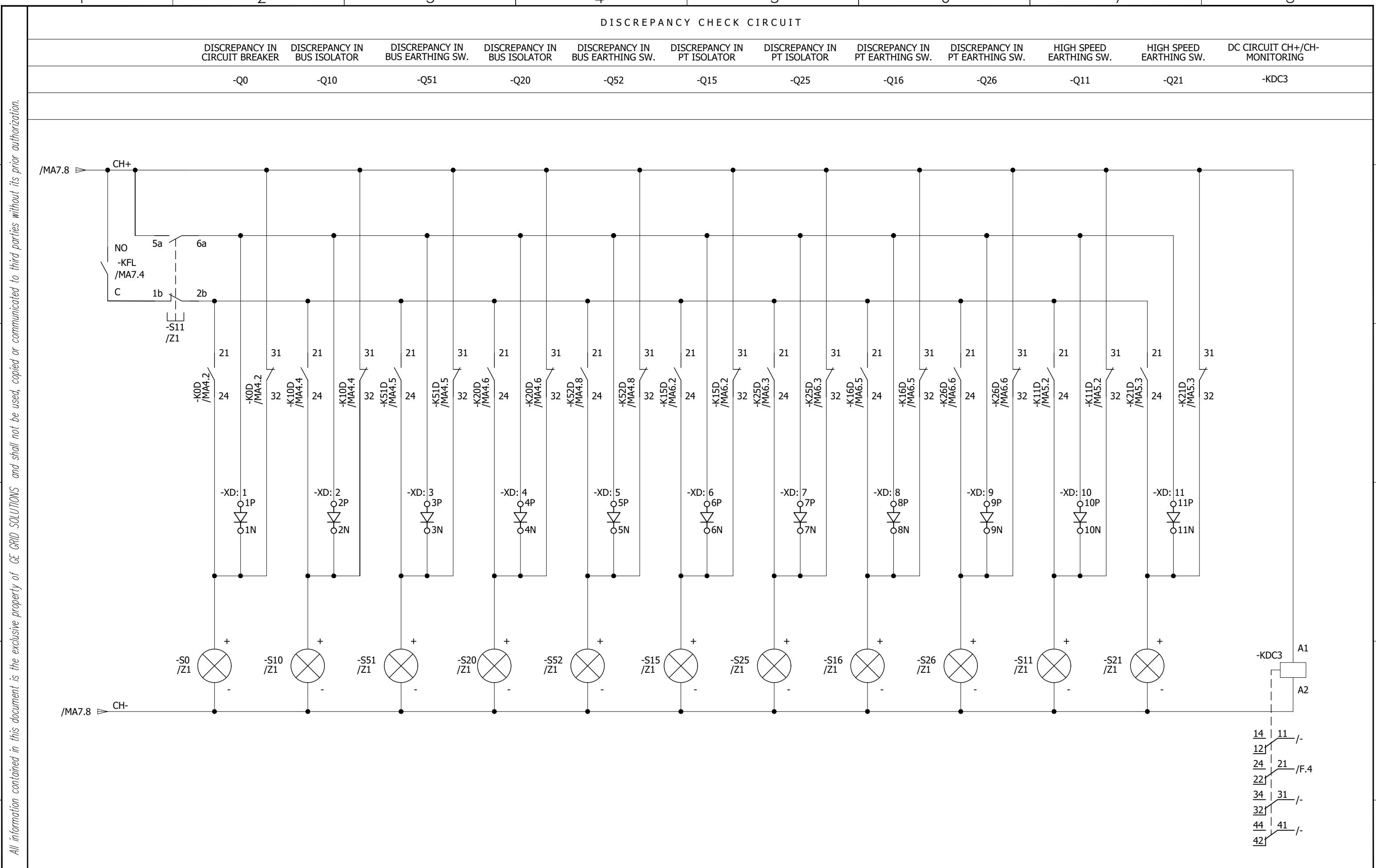


/MA6.8 ▷ CH-

CH- ▷ /MA8.1

	0	AS BUILT	30.10.2018	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 220kV COUPLER BAY CONTROL PANEL (=D06+C8) DISCREPANCY CHECK CIRCUIT	Drawing no. P60194-E-DCC-SC-001	
	REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type MA7	Sheet no. 35
A											
B											
C											
D											
E											
F											

DISCREPANCY CHECK CIRCUIT



0	AS BUILT	30.10.2018	ASJ	Manufacturer EPE SOL 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 220kV COUPLER BAY CONTROL PANEL (=D06+C8) DISCREPANCY CHECK CIRCUIT	Drawing no. P60194-E-DCC-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type MA8
									Sheet no. 36

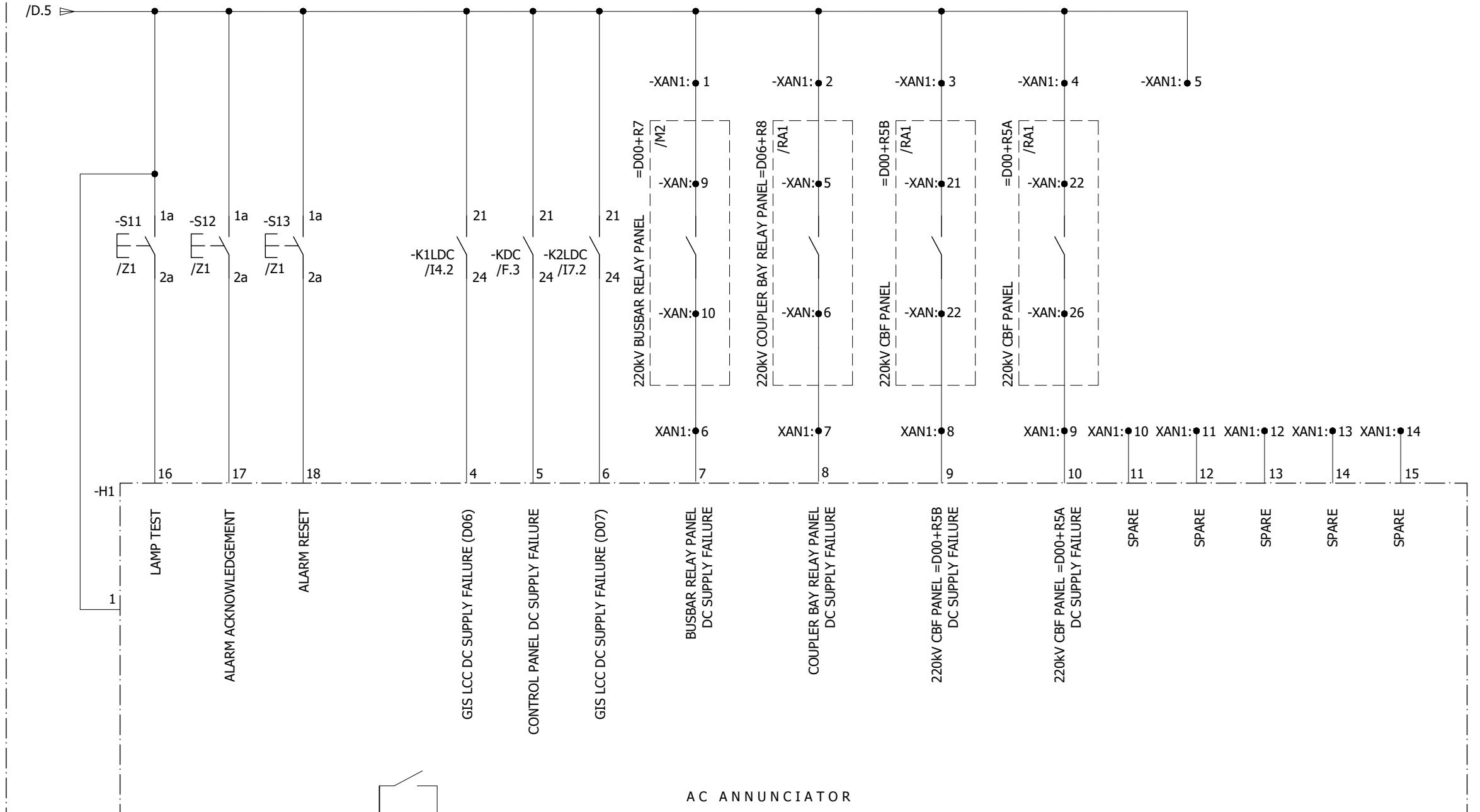
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V LINE CONTROL PANFI

=D05+C4

/RA⁷

ANNUNCIATION CIRCUIT



AC ANNUNCIATORI

The diagram illustrates a ladder logic program with two vertical buses. The left bus contains contacts labeled -XF: 6, -XF: 8, and -XF: 2. The right bus contains contacts labeled -XF: 1, -XF: 3, and -XF: 2. A central vertical line connects these contacts. Below the contacts are coils labeled AC BELL CIRCUIT, DC HOOTER CIRCUIT, and AC FAULT SUPPLY. The coil for AC FAULT SUPPLY is connected to the bottom contact of the -XF: 2 row.

/D.5 ➔ 0 VAC
 -XF: 1 AC BELL CIRCUIT ➔ /RA2.1
 -XF: 3 DC HOOTER CIRCUIT ➔ /RA2.1
 -XF: 2 AC FAULT SUPPLY ➔ /RA2.1
 -XF: 4 DC FAULT SUPPLY ➔ /RA2.1

0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 7-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 220KV COUPLER BAY CONTROL PANEL (=D06+C8) AC ANNUNCIATIONS	Drawing no. P60194-E-DCC-SC-001
									Project no. P-60194
									Sheet type RA1
REV.	DESCRIPTION	DATE	DRAWER						Sheet no. 37

ANNUNCIATION CIRCUIT

All information contained in this document is the exclusive property of GE GRID SOLUTIONS and shall not be used, copied or communicated to third parties without its prior authorization.

A

A

B

B

C

C

D

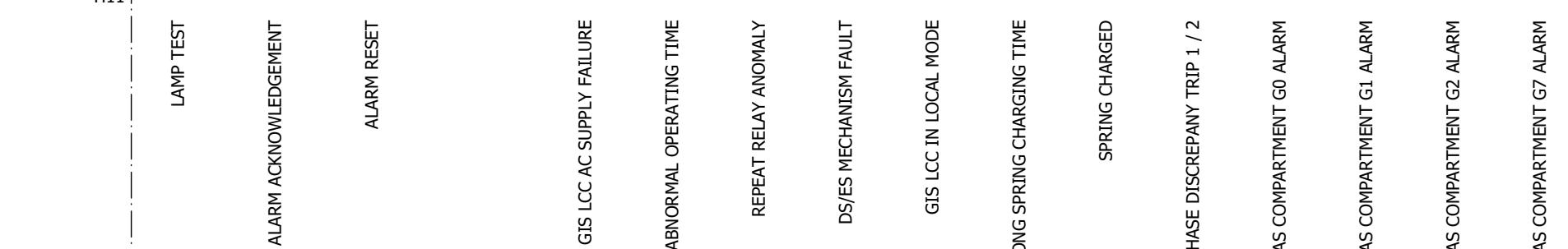
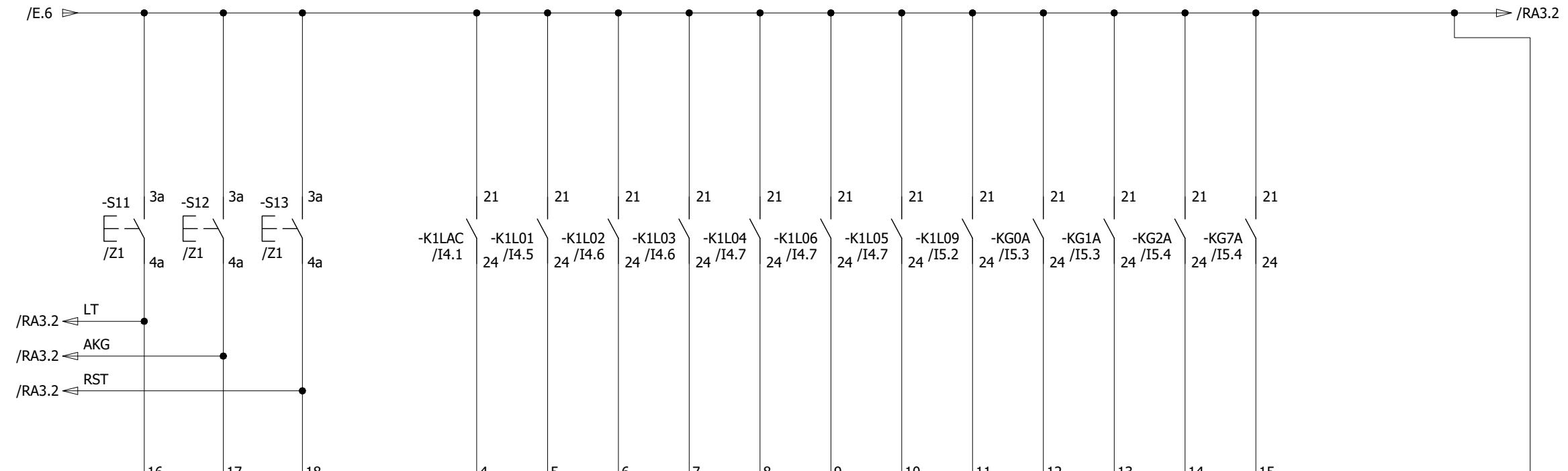
D

E

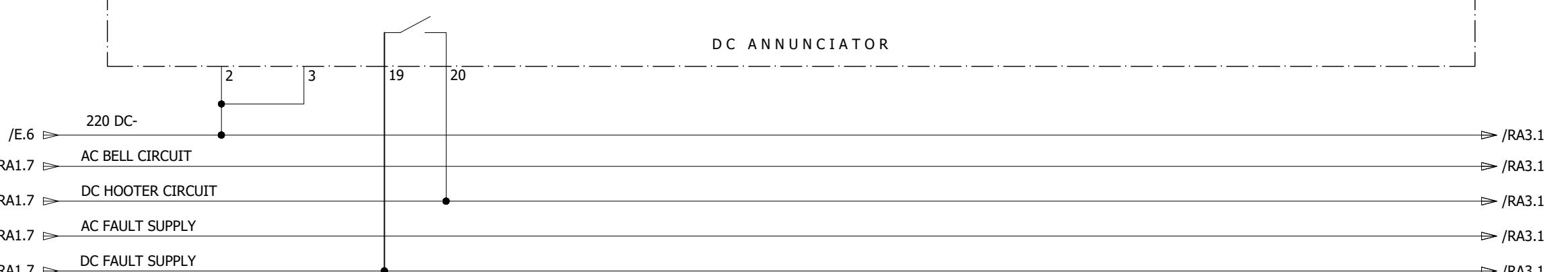
E

F

F



DC ANNUNCIATOR



0	AS BUILT	30.10.2018	ASJ	Manufacturer  7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220kV COUPLER BAY CONTROL PANEL (=D06+C8) PROTECTION TRIPS	Drawing no. P60194-E-DCC-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194 Sheet type RA2 Sheet no. 38

ANNUNCIATION CIRCUIT

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A

A

B

B

C

C

D

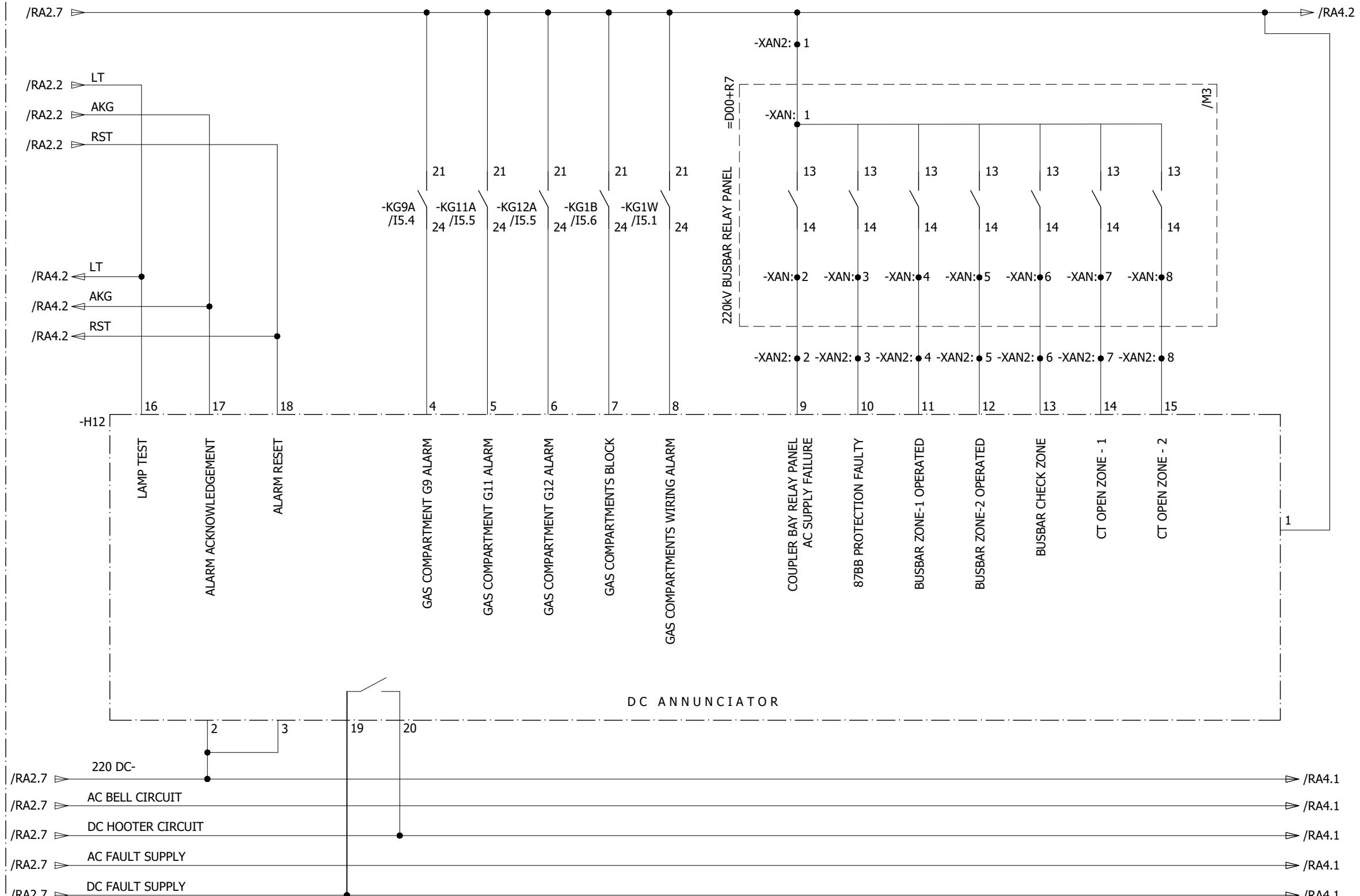
D

E

E

F

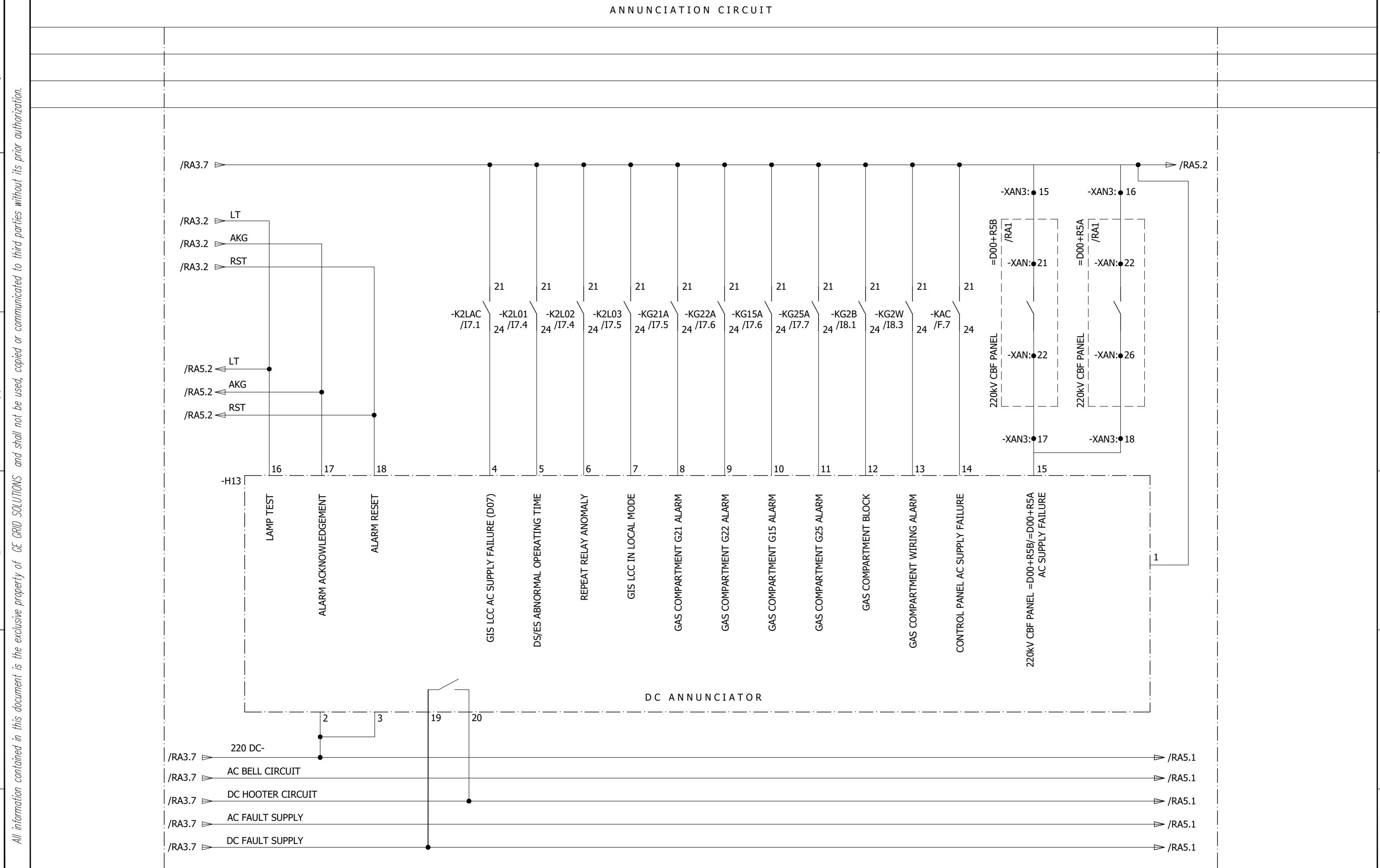
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0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220kV COUPLER BAY CONTROL PANEL (=D06+C8) ANNUNCIATOR ALARMS	Drawing no. P60194-E-DCC-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type RA3
									Sheet no. 39

ANNUNCIATION CIRCUIT

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0	AS BUILT	30.10.2018	ASJ	Manufacturer EPE SOL 7-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 220kV COUPLER BAY CONTROL PANEL (=D06+C8) ANNUNCIATOR ALARMS	Drawing no. P60194-E-DCC-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194

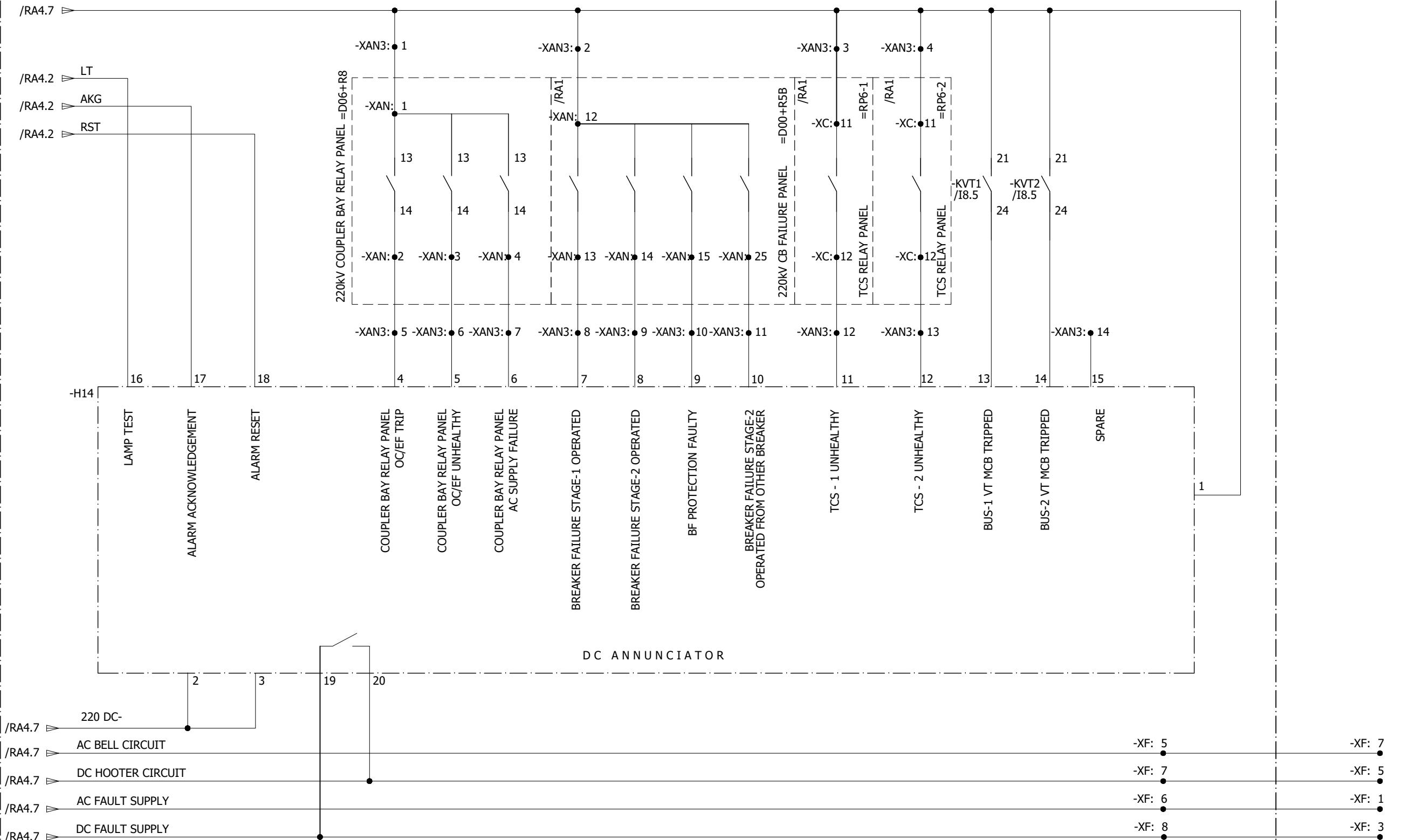
ANNUNCIATION CIRCUIT

220kV LINE CONTROL PANEL

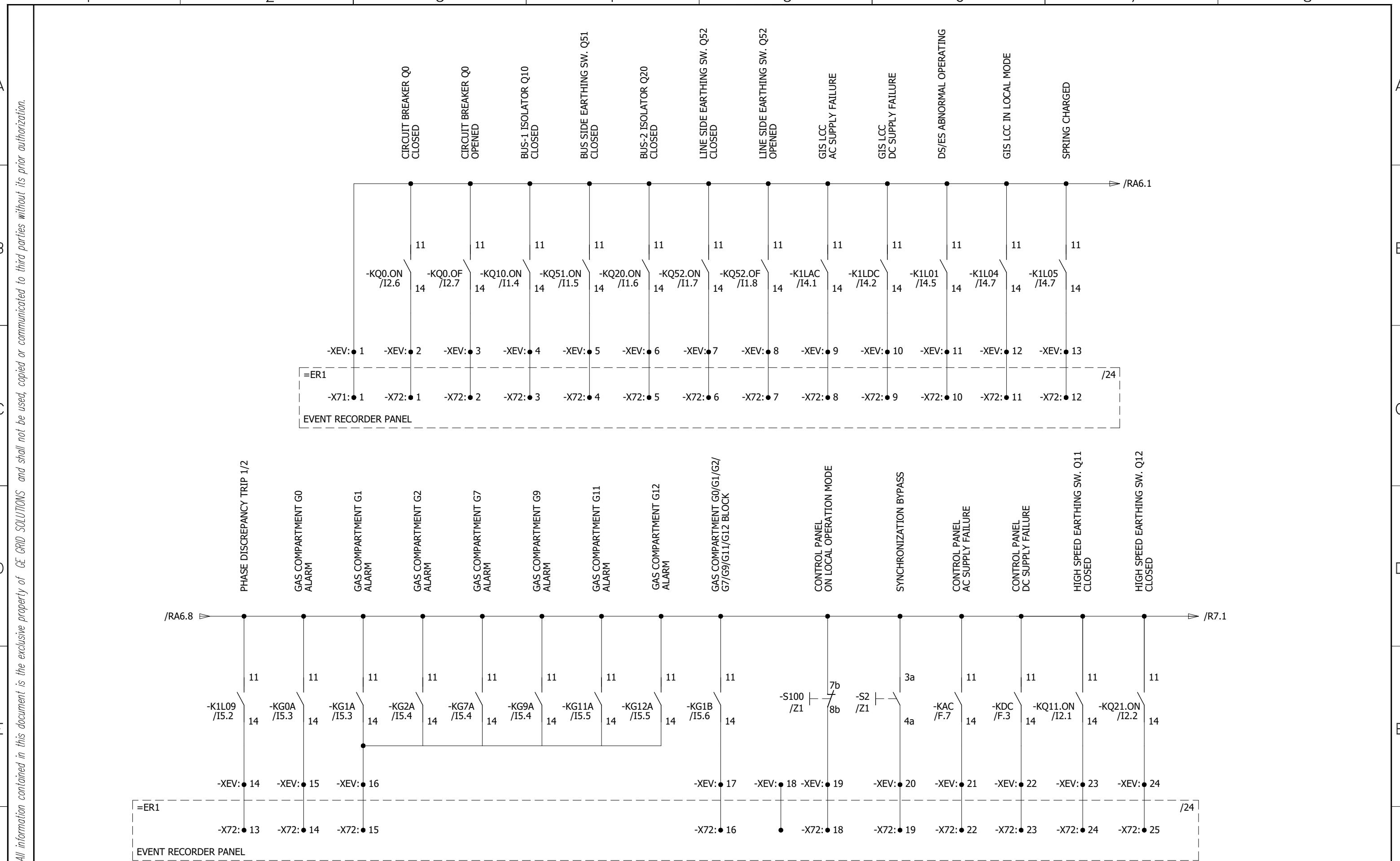
=D08+C4

/RA1

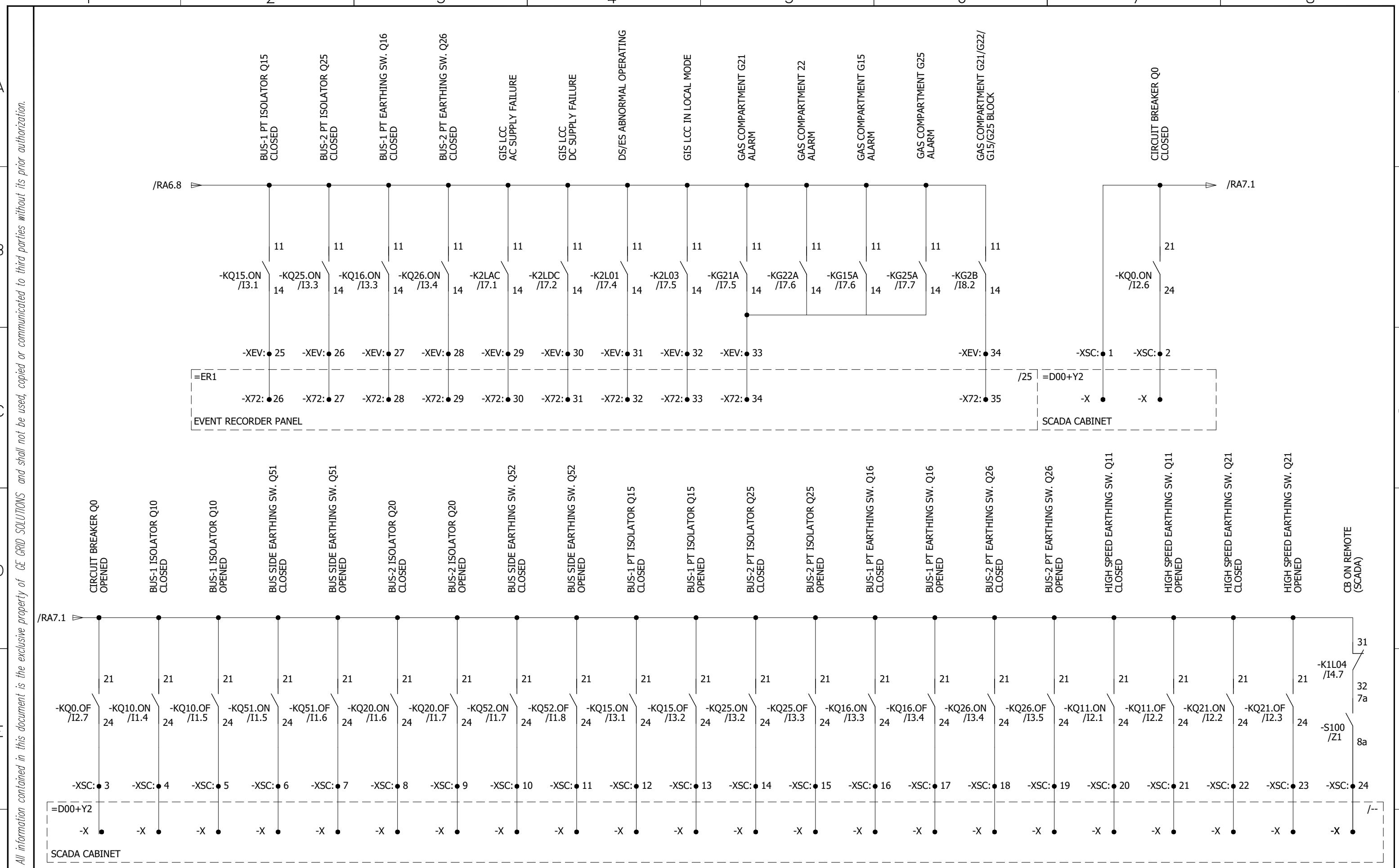
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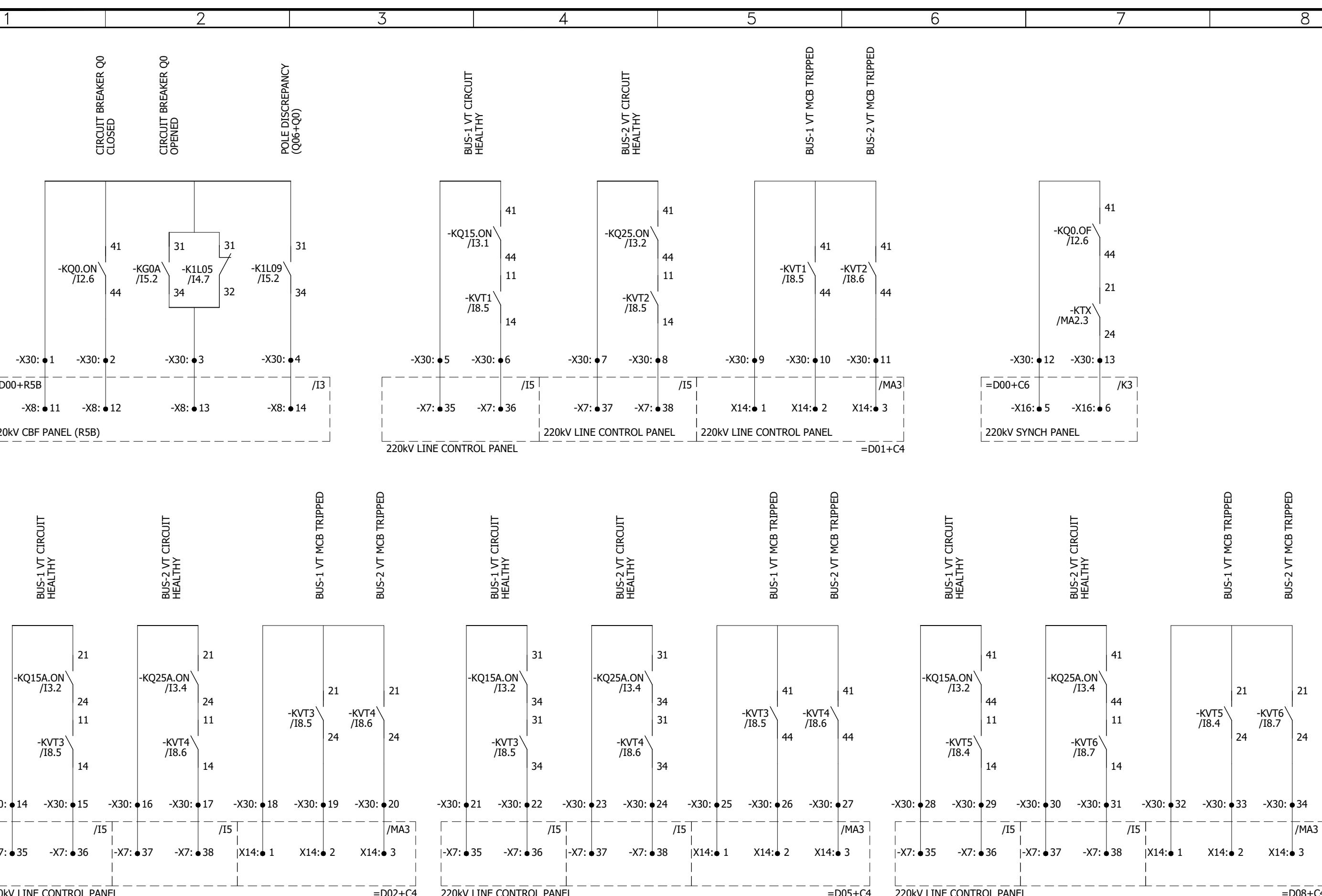
0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220kV COUPLER BAY CONTROL PANEL (=D06+C8) ANNUNCIATOR ALARMS	Drawing no. P60194-E-DCC-SC-001
									Project no. P-60194
									Sheet type RA5
									Sheet no. 41
REV.	DESCRIPTION	DATE	DRAWER	3	4	5	6	7	8



0	AS BUILT	30.10.2018	ASJ	Manufacturer EPE SOL 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 220kV COUPLER BAY CONTROL PANEL (=D06+C8) EVENT RECORDER & SCADA SIGNALS	Drawing no. P60194-E-DCC-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type RA6
									Sheet no. 42

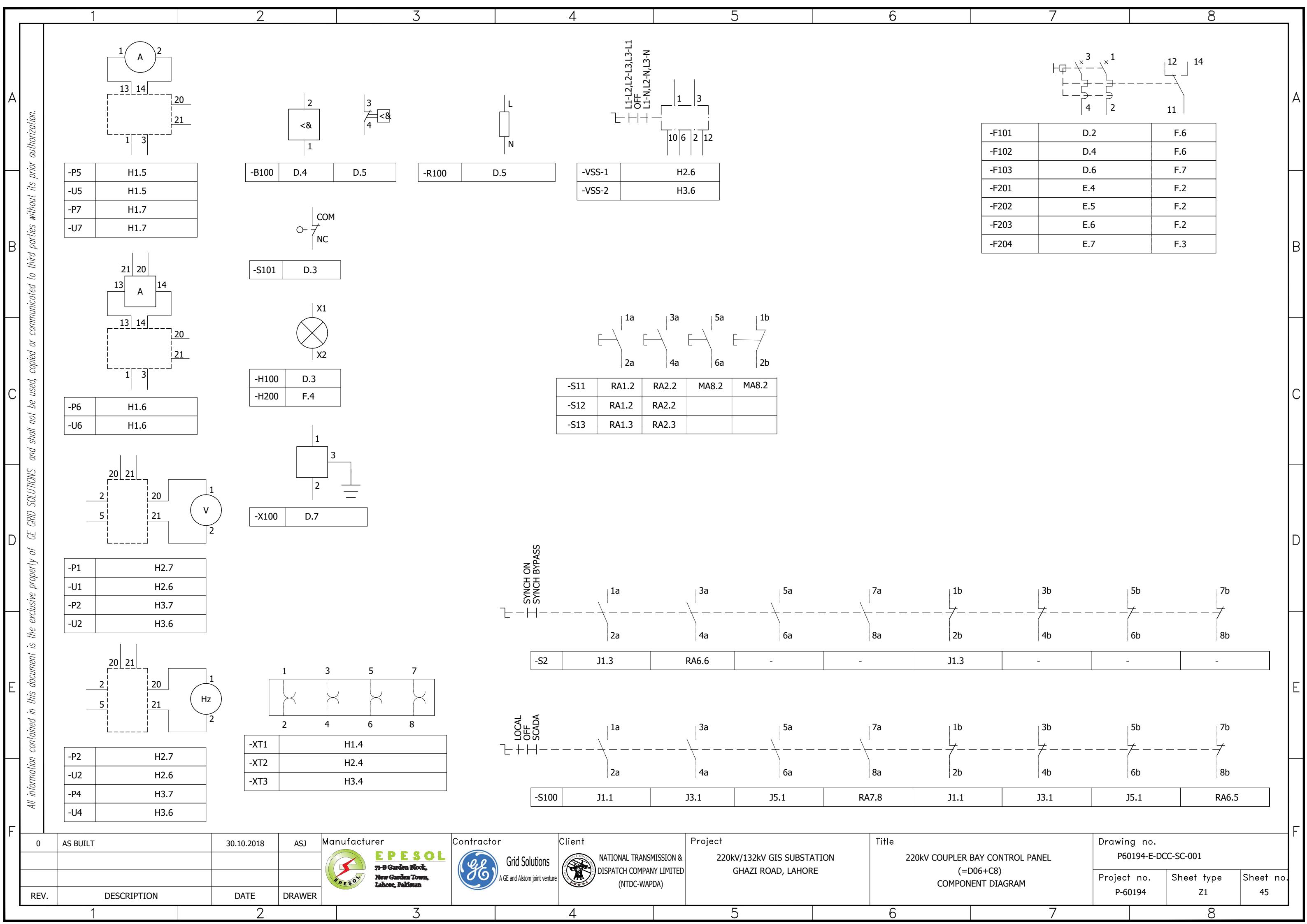


0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPEPSOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220kV COUPLER BAY CONTROL PANEL (=D06+C8) EVENT RECORDER & SCADA SIGNALS	Drawing no. P60194-E-DCC-SC-001		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type RA7	Sheet no. 43
1			2		3		4		5		6

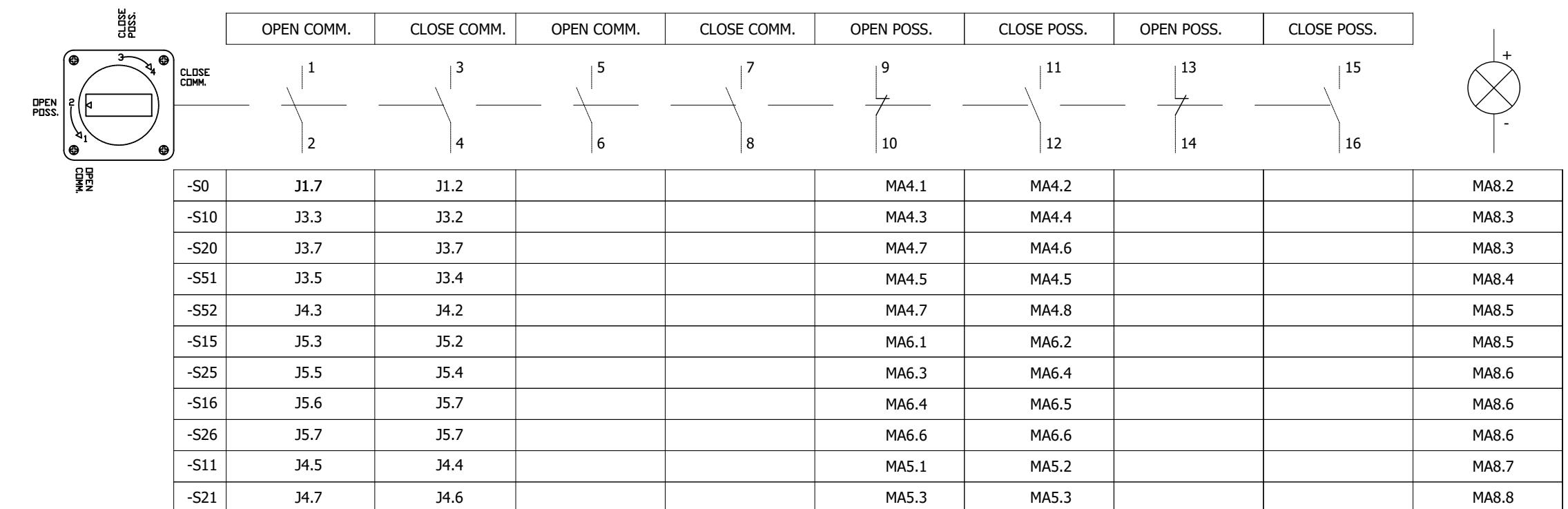


0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220kV COUPLER BAY CONTROL PANEL (=D06+C8) EXTERNAL SIGNAL	Drawing no. P60194-E-DCC-SC-001		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type RA7-1	Sheet no. 44
1	2	3	4	5	6	7	8				

1 2 3 4 5 6 7 8



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0	AS BUILT	30.10.2018	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 220kV COUPLER BAY CONTROL PANEL (=D06+C8) COMPONENT DIAGRAM	Drawing no. P60194-E-DCC-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194 Sheet type Z1A Sheet no. 45a