

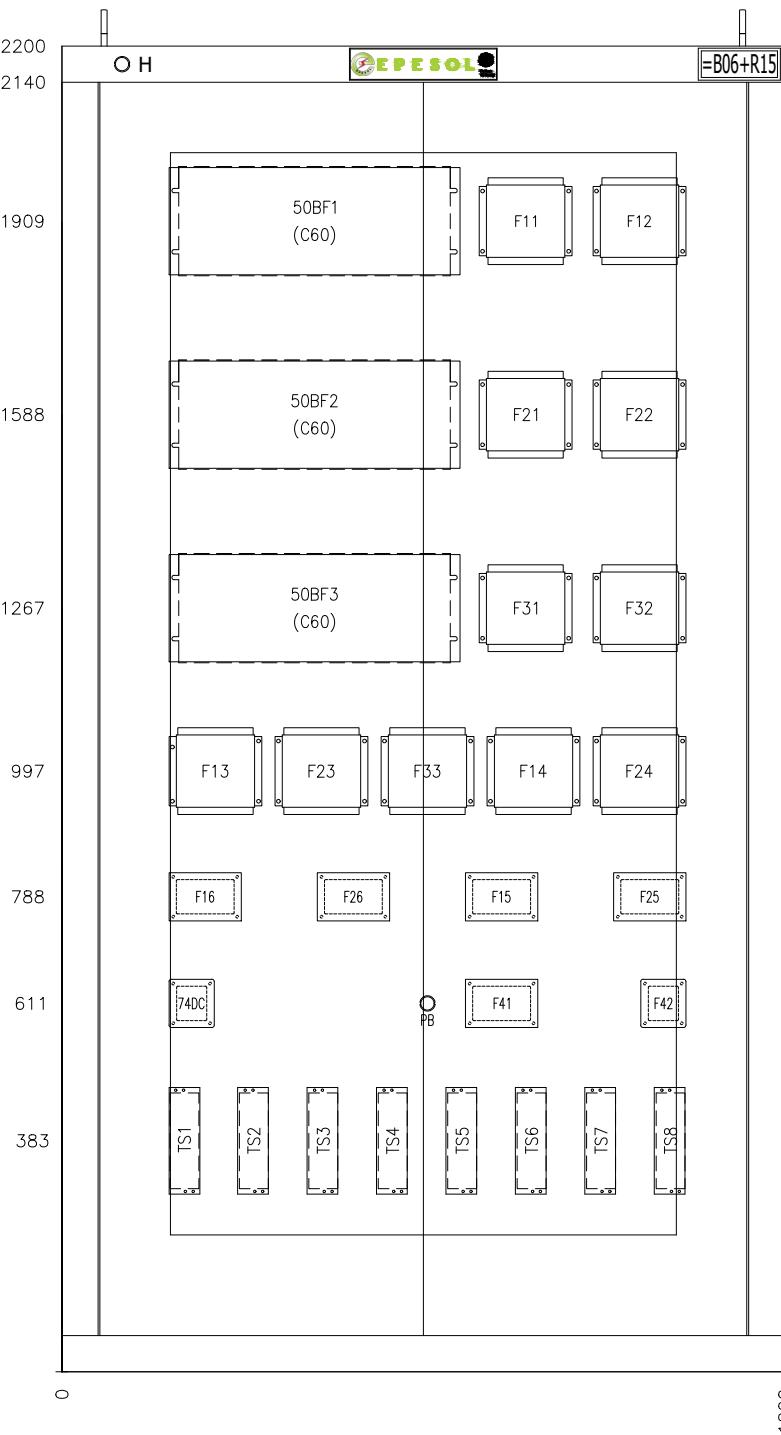
LAYOUT DIAGRAM

500kV CIRCUIT BREAKER

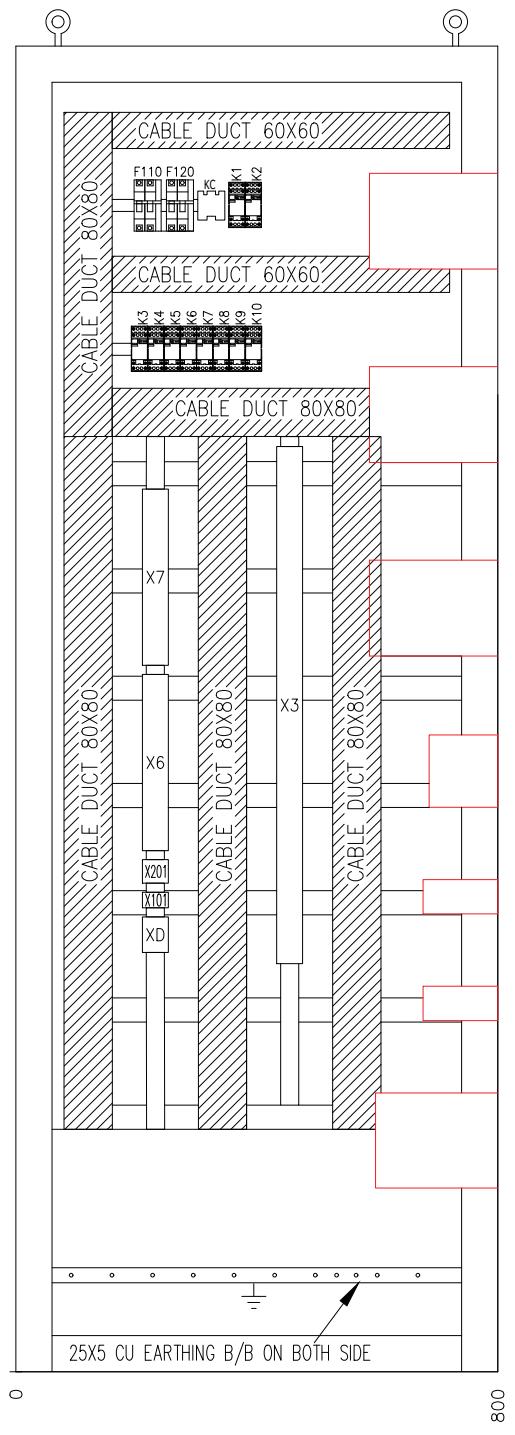
FAILURE PROTECTION PANEL

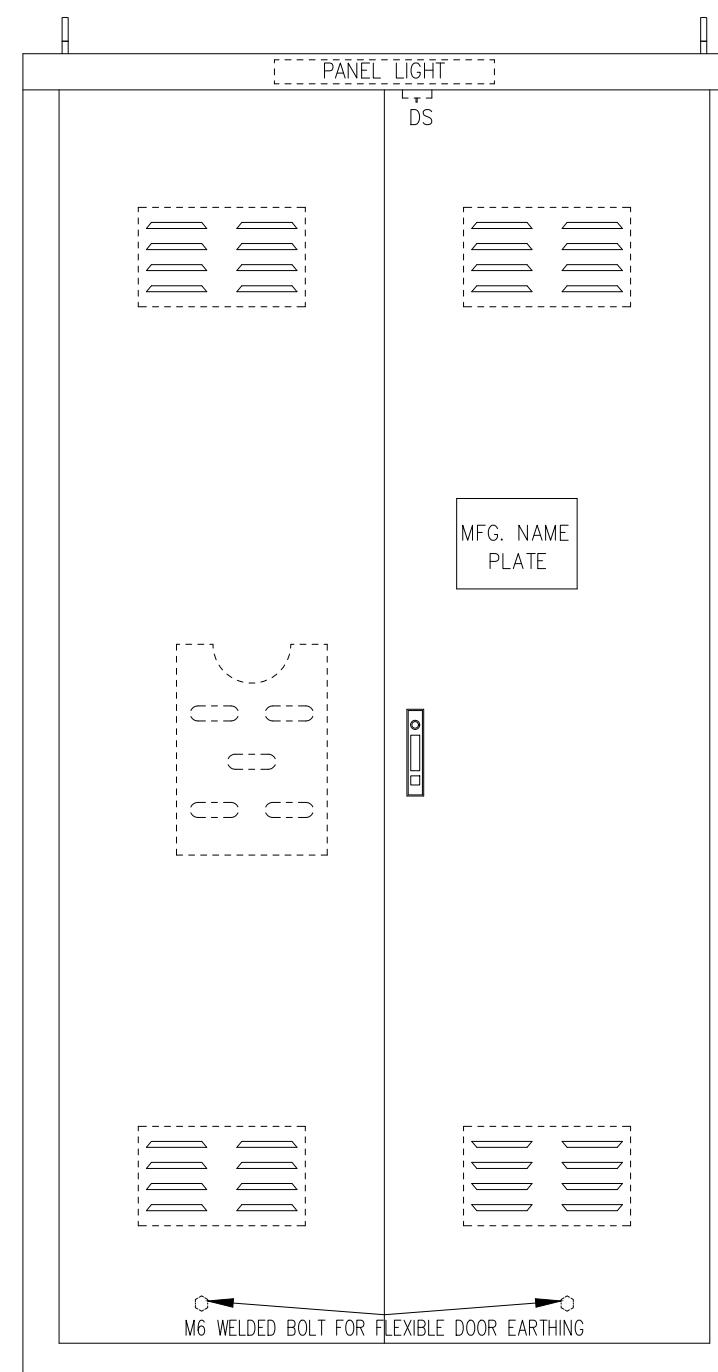
TYPE =B06+R15

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: COVER SHEET	DWG# EPE/ENU-18/B61548	SHT: 01 OF 03
NAH Q.	MSS M. Sohail	MUR Iy		500kV CB FAILURE PROT. PANEL TYPE =B06+R15	EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019 AS BUILT REV: 0



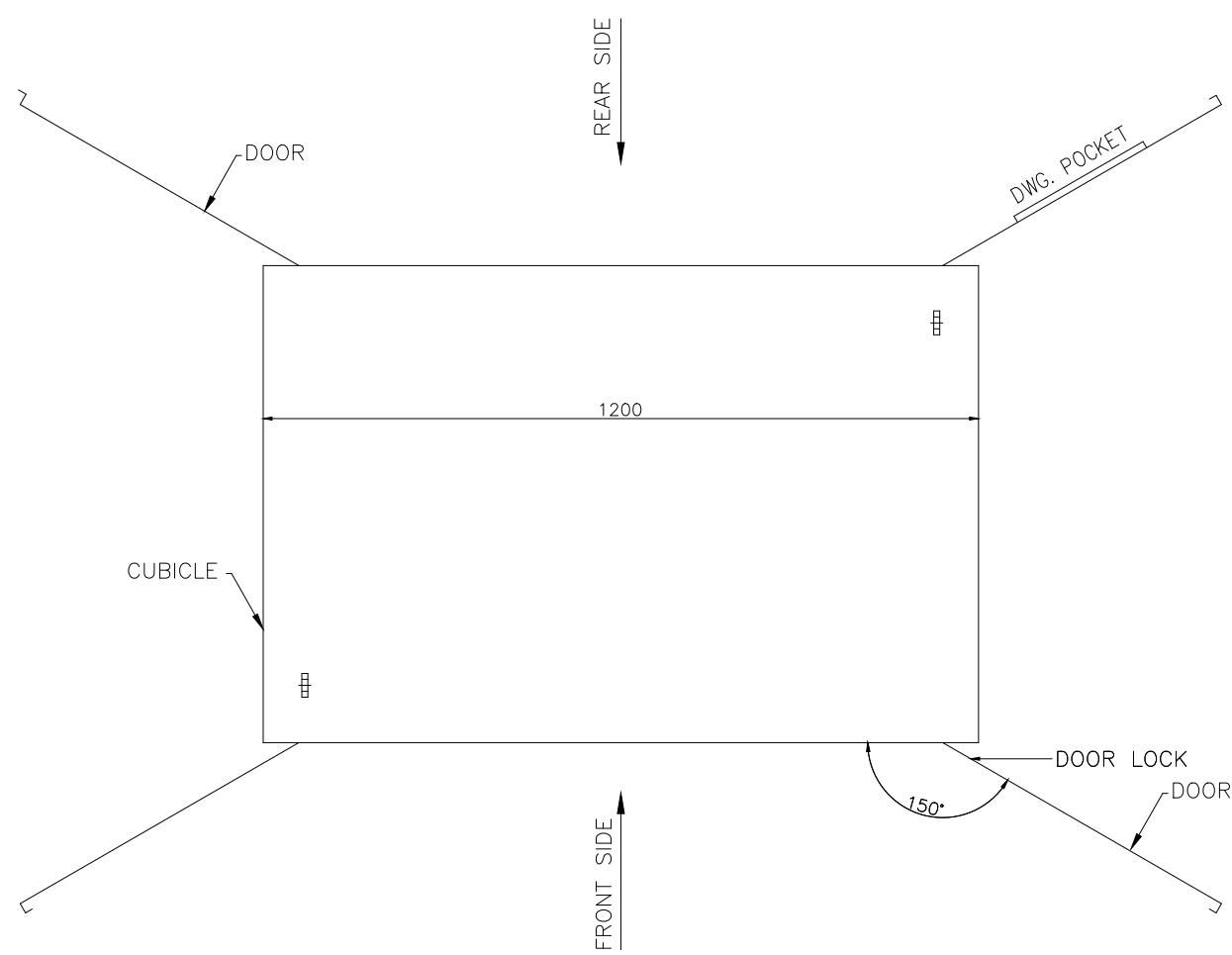
FRONT VIEW





REAR VIEW

[:: PANEL LIGHT ::]

TOP VIEW
DOOR OPENING DETAIL

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: LAYOUT DIAGRAM 500kV CB FAILURE PROT. PANEL TYPE =B06+R15	DWG# EPE/ENU-18/B61548	SHT: 030F 03
NAH [Signature]	MSS [Signature]	MUR [Signature]		EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT

LIST OF APPARATUS

500kV CIRCUIT BREAKER

FAILURE PROTECTION PANEL

TYPE R15

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: COVER SHEET 500KV CB FAILURE PROT. PANEL TYPE R15	DWG# EPE/ENU-18/B61549	SHT: 01 OF 03
NAH 	MSS 	MUR 		 EPESOL Pvt Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT

1	2	3	4	5	6	7	8			
SR.	ITEM DESIGNATION		DESCRIPTION		QTY	TYPE	MAKE	COUNTRY OF ORIGIN	ORDERING INFORMATION	SHEET NO
A	1 50BF1		CIRCUIT BREAKER FAILURE PROTECTION RELAY FOR B6Q1		1	C60	GE	CANADA	C60-U03-HKH-F8L-H6C-	
	2 50BF2		CIRCUIT BREAKER FAILURE PROTECTION RELAY FOR B6Q2		1	C60	GE	CANADA	M6C-P6D-UXX-WXX	A
	3 50BF3		CIRCUIT BREAKER FAILURE PROTECTION RELAY FOR B6Q3		1	C60	GE	CANADA	C60-U03-HKH-F8L-H6C-	
B	4 F11, F12, F13, F14		TRIP RELAY HAND AND ELECTRICAL RESET, 16 C/O CONTACTS, HIGH BURDEN, 220 VDC		11	BI-16R	ARTECHE	SPAIN	BI-16RP-HB-220VDC	
	F21, F22, F23, F24									B
	F31, F32, F33									
C	5 F15, F16, F25, F26		TRIP RELAY HAND AND ELECTRICAL RESET, 8 C/O CONTACTS, HIGH BURDEN, 220 VDC		4	BJ-8R	ARTECHE	SPAIN	BJ-8RP-HB-220VDC	
										C
	6 F41		SELF RESET TRIP RELAY, 8 C/O CONTACTS, HIGH BURDEN, 220 VDC		1	RJ-8R	ARTECHE	SPAIN	RJ-8R-HB-220VDC-OP-01110	
D	7 F42		SELF RESET TRIP RELAY, 4 C/O CONTACTS, HIGH BURDEN, 220 VDC		1	RF-4R	ARTECHE	SPAIN	RF-4R-HB-220VDC-OP-01110	
	8 74DC		DC SUPERVISION RELAY 220 VDC		1	VDF-10	ARTECHE	SPAIN	VDF10-OP2-220VDC	D
E	9 PB		PUSH BUTTON (RESET)		1	YS-AP	YONGSUNG	SOUTH KOREA	YS-AP1-2-40-Y-D-W	
	10 TS1		TEST BLOCK (14 FINGERS)		1	saTECH TSB 14	ARTECHE	SPAIN	TSB-14-222211111AAAB	E
	11 TS2, TS4, TS7, TS8		TEST BLOCK (14 FINGERS)		4	saTECH TSB 14	ARTECHE	SPAIN	TSB-14-222221111111	
F	12 TS3, TS6		TEST BLOCK (14 FINGERS)		2	saTECH TSB 14	ARTECHE	SPAIN	TSB-14-11111ABABABAB	F
	13 TS5		TEST BLOCK (14 FINGERS)		1	saTECH TSB 14	ARTECHE	SPAIN	TSB-14-11111111111111	
	14 H		INDICATION LAMP GREEN		1	YS	YONGSUNG	SOUTH KOREA	YS-PL-2-AL-22-G-W	
G	15 K1 TO K10		MINIATURE RELAY, 220 VDC, WITH 4 C/O CONTACTS		10	PRC	GE	HUNGARY/POLAND	PRC4M40DCML	G
	16 KAC1		MINIATURE RELAY, 220 VAC, WITH 4 C/O CONTACTS		1	PRC	GE	HUNGARY/POLAND	PRC4M40ANL	E
	17 KC		CONTACTOR RELAY, 16A, 230 VDC, WITH 2NO+2NC CONTACTS		1	MCR	GE	HUNGARY/POLAND	MCRC022ATWN	
H	18 F110, F120		DC MCB, 2 POLE, 10A, 220VDC WITH 1 C/O CONTACTS, 10KA		2	EP-100	GE	HUNGARY/POLAND	EP102UCC10+CAH(1)	H
	19 F100, F101		AC MCB, 2 POLE, 6A, 240VAC WITH 1 C/O CONTACT, 10KA		2	G60	GE	HUNGARY/POLAND	G62C06+CAH(1)	
	20 F102		RCBO, RATED 16A, 1P+N, 240V AC, WITH 1 C/O CONTACTS		1	DM100	GE	HUNGARY/POLAND	DM100C16/030+CAH(1)	
APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: LIST OF APPARATUS 500KV CB FAILURE PROT. PANEL TYPE R15	 EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61549	SHT: 02 OF 03			
NAH Q.	MSS M. Sohail	MUR I.				DATE: 07.03.2019	AS BUILT	REV: 0		

1	2	3	4	5	6	7	8		
SR.	ITEM DESIGNATION		DESCRIPTION	QTY	TYPE	MAKE	COUNTRY OF ORIGIN	ORDERING INFORMATION	SHEET NO
A	21	TH+HS	THERMOSTAT AND HUMIDISTAT	1	ELH-220	E-LABS	PAKISTAN	YSP3315GWB+YSMS-C	
B	22	SH	SPACE HEATER	1	ELH-220	E-LABS	PAKISTAN		
C	23	DS	DOOR SWITCH WITH COVER	1	YSP	YONGSUNG	SOUTH KOREA	YSP3315GWB+YSMS-C	
D	24	TPS	240 VAC, 16A, THREE PIN SOCKET OUTLET	1		LEAR	CHINA		
E	25	TLS	TELEPHONE SOCKET	1		LOCAL	PAKISTAN		
F	26	IL	PANEL LIGHT, 5W, 220 VAC	1	YS	YONGSUNG	SOUTH KOREA	YS-T8-30-5W	
G	27	X1	DISCONNECTING TERMINAL BLOCKS FOR CT CIRCUIT WITH SHORTING ARRANGEMENT	35	SCB-6	CABUR	ITALY		
H	28	X101	TERMINAL BLOCKS FOR DC SUPPLY MAIN 1	4	CBD-4	CABUR	ITALY		
I	29	X201	TERMINAL BLOCKS FOR DC SUPPLY MAIN 2	6	CBD-4	CABUR	ITALY		
J	30	X6	TERMINAL BLOCKS FOR TRIP CIRCUIT - 1	45	CBD-4	CABUR	ITALY		
K	31	X7	TERMINAL BLOCKS FOR TRIP CIRCUIT - 2	45	CBD-4	CABUR	ITALY		
L	32	X3	TERMINAL BLOCKS FOR CONTROL CIRCUIT	135	CBD-4	CABUR	ITALY		
M	33	X9	TERMINAL BLOCKS FOR ANNUNCIATION CIRCUIT	16	CBD-4	CABUR	ITALY		
N	34	X13	TERMINAL BLOCKS FOR EVENT RECORDER & FAULT RECORDER CIRCUIT	25	CBD-4	CABUR	ITALY		
O	35	X14	TERMINAL BLOCKS FOR SCADA CIRCUIT	14	CBD-4	CABUR	ITALY		
P	36	X100	TERMINAL BLOCKS FOR AC DISTRIBUTION	15	CBD-4	CABUR	ITALY		
Q	37	X15	TERMINAL BLOCKS FOR COMMUNICATION CIRCUIT	9	CBD-4	CABUR	ITALY		
R	38	XD	TERMINAL BLOCK WITH DIODE TYPE IN-D4007, RATED MAXIMUM VOLTAGE 350VDC, RATED BREAK DOWN VOLTAGE 430VDC	8	DAS.4/6	CABUR	ITALY		
S	39	X2	TERMINAL BLOCKS FOR SYNC CIRCUIT	8	CBD-4	CABUR	ITALY		
APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: LIST OF APPARATUS 500KV CB FAILURE PROT. PANEL TYPE R15	EPE SOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61549	SHT: 03 OF 03		
NAH	MSS	MUR				DATE: 07.03.2019	AS BUILT	REV: 0	

SCHEMATIC DIAGRAM OF 500kV BREAKER FAILURE PROTECTION PANEL TYPE R15 FOR ONE AND A HALF BREAKER SCHEME

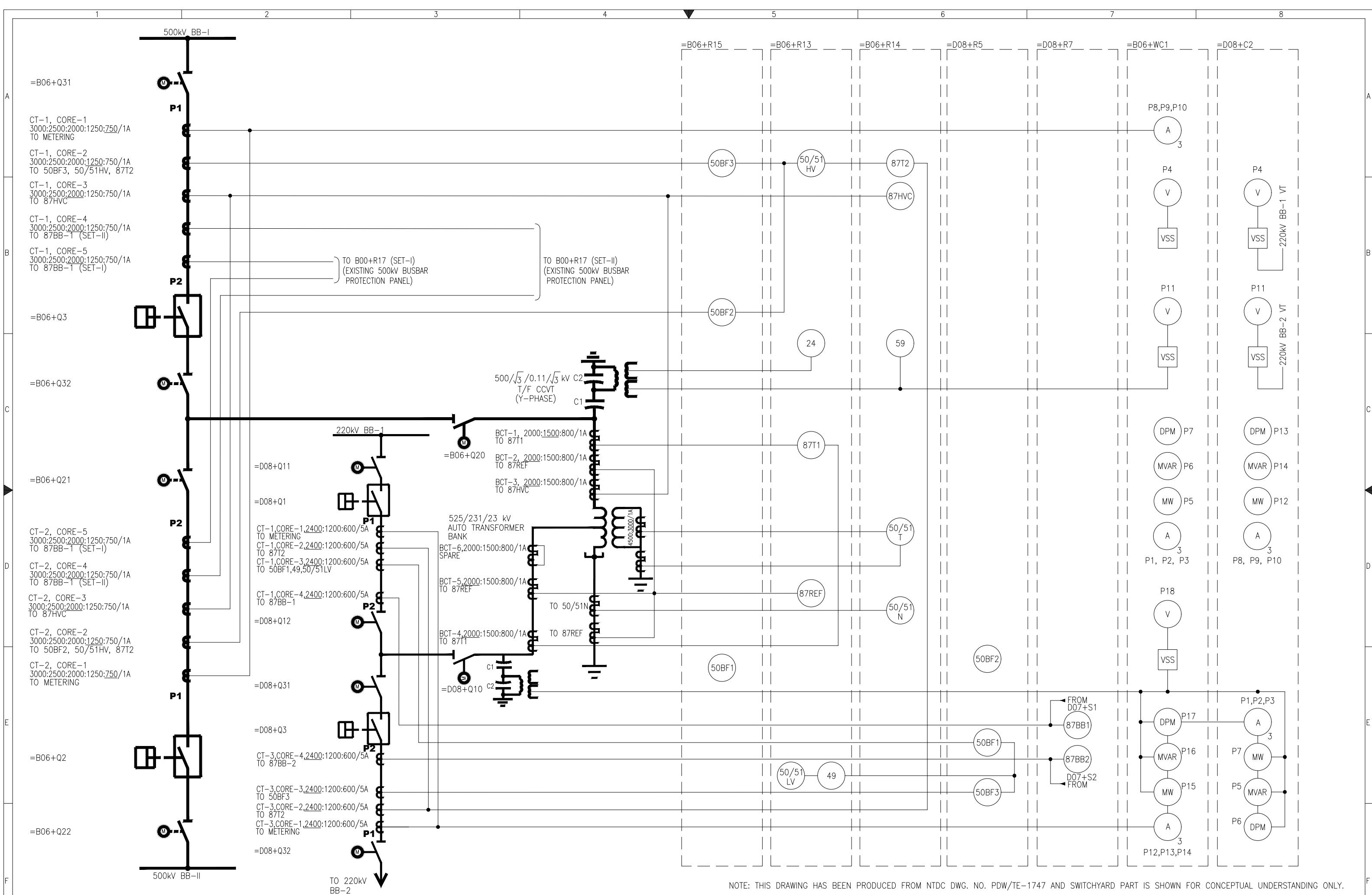
APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE:	COVER SHEET 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15	EPESOL Pvt. Ltd 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61550	SHT: 01 OF 35
NAH Q.	MSS M. Sohail	MUR B						

DESCRIPTION	SHEET NO	DESCRIPTION	SHEET NO
COVER SHEET	01	B06+Q2 TRIP CIRCUIT	18
LIST OF CONTENTS	02	B06+Q3 TRIP CIRCUIT	19
LIST OF SYMBOLS	03	D08+Q1 TRIP CIRCUIT	20
SINGLE LINE DIAGRAM	04	D08+Q2 TRIP CIRCUIT	21
TRIP LOGIC FOR =B06+R15	04a	BB+DTT	22
DC SUPPLY DISTRIBUTION	05	BFI FOR D08+Q1,D08+Q3	23
CB CLOSE BLOCK CIRCUIT	06	SIGNAL MULTIPLICATION	24
BF1 PROT. CT CIRCUIT	07	ANNUNCIATION CIRCUIT	25
BF2 PROT. CT CIRCUIT	08	ER SIGNALLING CIRCUIT	26
BF3 PROT. CT CIRCUIT	09	FR SIGNALLING CIRCUIT	27
BF1 PROT. DC CIRCUIT	10	SCADA SIGNALLING CIRCUIT	28
BF1 PROT. DC CIRCUIT	11	COMMUNICATION CIRCUIT	29
BREAKER FAILURE INITIATION FOR B06+Q1	13	DEVICE DETAIL FOR 50BF1	31
BREAKER FAILURE INITIATION FOR B06+Q2	14	DEVICE DETAIL FOR 50BF2	32
BREAKER FAILURE INITIATION FOR B06+Q3	15	DEVICE DETAIL FOR 50BF3	33
BB LOCKOUTS	16	DEVICE DETAIL FOR TEST BLOCKS	34
B06+Q1 TRIP CIRCUIT	17	DEVICE DETAIL FOR TEST BLOCKS	35

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: LIST OF CONTENTS 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15	EPE SOL Pvt Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61550	SHT: 02 OF 35
NAH Q.	MSS M. Sohail	MUR Ilyas				DATE: 07.03.2019	AS BUILT

A
B
C
D
E
F
A
B
C
D
E
F
LIST OF SYMBOLS AND DESIGNATIONS

	MOTORIZED HV DISCONNECTOR		TRAFO DIFFERENTIAL PROTECTION RELAY
	HV CIRCUIT BREAKER		REF PROTECTION RELAY
	525/231/23 kV AUTO TRANSFORMER		HV OVERCURRENT PROTECTION RELAY
	CAPACITOR VOLTAGE TRANSFORMER		THERMAL OVERLOAD PROTECTION RELAY
	RELAY PANEL TERMINAL BLOCK		LV OVERCURRENT PROTECTION RELAY
	CONTROL PANEL TERMINAL BLOCK		OVERFLUXING PROTECTION RELAY
	EARTH CONNECTION	74-DC	DC CIRCUIT SUPERVISION RELAY
	NORMALLY CLOSED CONTACT	X	TERMINAL BLOCKS
	NORMALLY OPEN CONTACT	K	AUXILIARY RELAY/CONTACTOR
	CHANGE OVER CONTACT		
	MINIATURE CIRCUIT BREAKER		
	INDICATING BULB/LED/CUBICLE LIGHT		
	220V SOCKET		
	SPACE HEATER		
	COIL		
	EQUIPMENT WITHIN PANEL		
	INDEPENDENT PANEL		
	INDEPENDENT PANEL		



NOTE: THIS DRAWING HAS BEEN PRODUCED FROM NTDC DWG. NO. PDW/TE-1747 AND SWITCHYARD PART IS SHOWN FOR CONCEPTUAL UNDERSTANDING ONLY

BB-2	NOTE: THIS DRAWING HAS BEEN PRODUCED FROM RIBD Dwg. No. PDU/IE/17/1 AND SWITCHARD PART IS SHOWN FOR CONCEPTUAL UNDERSTANDING ONLY.										
APPROVED	CHECKED	DRAWN		PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/EO/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE:	SINGLE LINE DIAGRAM		EPE SOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61550	SHT: 04 OF 35	
NAH 	MSS 	MUR 				500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15			DATE: 07.03.2019	AS BUILT	REV: 0

	CB	DTT	B06+Q1	B06+Q3	B06+Q2	BB-I	BB-II	D08+Q1	D08+Q3
50BF B06+Q1	STAGE-I		X						
	STAGE-II	X		X		F			
50BF B06+Q3	STAGE-I			X					
	STAGE-II	X	X		X	XF		X	X
50BF B06+Q2	STAGE-I				X				
	STAGE-II			X			X	X	X
BB-I	STAGE-II		F	XF					
BB-II	STAGE-II				X				
D08+Q1	STAGE-II			X	X				
D08+Q3	STAGE-II			X	X				

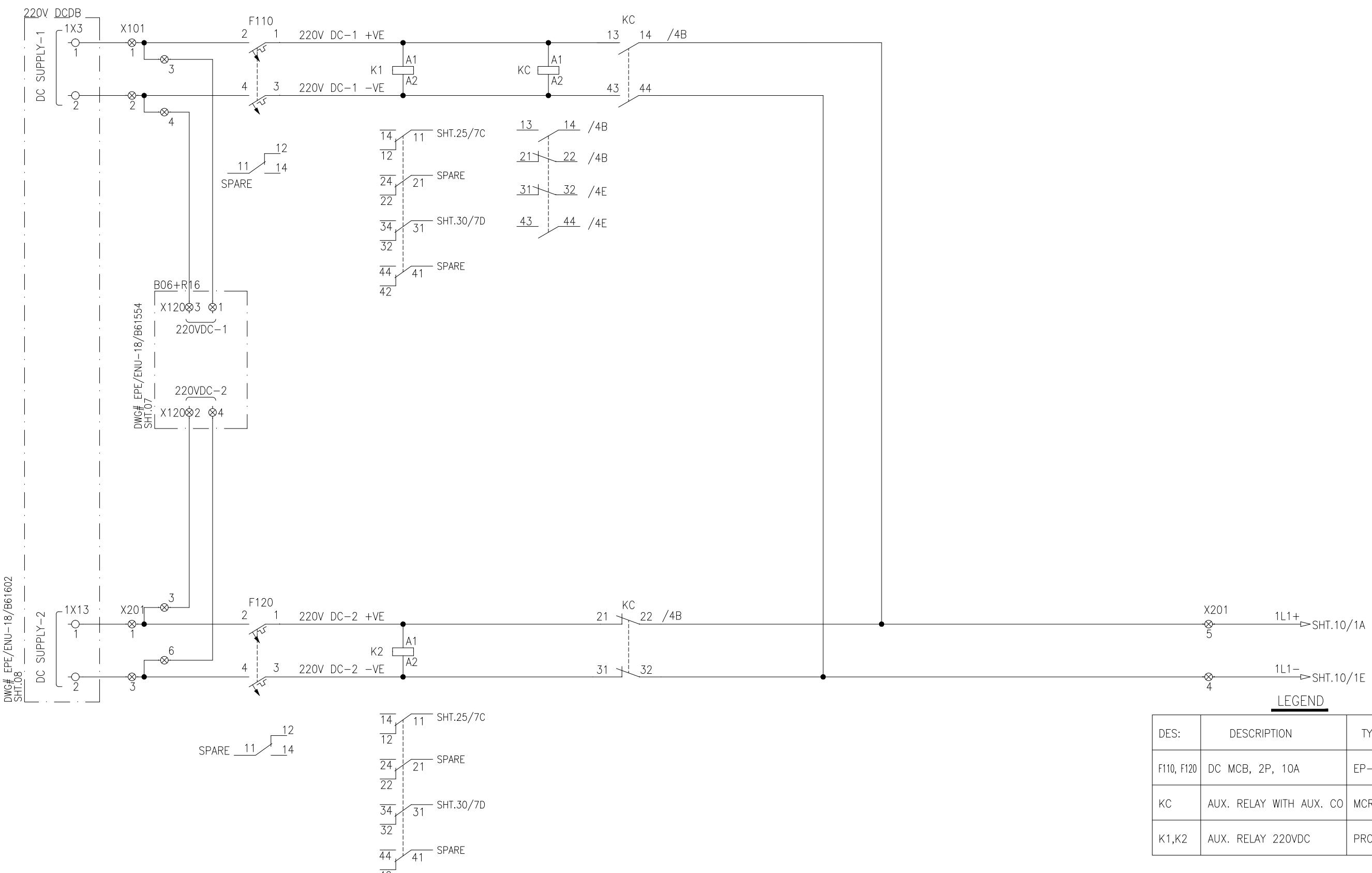
LEGEND

X	PRESENT
F	FUTURE
XF	TO BE REPLACED IN FUTURE

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: TRIP LOGIC FOR =B06+R15 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15	EPE SOL Pvt Ltd 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61550	SHT:04aOF 35
NAH Q.	MSS M. Sohail	MUR Ilyas				DATE: 07.03.2019	AS BUILT
						REV: 0	

DC SUPPLY SUPERVISION

INCOMING SUPPLY A

AC SUPPLY
TRIP

APPROVED: NAH
CHECKED: MSS
DRAWN: MUR



PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS

TITLE: DC SUPPLY DISTRIBUTION
500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15

DWG# EPE/ENU-18/B61550
SHT: 05 OF 35
71-B Garden Block, New Garden Town, Lahore, Pakistan
DATE: 07.03.2019
AS BUILT
REV: 0

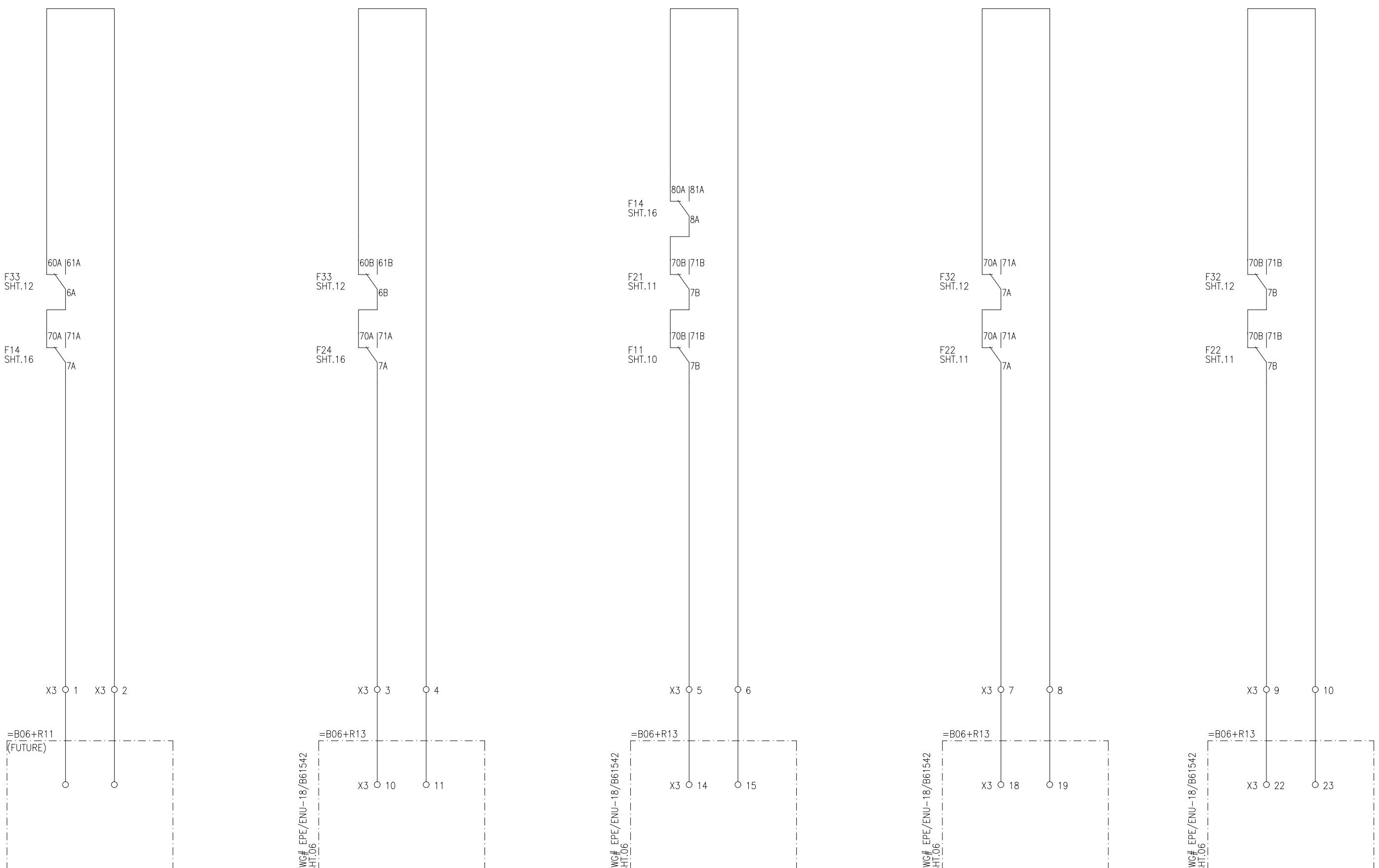
CB B06+Q1
CLOSING LOCKOUT

CB B06+Q2
CLOSING LOCKOUT

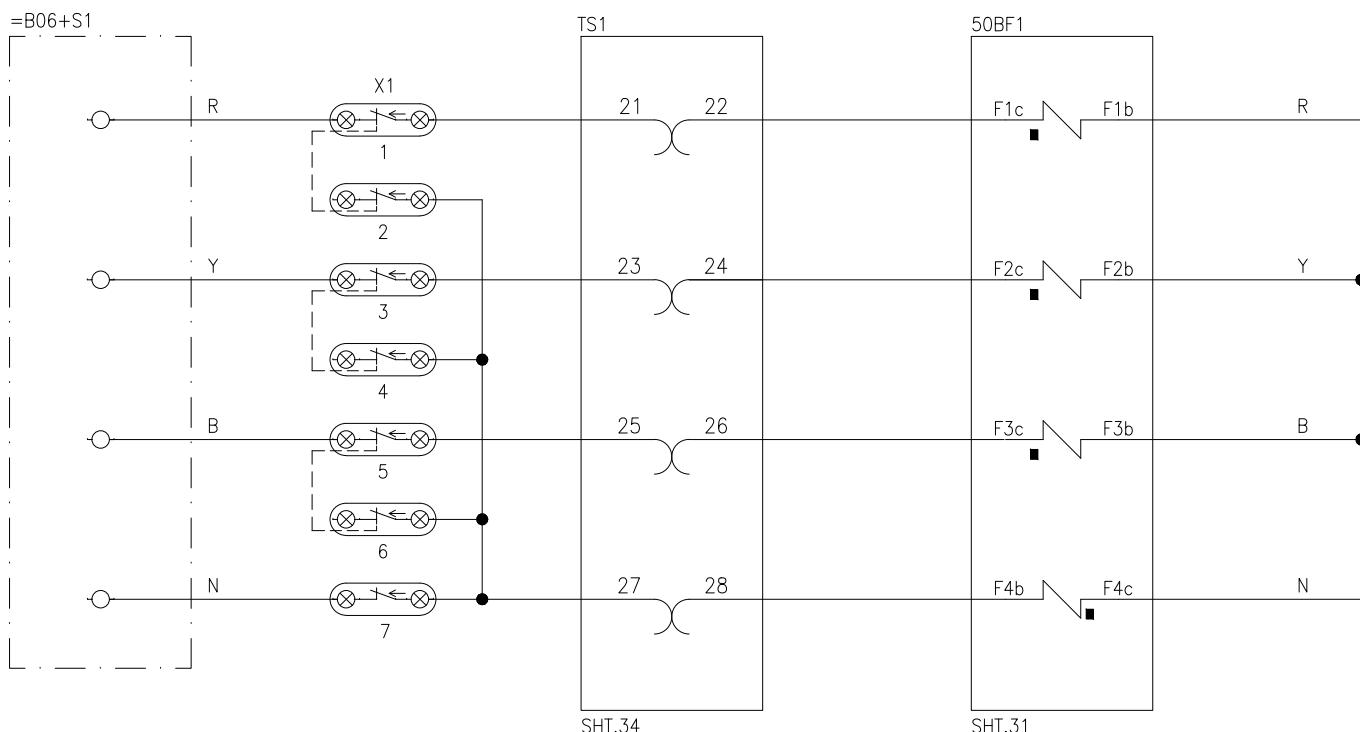
CB B06+Q3
CLOSING LOCKOUT

CB D08+Q1
CLOSING LOCKOUT

CB D08+Q3
CLOSING LOCKOUT



APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: CB CLOSE BLOCK CIRCUIT 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15	 EPESOL pvt. ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61550	SHT: 06 OF 35
NAH G.	MSS M. Sohel	MUR B				DATE: 07.03.2019	AS BUILT REV: 0

TEST BLOCK
BREAKER FAILURE
PROTECTION RELAYLEGEND

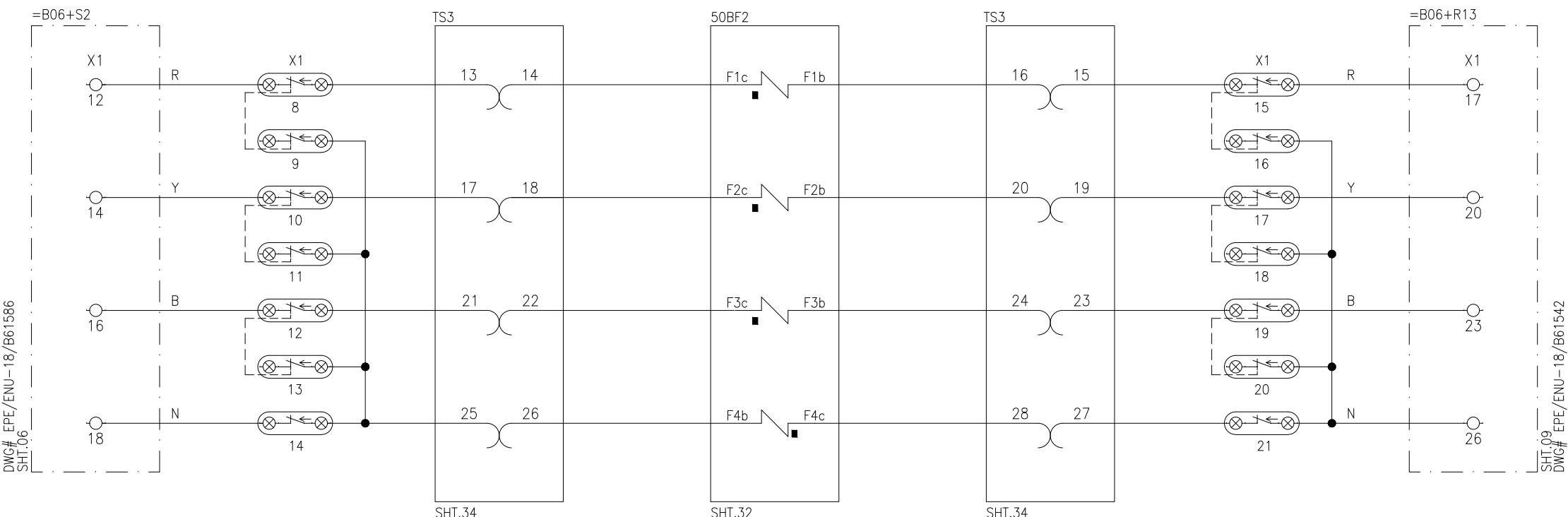
DES.	DESCRIPTION	TYPE	MAKE
TS1	TEST BLOCK (14 FINGERS)	saTECH TSB 14	ARTECHE
50BF1	BREAKER FAILURE PROT. RELAY	C60	GE

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: BREAKER FAILURE 1 PROT. CT CIRCUIT 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15	DWG# EPE/ENU-18/B61550	SHT: 07 OF 35
NAH	MSS	MUR		EPE SOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT
					REV: 0	

TEST BLOCK

BREAKER FAILURE
PROTECTION RELAY

TEST BLOCK



DWG# EPE/ENU-18/B61586

SHT.06

SHT.09 DWG# EPE/ENU-18/B61542

LEGEND

DES.	DESCRIPTION	TYPE	MAKE
TS3	TEST BLOCK (14 FINGERS)	saTECH TSB 14	ARTECHE
50BF2	BREAKER FAILURE PROT. RELAY	C60	GE

APPROVED	CHECKED	DRAWN
NAH	MSS	MUR



PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS

TITLE:
BREAKER FAILURE 2 PROT. CT CIRCUIT
500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15

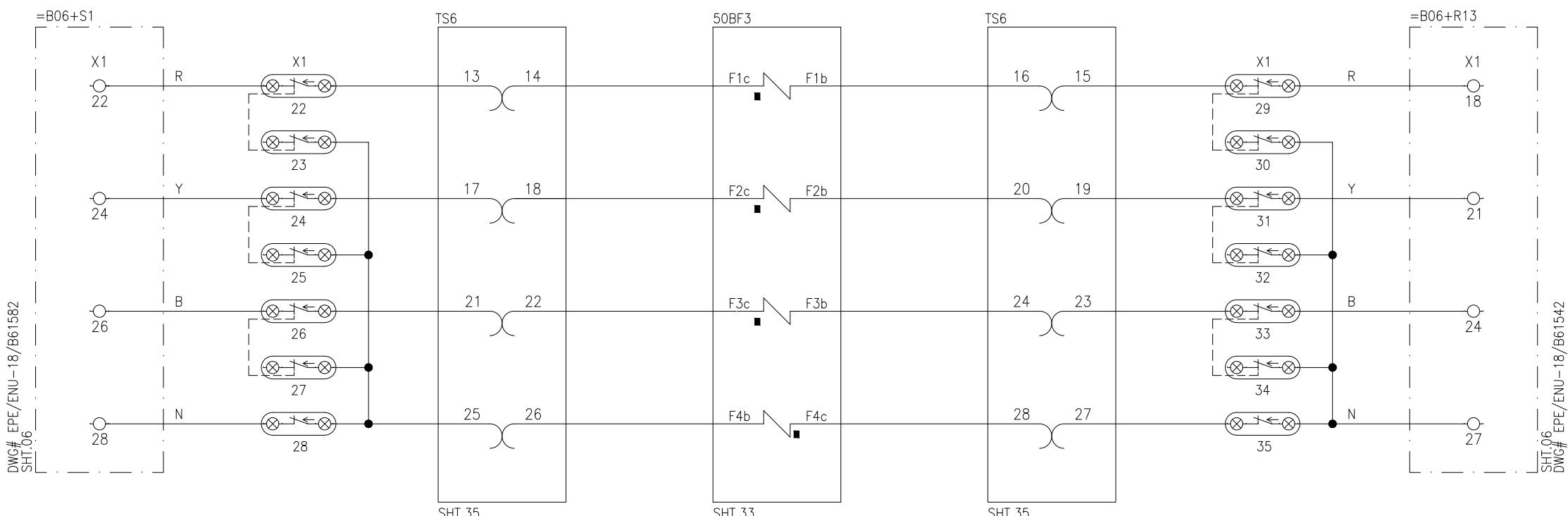
 **EPESOL Pvt. Ltd.**
71-B Garden Block, New Garden Town, Lahore, Pakistan

DWG# EPE/ENU-18/B61550 SHT: 08 OF 35
DATE: 07.03.2019 AS BUILT REV: 0

TEST BLOCK

BREAKER FAILURE
PROTECTION RELAY

TEST BLOCK



LEGEND

DES.	DESCRIPTION	TYPE	MAKE
TS5	TEST BLOCK (14 FINGERS)	saTECH TSB 14	ARTECHE
50BF3	BREAKER FAILURE PROT. RELAY	C60	GE

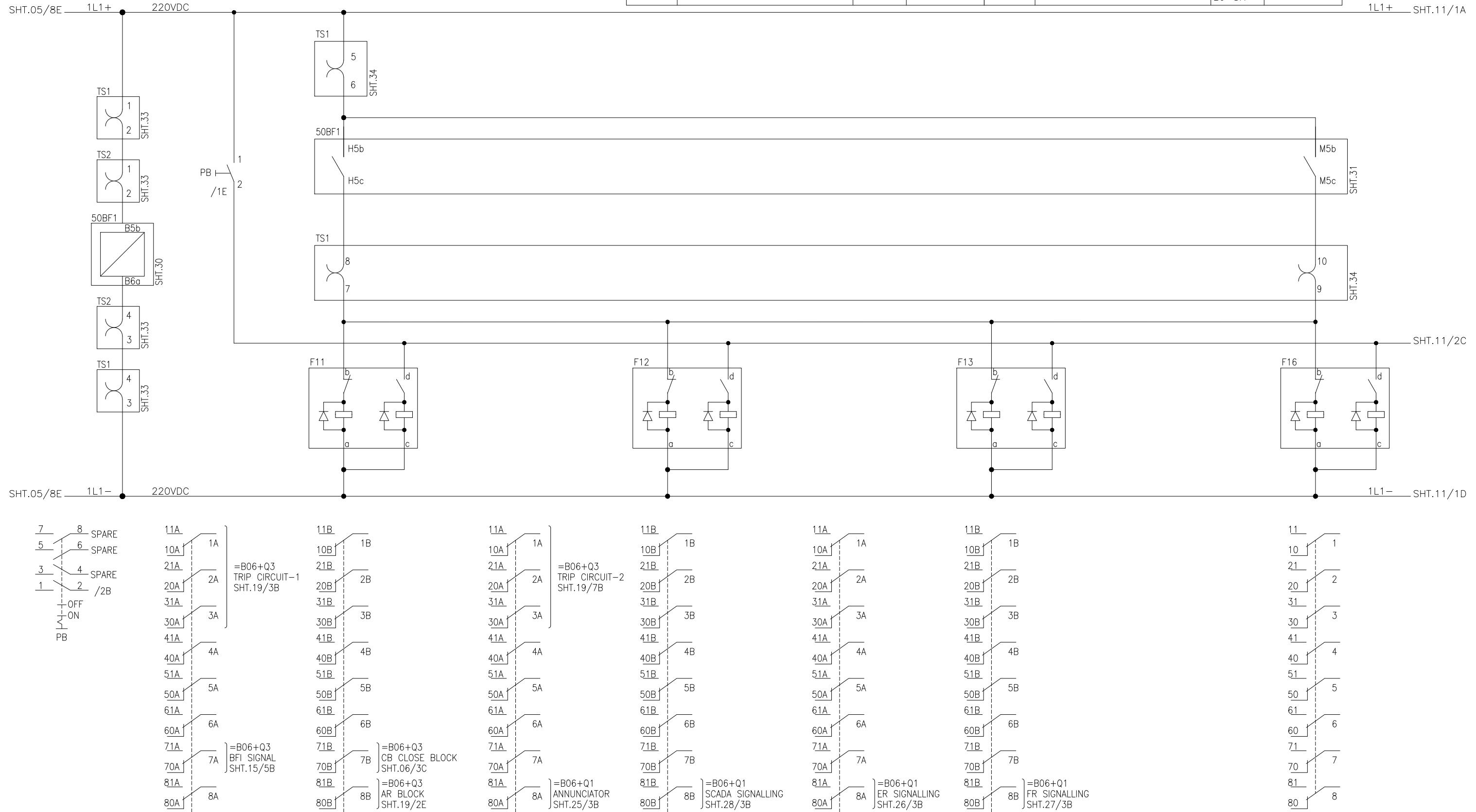
APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: BREAKER FAILURE 3 PROT. CT CIRCUIT 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15	DWG# EPE/ENU-18/B61550	SHT: 09 OF 35
NAH	MSS	MUR		EPE SOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT
					REV: 0	

50BF1 RESET CB B06+Q1
 DC PUSH BUTTON 50BF1 STG-2 TRIP
 SUPPLY /END ZONE FAULT

CB B06+Q1
 50BF1
 STG-2 TRIP/END ZONE FAULT

LEGEND

DES.	DESCRIPTION	TYPE	MAKE	DES.	DESCRIPTION	TYPE	MAKE
TS1	TEST BLOCK (14 FINGERS)	saTECH TSB 14	ARTECHE	PB	PUSH BUTTON	YS-AP	YONGSUNG
50BF1	BREAKER FAILURE PROT. RELAY	C60	GE	Fx	TRIP RELAY	BI-16R, BJ-8R	ARTECHE

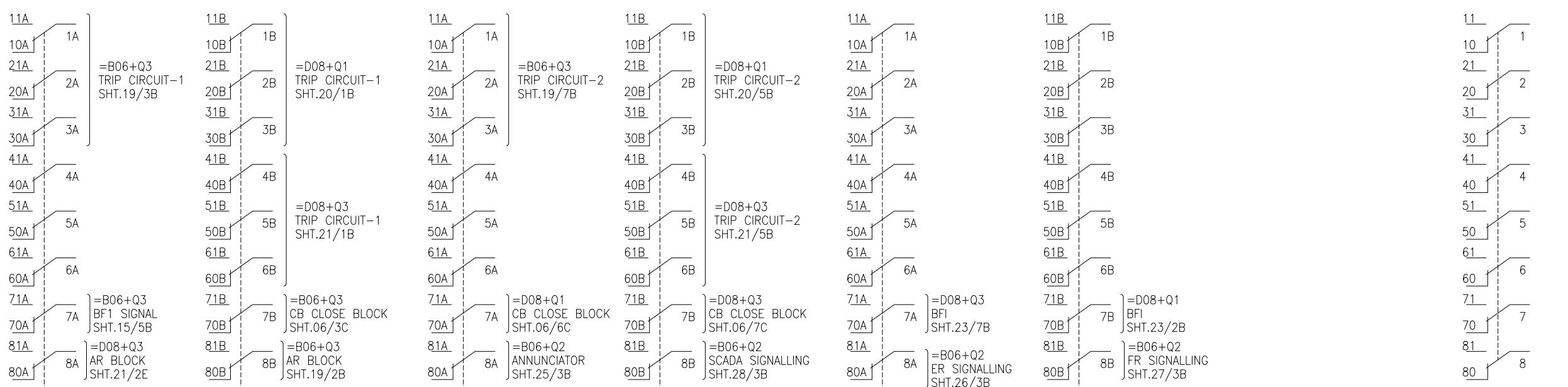
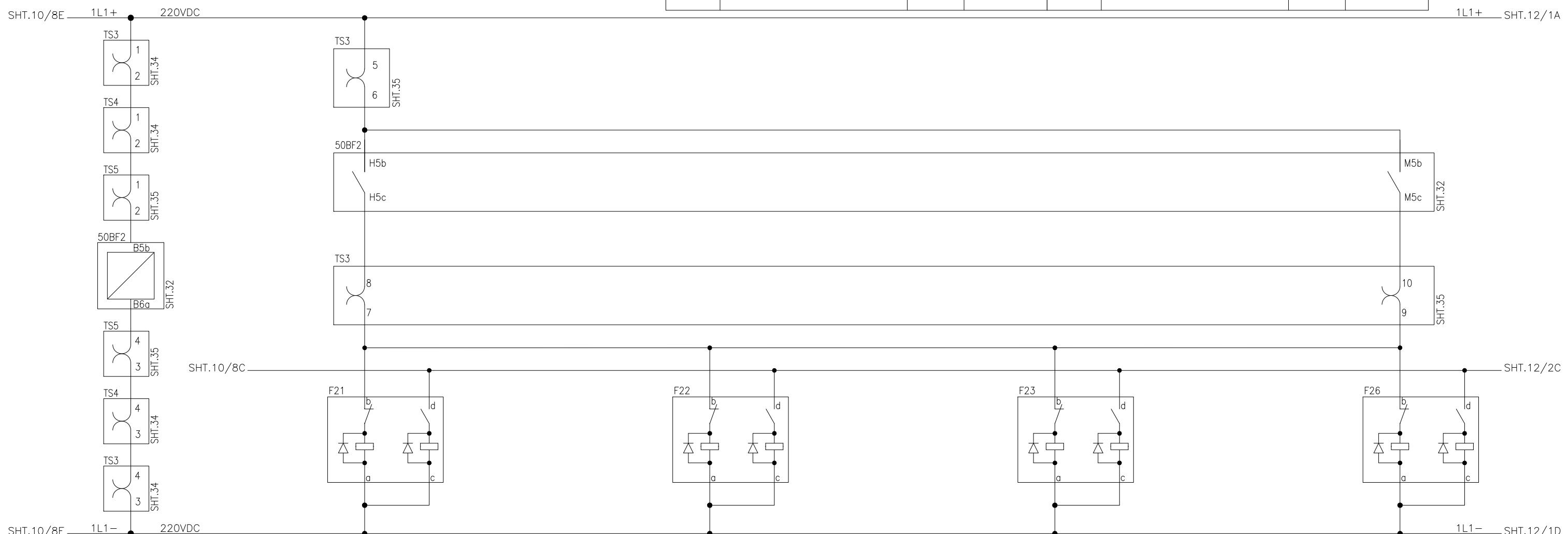


50BF2	CB B06+Q2
DC	50BF2 STG-2 TR
SUPPLY	/END ZONE FAUL

CB B06+Q2
50BF2
TRIP/END ZONE FAULT

LEGEND

DES.	DESCRIPTION	TYPE	MAKE	DES.	DESCRIPTION	TYPE	MAKE
TS3	TEST BLOCK (14 FINGERS)	saTECH TSB 14	ARTECHE	Fx	TRIP RELAY	BI-16R	ARTECHE
50BF2	BREAKER FAILURE PROT. RELAY	C60	GE	Fx	TRIP RELAY	BJ-8R	ARTECHE



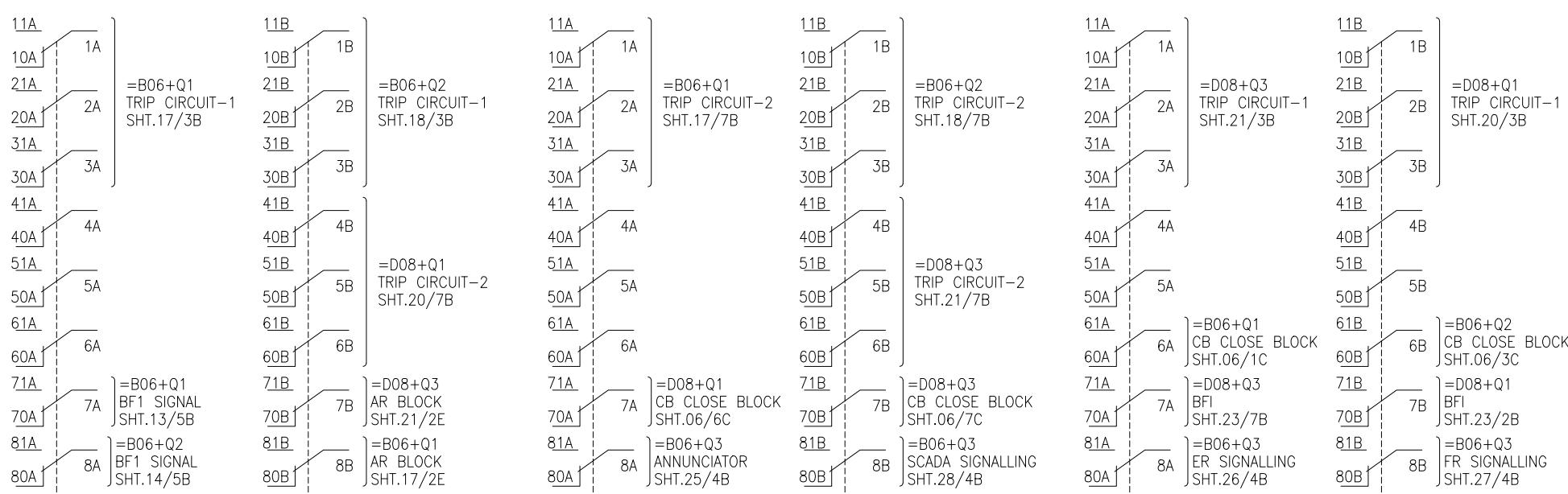
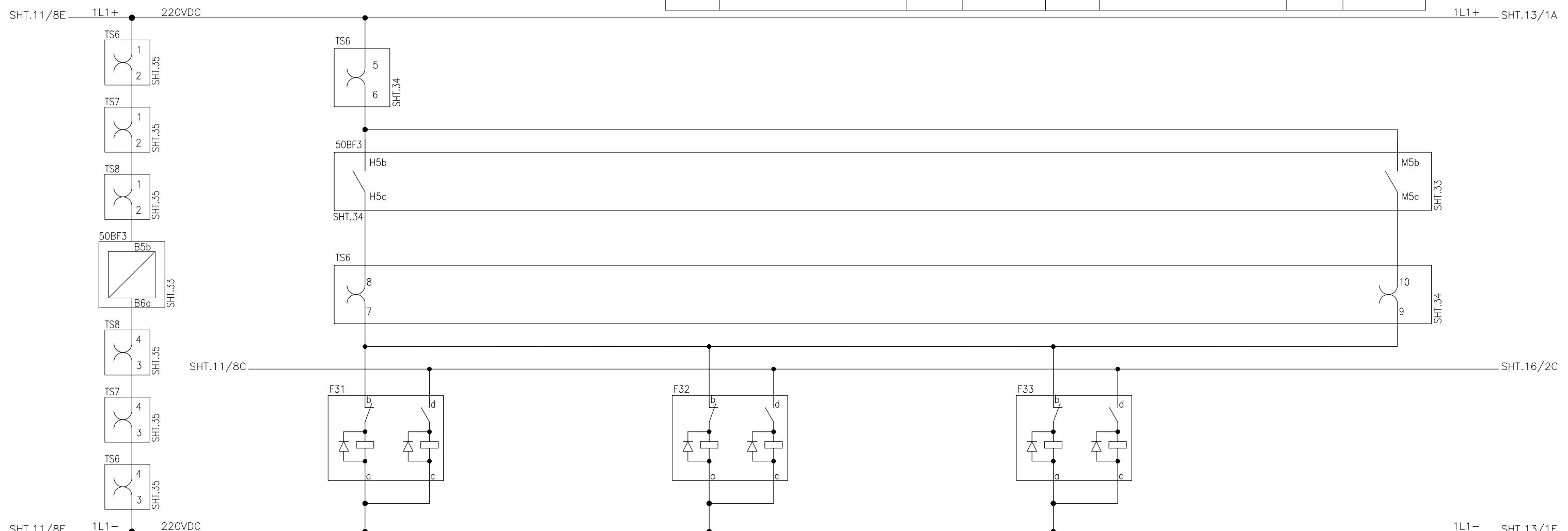
APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: BREAKER FAILURE 2 PROT. DC CIRCUIT 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15	 EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61550	SHT: 11 OF 35
NAH <i>G.J.</i>	MSS <i>M. Sohail</i>	MUR <i>M.S.</i>				DATE: 07.03.2019	AS BUILT

50BF3 CB B06+Q3
DC 50BF3 STG-2 TRIP
SUPPLY /END ZONE FAULT

CB B06+Q3
50BF3 STG-2 TRIP/END ZONE FAULT

LEGEND

DES.	DESCRIPTION	TYPE	MAKE	DES.	DESCRIPTION	TYPE	MAKE
TS6	TEST BLOCK (14 FINGERS)	saTECH TSB 14	ARTECHE	Fx	TRIP RELAY	BI-16R	ARTECHE
50BF3	BREAKER FAILURE PROT. RELAY	C60	GE	Fx	TRIP RELAY	BJ-8R	ARTECHE



CB B06+Q1

DISTANCE SET-1 PROT.

DISTANCE SET-2 PROT.

▼

DISTANCE SET-I

DISTANCE SET-II

CB OPEN STATUS

ZONE-1 TRIP

ZONE-1 TRIP

=B06+Q3

BB-1 PROT. / ADJ.

Z2/Z3/STUB

Z2/Z3/STUB

CB

R-PH Y-PH B-PH

R-PH Y-PH B-PH

R-PH Y-PH B-PH

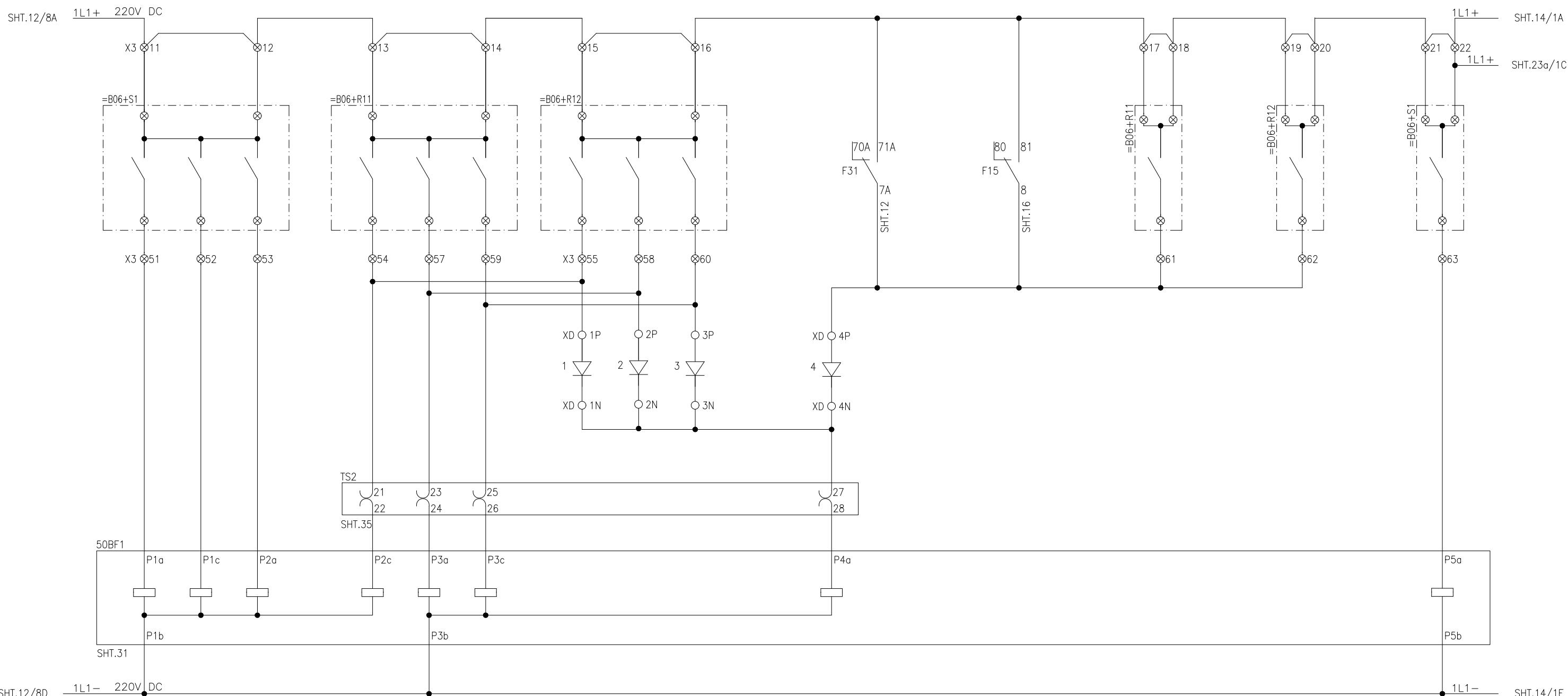
STG2 TRIP

DIA CBF STG-2

SOTF/PS/DTT/OV

SOTF/PS/DTT/OC&EF

FAULTY

LEGEND

DES.	DESCRIPTION	TYPE	MAKE
TS2	TEST BLOCK (14 FINGERS)	saTECH TSB 14	ARTECHE
50BF1	BREAKER FAILURE PROT. RELAY	C60	GE

NOTE:
TO BE SHORTED AT SITE.

CB B06+Q

CB OPEN STAT

R-PH Y-PH B-PH

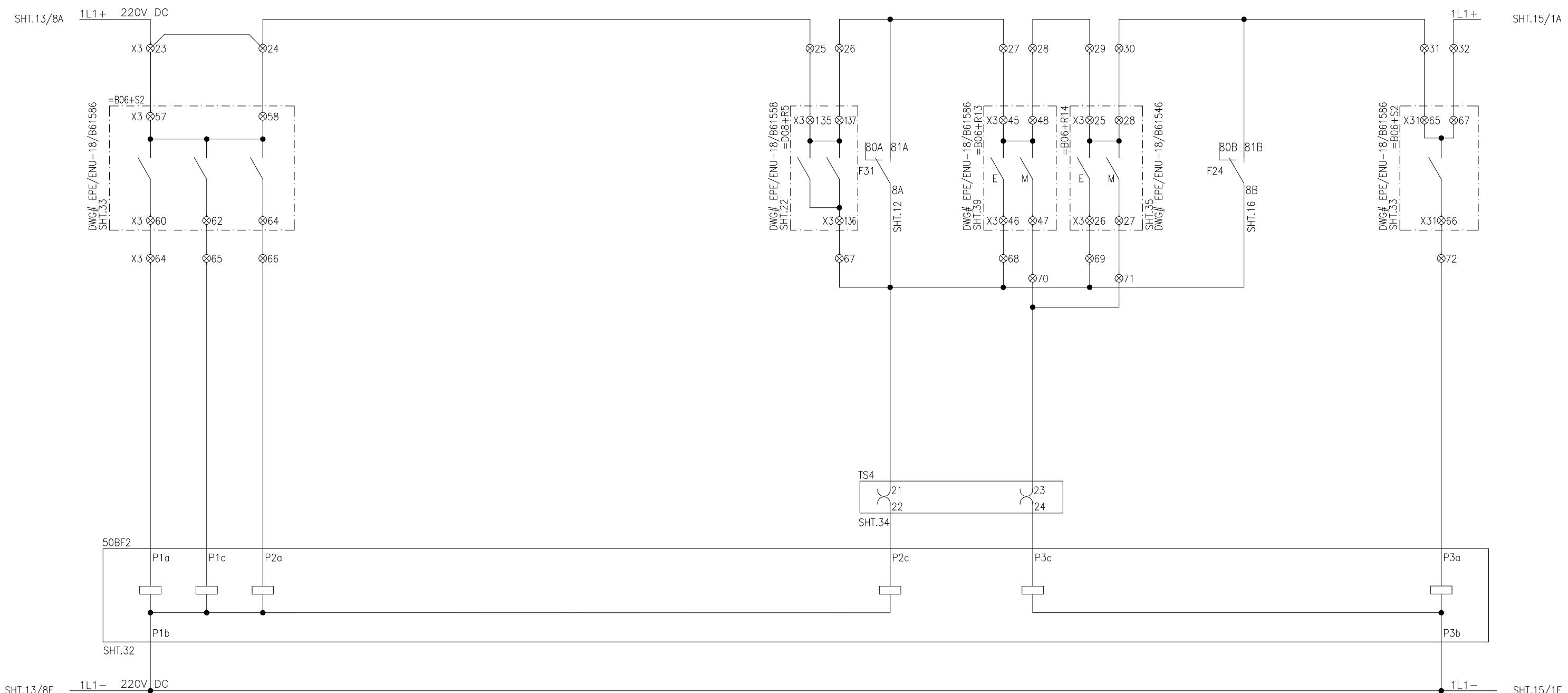
220kV BF1+BF3 50BF-3

D. SET-I TRAFO. SET-II

T. TRIP PROT. TRIP

BB-2 PROT. / ADJ.

CB



LEGEND

DES.	DESCRIPTION	TYPE	MAKE
50BF2	BREAKER FAILURE PROT. RELAY	C60	GE

NOTE:
TO BE SHORTED AT SITE.



E P E S O L Pvt. Ltd.

TITLE

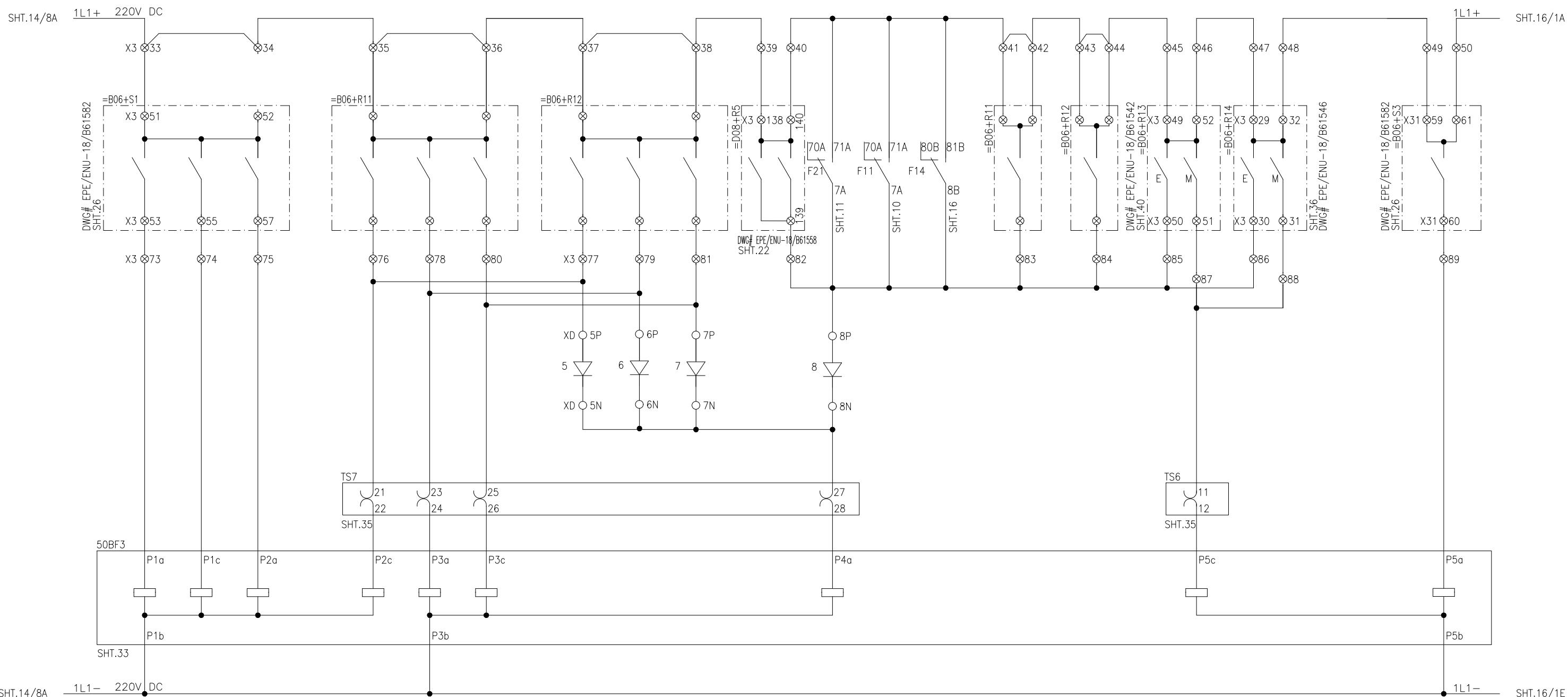
BREAKER FAILURE INITIATION FOR B06+Q2
500kV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15

DWG# EPE/ENIU-18/B61550 SHT: 14 OF 35

DATE: 07.03.2019

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: BREAKER FAILURE INITIATION FOR B06+Q2 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15	 EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61550	SHT: 14 OF 35				
NAH C	MSS M	MUR B		1	2	3	4	5	6	7	8

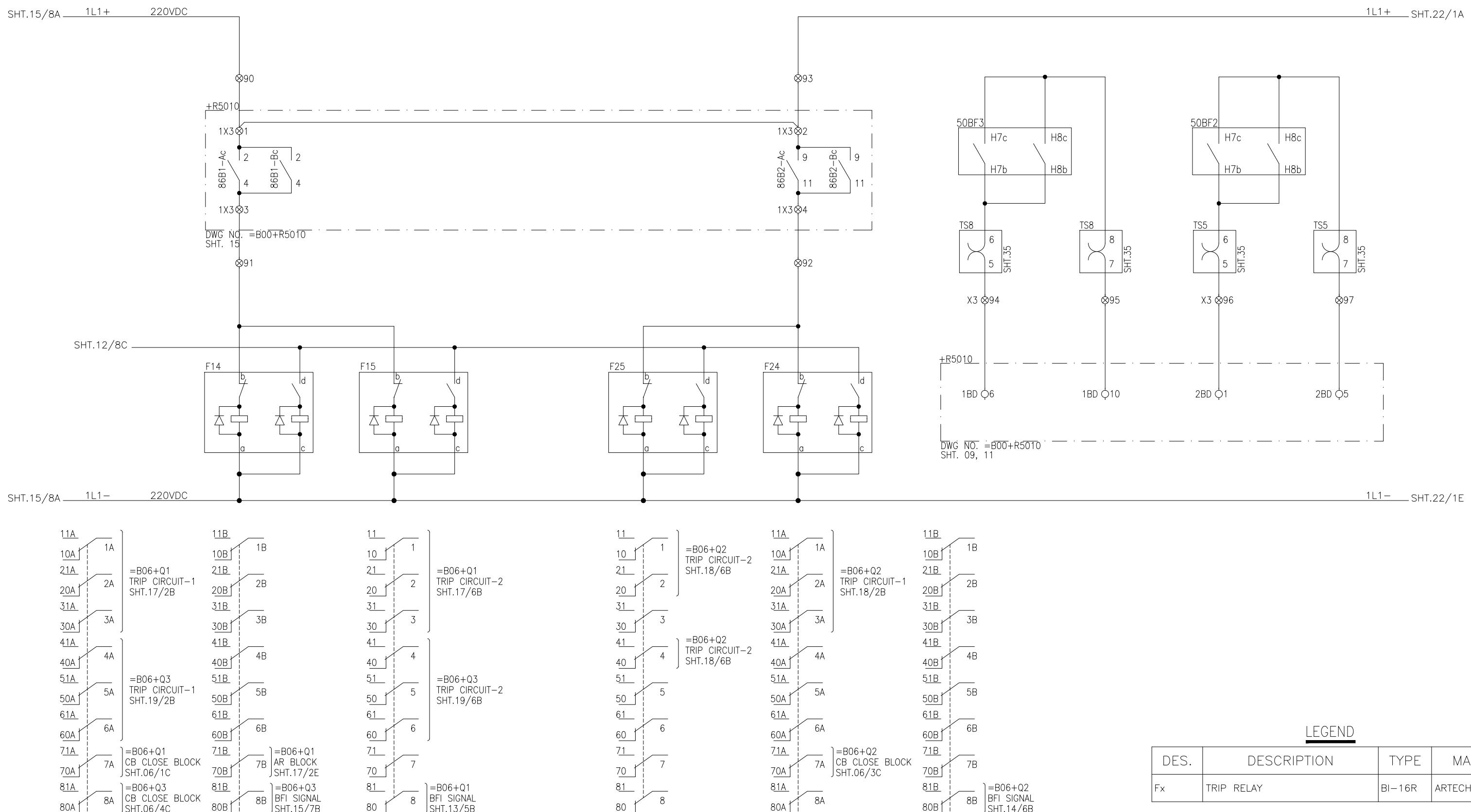
CB B06+Q3	DISTANCE SET-1 PROT.	DISTANCE SET-2 PROT.	=D8+Q1/ =B6+Q2	=B6+Q1 BB-1 PROT.	DIST. SET-I	DIST. SET-II	TRAFO. SET-I	TRAFO. SET-II
CB OPEN STATUS	ZONE-1 TRIP	ZONE-1 TRIP	=D7+Q3 STG-2	STG-2 /ADJ. DIA	Z2/Z3/STUB	Z2/Z3/STUB/SOTF/	PROT. TRIP	PROT. TRIP
R-PH Y-PH B-PH	R-PH Y-PH B-PH	R-PH Y-PH B-PH	STG-2 TRIP	TRIP	TRIP	CBF STG-2 SOTF/PS/DTT/OV	PS/DTT/OC&EF	ELECT./MECH.

**LEGEND**

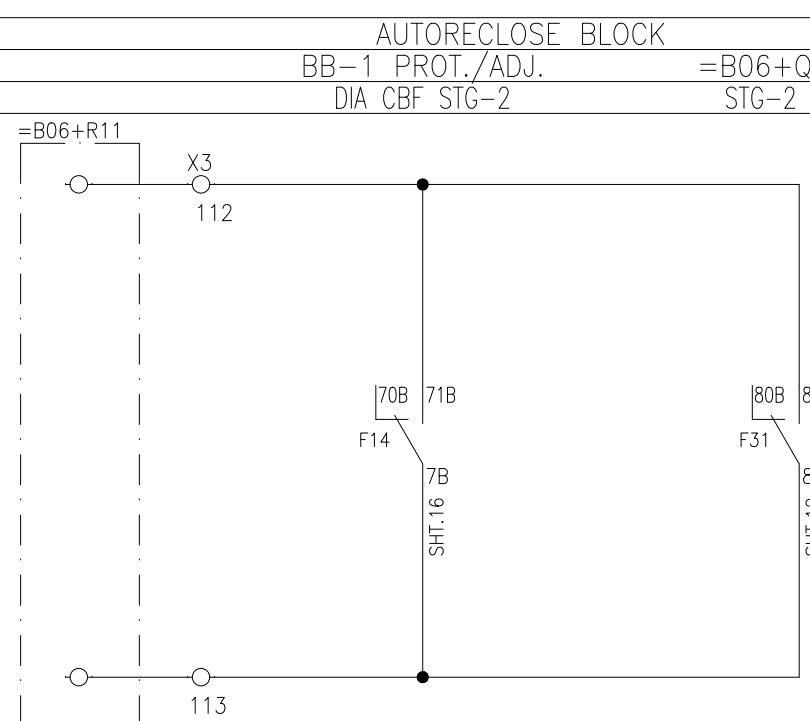
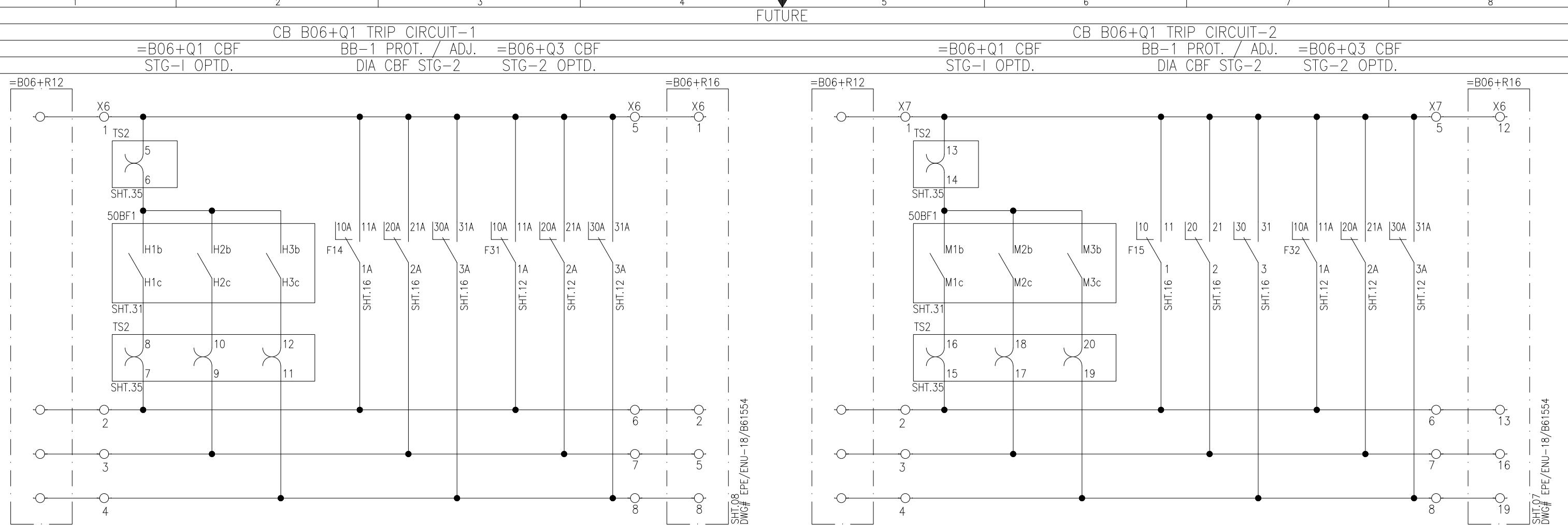
DES.	DESCRIPTION	TYPE	MAKE
TS6	TEST BLOCK (14 FINGERS)	saTECH TSB 14	ARTECHE
50BF3	BREAKER FAILURE PROT. RELAY	C60	GE

NOTE:
TO BE SHORTED AT SITE.

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: BREAKER FAILURE INITIATION FOR B06+Q3 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15	DWG# EPE/ENU-18/B61550	SHT: 15 OF 35
NAH [Signature]	MSS [Signature]	MUR [Signature]			DATE: 07.03.2019	AS BUILT

LOCKOUT FOR
BUSBAR-1LOCKOUT FOR
BUSBAR-250BF3 STG-2
FOR BB-150BF2 STG-2
FOR BB-2

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS		TITLE: BUSBAR LOCKOUT 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15	EPE SOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61550	SHT: 16 OF 35	
NAH [Signature]	MSS [Signature]	MUR [Signature]					DATE: 07.03.2019	AS BUILT	REV: 0



APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: CB B06+Q1 TRIP CKT-1/2 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15	 EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61550	SHT: 17 OF 35
NAH 	MSS 	MUR 				DATE: 07.03.2019	AS BUILT

1

2

3

4

5

6

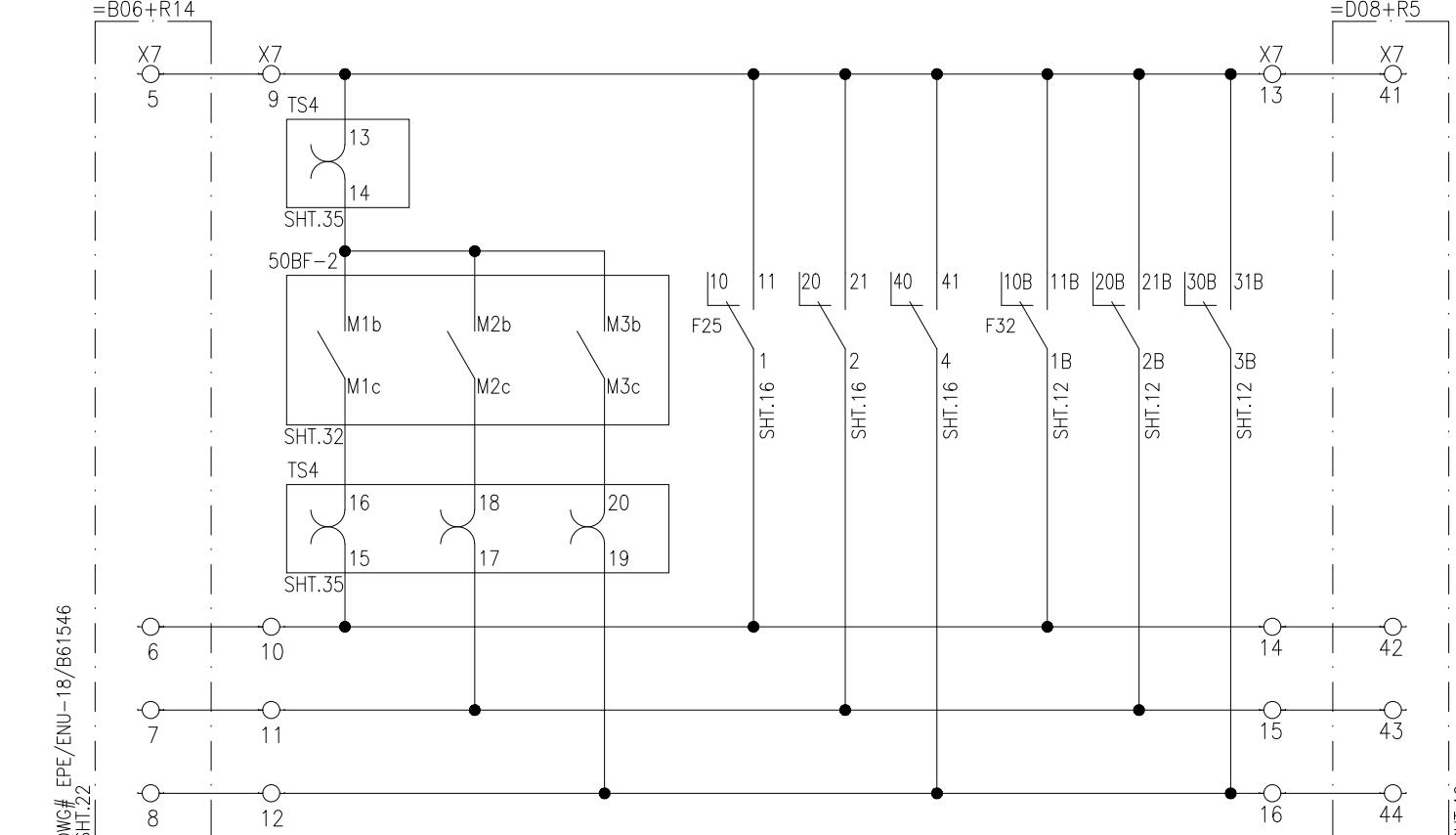
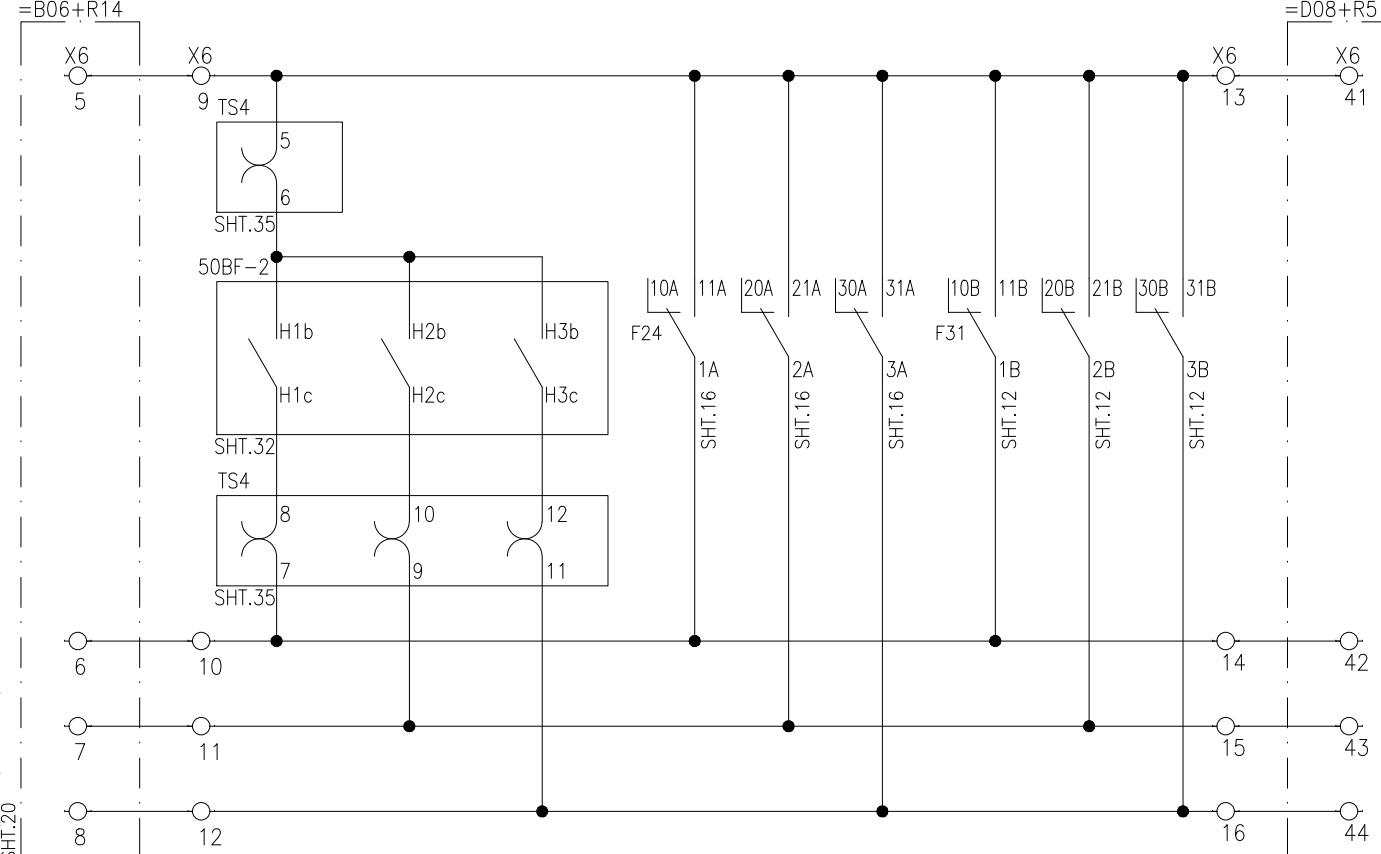
7

8

CB B06+Q2 TRIP CIRCUIT-1

=B06+Q2 CBF
STG-I OPTD.BB-2 PROT. / ADJ.
DIA CBF STG-2=B06+Q3 CBF
STG-2 OPTD.

CB B06+Q2 TRIP CIRCUIT-2

=B06+Q2 CBF
STG-I OPTD.BB-2 PROT. / ADJ.
DIA CBF STG-2=B06+Q3 CBF
STG-2 OPTD.

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: CB B06+Q2 TRIP CKT-1/2 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15	DWG# EPE/ENU-18/B61550	SHT: 18 OF 35
NAH [Signature]	MSS [Signature]	MUR [Signature]		EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT REV: 0

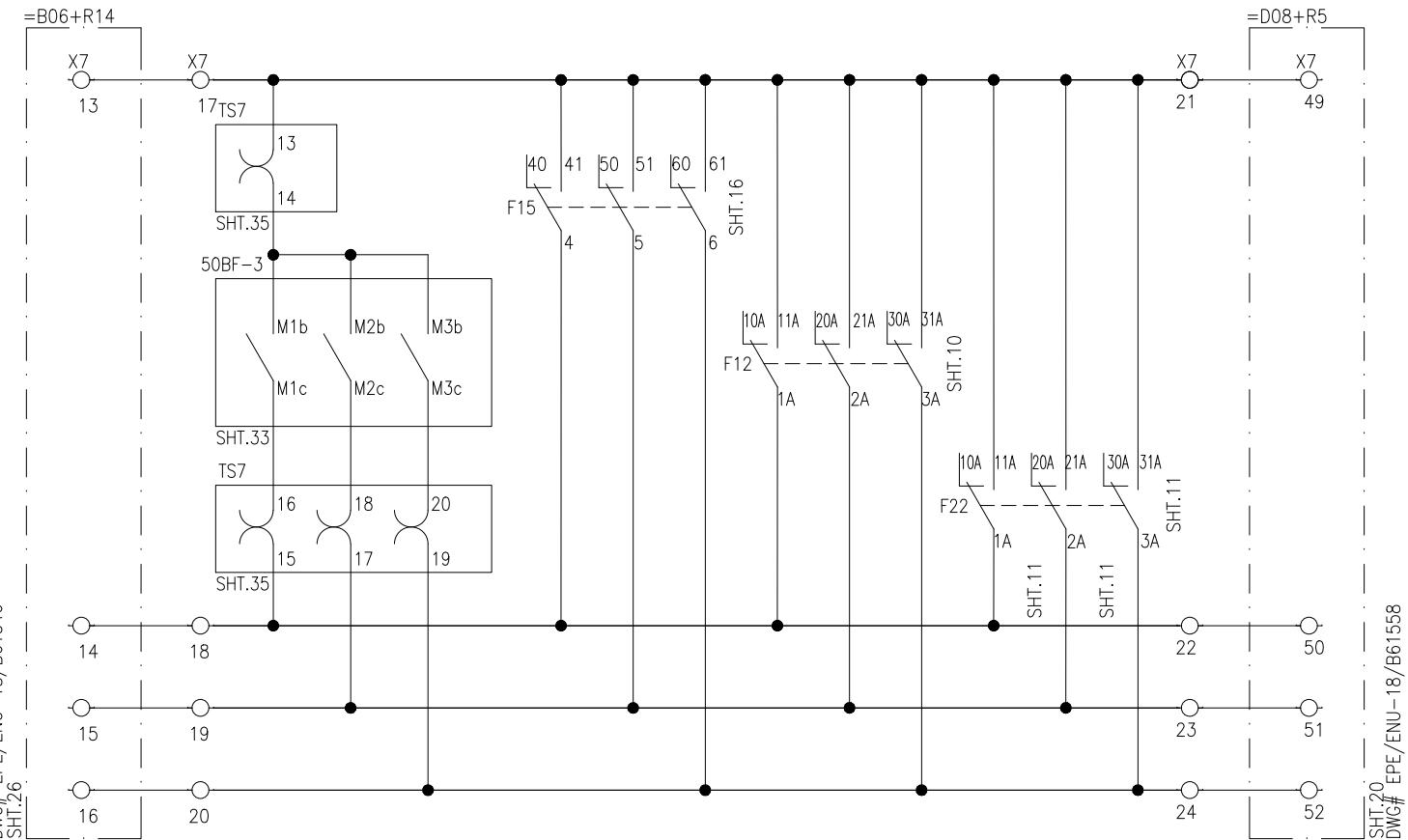
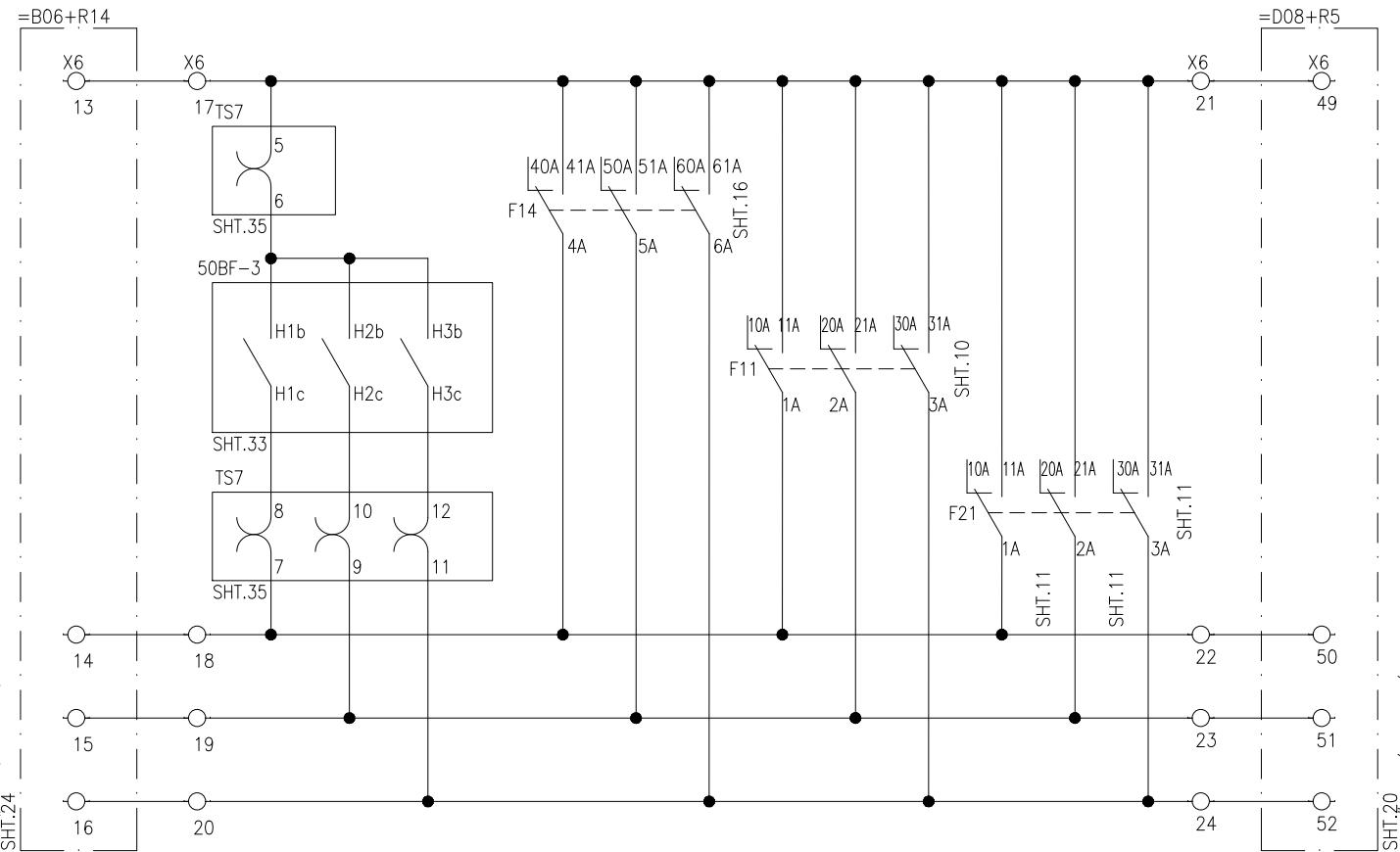
1 2 3 4 ▼ 5 6 7 8

CB B06+Q3 TRIP CIRCUIT-1

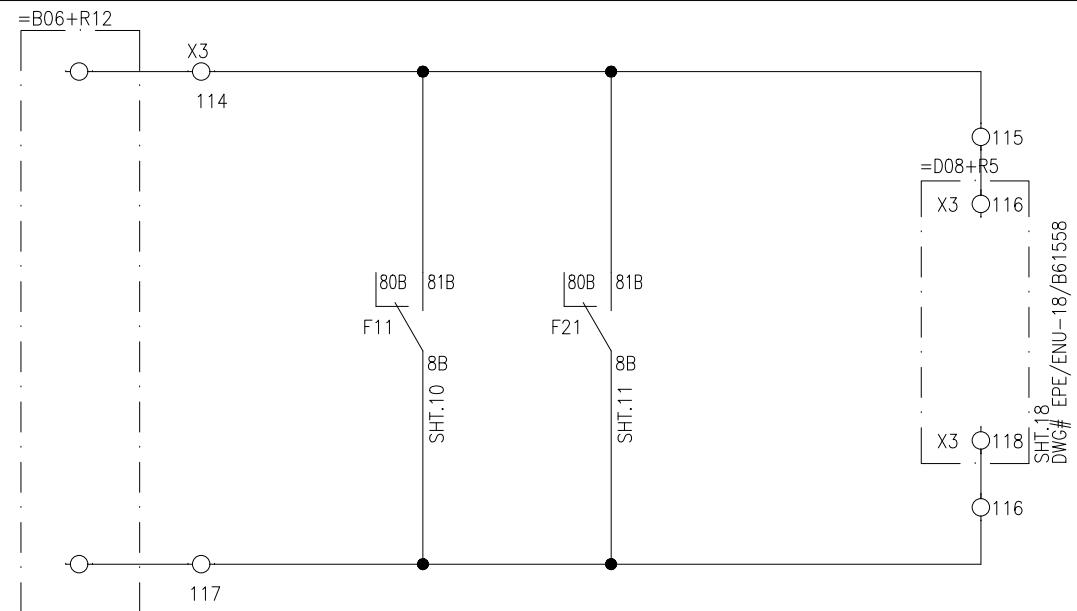
=B06+Q3 CBF BB-1 PROT. / ADJ. =B06+Q1 CBF =B06+Q2 CBF
STG-I OPTD. DIA CBF STG-2 STG-2 OPTD. STG-2 OPTD.

CB B06+Q3 TRIP CIRCUIT-2

=B06+Q3 CBF BB-1 PROT. / ADJ. =B06+Q1 CBF =B06+Q2 CBF
STG-I OPTD. DIA CBF STG-2 STG-2 OPTD. STG-2 OPTD.



AR BLOCK FOR =B06+Q3 (FUTURE)
=B06+Q1 CBF =B06+Q2 CBF D08+Q1 & D08+Q3
STG-2 OPTD. STG-2 OPTD. STG-2 OPTD.

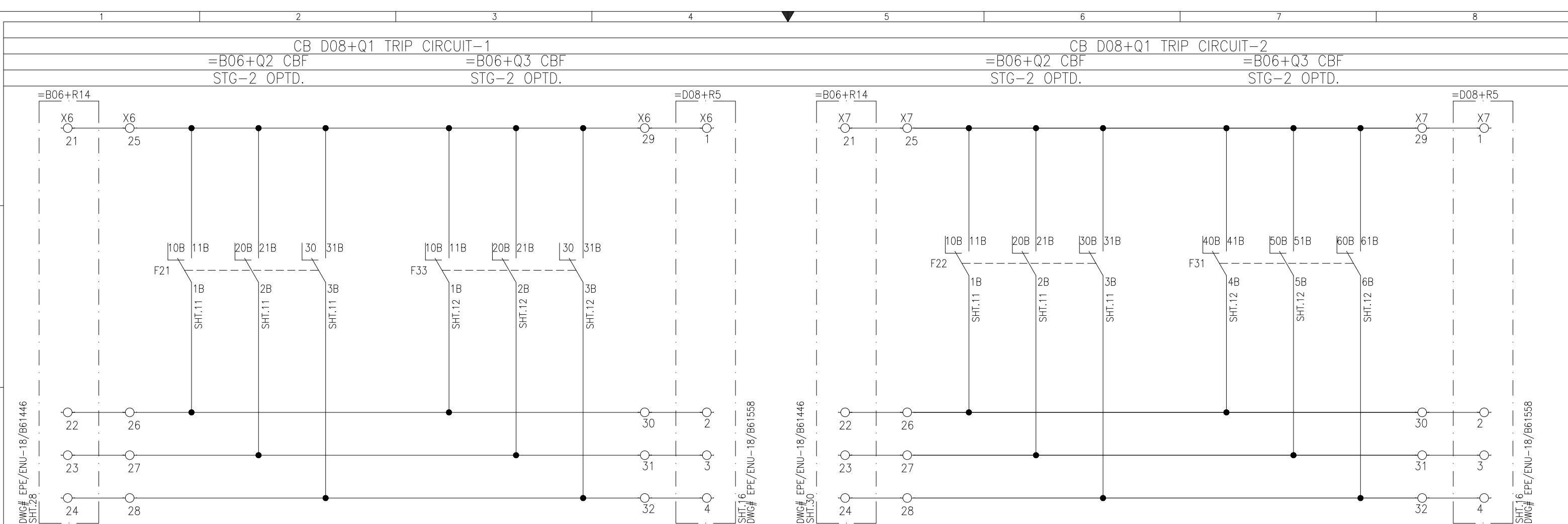


APPROVED CHECKED DRAWN PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS TITLE: CB B06+Q3 TRIP CKT-1/2 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15

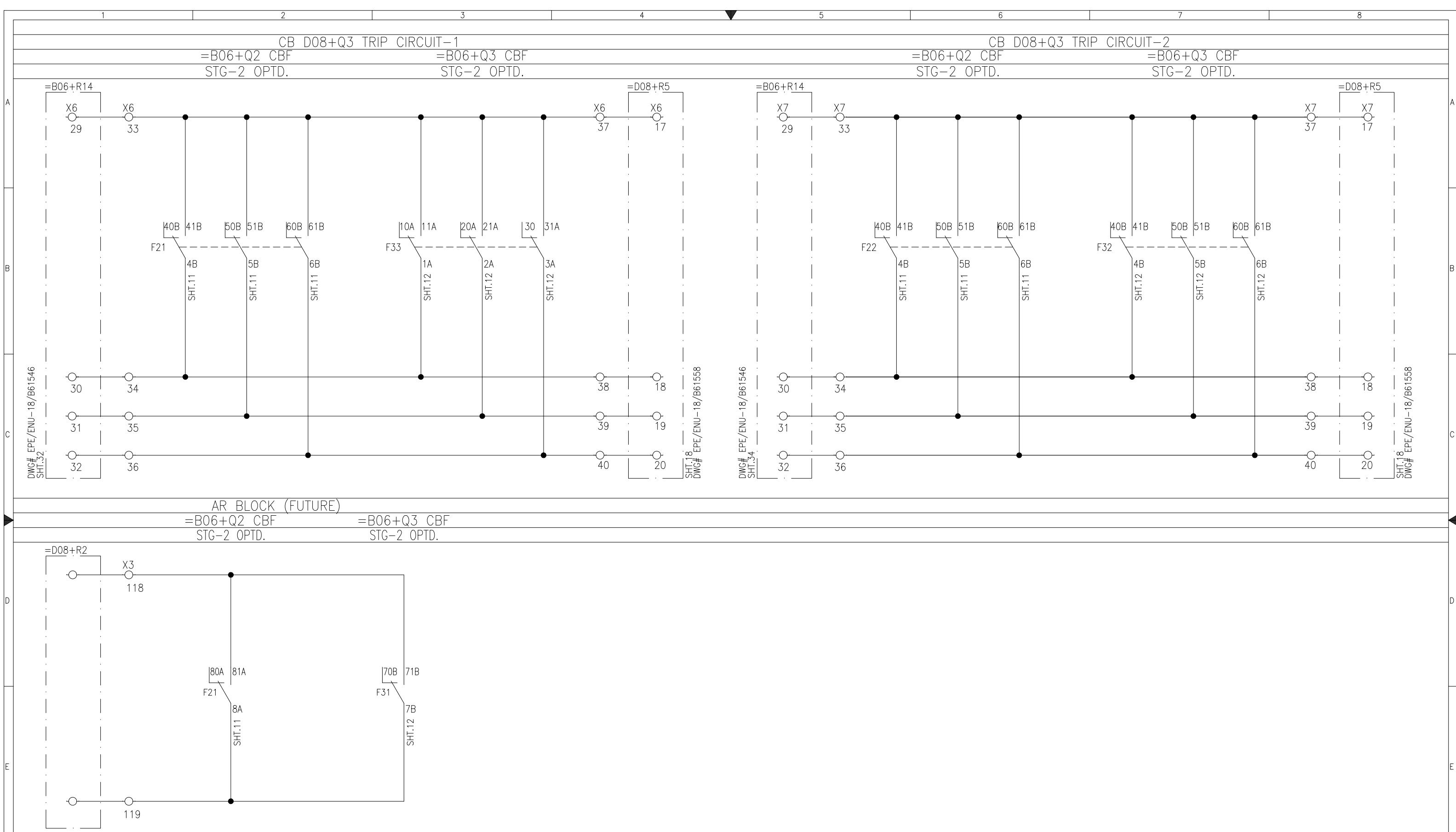


DWG# EPE/ENU-18/B61550 SHT: 19 OF 35
DATE: 07.03.2019 AS BUILT REV: 0





APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: CB D08+Q1 TRIP CKT-1/2 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15	DWG# EPE/ENU-18/B61550	SHT: 20 OF 35
NAH Q.	MSS M. Sohail	MUR Iy		EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT

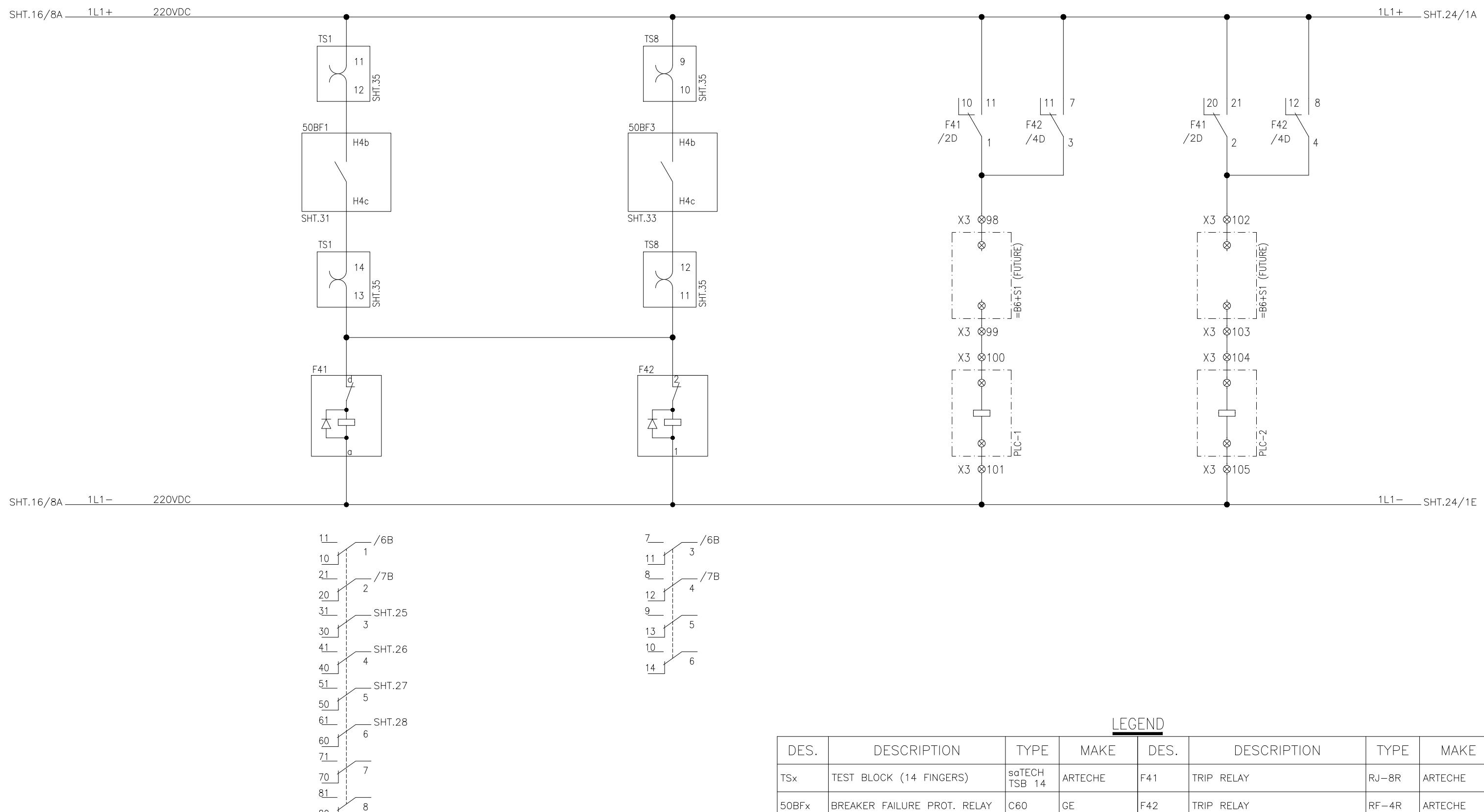


APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: CB D08+Q3 TRIP CKT-1/2 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15	DWG# EPE/ENU-18/B61550	SHT: 21 OF 35
NAH Q.	MSS M. Sohail	MUR Iy		EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT REV: 0

DTT SEND ON
CBF STAGE-2 /
END ZONE FAULT

PLC SET-1
SEND

PLC SET-2
SEND



APPROVED CHECKED DRAWN



PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018
FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS

TITLE:

DTT SIGNAL
500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15

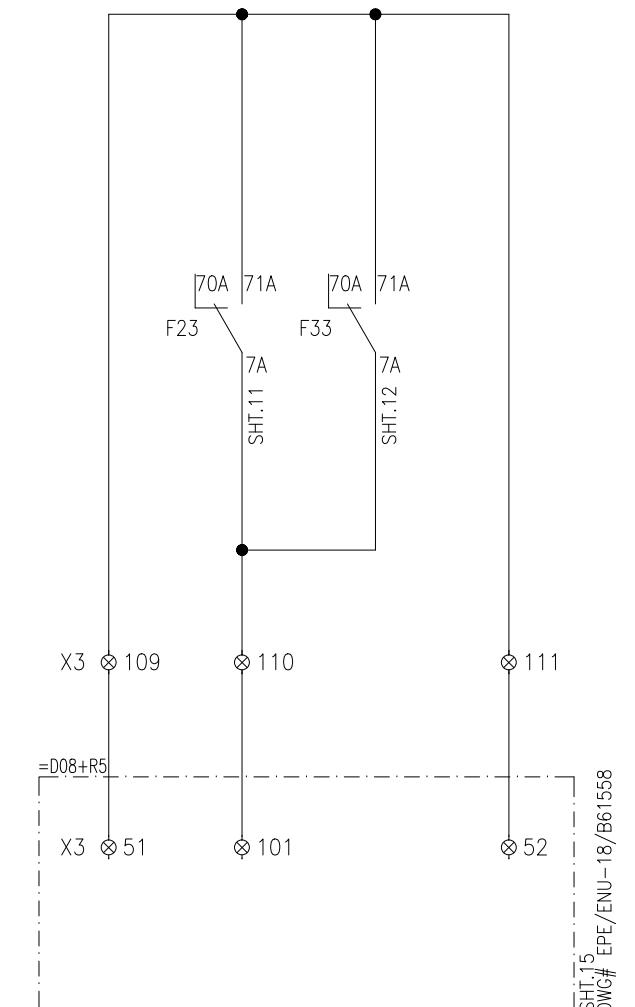
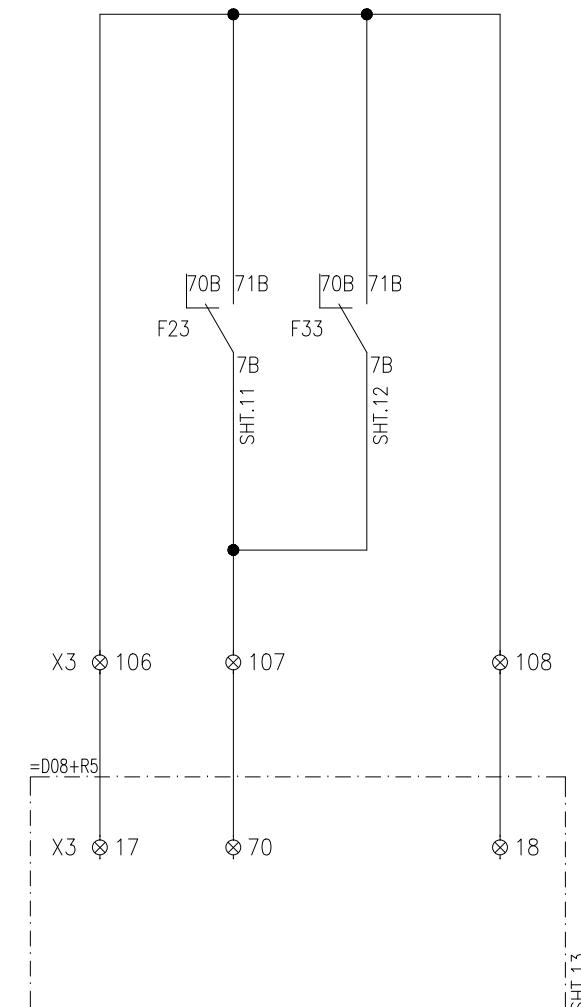
EPE SOL Pvt Ltd
71-B Garden Block, New Garden Town, Lahore, Pakistan

DWG# EPE/ENU-18/B61550 SHT: 22 OF 35

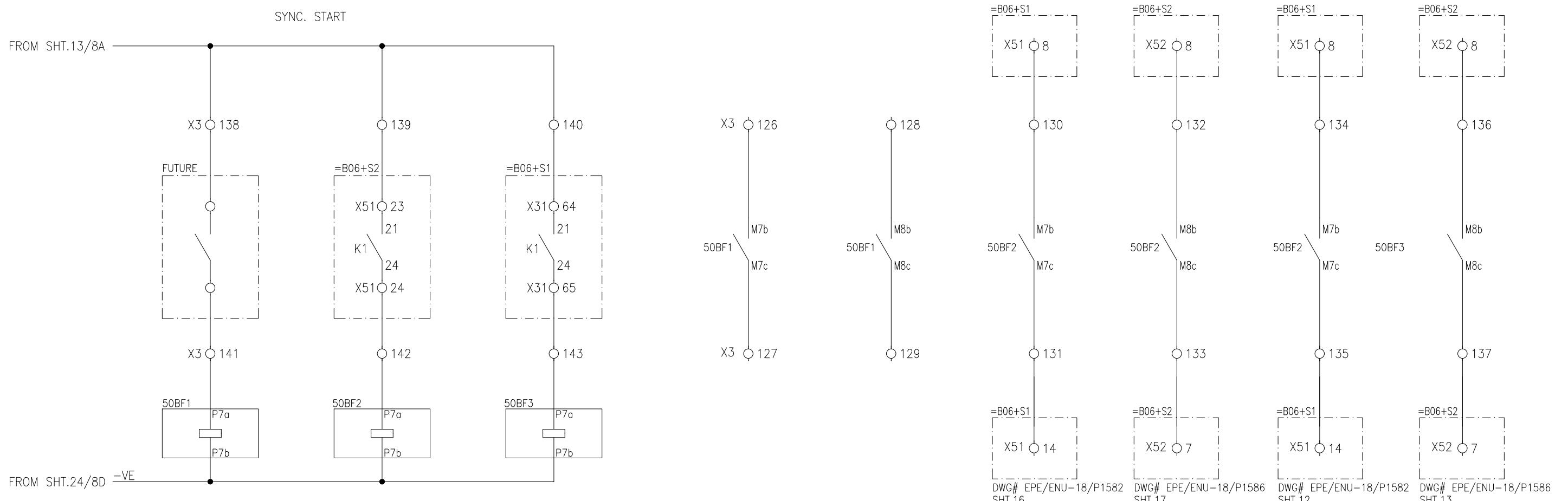
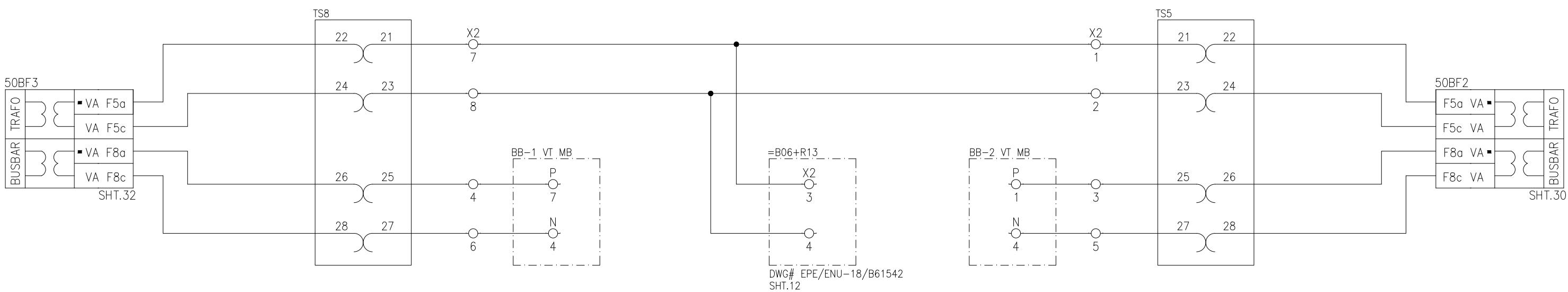
DATE: 07.03.2019 AS BUILT REV: 0

INITIATION FOR
220KV D08+Q1

INITIATION FOR
220KV D08+Q3

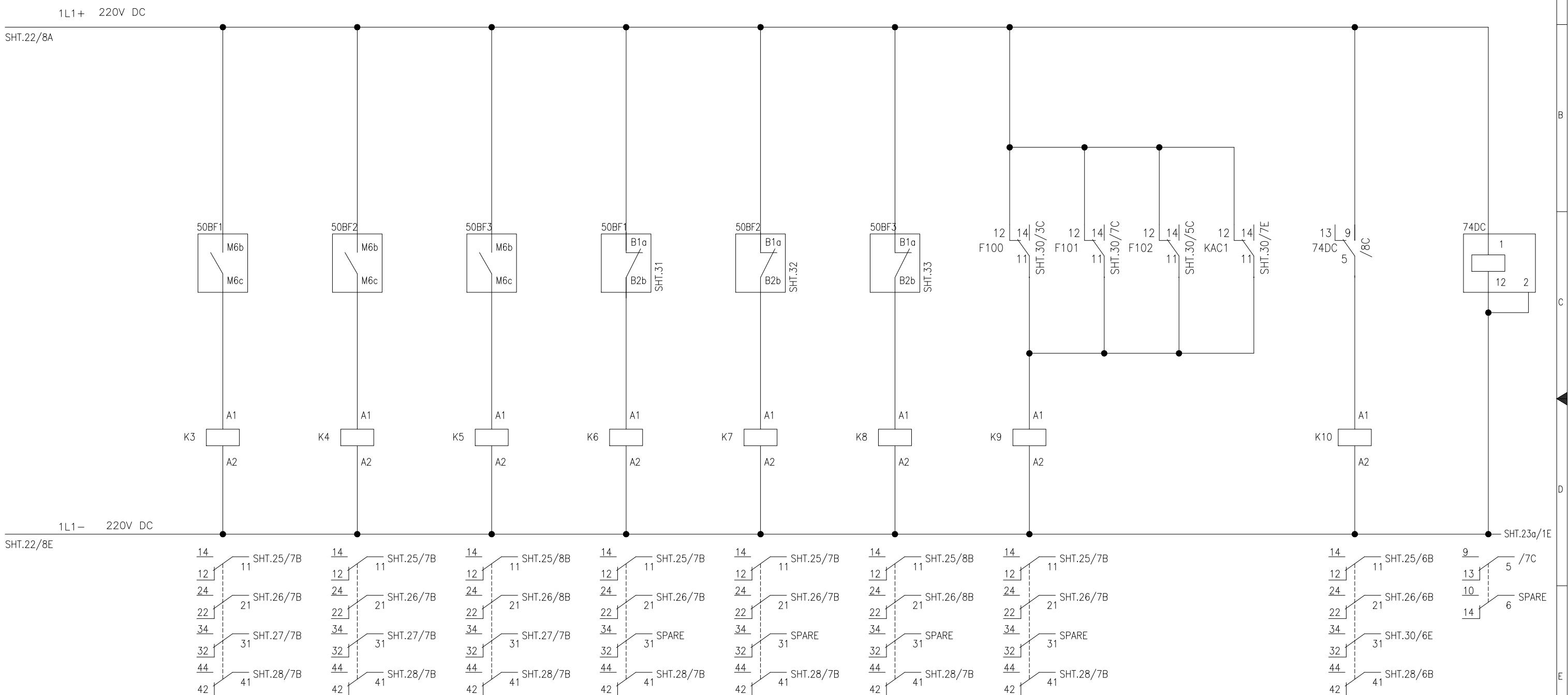


APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE:	DWG# EPE/ENU-18/B61550	SHT: 23 OF 35
NAH	MSS	MUR		INITIATION FOR CB D08+Q1 & D08+Q3 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15	EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019 AS BUILT REV: 0



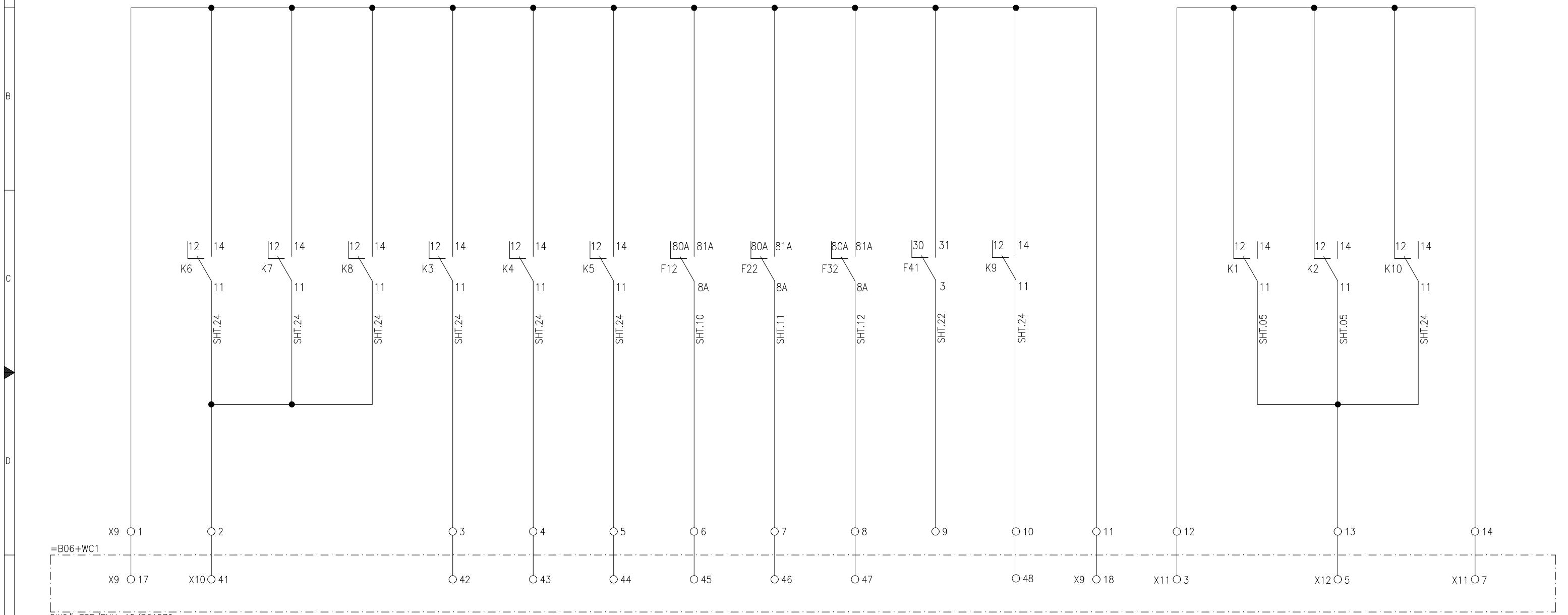
APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: SYNC CIRCUIT FOR =B06Q2 & =B06Q3 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15	DWG# EPE/ENU-18/B61550	SHT: 23aOF 35
NAH	MSS	MUR		EPE SOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT

CBF 50BF1 STG-1 OPERATED	CBF 50BF2 STG-1 OPERATED	CBF 50BF3 STG-1 OPERATED	CBF 50BF1 UNHEALTHY	CBF 50BF2 UNHEALTHY	CBF 50BF3 UNHEALTHY	PANEL AC SUPPLY FAIL	PANEL DC SUPPLY FAIL	DC SUPPLY SUPERVISION
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1 2 3 4 5 6 7 8

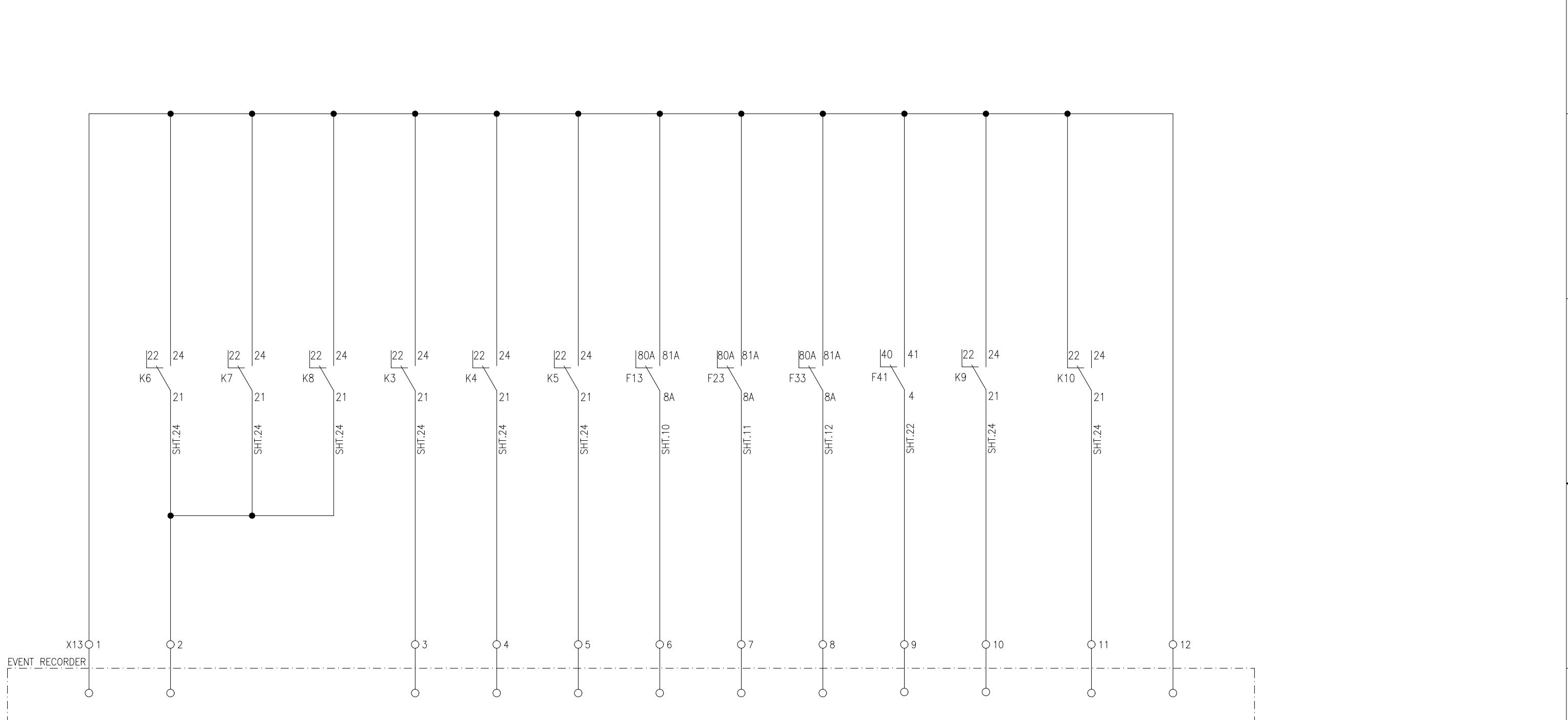
50BF-1	50BF-2	50BF-3	B06+Q1	B06+Q2	B06+Q3	B06+Q1	B06+Q2	B06+Q3				
RELAY	RELAY	RELAY	50BF-1	50BF-2	50BF-3	50BF-1	50BF-2	50BF-3	DTT	AC SUPPLY	DC SUPPLY	
UNHEALTHY	UNHEALTHY	UNHEALTHY	STG-1 TRIP	STG-1 TRIP	STG-1 TRIP	STG-2 TRIP	STG-2 TRIP	STG-2 TRIP	SENT	FAIL	FAIL	



APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: ANNUNCIATION CIRCUIT 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15	DWG# EPE/ENU-18/B61550	SHT: 25 OF 35
NAH Q	MSS M	MUR		EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT

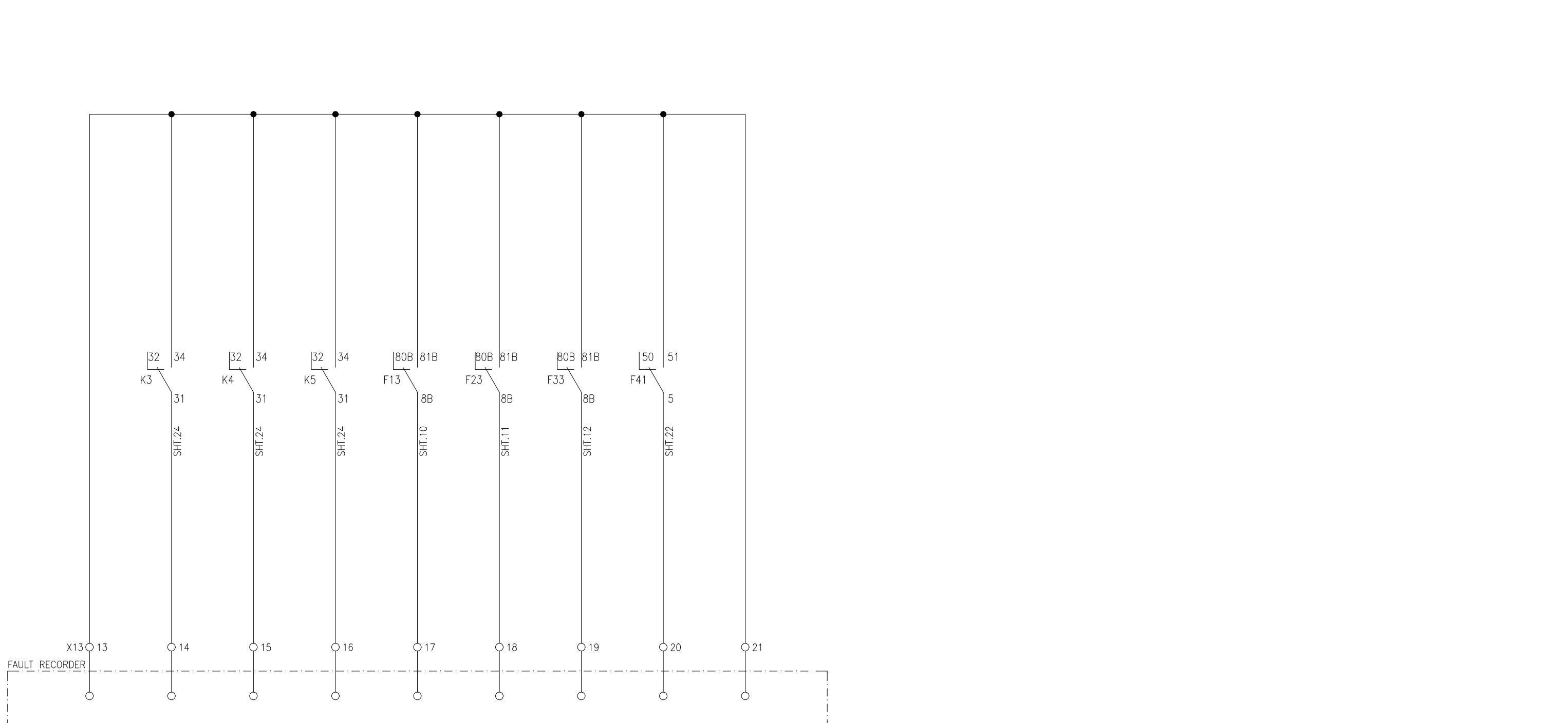
1 2 3 4 ▼ 5 6 7 8

50BF-1	50BF-2	50BF-3	B06+Q1	B06+Q2	B06+Q3	B06+Q1	B06+Q2	B06+Q3
RELAY	RELAY	RELAY	50BF-1	50BF-2	50BF-3	50BF-1	50BF-2	50BF-3
UNHEALTHY	UNHEALTHY	UNHEALTHY	STG-1 TRIP	STG-1 TRIP	STG-1 TRIP	STG-2 TRIP	STG-2 TRIP	STG-2 TRIP



APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: ER SIGNALING CIRCUIT 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15	DWG# EPE/ENU-18/B61550	SHT: 26 OF 35
NAH Q	MSS M Sohail	MUR Ilyas		E P E S O L P v t . L t d . 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT

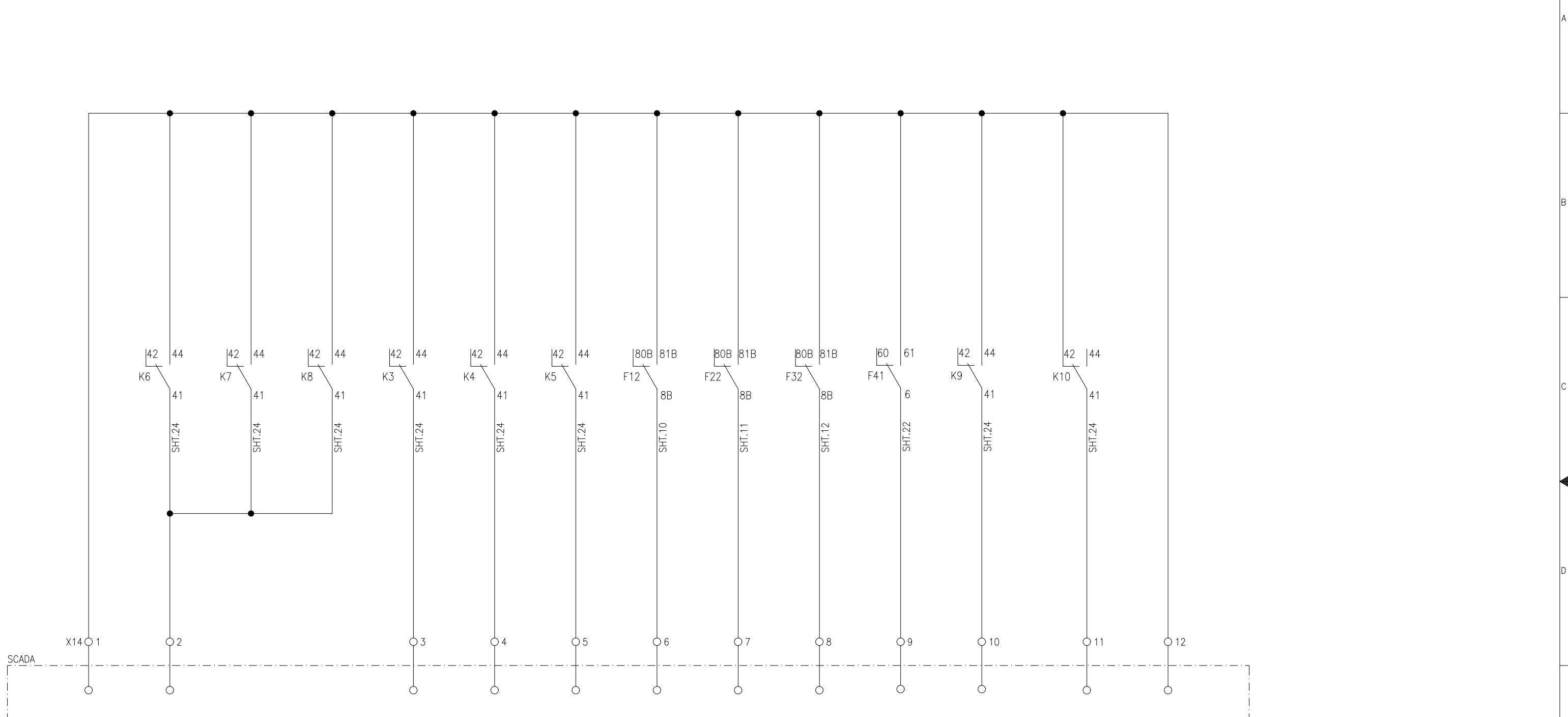
B06+Q1 50BF-1	B06+Q2 50BF-2	B06+Q3 50BF-3	B06+Q1 50BF-1	B06+Q2 50BF-2	B06+Q3 50BF-3	
STG-1 TRIP	STG-1 TRIP	STG-1 TRIP	STG-2 TRIP	STG-2 TRIP	STG-2 TRIP	DTT SENT



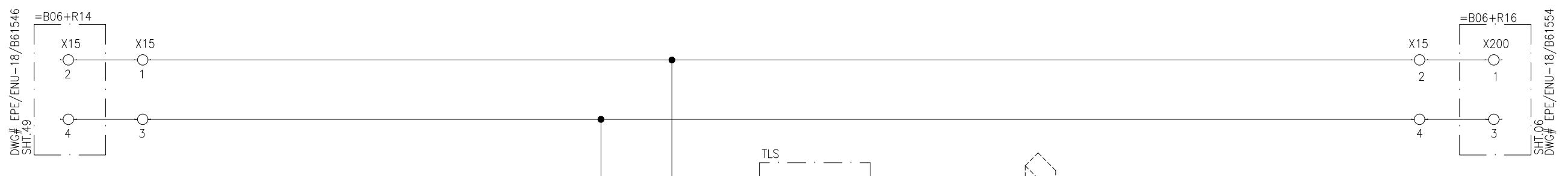
APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: FR SIGNALING CIRCUIT 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15	DWG# EPE/ENU-18/B61550	SHT: 27 OF 35
NAH Q	MSS M Sohail	MUR Iy		E P E S O L P v t . L t d 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT

1 2 3 4 ▼ 5 6 7 8

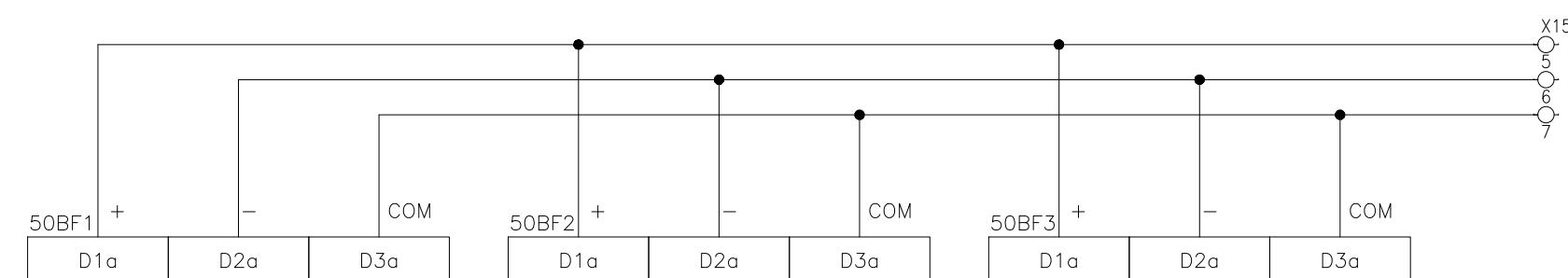
50BF-1	50BF-2	50BF-3	B06+Q1	B06+Q2	B06+Q3	B06+Q1	B06+Q2	B06+Q3
RELAY	RELAY	RELAY	50BF-1	50BF-2	50BF-3	50BF-1	50BF-2	50BF-3
UNHEALTHY	UNHEALTHY	UNHEALTHY	STG-1 TRIP	STG-1 TRIP	STG-1 TRIP	STG-2 TRIP	STG-2 TRIP	STG-2 TRIP



APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: SCADA SIGNALING CIRCUIT 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15	DWG# EPE/ENU-18/B61550	SHT: 28 OF 35
NAH [Signature]	MSS [Signature]	MUR [Signature]	 EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan		DATE: 07.03.2019	AS BUILT REV: 0

TELEPHONE SOCKET
SOCKET

RS-485 COMMUNICATION LOOP



LEGEND

DES:	DESCRIPTION	TYPE	MAKE
TLS	TELEPHONE SOCKET	LOCAL	LOCAL

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: COMMUNICATION CIRCUIT 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15	DWG# EPE/ENU-18/B61550	SHT: 29 OF 35
NAH [Signature]	MSS [Signature]	MUR [Signature]	 EPESOL Pvt Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT	REV: 0

AC SUPPLY DISTRIBUTION

**DOOR SWITCH &
CUBICLE LIGHT**

SPACE HEATER THERMOSTAT

THREE
PIN SOCKET

PANEL DC SUPPLY
HEALTHY

PANEL AC SUPPLY SUPERVISION

LEGEND

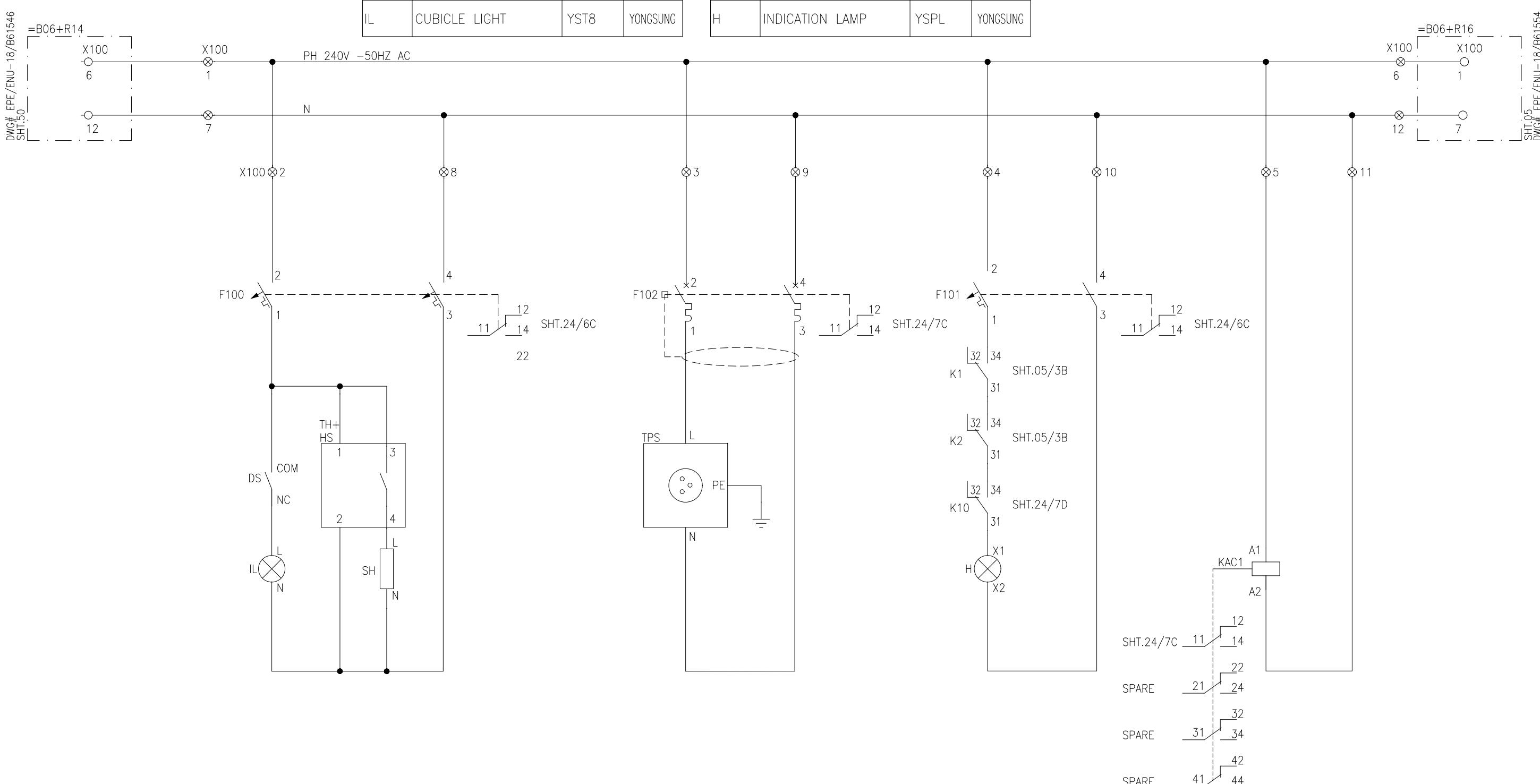
DES:	DESCRIPTION	TYPE	MAKE
TPS	THREE PIN SOCKET	220V SOCKET	LEAR
SH	SPACE HEATER	ELH220	E-LABS
TH+HS	THERMOSTAT	ELH220	E-LABS
IL	CUBICLE LIGHT	YST8	YONGSUNG

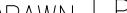
LEGEND

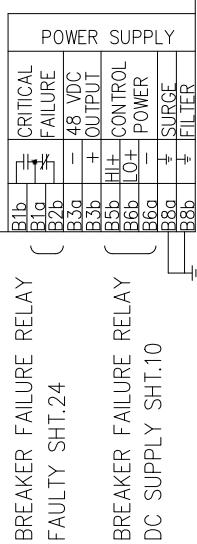
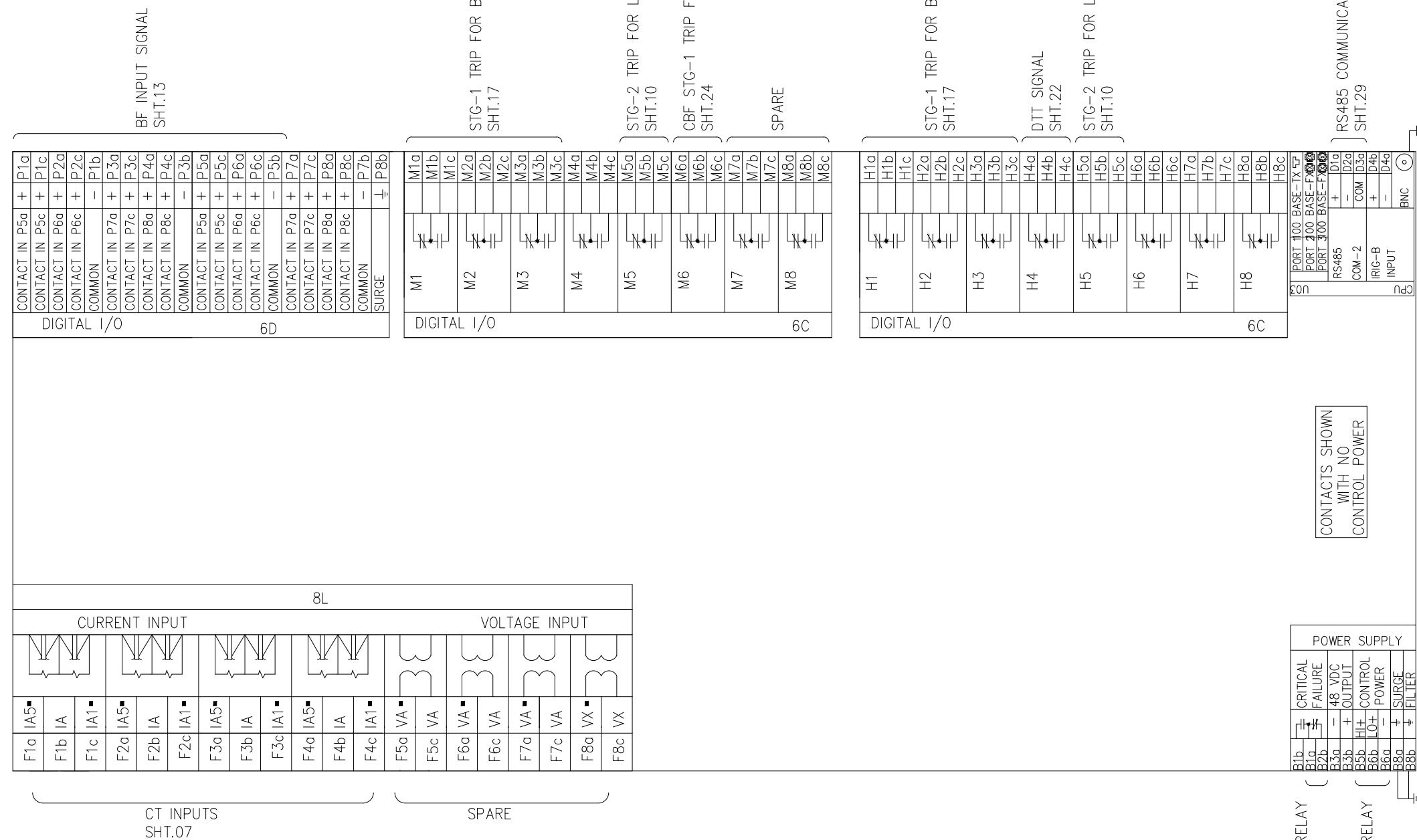
DS	DOOR SWITCH	YSP+YSMS-C	YONGSUN
F100, F101	TWO POLE AC MCB	G60	GE
F102	ELCB	DM100	GE
K10	AUX. RELAY 240VAC	PRC	GE
H	INDICATION LAMP	YSPL	YONGSUN

LEGEND

K07, K08 | AUX. RELAY 220VDC | PRC | GE



APPROVED	CHECKED	DRAWN	 PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/EO/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE:	 E P E S O L P v t . L t d. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61550	SHT: 30 OF 35
NAH 	MSS 	MUR 		AC SUPPLY DISTRIBUTION 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15		DATE: 07.03.2019	AS BUILT



BREAKER FAILURE RELAY TYPE C60
C60-U03-HKHH-F8L-H6C-M6C-P6D-UXX-WXX

50BF1

APPROVED	CHECKED	DRAWN
NAH	MSS	MUR

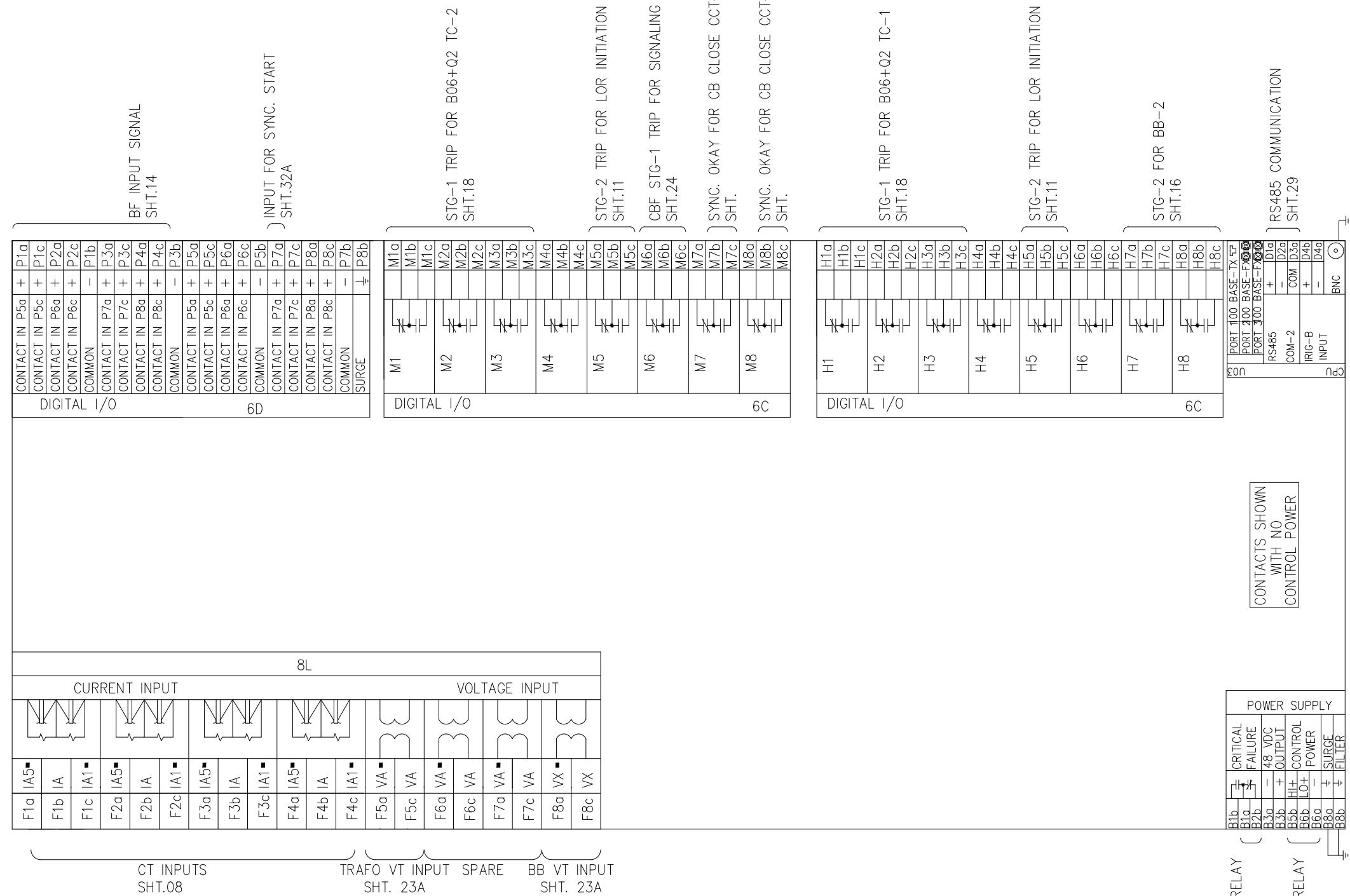


PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS

TITLE:
DEVICE DETAIL
500kV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15

EPE SOL Pvt. Ltd.
71-B Garden Block, New Garden Town, Lahore, Pakistan

DWG# EPE/ENU-18/B61550 SHT: 31 OF 35
DATE: 07.03.2019 AS BUILT REV: 0

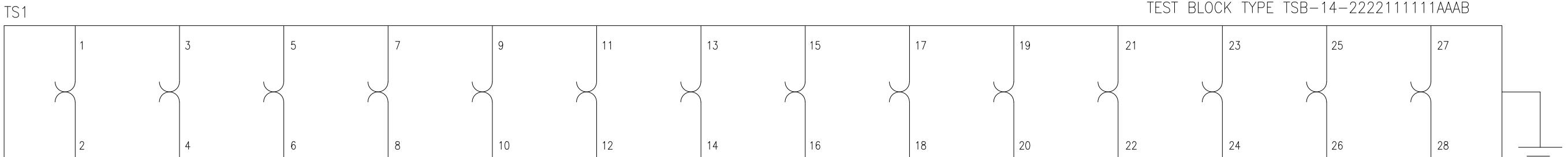


BREAKER FAILURE RELAY TYPE C60
C60-U03-HKH-F8L-H6C-M6C-P6D-UXX-WXX

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: DEVICE DETAIL 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15	 EPESOL Pvt Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61550	SHT: 32 OF 35
NAH Q.	MSS M. Sohail	MUR 				DATE: 07.03.2019	AS BUILT

A

TEST BLOCK TYPE TSB-14-222211111AAAB

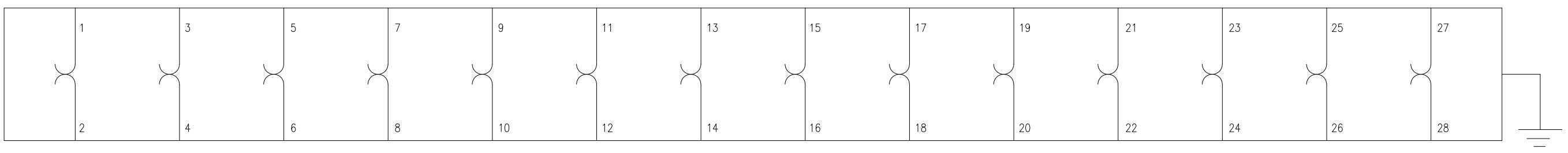
POWER SUPPLY
50BF1
SHT.10=B06+Q1
LOR INITIATION
SHT.10DTT
50BF1
SHT.22

SPARE

CT CIRCUIT
50BF1
SHT.07

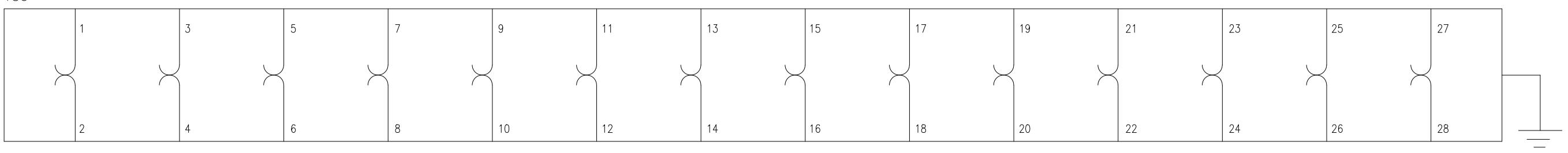
B

TEST BLOCK TYPE TSB-14-222221111111

POWER SUPPLY
50BF1
SHT.10=B06+Q1 STAGE-1/TRIP CIRCUIT-1
FOR 50BF1
SHT.17=B06+Q1 STAGE-1 OPERATED/TRIP CIRCUIT-2
FOR 50BF1
SHT.17BFI FOR =B06+Q1
50BF1
SHT.13

C

TEST BLOCK TYPE TSB-14-111111ABABABAB

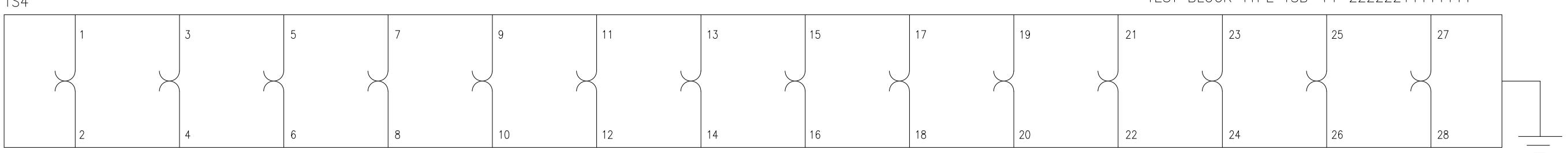
POWER SUPPLY
50BF2
SHT.11=B06+Q2
LOR INITIATION
SHT.11

SPARE

CT CIRCUIT
50BF2
SHT.08

D

TEST BLOCK TYPE TSB-14-222221111111

POWER SUPPLY
50BF2
SHT.11=B06+Q2 STAGE-1/TRIP CIRCUIT-1
FOR 50BF2
SHT.18=B06+Q2 STAGE-1 OPERATED/TRIP CIRCUIT-2
FOR 50BF2
SHT.18BFI FOR =B06+Q2
50BF2
SHT.11

SPARE

E

TITLE:

DEVICE DETAILS FOR TEST BLOCK
500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15E P E S O L P v t . L t d .
71-B Garden Block, New Garden Town, Lahore, Pakistan

DWG# EPE/ENU-18/B61550 SHT: 34 OF 35

DATE: 07.03.2019

AS BUILT

REV: 0

APPROVED	CHECKED	DRAWN
NAH	MSS	MUR

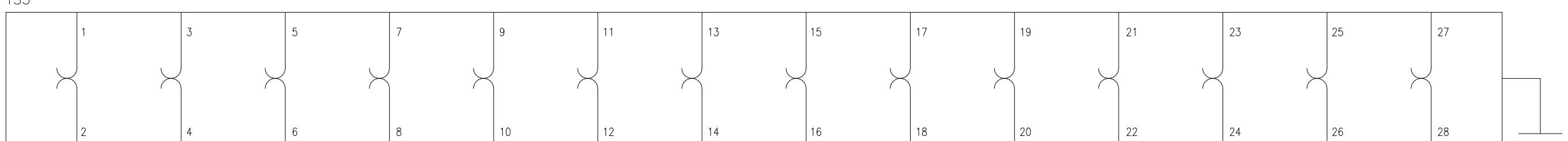


PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS

1 2 3 4 5 6 7 8

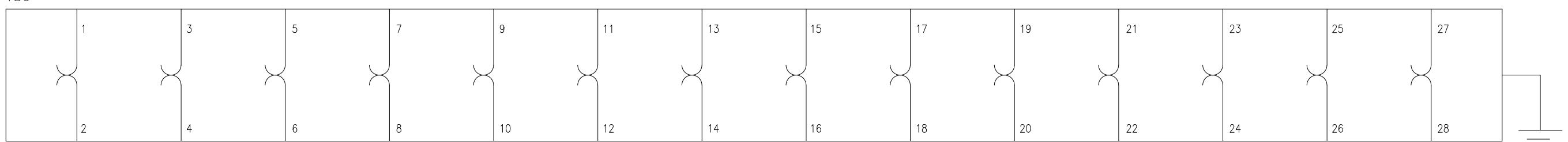
A

TEST BLOCK TYPE TSB-14-11111111111111



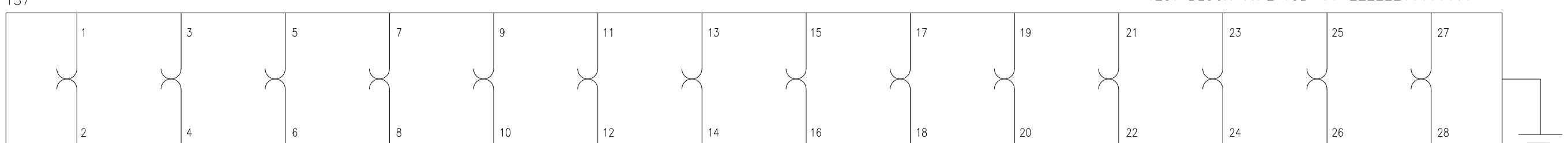
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TEST BLOCK TYPE TSB-14-111111ABABABAB



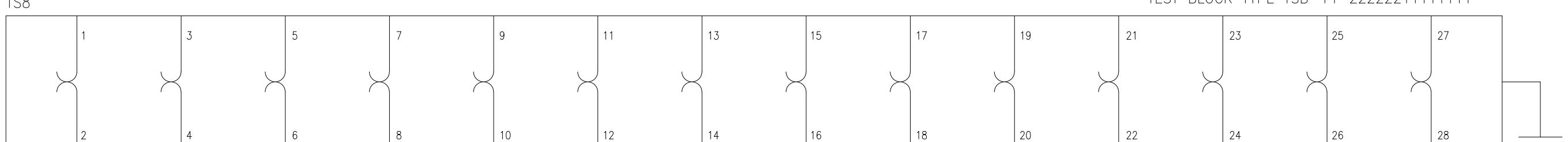
C

TEST BLOCK TYPE TSB-14-22222211111111



D

TEST BLOCK TYPE TSB-14-22222211111111



E

DWG# EPE/ENU-18/B61550 SHT: 35 OF 35



PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018
FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS

TITLE:
DEVICE DETAILS FOR TEST BLOCK
500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15



E P E S O L P v t . L t d.
71-B Garden Block, New Garden Town, Lahore, Pakistan

DWG# EPE/ENU-18/B61550 SHT: 35 OF 35
DATE: 07.03.2019 AS BUILT REV: 0

APPROVED	CHECKED	DRAWN
NAH	MSS	MUR

Sr.	CABLE DESIGNATION		CORE CROSS SECTION		DESTINATION													SCHEME DWG. REF: EPE/ENU-18/B61550				
A	1																					
A	2																					
A	3																					
A	4																					
A	5																					
A	6																					
B	7																					
B	8																					
B	9																					
B	10																					
B	11																					
B	12																					
C	1	2	3	4	5	6	7	8	9	10	11	12										
D																						
E																						
F																						
APPROVED			CHECKED		DRAWN		PROJECT:		TITLE:													
NAH			MSS		MUR		NTDC PO# CE/MP&M/M(P)/AM-VI/E0/ 9417-29 DATED 14.11.2018 FOR PROCUREMENT OF 220KV & 500KV PROTECTION & CONTROL PANELS		TITLE: TERMINAL DETAIL 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15													

Sr.	CABLE DESIGNATION	CORE CROSS SECTION	DESTINATION														
A	1																
B	2																
C	3																
D	4																
E	5																
F	6																
G	7																
H	8																
I	9																
J	10																
K	11																
L	12																
M	1	2	3	4	5	6	7	8	9	10	11	12					
N																	
O																	
P																	
Q																	
R																	
S																	
T																	
U																	
V																	
W																	
X																	
Y																	
Z																	

LEGEND:

TEMPORARY SHORTENING LINK



PERMANENT LINK



END COVER

REMOTE DESTINATION

TERMINAL BLOCK

TERMINAL NO

TERMINAL STRIP X101

LINK	REFERENCE		TERMINAL NO
	SHT	/	

	05	/	2A	1
	05	/	2B	2
				3
				4

TERMINATION B

ITEM DESIGNATION

TERMINAL NO

F110

2

F110

4

Sr.	CABLE DESIGNATION		CORE CROSS SECTION		DESTINATION		LEGEND:   																					
A 1																												
A 2																												
A 3																												
A 4																												
A 5																												
A 6																												
B 7																												
B 8																												
B 9																												
B 10																												
B 11																												
B 12																												
C 1	2	3	4	5	6	7	8	9	10	11	12																	
D 1																												
D 2																												
D 3																												
D 4																												
E 1																												
E 2																												
F 1																												
F 2																												
F 3																												
F 4																												
F 5																												
F 6																												
F 7																												
F 8																												
F 9																												
F 10																												
F 11																												
F 12																												
F 13																												
F 14																												
F 15																												
F 16																												
F 17																												

Sr.	CABLE DESIGNATION			CORE CROSS SECTION			DESTINATION			LEGEND:												SCHEME DWG. REF: EPE/ENU-18/B61550																						
A	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	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				
B	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	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
C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	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				
D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	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				
E	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	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				
F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	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				
APPROVED			CHECKED	DRAWN	PROJECT:			TITLE:			E P E S O L P v t . L t d .												DWG# EPE/ENU-18/B61551			SHT: 04 OF 18																		
NAH			MSS	MUR	NTDC PO# CE/MP&M/M(P)/AM-VI/E0/ 9417-29 DATED 14.11.2018 FOR PROCUREMENT OF 220KV & 500KV PROTECTION & CONTROL PANELS			TERMINAL DETAIL			71-B Garden Block, New Garden Town, Lahore, Pakistan												DATE: 07.03.2019			AS BUILT	REV: 0																	

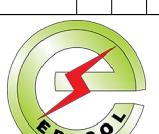
Sr.	CABLE DESIGNATION	CORE CROSS SECTION	DESTINATION	LEGEND:												SCHEME DWG. REF: EPE/ENU-18/B61550									
A	1																								
A	2																								
A	3																								
A	4																								
A	5																								
A	6																								
B	7																								
B	8																								
B	9																								
B	10																								
B	11																								
B	12																								
C	1	2	3	4	5	6	7	8	9	10	11	12				TERMINAL STRIP X6									
C																LINK	REFERENCE		TERMINAL NO						
C																	SHT / REF			41					
D																				42					
D																				43					
E																				44					
F																				45					
TERMINATION B												ITEM DESIGNATION						TERMINAL NO							
APPROVED	CHECKED	DRAWN	PROJECT: NTDC PO# CE/MP&M/M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR PROCUREMENT OF 220KV & 500KV PROTECTION & CONTROL PANELS												TITLE: TERMINAL DETAIL						DWG# EPE/ENU-18/B61551	SHT: 05 OF 18			
NAH	MSS	MUR													EPE SOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan						DATE: 07.03.2019	AS BUILT	REV: 0		

APPROVED	CHECKED	DRAWN	PROJECT: NTDC PO# CE/MP&M/M(P)/AM-VI/EO/ 9417-29 DATED 14.11.2018 FOR PROCUREMENT OF 220KV & 500KV PROTECTION & CONTROL PANELS	TITLE: TERMINAL DETAIL 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15	 EPESOL Pvt Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61551	SHT: 06 OF 18
NAH	MSS M. Sohail	MUR				DATE: 07.03.2019	AS BUILT

Sr.	CABLE DESIGNATION	CORE CROSS SECTION	DESTINATION	LEGEND:												SCHEME DWG. REF: EPE/ENU-18/B61550								
A	1																							
A	2																							
A	3																							
A	4																							
A	5																							
A	6																							
B	7																							
B	8																							
B	9																							
B	10																							
B	11																							
B	12																							
C	1	2	3	4	5	6	7	8	9	10	11	12				TERMINAL STRIP X7								
C																LINK	REFERENCE		TERMINAL NO					
C																	SHT / REF			41				
D																				42				
D																				43				
D																				44				
D																				45				
E																								
F																								
APPROVED	CHECKED	DRAWN	PROJECT: NTDC PO# CE/MP&M/M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR PROCUREMENT OF 220KV & 500KV PROTECTION & CONTROL PANELS												TITLE: TERMINAL DETAIL		EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan				DWG# EPE/ENU-18/B61551		SHT: 07 OF 18	
NAH Q.	MSS M. Sohail	MUR Iy																			DATE: 07.03.2019		AS BUILT	REV: 0

Sr.	CABLE DESIGNATION		CORE CROSS SECTION		DESTINATION		LEGEND:		SCHEME DWG. REF: EPE/ENU-18/B61550										
A	1																		
A	2																		
A	3																		
A	4																		
A	5																		
A	6																		
B	7																		
B	8																		
B	9																		
B	10																		
B	11																		
B	12																		
C	1	2	3	4	5	6	7	8	9	10	11	12							
D																			
E																			
F																			
REMOTE DESTINATION				TERMINAL BLOCK		TERMINAL NO		TERMINAL STRIP X3										TERMINATION B	
								LINK		REFERENCE		TERMINAL NO						ITEM DESIGNATION	
								SHT / REF										TERMINAL NO	
								06 / 1E		1								F14	
								06 / 1E		2								60A	
								06 / 3E		3								7A	
								06 / 3E		4								F24	
								06 / 4E		5								F33	
								06 / 5E		6								F11	
								06 / 6E		7								F14	
								06 / 6E		8								80A	
								06 / 7E		9								F22	
								06 / 8E		10								7A	
								13 / 1A		11								F32	
								13 / 2A		12								70A	
								13 / 3A		13								F32	
								13 / 3A		14								7B	
								13 / 4A		15								F22	
								13 / 4A		16								7B	
								13 / 6A		17								F22	
								13 / 6A		18								F32	
								13 / 7A		19								70B	
								13 / 7A		20								F14	
								13 / 8A		21								F22	
								13 / 8A		22								F32</	

SCHEME DWG. REF: EPE/ENU-18/B61550

Sr.	CABLE DESIGNATION	CORE CROSS SECTION	DESTINATION	LEGEND:												SCHEME DWG. REF: EPE/ENU-18/B61550					
A	1																				
A	2																				
A	3																				
A	4																				
A	5																				
A	6																				
B	7																				
B	8																				
B	9																				
B	10																				
B	11																				
B	12																				
c	1	2	3	4	5	6	7	8	9	10	11	12				TERMINAL STRIP X3					
c																LINK	REFERENCE	TERMINAL NO			
c																			SHT / REF		
c																			121		
c																			122		
c																			123		
c																			124		
c																			125		
c																			23a / 4D	126	
c																			23a / 4E	127	
c																			23a / 5D	128	
c																			23a / 5E	129	
c																			23a / 6D	130	
c																			23a / 6E	131	
c																			23a / 6D	132	
c																			23a / 6E	133	
c																			23a / 7D	134	
c																			23a / 7E	135	
c																			23a / 8D	136	
c																			23a / 8E	137	
D																			23a / 2C	138	
D																			23a / 2E	139	
D																			23a / 3C	140	
D																			23a / 3E	141	
D																			23a / 3C	142	
D																			23a / 3E	143	
E																					
F																					
APPROVED	CHECKED	DRAWN	PROJECT:	TITLE: TERMINAL DETAIL 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15								 EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan						DWG# EPE/ENU-18/B61551	SHT: 11 OF 18		
NAH	MSS	MUR	NTDC PO# CE/MP&M/M(P)/AM-VI/E0/ 9417-29 DATED 14.11.2018 FOR PROCUREMENT OF 220KV & 500KV PROTECTION & CONTROL PANELS															DATE: 07.03.2019	AS BUILT	REV: 0	

Sr.	CABLE DESIGNATION		CORE CROSS SECTION		DESTINATION		LEGEND:												SCHEME DWG. REF: EPE/ENU-18/B61550		
A	1																				
A	2																				
A	3																				
A	4																				
A	5																				
A	6																				
B	7																				
B	8																				
B	9																				
B	10																				
B	11																				
B	12																				
C	1	2	3	4	5	6	7	8	9	10	11	12									
D																					
E																					
F																					
APPROVED		CHECKED		DRAWN		PROJECT: NTDC PO# CE/MP&M/M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR PROCUREMENT OF 220KV & 500KV PROTECTION & CONTROL PANELS						TITLE: TERMINAL DETAIL		DWG# EPE/ENU-18/B61551		SHT: 12 OF 18					
NAH		MSS		MUR																	
1		2		3		4		5		6		7		8		9		10		11	
A-		B-		C-		D-		E-		F-		G-		H-		I-		J-		K-	
A		B		C		D		E		F		G		H		I		J		K	
A		B		C		D		E		F		G		H		I		J		K	
A		B		C		D		E		F		G		H		I		J		K	
A		B		C		D		E		F		G		H		I		J		K	
A		B		C		D		E		F		G		H		I		J		K	
A		B		C		D		E		F		G		H		I		J		K	
A		B		C		D		E		F		G		H		I		J		K	
A		B		C		D		E		F		G		H		I		J		K	
A		B		C		D		E		F		G		H		I		J		K	
A		B		C		D		E		F		G		H		I		J		K	
A		B		C		D		E		F		G		H		I		J		K	
A		B		C		D		E		F		G		H		I		J		K	
A		B		C		D		E		F		G		H		I		J		K	
A		B		C		D		E		F		G		H		I		J		K	
A		B		C		D		E		F		G		H		I		J		K	
A		B		C		D		E		F		G		H		I		J		K	
A		B		C		D		E		F		G		H		I		J		K	
A																					

LEGEND



TEMPORARY SHORTENING LINK



PERMANENT LINK



END COVER

SCHEME DWG. REF: EPE/ENU-18/B61550

APPROVED	CHECKED	DRAWN	PROJECT:
NAH 	MSS M 	MUR 	 NTDC PO# CE/MP&M/M(P)/AM-VI/E0/ 9417-29 DATED 14.11.2018 FOR PROCUREMENT OF 220KV & 500KV PROTECTION & CONTROL PA



PROJECT: NTDC PO# CE/MP&M/M(P)/AM-VI/EO/
9417-29 DATED 14.11.2018 FOR PROCUREMENT
OF 220KV & 500KV PROTECTION & CONTROL PANEL

	TITLE:	TERMINAL DETAIL
IT	500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15	



E P E S O L P v t . L t d .

DWG# EPE/ENU-18/B61551 SHT: 13 OF 18
 DATE: 07.03.2019 **AS BUILT** REV: 0

SCHEME DWG. REF: EPE/ENU-18/B61550

LEGEND:



TEMPORARY SHORTENING LINK



PERMANENT LINK



END COVER

TERMINAL STRIP X14

TERMINATION B

PROJECT
TRANSMISSION & DESPATCH COMPANY

T:
NTDC PO# CE/MP&M/M(P)/AM-VI/E0/
9417-29 DATED 14.11.2018 FOR PROCUREMENT
OF 220KV & 500KV PROTECTION & CONTROL PANEL

五

TITLE: NT
TERMINAL DETAIL
S 500W BREAKER FAILURE PROTECTION PANEL TYPE -R06 LP15



E P E S O L P v t . L t d .

DWO II_EBE /ENH_12 /D61554

DWG# EPE/ENU-

8/B61551

SHI: 14

LEGEND



TEMPORARY SHORTENING LINK



PERMANENT LINK



END COVER

TERMINATION B	
ITEM DESIGNATION	TERMINAL NO
F100	2
F102	2
F101	2
KAC1	A1
F100	4
F102	4
F101	4
KAC1	A2

APPROVED	CHECKED	DRAWN	PROJECT:
NAH 	MSS M 	MUR 	 NTDC PO# CE/MP&M/M(P)/AM-VI/E0/ 9417-29 DATED 14.11.2018 FOR PROCUREMENT OF 220KV & 500KV PROTECTION & CONTROL PA



PROJECT: NTDC PO# CE/MP&M/M(P)/AM-VI/EO/
9417-29 DATED 14.11.2018 FOR PROCUREMENT
OF 220KV & 500KV PROTECTION & CONTROL PANEL

TITLE: TERMINAL DETAIL
NT LS 5000W BREAKER FAILURE PROTECTION PANEL TYPE -P06 LP15



E P E S O L P v t . L t d .

DWG# EPE/ENU-18/B61551 SHT: 15 OF 18
 DATE: 07.03.2019 AS BUILT REV: 0

LEGEND:



TEMPORARY SHORTENING LINK

PERMANENT LINK



END COVER

APPROVED	CHECKED	DRAWN	PROJECT:
NAH 	MSS 	MUR 	 NTDC PO# CE/MP&M/M(P)/AM-VI/EO/ 9417-29 DATED 14.11.2018 FOR PROCUREMENT OF 220KV & 500KV PROTECTION & CONTROL PA

TITLE: TERMINAL DETAIL
NT S 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15



E P E S O L Pvt. Ltd.
71-B Garden Block, New Garden Town, Lahore, Pakistan

DWG# EPE/ENU-18/B61551	SHT: 16 OF 18
DATE: 07.03.2019	AS BUILT

Sr.	CABLE DESIGNATION	CORE CROSS SECTION	DESTINATION	LEGEND:												SCHEME DWG. REF: EPE/ENU-18/B61550									
A	1																								
A	2																								
A	3																								
A	4																								
A	5																								
A	6																								
B	7																								
B	8																								
B	9																								
B	10																								
B	11																								
B	12																								
C	1	2	3	4	5	6	7	8	9	10	11	12				TERMINAL STRIP XD									
C																LINK	REFERENCE		TERMINAL NO						
C																	SHT / REF								
C																13 / 4C	1								
C																13 / 4C	2								
C																13 / 4C	3								
C																13 / 5C	4								
C																15 / 4C	5								
C																15 / 4C	6								
C																15 / 4C	7								
C																15 / 5C	8								
D																									
E																									
F																									
APPROVED	CHECKED	DRAWN	PROJECT: NTDC PO# CE/MP&M/M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR PROCUREMENT OF 220KV & 500KV PROTECTION & CONTROL PANELS												TITLE: TERMINAL DETAIL		EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan				DWG# EPE/ENU-18/B61551		SHT: 17 OF 18		
NAH Q.	MSS M. Sohail	MUR I.																					DATE: 07.03.2019	AS BUILT	REV: 0

Sr.	CABLE DESIGNATION		CORE CROSS SECTION		DESTINATION		LEGEND:												SCHEME DWG. REF: EPE/ENU-18/B61550		
A	1																				
A	2																				
A	3																				
A	4																				
A	5																				
A	6																				
B	7																				
B	8																				
B	9																				
B	10																				
B	11																				
B	12																				
C	1	2	3	4	5	6	7	8	9	10	11	12									
D																					
D																					
D																					
E																					
F																					
APPROVED	CHECKED	DRAWN	PROJECT: NTDC PO# CE/MP&M/M(P)/AM-VI/EO/ 9417-29 DATED 14.11.2018 FOR PROCUREMENT OF 220KV & 500KV PROTECTION & CONTROL PANELS				TITLE: TERMINAL DETAIL 500KV BREAKER FAILURE PROTECTION PANEL TYPE =B06+R15		 EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan										DWG# EPE/ENU-18/B61551	SHT: 18 OF 18	
NAH Q.	MSS M. Sohail	MUR Iy																	DATE: 07.03.2019	AS BUILT	REV: 0
1																			7		8

LEGEND:



TEMPORARY SHORTENING LINK



PERMANENT LINK



END COVER

REMOTE DESTINATION

TERMINAL BLOCK

TERMINAL NO

TERMINAL STRIP X2

LINK	REFERENCE		TERMINAL NO
	SHT	REF	

		23a / 6A	1
		23a / 6A	2
		23a / 6B	3
		23a / 3B	4
		23a / 6B	5
		23a / 3B	6
		23a / 3A	7
		23a / 3A	8

TERMINATION B

ITEM DESIGNATION	TERMINAL NO
TS5	21
TS5	23
TS5	25
TS8	25
TS5	27
TS8	27
TS8	7
TS8	8