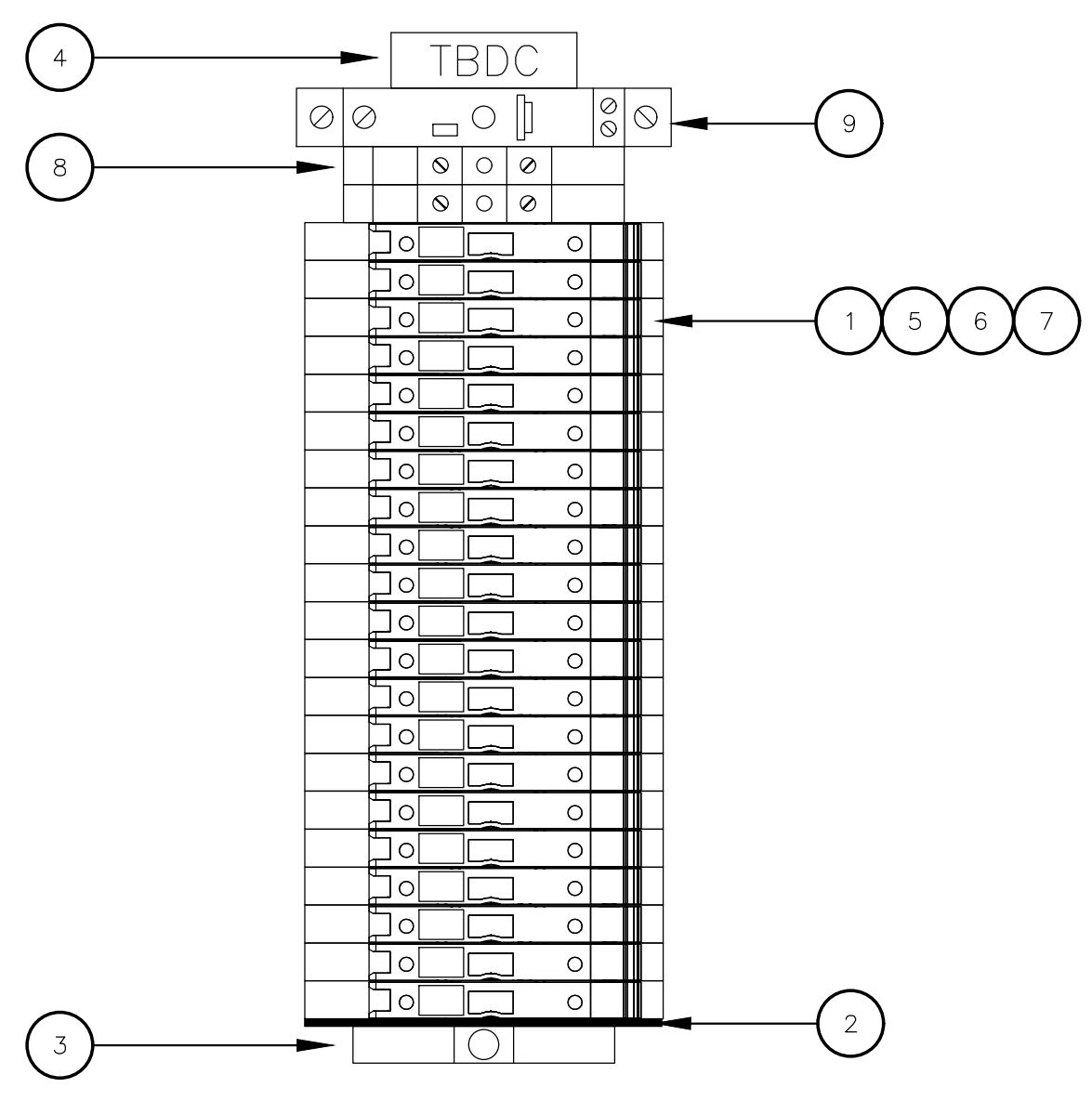
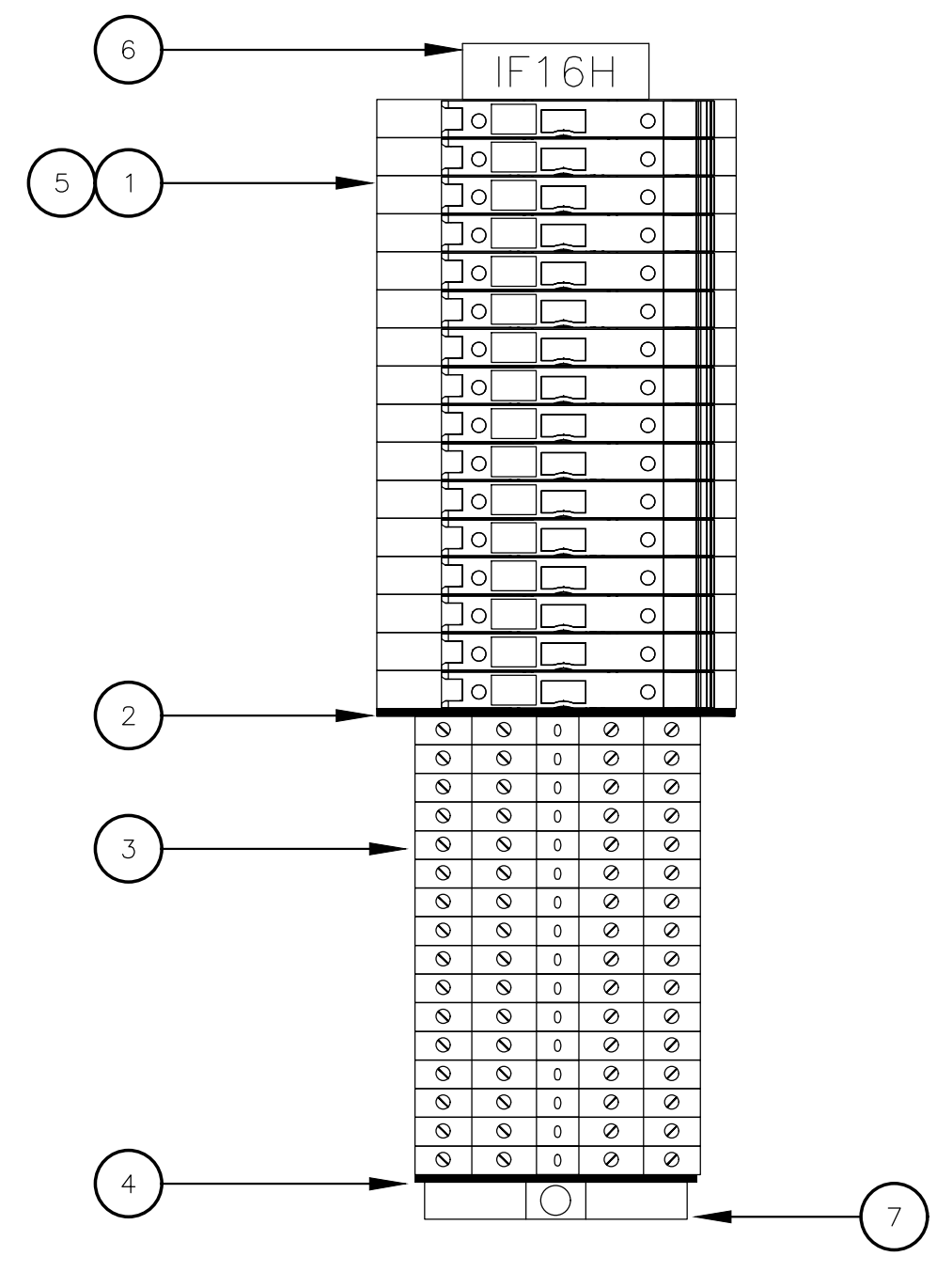


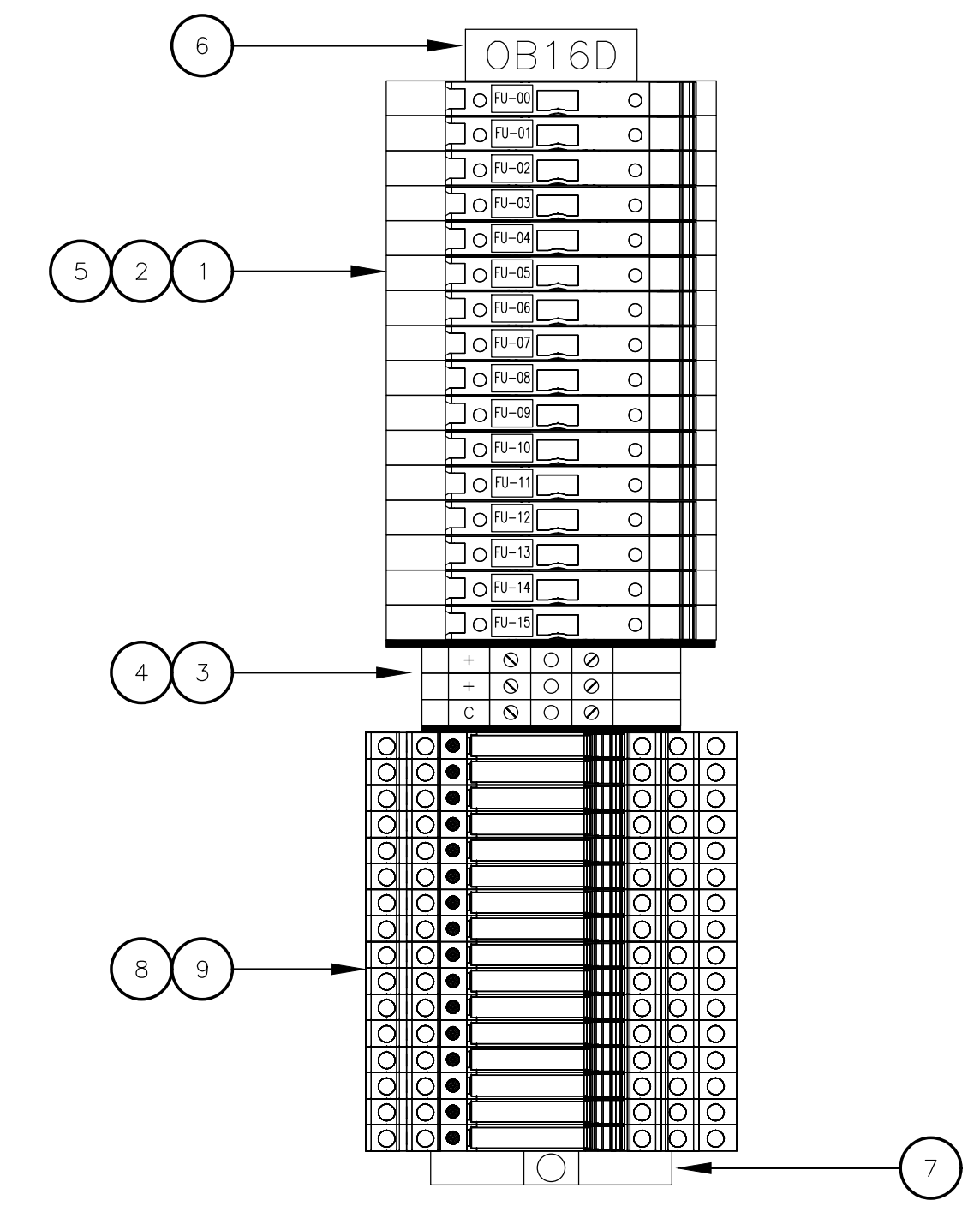
TBDC WIRING ASSEMBLY BILL OF MATERIAL				
ITEM NO.	QTY	DESCRIPTION	VENDOR	SUPPLIED BY
1	21	2-LEVEL TERMINAL BLOCK W/FUSED CIRCUIT	ALLEN BRADLEY	PANEL SHOP
2	1	END BARRIER FOR JD3FB	ALLEN BRADLEY	PANEL SHOP
3	1	END ANCHOR	ALLEN BRADLEY	PANEL SHOP
4	1	GROUP MARKER	ALLEN BRADLEY	PANEL SHOP
5	15	FUSE, 5x20, 5A, CERAMIC	BUSSMAN	PANEL SHOP
6	3	FUSE, 5x20, 2A, CERAMIC	BUSSMAN	PANEL SHOP
7	3	FUSE, 5x20, 1A, CERAMIC	BUSSMAN	PANEL SHOP
8	2	TERMINAL BLOCK	ALLEN BRADLEY	PANEL SHOP
9	1	CIRCUIT BREAKER, CI, D2, 12A	PHOENIX CONTACT	PANEL SHOP



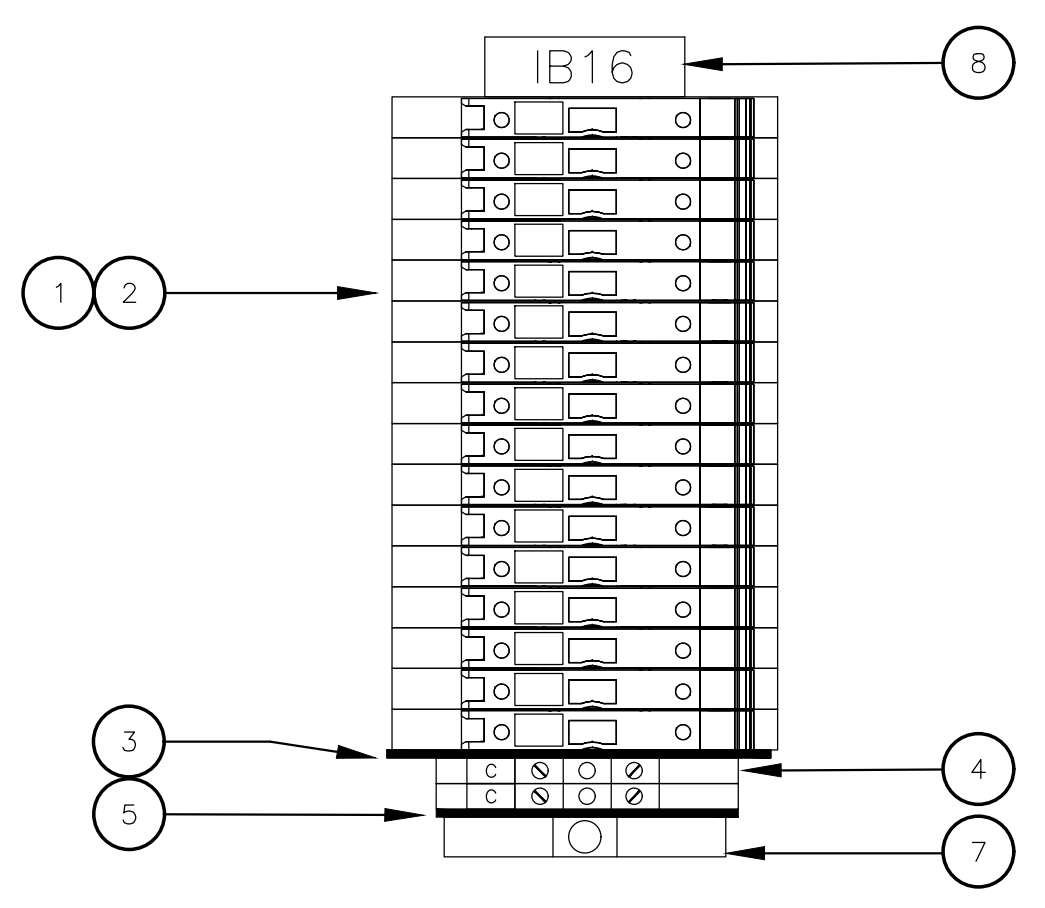
1756-IF16H WIRING ASSEMBLY BILL OF MATERIAL				
ITEM NO.	QTY	DESCRIPTION	VENDOR	SUPPLIED BY
1	16	2-LEVEL TERMINAL BLOCK W/FUSED CIRCUIT	ALLEN BRADLEY	PANEL SHOP
2	1	END BARRIER FOR JD3FB	ALLEN BRADLEY	PANEL SHOP
3	16	2-LEVEL TERMINAL BLOCKS	ALLEN BRADLEY	PANEL SHOP
4	1	END BARRIER FOR 2-LEVEL TERMINAL BLOCK	ALLEN BRADLEY	PANEL SHOP
5	16	FUSE, 5x20, 500mA, CERAMIC	BUSSMAN	PANEL SHOP
6	1	GROUP MARKER	ALLEN BRADLEY	PANEL SHOP
7	1	END ANCHOR	ALLEN BRADLEY	PANEL SHOP



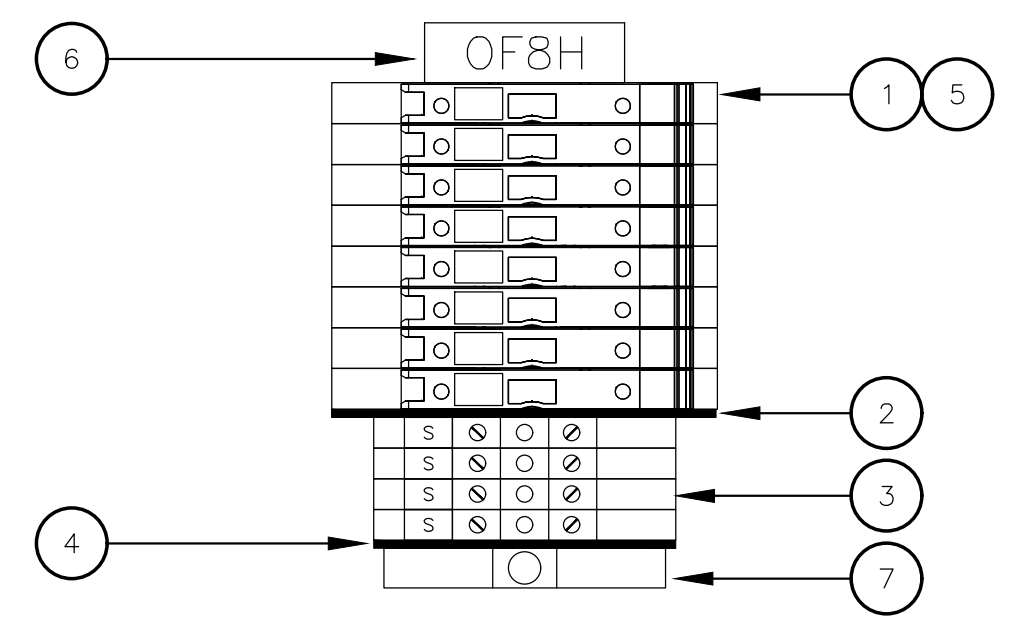
1756-OB16D WIRING ASSEMBLY BILL OF MATERIAL				
ITEM NO.	QTY	DESCRIPTION	VENDOR	SUPPLIED BY
1	16	2-LEVEL TERMINAL BLOCK W/ FUSED CIRCUIT	ALLEN BRADLEY	PANEL SHOP
2	1	END BARRIER FOR JD3FB	ALLEN BRADLEY	PANEL SHOP
3	3	TERMINAL BLOCKS	ALLEN BRADLEY	PANEL SHOP
4	1	END BARRIER FOR TERMINAL BLOCK	ALLEN BRADLEY	PANEL SHOP
5	16	FUSE, 5x20, 2A, CERAMIC	BUSSMAN	PANEL SHOP
6	1	GROUP MARKER	ALLEN BRADLEY	PANEL SHOP
7	1	END ANCHOR	ALLEN BRADLEY	PANEL SHOP
8	16	RELAY TERMINAL, SPDT, 24VDC	ALLEN BRADLEY	PANEL SHOP
9	1	JUMPER, 20 POS, GRAY, FOR RELAY COMMON	ALLEN BRADLEY	PANEL SHOP



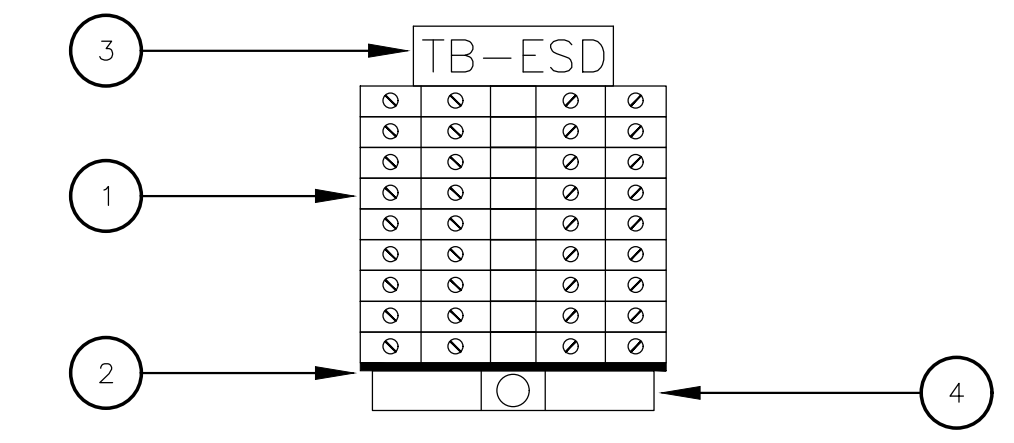
1756-IB16 WIRING ASSEMBLY BILL OF MATERIAL				
ITEM NO.	QTY	DESCRIPTION	VENDOR	SUPPLIED BY
1	16	2-LEVEL TERMINAL BLOCK W/ FUSED CIRCUIT	ALLEN BRADLEY	PANEL SHOP
2	16	FUSE 5x20 mm MEDIUM TIME LAG, 1A, CERAMIC (OR EQUAL)	BUSSMAN	PANEL SHOP
3	1	END BARRIER FOR JD3FB	ALLEN BRADLEY	PANEL SHOP
4	2	TERMINAL BLOCKS	ALLEN BRADLEY	PANEL SHOP
5	1	END BARRIER FOR TERMINAL BLOCK	ALLEN BRADLEY	PANEL SHOP
6	AR	JUMPER STOCK FOR 2-LEVEL TERMINAL BLOCKS	ALLEN BRADLEY	PANEL SHOP
7	1	END ANCHOR	ALLEN BRADLEY	PANEL SHOP
8	1	GROUP MARKER	ALLEN BRADLEY	PANEL SHOP



1756-OF8H WIRING ASSEMBLY BILL OF MATERIAL				
ITEM NO.	QTY	DESCRIPTION	VENDOR	SUPPLIED BY
1	8	2-LEVEL TERMINAL BLOCK W/FUSED CIRCUIT	ALLEN BRADLEY	PANEL SHOP
2	1	END BARRIER FOR JD3FB	ALLEN BRADLEY	PANEL SHOP
3	4	TERMINAL BLOCKS	ALLEN BRADLEY	PANEL SHOP
4	1	END BARRIER FOR TERMINAL BLOCK	ALLEN BRADLEY	PANEL SHOP
5	8	FUSE, 5x20, 500mA, CERAMIC	BUSSMAN	PANEL SHOP
6	1	GROUP MARKER	ALLEN BRADLEY	PANEL SHOP
7	1	END ANCHOR	ALLEN BRADLEY	PANEL SHOP



TB-ESD WIRING ASSEMBLY BILL OF MATERIAL				
ITEM NO.	QTY	DESCRIPTION	VENDOR	SUPPLIED BY
1	9	TERMINAL BLOCKS	ALLEN BRADLEY	PANEL SHOP
2	1	END BARRIER FOR JD4	ALLEN BRADLEY	PANEL SHOP
3	1	GROUP MARKER	ALLEN BRADLEY	PANEL SHOP
4	1	END ANCHOR	ALLEN BRADLEY	PANEL SHOP



THIS DRAWING AND OTHER RELATED DOCUMENTS, IS A PROPERTY OF LONEB. IT SHALL ONLY BE USED FOR PURPOSES AUTHORIZED IN WRITING BY THE MANAGEMENT. ATTEMPTS OF COPYING, MODIFYING, STORING OR TRANSMITTING IN ANY FORM OR BY ANY MEANS (MECHANICAL, ELECTRONIC OR OTHERWISE) WITHOUT PRIOR AGREEMENT WITH LONEB IS HIGHLY PROHIBITED.

REF DWG. NO.	DESCRIPTION	REV	DESCRIPTION	DATE	BY	CHKD	LTES APV	LONEB APV	NPDC NWD APV
		B	ISSUED FOR APPROVAL	12/23/20	JPB	SRB	SCP		
		A	ISSUED FOR REVIEW	07/16/20	AMH	SRB	SCP		

AUTHORIZED FOR RELEASE

TITLE	DATE	BY
LTES PROJECT MANAGER		
LONEB PROJECT MANAGER		

LONE TREE ENGINEERING SERVICES
7807 E PEAKVIEW AVE, STE 150
CENTENNIAL, CO 80111, USA

CLIENT

NIGERIAN PETROLEUM DEVELOPMENT COMPANY

LONEB RESOURCES NIG. LTD

UTOROGU GAS EXPANSION PROJECT
UTOROGU, NIGERIA
L1901-NPDC
CONTROL PANEL
TERMINAL BLOCK ASSEMBLIES

DRAWN BY	DATE	LTES NO:	DWG. NO.	REV
A. HOGAN	05/21/20	19016-00	L1901-NPDC-INS-DWG-00110	B
SCALE:	NONE			

Plotted by: JOSEPH BOND Date: 12/17/2020 9:29 AM Drawing: P:\High Country Sales\Utorogu Cryo Drawings\Electrical-Instrumentation\L1901-NPDC-INS-DWG-00110.dwg

PLC BILL OF MATERIAL					
ITEM NO.	QTY	DESCRIPTION	VENDOR	PART NUMBER	SUPPLIED BY
1	1	CONCEPT WALL MOUNTED ENCLOSURE	HOFFMAN	A604812LP	PANEL SHOP
2	1	BACK PANEL	HOFFMAN	A60P48	PANEL SHOP
3	2	7-SLOT CONTROLLOGIX CHASSIS	ALLEN-BRADLEY	1756-A7	PANEL SHOP
4	2	CONTROLLOGIX 5580 PROCESSOR WITH 5 MB USER MEMORY	ALLEN-BRADLEY	1756-L82E	PANEL SHOP
5	2	CHASSIS POWER SUPPLY, 24VDC	ALLEN-BRADLEY	1756-PB75	PANEL SHOP
6	4	ETHERNET/IP COMMUNICATION MODULE, DUAL PORT, 10/100	ALLEN-BRADLEY	1756-EN2TR	PANEL SHOP
7	2	REDUNDANCY MODULE	ALLEN-BRADLEY	1756-RM2	PANEL SHOP
8	A/R	DIN RAIL, 35 MM, PERFORATED, 7.5	ALLEN-BRADLEY	199-DR1	PANEL SHOP
9	4	END ANCHOR	ALLEN-BRADLEY	1492-EAJ35	PANEL SHOP
10	1	MANAGED GIGABIT ETHERNET SWITCH W/ 14 10/100BASE(X), 4 10/100/1000BASE(X) OR 100/1000BASE SFP PORTS (PLANT NETWORK)	MOXA	EDS-518E-4GTXSFP	PANEL SHOP
11	1	STRATIX 5400, 16 COPPER 10/100/1000 PORTS, 4 COMBO 10/100/1000 PORTS (I/O NETWORK)	ALLEN-BRADLEY	1783-HMS16TG4CGN	PANEL SHOP
12	1	48 FIBER FHD FIBER OPTIC WALL MOUNT ENCLOSURE, 2-DOOR-ADAPTER PANEL	FS	FHD-FWME2	PANEL SHOP
13	1	SLACK SPOOL	FS	INCLUDED W/ PANEL	PANEL SHOP
14	1	GROMMET	FS	INCLUDED W/ PANEL	PANEL SHOP
15	1	STRAIN RELIEF BRACKET	FS	INCLUDED W/ PANEL	PANEL SHOP
16	2	24F, 12X LC DUPLEX FIBER ADAPTER PANEL	FS	35488	PANEL SHOP
17	1	ISOLATED GROUND BAR ASSEMBLY	DWG#	L1901-NPDC-ELE-DWG-00002	PANEL SHOP
18	1	EQUIPMENT GROUND BAR ASSEMBLY	DWG#	L1901-NPDC-ELE-DWG-00002	PANEL SHOP
19	1	DC POWER DISTRIBUTION TERMINAL ASSEMBLY	DWG#	L1901-NPDC-INS-DWG-00110	PANEL SHOP
20	A/R	WIREWAY, 4"x4", GRAY W/COVER (DC)	PANDUIT	F4X4LG6	PANEL SHOP
21	A/R	WIREWAY, 3"x4", GRAY W/COVER (DC)	PANDUIT	F3X4LG6	PANEL SHOP
22	1	REDUNDANCY FIBER CABLE, 1 METER	ALLEN BRADLEY	1756-RMC1	PANEL SHOP
23	4	STRATIX FIBER SFP, 1000 MBIT CONNECTIVITY OVER MULTI-MODE FIBER (LC CONN.)	ALLEN BRADLEY	1783-SFP1GSX	PANEL SHOP
24	4	SFP MODULE WITH 1 1000BASESX PORT WITH LC CONNECTOR FOR 300/550 M TRANSMISSION, -40 TO 85°C OPERATING TEMPERATURE	MOXA	SFP-1GSXLC-T	PANEL SHOP
25	1	ETHERNET/IP TO MODBUS TCP/IP (FOR SWITCHGEAR/RELAYS)	PROSOFT	PLX31-EIP-MBTCP	PANEL SHOP
26	4	LC-LC 10 GBE 50M 1.6MM DUPL 2 METER PATCH CABLE	PANDUIT	FXE10-10M2Y	PANEL SHOP

LAMACOID NAMEPLATE SCHEDULE				
ITEM NO.	FIRST LINE	SECOND LINE	THIRD LINE	SUPPLIED BY
1	BALANCE OF PLANT	PLC PANEL		PANEL SHOP
2	ISOLATED	GROUND		PANEL SHOP
3	EQUIPMENT	GROUND		PANEL SHOP
4	I/O NETWORK	SWITCH		PANEL SHOP
5	PLANT NETWORK	SWITCH		PANEL SHOP
6	I/O			PANEL SHOP
7	PLANT			PANEL SHOP

TB NAMEPLATE SCHEDULE				
ITEM NO.	FIRST LINE	SECOND LINE	THIRD LINE	SUPPLIED BY
1	TBDC			PANEL SHOP
2				
3				
4				
5				

THIS DRAWING AND OTHER RELATED DOCUMENTS, IS A PROPERTY OF LONEB. IT SHALL ONLY BE USED FOR PURPOSES AUTHORIZED IN WRITING BY THE MANAGEMENT. ATTEMPTS OF COPYING, MODIFYING, STORING OR TRANSMITTING IN ANY FORM OR BY ANY MEANS (MECHANICAL, ELECTRONIC OR OTHERWISE) WITHOUT PRIOR AGREEMENT WITH LONEB IS HIGHLY PROHIBITED.	REF DWG. NO.	DESCRIPTION	REV	DESCRIPTION	DATE	BY	CHKD	LTES APV	LONEB APV	NPDC NWD APV
			B	ISSUED FOR APPROVAL	12/23/20	JJB	SRB	SCP		
			A	ISSUED FOR REVIEW	07/16/20	AMH	SRB	SCP		

AUTHORIZED FOR RELEASE		
TITLE	DATE	BY
LTES PROJECT MANAGER		
LONEB PROJECT MANAGER		

CLIENT



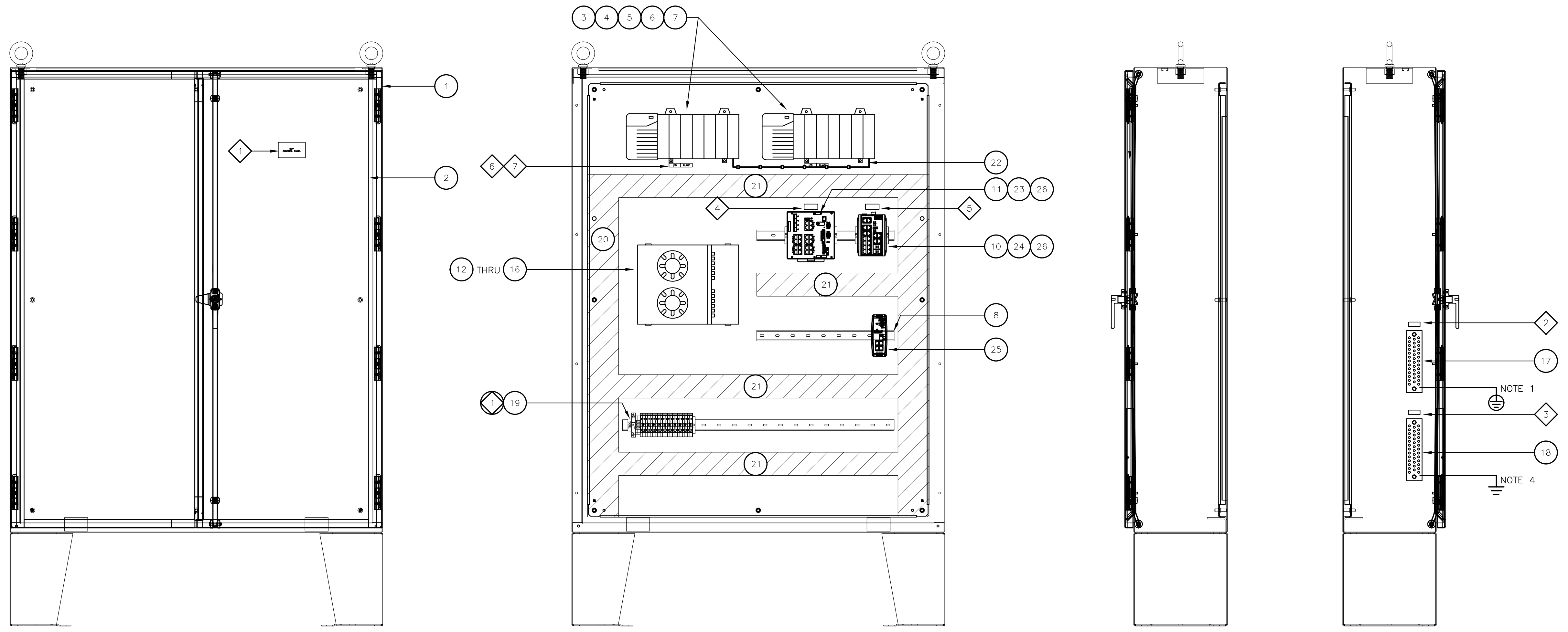
NIGERIAN PETROLEUM DEVELOPMENT COMPANY



LONEB RESOURCES NIG. LTD

UTOROGU GAS EXPANSION PROJECT UTOROGU, NIGERIA L1901-NPDC CONTROL PANEL BILL OF MATERIAL AND NAMEPLATE SCHEDULE				REV
DRAWN BY	DATE	LTES NO: 19016-00	DWG. NO	B
A. HOGAN	05/21/20	SCALE: NONE	L1901-NPDC-INS-DWG-00111	

Plotted by: J05EPH.BOND Date: 12/16/2020 12:05 PM Drawing: P:\High Country Sales\Drawings\Electrical-Instrumentation\L1901-NPDC-INS-DWG-00111.dwg



FRONT VIEW

FRONT INSIDE VIEW

LEFT INSIDE VIEW

RIGHT INSIDE VIEW

- NOTES:
1. ELECTRICAL CONTRACTOR TO RUN A #2 GND FROM THE ISOLATED GROUND BAR DIRECTLY TO THE GROUND GRID.
 2. ELECTRICAL CONTRACTOR TO RUN A #4 GND FROM THE EQUIPMENT GROUND BAR TO THE GROUND GRID OR NEAREST STEEL.

THIS DRAWING AND OTHER RELATED DOCUMENTS, IS A PROPERTY OF LONEB. IT SHALL ONLY BE USED FOR PURPOSES AUTHORIZED IN WRITING BY THE MANAGEMENT. ATTEMPTS OF COPYING, MODIFYING, STORING OR TRANSMITTING IN ANY FORM OR BY ANY MEANS (MECHANICAL, ELECTRONIC OR OTHERWISE) WITHOUT PRIOR AGREEMENT WITH LONEB IS HIGHLY PROHIBITED.

REF DWG. NO.	DESCRIPTION	REV	DESCRIPTION	DATE	BY	CHKD	LTES APV	LONEB APV	NPDC NWD APV
		B	ISSUED FOR APPROVAL	12/23/20	JJB	SRB	SCP		
		A	ISSUED FOR REVIEW	07/16/20	AMH	SRB	SCP		

AUTHORIZED FOR RELEASE		
TITLE	DATE	BY
LTES PROJECT MANAGER		
LONEB PROJECT MANAGER		

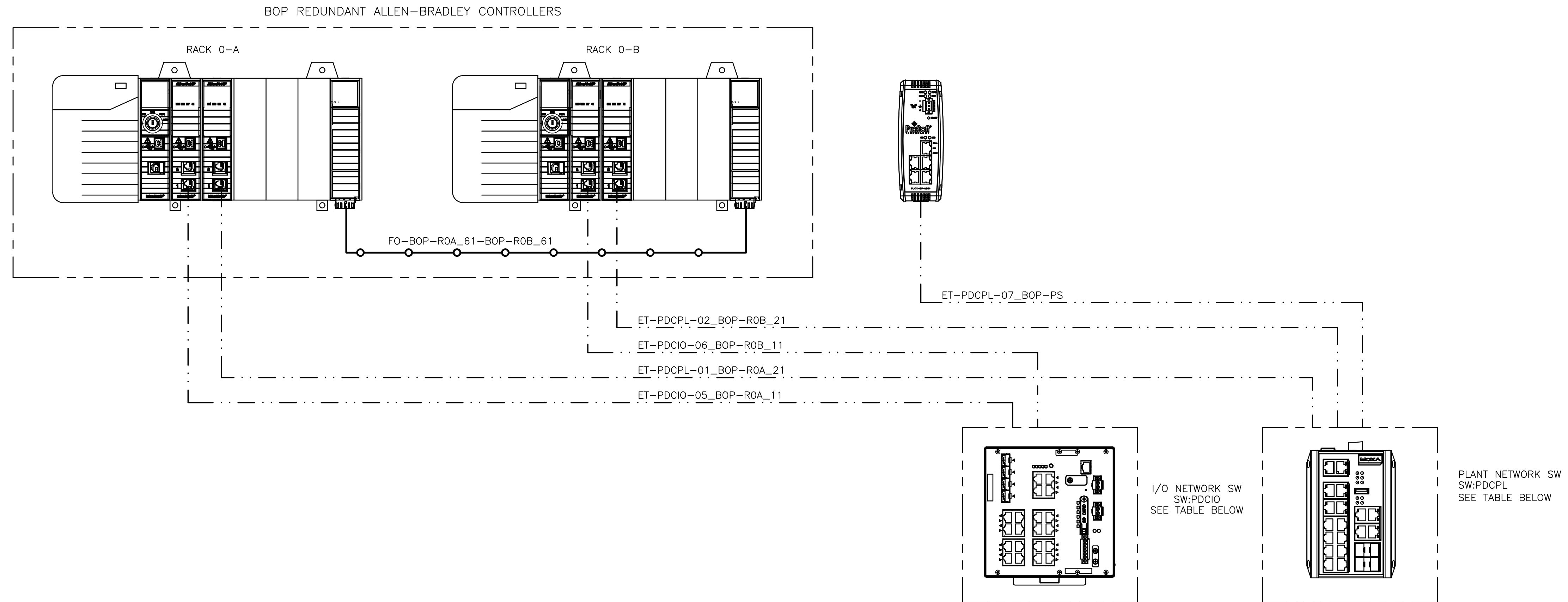
CLIENT

NIGERIAN PETROLEUM DEVELOPMENT COMPANY

LONEB RESOURCES NIG. LTD

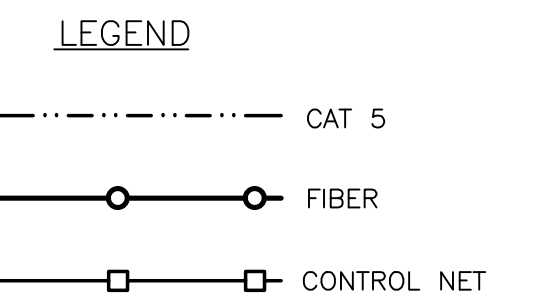
UTOROGU GAS EXPANSION PROJECT UTOROGU, NIGERIA L1901-NPDC CONTROL PANEL CONTROL PANEL LAYOUT			
DRAWN BY	DATE	LTES NO: 19016-00	DWG. NO.
A. HOGAN	05/21/20	SCALE: NONE	L1901-NPDC-INS-DWG-00112
REV	B		

POWER DISTRIBUTION CENTER (PDC)



PDC I/O NETWORK SWITCH					
PART NO:		1783-HMS16TG4CGN			
Port Type	Speed	Port No.	Description	Fiber Pair / Cable Color	Cable Number
SFP-MM-LC	GE	1	MULTIMODE FIBER - REMOTE 40 I/O SWITCH - PORT 2	GRN/BRN	FO-RIN40_02-PDCIO_01
SFP-MM-LC	GE	2	MULTIMODE FIBER - REMOTE 10 I/O SWITCH - PORT 1	GRN/BRN	FO-PDCIO_02-RIN10_01
RJ45	GE	3	CAT6 HIGH VOLTAGE - MCC #1 I/O SWITCH - PORT 1	TEAL	ET-PDCIO_03-MCC1_01
RJ45	GE	4	CAT6 HIGH VOLTAGE - MCC #3 I/O SWITCH - PORT 2	TEAL	ET-MCCEM_02-PDCIO_04
RJ45		5	BOP PLC - RACK 00A - SLOT 01 - PORT 01	RED	ET-PDCIO-05_BOP-ROA_11
RJ45		6	BOP PLC - RACK 00B - SLOT 01 - PORT 01	RED	ET-PDCIO-06_BOP-ROB_11
RJ45		7	ESD PLC - RACK 00 - SLOT 02 - PORT 01	RED	ET-PDCIO-07_ESD-R0_21
RJ45		8	UOP PLC - RACK 00A - SLOT 04 - PORT 01	RED	ET-PDCIO-08_CRYO-ROA_41
RJ45		9	UOP PLC - RACK 00B - SLOT 04 - PORT 01	RED	ET-PDCIO-09_CRYO-ROB_41
RJ45		10	BOP PDC RIO01 - SLOT 00 - PORT 01	RED	ET-PDCIO_10-RIO01_01
RJ45		11	ESD PDC RIO05 - SLOT 00 - PORT 01	RED	ET-RIO05_02-PDCIO_11
RJ45		12	SPARE		
RJ45		13	SPARE		
RJ45		14	SPARE		
RJ45		15	SPARE		
RJ45		16	SPARE		
RJ45		17	SPARE		
RJ45		18	SPARE		
RJ45		19	SPARE		
RJ45		20	SPARE		

PDC PLANT SWITCH					
PART NO:		EDS-518E-4GTXSFP			
Port Type	Speed	Port No.	Description	Fiber Pair / Cable Color	Cable Number
LC - RR	GE		MULTIMODE FIBER - REMOTE 10 PLANT SWITCH - PORT 2	Blu/Orn	FO-PDCPL_G1-RPN10_G2
LC - RR	GE	G2	MULTIMODE FIBER - CCR PLANT SWITCH - PORT 1	Blu/Orn	FO-CCRPL_G1-PDCPL_G2
C / SFP		G3			
C / SFP		G4			
C		1	BOP PLC RACK 01A 1756-EN2TR - PLANT NET - SLOT 02 - PORT 1	BLUE	ET-PDCPL-01_BOP-ROA_21
C		2	BOP PLC RACK 01B 1756-EN2TR - PLANT NET - SLOT 02 - PORT 1	BLUE	ET-PDCPL-02_BOP-ROB_21
C		3	ESD PLC 1756-EN2TR - PLANT NET - SLOT 03 - PORT 1	BLUE	ET-PDCPL_03-ESD-R0_31
C		4	CRYO PLC RACK 01A 1756-EN2TR - PLANT NET - SLOT 02 - PORT 1	BLUE	ET-PDCPL_04-CRYO-ROA_21
C		5	CRYO PLC RACK 01B 1756-EN2TR - PLANT NET - SLOT 02 - PORT 1	BLUE	ET-PDCPL_05-CRYO-ROB_21
C		6	SWITCHGEAR CONTROL SYSTEM - CAT6 HIGH VOLTAGE	TEAL	ET-PDCPL_06-SWGR
C		7	PROSOFT (SWITCHGEAR/RELAYS)	BLUE	ET-PDCL-07_BOP-PS
C		8	SPARE		
C		9	SPARE		
C		10	SPARE		
C		11	SPARE		
C		12	SPARE		
C		13	SPARE		
C		14	ENGINEERING WORKSTATION		ET-PDCPL_14-EWS02



THIS DRAWING AND OTHER RELATED DOCUMENTS, IS A PROPERTY OF LONEB. IT SHALL ONLY BE USED FOR PURPOSES AUTHORIZED IN WRITING BY THE MANAGEMENT. ATTEMPTS OF COPYING, MODIFYING, STORING OR TRANSMITTING IN ANY FORM OR BY ANY MEANS (MECHANICAL, ELECTRONIC OR OTHERWISE) WITHOUT PRIOR AGREEMENT WITH LONEB IS HIGHLY PROHIBITED.

REF DWG. NO.	DESCRIPTION	REV	DESCRIPTION	DATE	BY	CHKD	LTES APV	LONEB APV	NPDC NWD APV
		B	ISSUED FOR APPROVAL	12/23/20	JOB	SRB	SCP		
		A	ISSUED FOR REVIEW	07/16/20	AMH	SRB	SCP		

AUTHORIZED FOR RELEASE

TITLE	DATE	BY
LTES PROJECT MANAGER		
LONEB PROJECT MANAGER		

LONE TREE ENGINEERING SERVICES
7807 E PEAKVIEW AVE, STE 150
CENTENNIAL, CO 80111, USA

CLIENT

NIGERIAN PETROLEUM DEVELOPMENT COMPANY

LONEB RESOURCES NIG. LTD

UTOROGU GAS EXPANSION PROJECT
UTOROGU, NIGERIA
L1901-NPDC
CONTROL PANEL
COMMUNICATIONS

DRAWN BY	DATE	LTES NO:	DWG. NO.	REV
A. HOGAN	05/21/20	19016-00	L1901-NPDC-INS-DWG-00114	B
SCALE: NONE				

Plotted by: JOSEPH BOND Date: 12/23/2020 2:26 PM Drawing: P:\High Country Sales\Utorogu Cryo Drawings\Electrical-Instrumentation\L1901-NPDC-INS-DWG-00114.dwg