

X ESD PLC/RIO-05 BILL OF MATERIAL					
ITEM NO.	QTY	DESCRIPTION	VENDOR	PART NUMBER	SUPPLIED BY
1	1	CONCEPT WALL MOUNTED ENCLOSURE	HOFFMAN	CSD603612	PANEL SHOP
2	1	BACK PANEL	HOFFMAN	CP6036	PANEL SHOP
3	1	ENCLOSURE MOUNTING BRACKET	HOFFMAN	CMFK	PANEL SHOP
4	1	7-SLOT CONTROLLOGIX CHASSIS	ALLEN-BRADLEY	1756-A7	PANEL SHOP
5	1	CHASSIS POWER SUPPLY, 24VDC	ALLEN-BRADLEY	1756-PB75	PANEL SHOP
6	1	CONTROLLOGIX 5580 PROCESSOR	ALLEN-BRADLEY	1756-L81ES	PANEL SHOP
7	2	ETHERNET/IP COMMUNICATION MODULE, DUAL PORT, 10/100	ALLEN-BRADLEY	1756-EN2TR	PANEL SHOP
8	4	EMPTY SLOT FILLER CARD	ALLEN-BRADLEY	1756-N2	PANEL SHOP
9	1	5094 ETHERNET ADAPTER 16 MODULES RJ45	ALLEN-BRADLEY	5094-AEN2TR	PANEL SHOP
10	3	FLEX 5000 ANALOG INPUT, 8 POINT, CURRENT/VOLTAGE MODULE, HART, (RTB3I)	ALLEN-BRADLEY	5094-IF8IH	PANEL SHOP
11	1	FLEX 5000 DISCRETE INPUT, 16 POINT, MODULE, (RTB3)	ALLEN-BRADLEY	5094-IB16	PANEL SHOP
12	2	FLEX 5000 DISCRETE INPUT, 16 POINT, SAFETY MODULE, (RTB3I)	ALLEN-BRADLEY	5094-IB16S	PANEL SHOP
13	1	FLEX 5000 DISCRETE OUTPUT, 16 POINT, SAFETY MODULE, (RTB3I)	ALLEN-BRADLEY	5094-OB16S	PANEL SHOP
14	7	MOUNTING BASE	ALLEN-BRADLEY	5094-MB	PANEL SHOP
15	1	REMOVABLE TERMINAL BLOCK	ALLEN-BRADLEY	5094-RTB3	PANEL SHOP
16	6	REMOVABLE TERMINAL BLOCK, ISOLATED (FOR SAFETY MODULES)	ALLEN-BRADLEY	5094-RTB3I	PANEL SHOP
17		EMPTY SLOT FILLER	ALLEN-BRADLEY	5094-N2	PANEL SHOP
18	1	SAFETY CONTROL RELAY	ALLEN-BRADLEY	700S-DCP1020Z24	PANEL SHOP
19	1	2-POSITION RED PUSH-PULL TWIST E-STOP	ALLEN-BRADLEY	800T-FXLE6AP	PANEL SHOP
20	1	JUMBO PROTECTIVE GUARD	ALLEN-BRADLEY	800T-N310J	PANEL SHOP
21	A/R	DIN RAIL, 35 MM, PERFORATED, 7.5	ALLEN-BRADLEY	199-DR1	PANEL SHOP
22		END ANCHOR	ALLEN-BRADLEY	1492-EAJ35	PANEL SHOP
23	1	ISOLATED GROUND BAR ASSEMBLY	DWG#	L1901-NPDC-ELE-DWG-00002	PANEL SHOP
24	1	EQUIPMENT GROUND BAR ASSEMBLY	DWG#	L1901-NPDC-ELE-DWG-00002	PANEL SHOP
25	1	DC POWER DISTRIBUTION TERMINAL ASSEMBLY	DWG#	L1901-NPDC-INS-DWG-01009	PANEL SHOP
26	1	TB-ESD TERMINAL ASSEMBLY	DWG#	L1901-NPDC-INS-DWG-01009	PANEL SHOP
27	3	8-CHANNEL ANALOG INPUT ASSEMBLY	DWG#	L1901-NPDC-INS-DWG-01009	PANEL SHOP
28	1	16-POINT 24VDC DISCRETE INPUT ASSEMBLY	DWG#	L1901-NPDC-INS-DWG-01009	PANEL SHOP
29	2	16-POINT 24VDC DISCRETE INPUT ASSEMBLY (SAFETY)	DWG#	L1901-NPDC-INS-DWG-01009	PANEL SHOP
30	1	16-POINT 24VDC DISCRETE OUTPUT ASSEMBLY (SAFETY)	DWG#	L1901-NPDC-INS-DWG-01009	PANEL SHOP
31	A/R	WIREWAY, 3"x4", GRAY W/COVER (DC)	PANDUIT	F3X4LG6	PANEL SHOP

X LAMACOID NAMEPLATE SCHEDULE				
ITEM NO.	FIRST LINE	SECOND LINE	THIRD LINE	SUPPLIED BY
1	ESD PLC/	RIO-05		PANEL SHOP
2	ISO	GROUND		PANEL SHOP
3	EQP	GROUND		PANEL SHOP
4				
5				

X TB NAMEPLATE SCHEDULE				
ITEM NO.	FIRST LINE	SECOND LINE	THIRD LINE	SUPPLIED BY
1	TBDC			PANEL SHOP
2	TB-ESD			PANEL SHOP
3	R5S1			PANEL SHOP
4	R5S2			PANEL SHOP
5	R5S3			PANEL SHOP
6	R5S4			PANEL SHOP
7	R5S5			PANEL SHOP
8	R5S6			PANEL SHOP
9	R5S7			PANEL SHOP

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			B	ISSUED FOR APPROVAL	12/23/20	JJB	SRB	SCP		
			A	ISSUED FOR REVIEW	07/16/20	AMH	SRB	SCP		

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LTES PROJECT MANAGER		
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NIGERIAN PETROLEUM DEVELOPMENT COMPANY



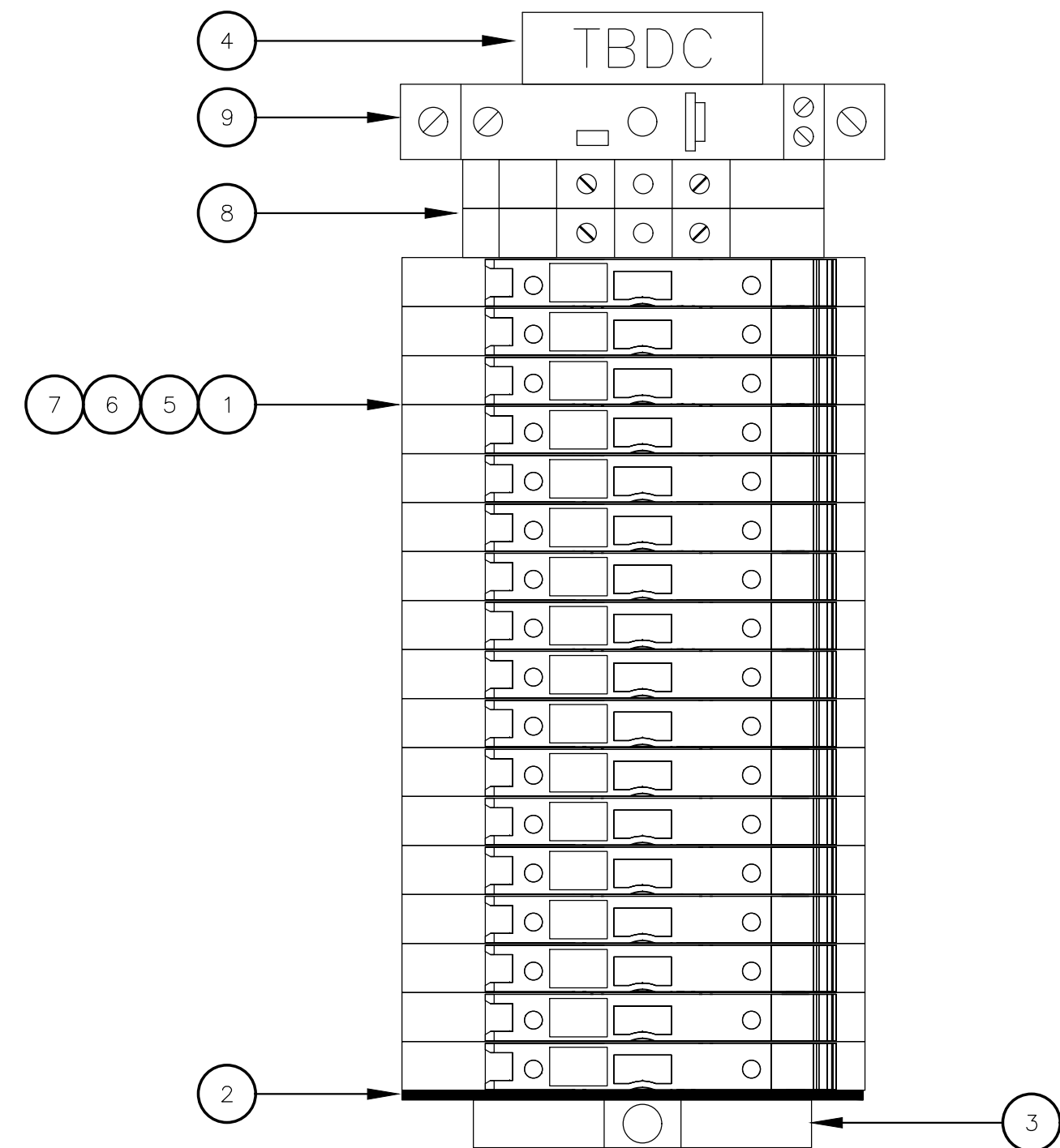
LONEB RESOURCES NIG. LTD

UTOROGU GAS EXPANSION PROJECT
 UTOROGU, NIGERIA
 L1901-NPDC
 ESD PLC/RIO-05
 BILL OF MATERIAL

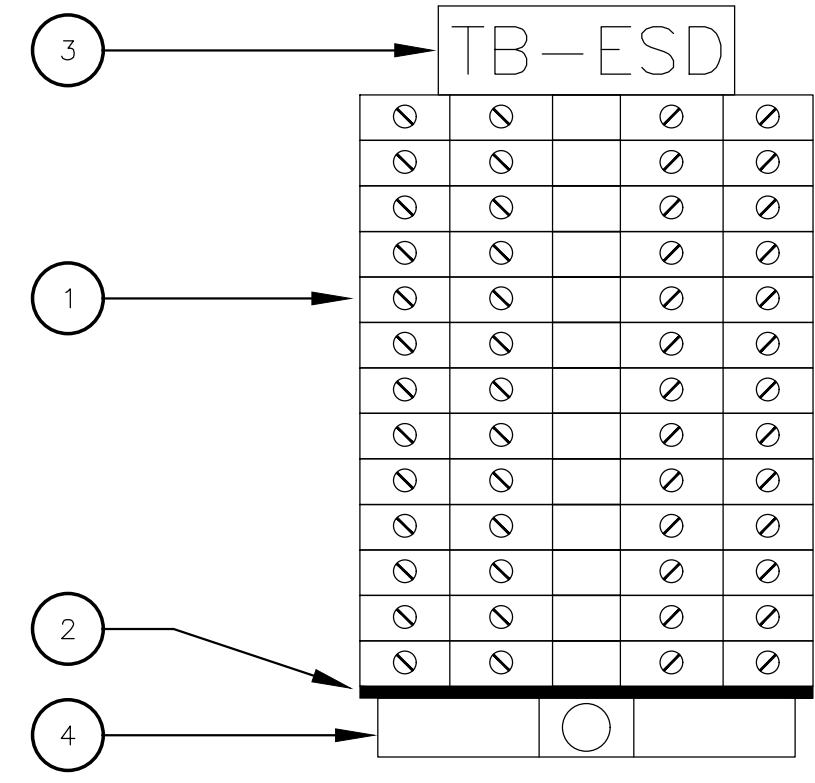
DRAWN BY	DATE	LTES NO:	DWG. NO	REV
A. HOGAN	06/08/20	19016-00	L1901-NPDC-INS-DWG-01000	B
SCALE: NONE				

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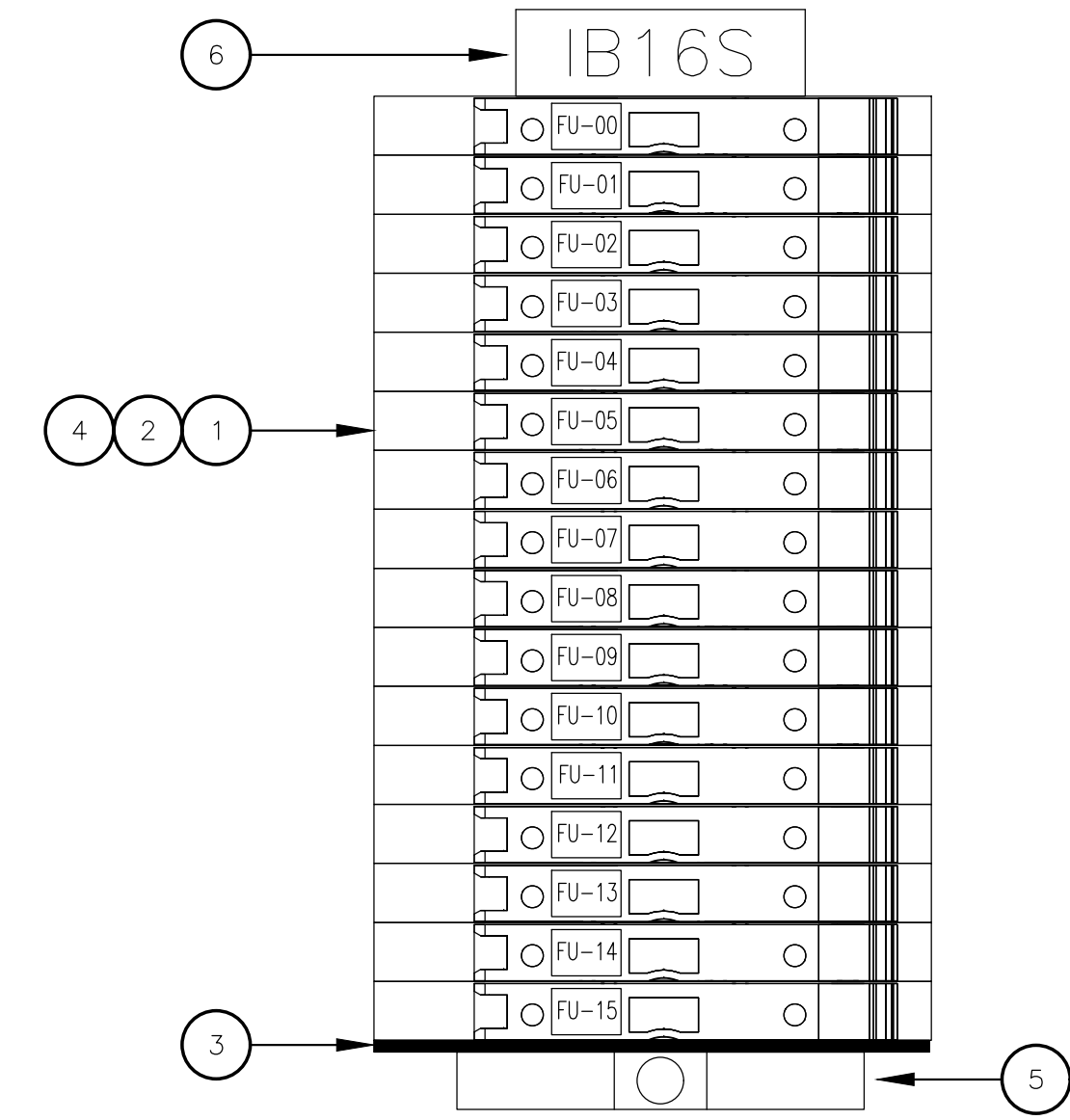
TBDC WIRING ASSEMBLY BILL OF MATERIAL				
ITEM NO.	QTY	DESCRIPTION	VENDOR	SUPPLIED BY
1	17	2-LEVEL TERMINAL BLOCK W/FUSED CIRCUIT	ALLEN BRADLEY	PANEL SHOP
2	1	END BARRIER FOR JD3FB	ALLEN BRADLEY	PANEL SHOP
3	1	END ANCHOR	ALLEN BRADLEY	PANEL SHOP
4	1	GROUP MARKER	ALLEN BRADLEY	PANEL SHOP
5	13	FUSE, 5x20, 5A, CERAMIC	BUSSMAN	PANEL SHOP
6	2	FUSE, 5x20, 2A, CERAMIC	BUSSMAN	PANEL SHOP
7	2	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



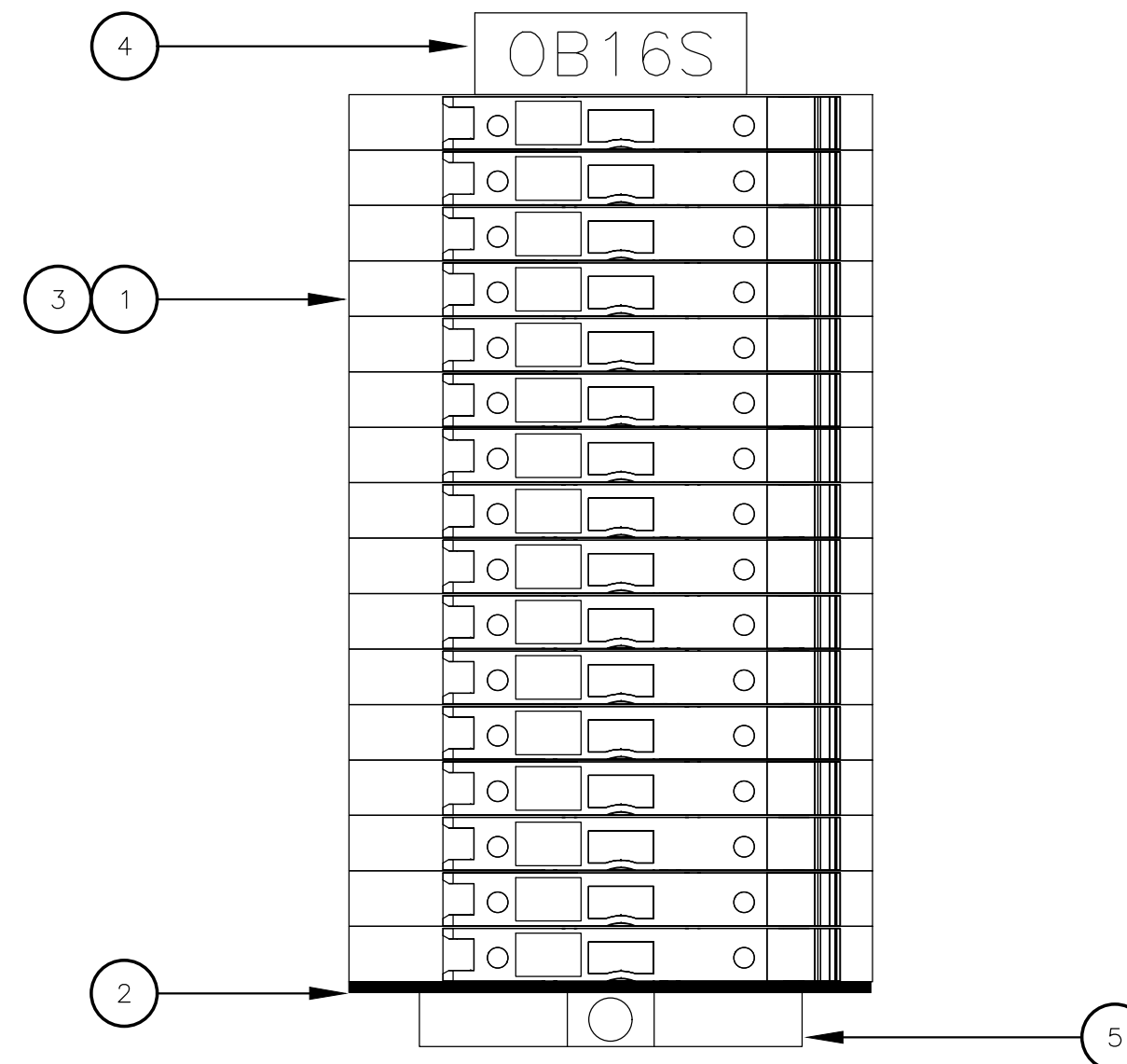
TB-ESD WIRING ASSEMBLY BILL OF MATERIAL				
ITEM NO.	QTY	DESCRIPTION	VENDOR	SUPPLIED BY
1	13	TERMINAL BLOCKS	ALLEN BRADLEY	PANEL SHOP
2	1	END BARRIER FOR JD4	ALLEN BRADLEY	PANEL SHOP
3	1	GROUP MARKER	ALLEN BRADLEY	PANEL SHOP
4	1	END ANCHOR	ALLEN BRADLEY	PANEL SHOP



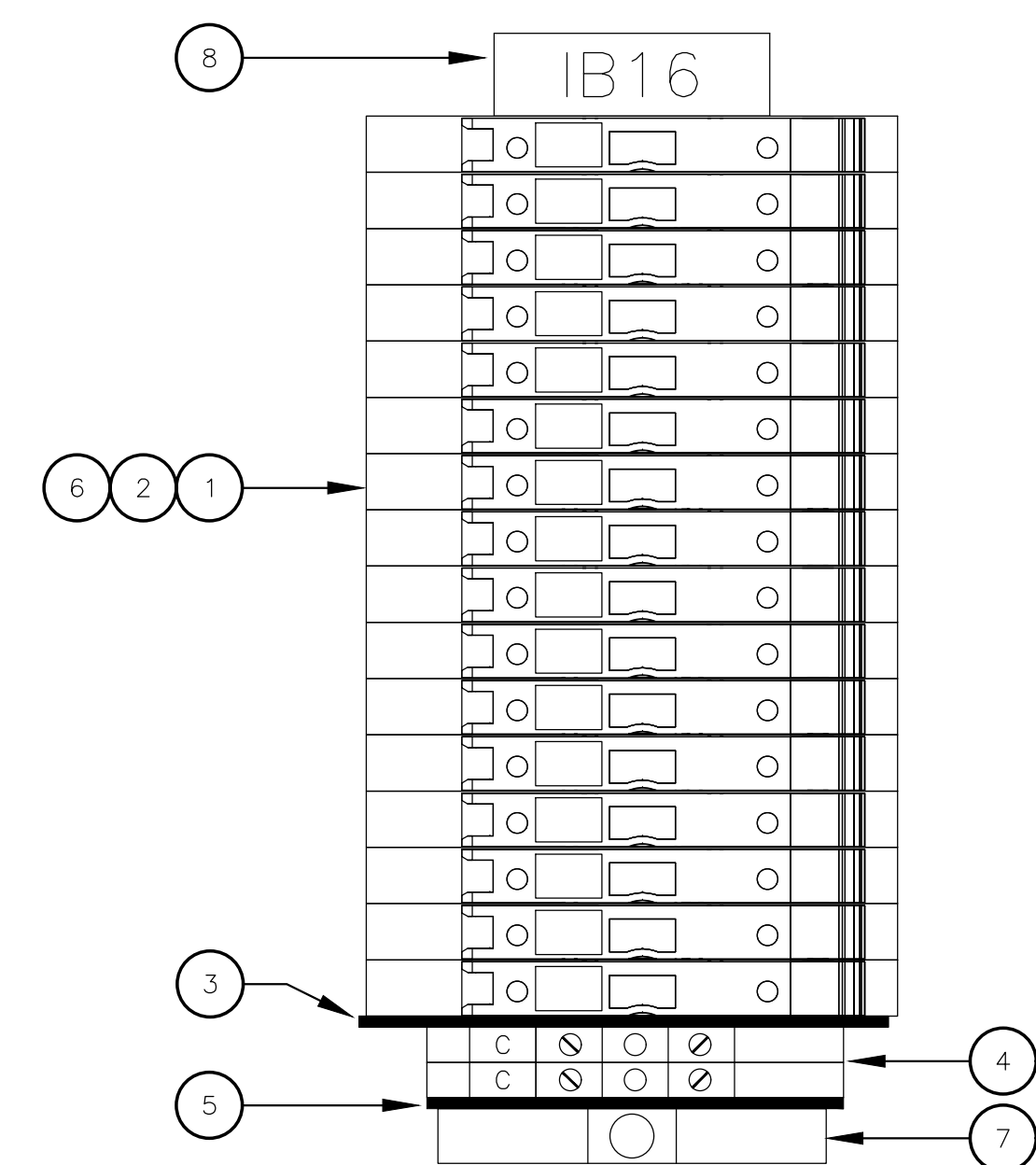
5094-IB16S WIRING ASSEMBLY BILL OF MATERIAL				
ITEM NO.	QTY	DESCRIPTION	VENDOR	SUPPLIED BY
1	16	2-LEVEL TERMINAL BLOCK W/ FUSED CIRCUIT	ALLEN BRADLEY	PANEL SHOP
2	16	FUSE 5x20 mm MEDIUM TIME LAG, 1A, CERAMIC (OR EQUAL)	BUSSMAN	PANEL SHOP
3	1	END BARRIER FOR 2-LEVEL TERMINAL BLOCK	ALLEN BRADLEY	PANEL SHOP
4	AR	JUMPER STOCK FOR 2-LEVEL TERMINAL BLOCKS	ALLEN BRADLEY	PANEL SHOP
5	1	END ANCHOR	ALLEN BRADLEY	PANEL SHOP
6	1	GROUP MARKER	ALLEN BRADLEY	PANEL SHOP



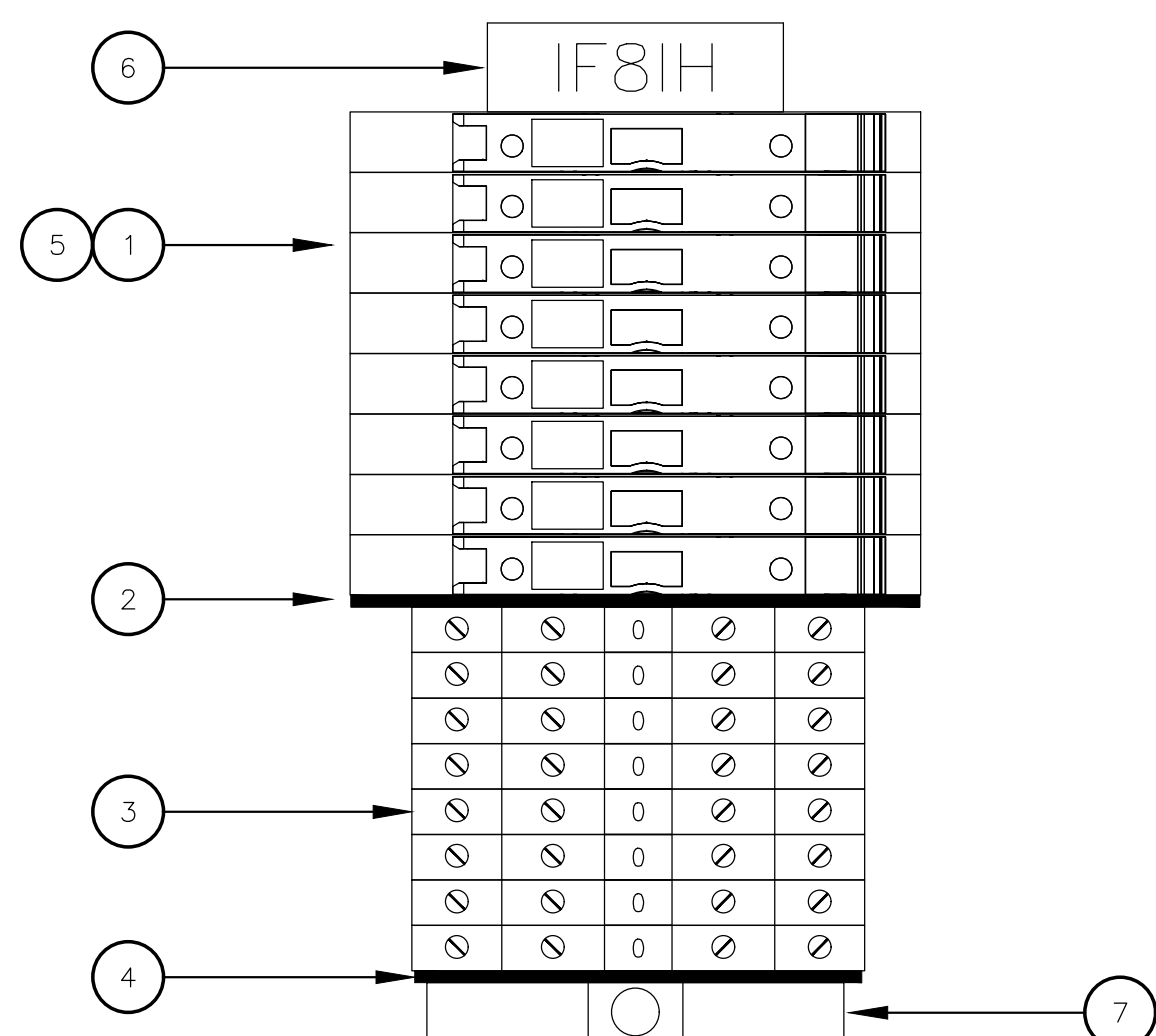
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ITEM NO.	QTY	DESCRIPTION	VENDOR	SUPPLIED BY
1	16	2-LEVEL TERMINAL BLOCK W/ FUSED CIRCUIT	ALLEN BRADLEY	PANEL SHOP
2	1	END BARRIER FOR JD3FB	ALLEN BRADLEY	PANEL SHOP
3	16	FUSE, 5x20, 2A, CERAMIC	BUSSMAN	PANEL SHOP
4	AR	GROUP MARKER	ALLEN BRADLEY	PANEL SHOP
5	1	END ANCHOR	ALLEN BRADLEY	PANEL SHOP



5094-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 2-LEVEL TERMINAL BLOCK	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



5094-IF8 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	8	2-LEVEL TERMINAL BLOCKS	ALLEN BRADLEY	PANEL SHOP
4	1	END BARRIER FOR 2-LEVEL 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



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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		

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TITLE	DATE	BY
LTES PROJECT MANAGER		
LONEB PROJECT MANAGER		

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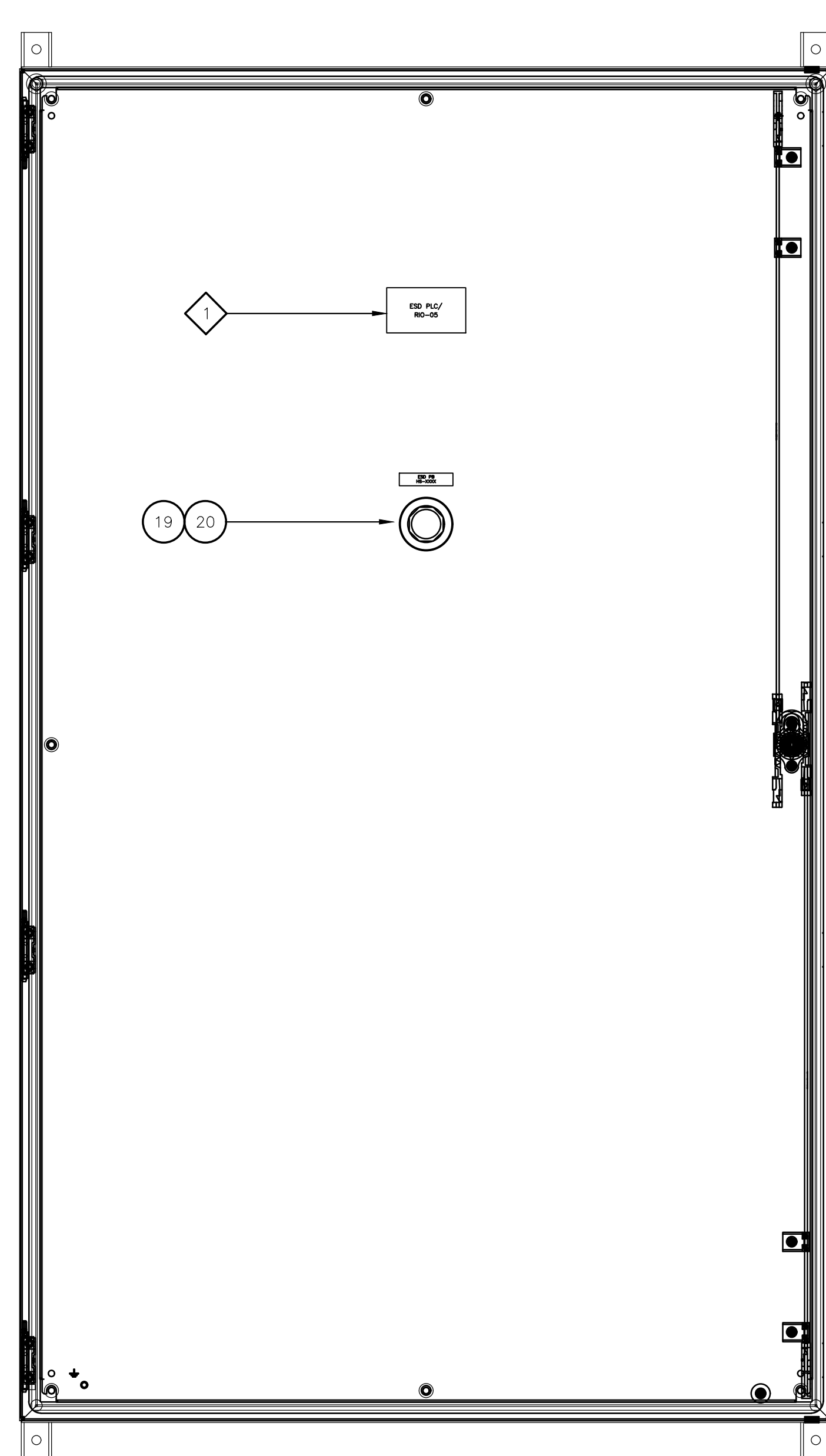
NIGERIAN PETROLEUM DEVELOPMENT COMPANY

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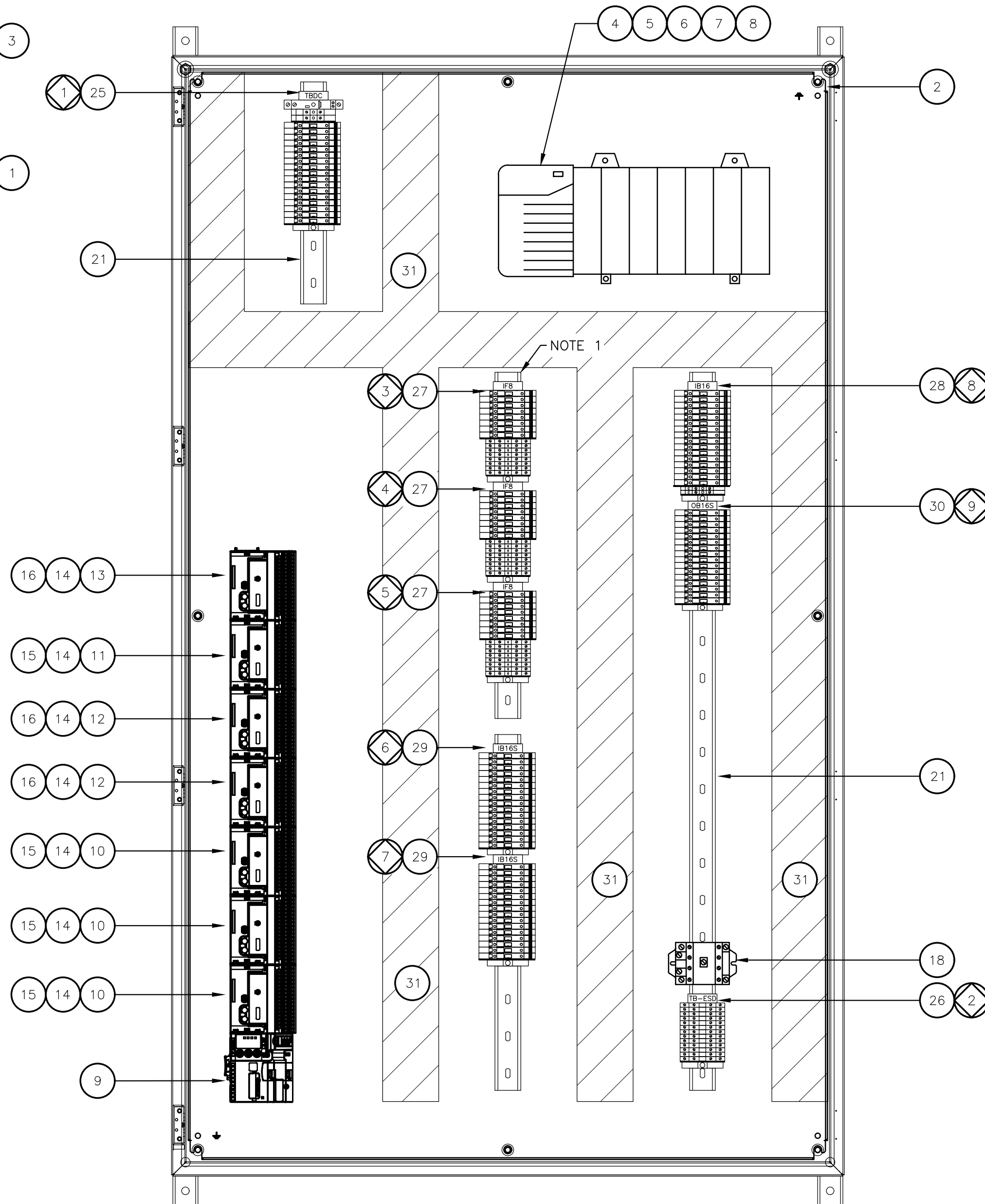
UTOROGU GAS EXPANSION PROJECT
UTOROGU, NIGERIA
L1901-NPDC
ESD PANEL
TERMINAL BLOCK ASSEMBLIES

DRAWN BY	DATE	LTES NO:	DWG. NO.
A. HOGAN	06/08/20	19016-00	L1901-NPDC-INS-DWG-01009
SCALE:	NONE		REV
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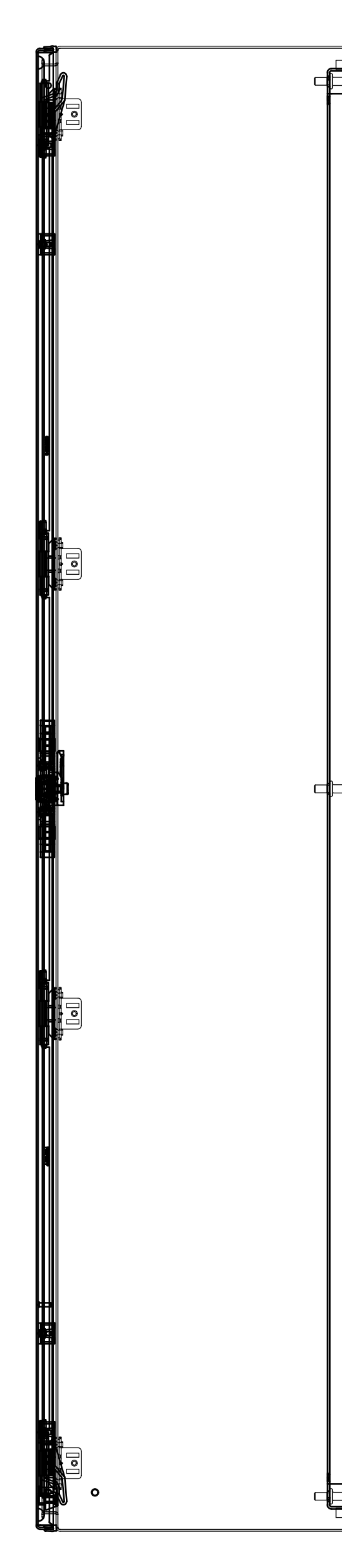
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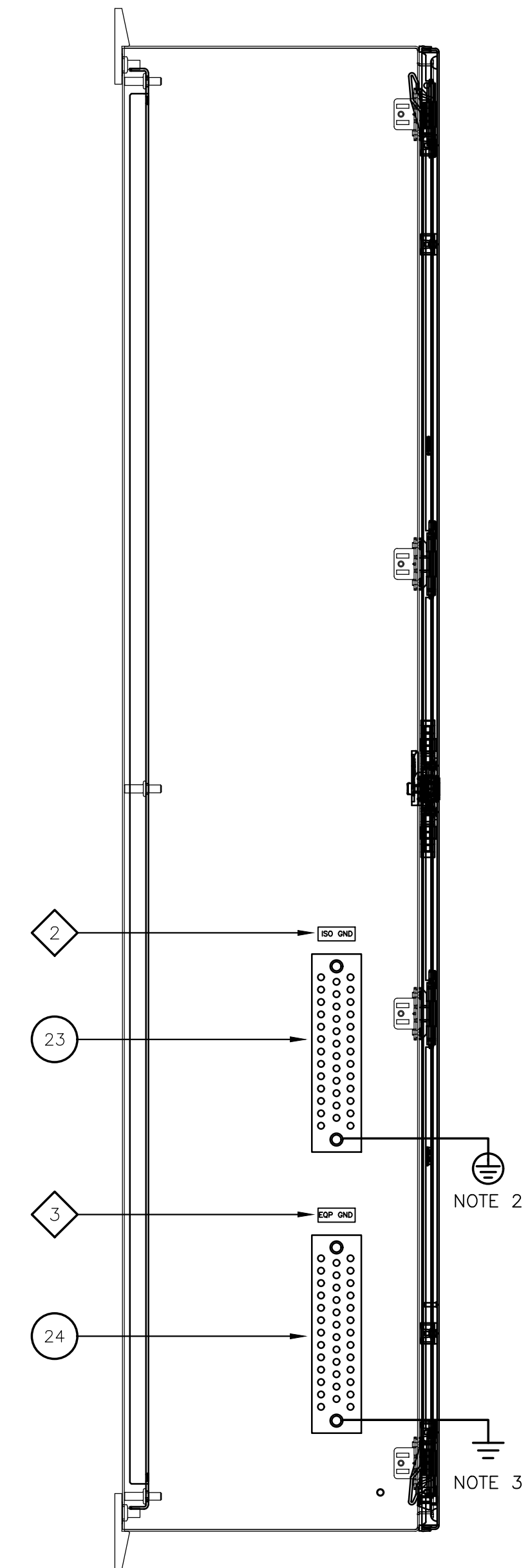
FRONT VIEW



FRONT INSIDE VIEW



LEFT INSIDE VIEW



RIGHT INSIDE VIEW

NOTES:

1. THE DINRAIL WITH THE ANALOG TERMINAL BLOCKS WILL BE ISOLATED WITH NYLON STAND-OFFS. TIE GROUND WIRE FROM DINRAIL DIRECTLY TO IGB.
2. ELECTRICAL CONTRACTOR TO RUN A #2 GND FROM THE ISOLATED GROUND BAR DIRECTLY TO THE GROUND GRID.
3. ELECTRICAL CONTRACTOR TO RUN A #4 GND FROM THE EQUIPMENT GROUND BAR TO THE GROUND GRID OR NEAREST STEEL.

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		A	ISSUED FOR REVIEW	07/16/20	AMH	SRB	SCP		

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TITLE	DATE	BY
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LONEB PROJECT MANAGER		

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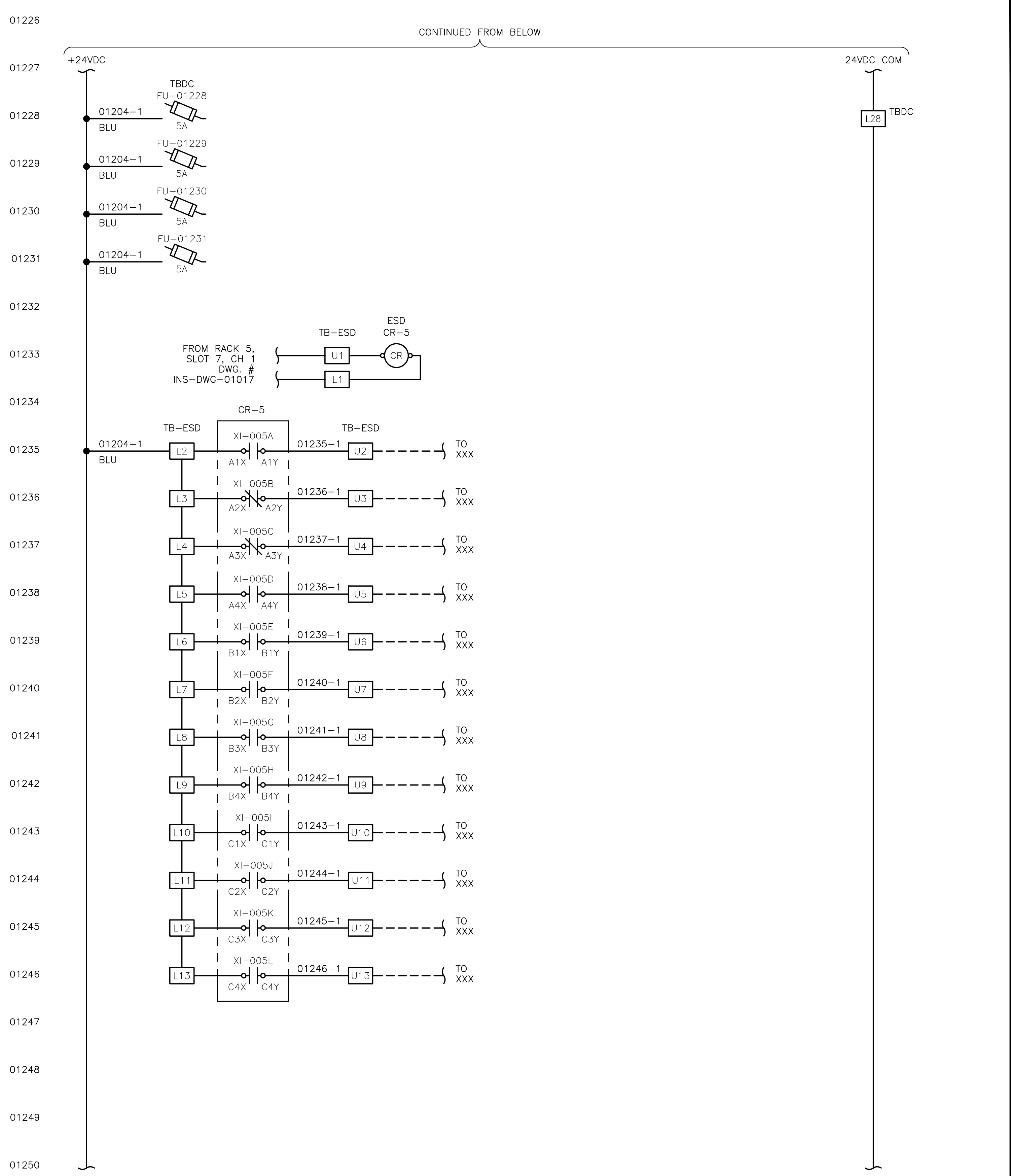
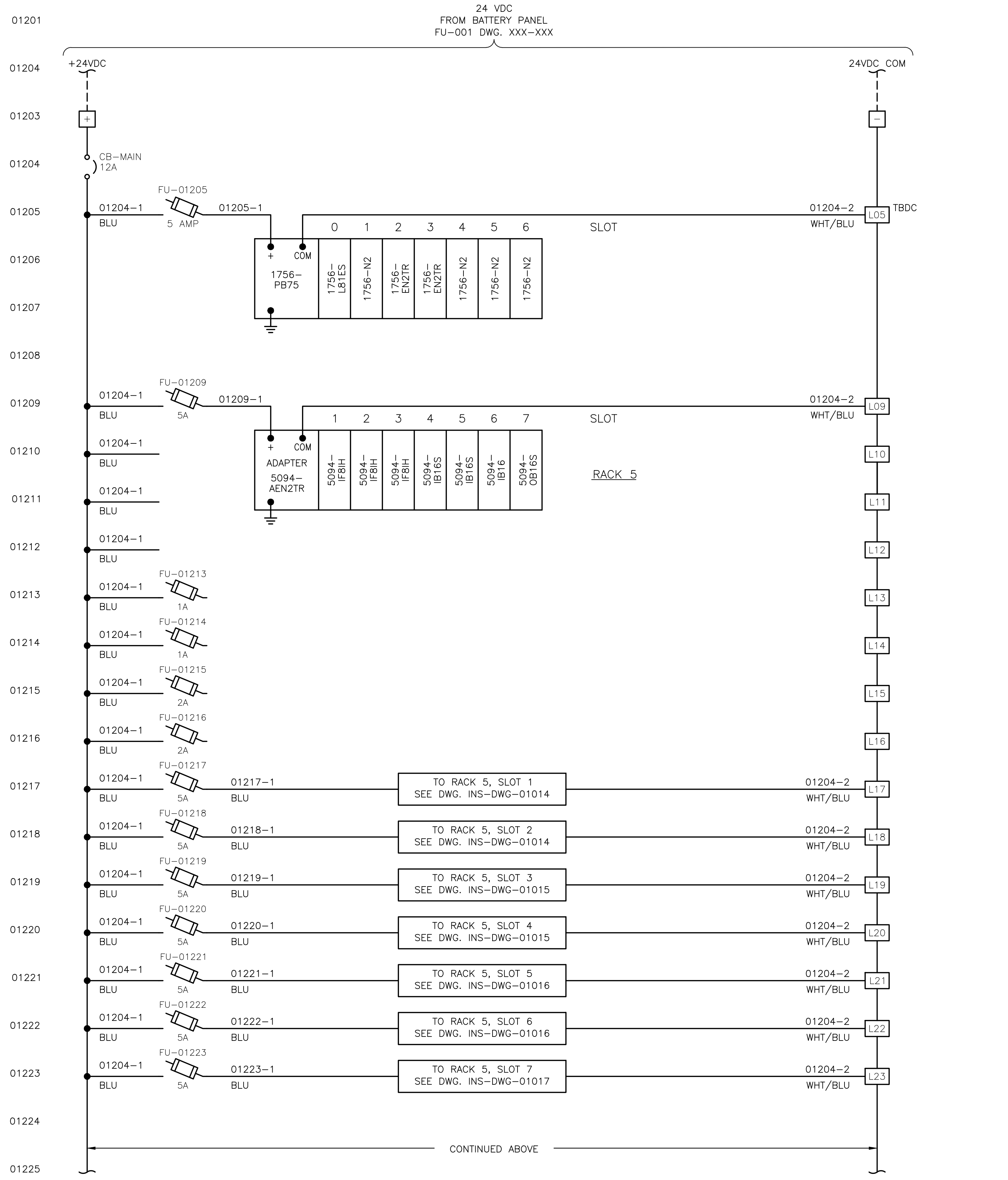
NIGERIAN PETROLEUM DEVELOPMENT COMPANY



LONEB RESOURCES NIG. LTD

UTOROGU GAS EXPANSION PROJECT
 UTOROGU, NIGERIA
 L1901-NPDC
 ESD PLC/RIO-05
 PANEL LAYOUT

DRAWN BY	DATE	LTES NO: 19016-00	DWG. NO.	REV
A. HOGAN	06/08/20	SCALE: 1:5	L1901-NPDC-INS-DWG-01010	B



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B			ISSUED FOR APPROVAL	12/23/20	JOB	SRB	SCP			
A			ISSUED FOR REVIEW	07/16/20	AMH	SRB	SCP			

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TITLE	DATE	BY
LTES PROJECT MANAGER		
LONEB PROJECT MANAGER		

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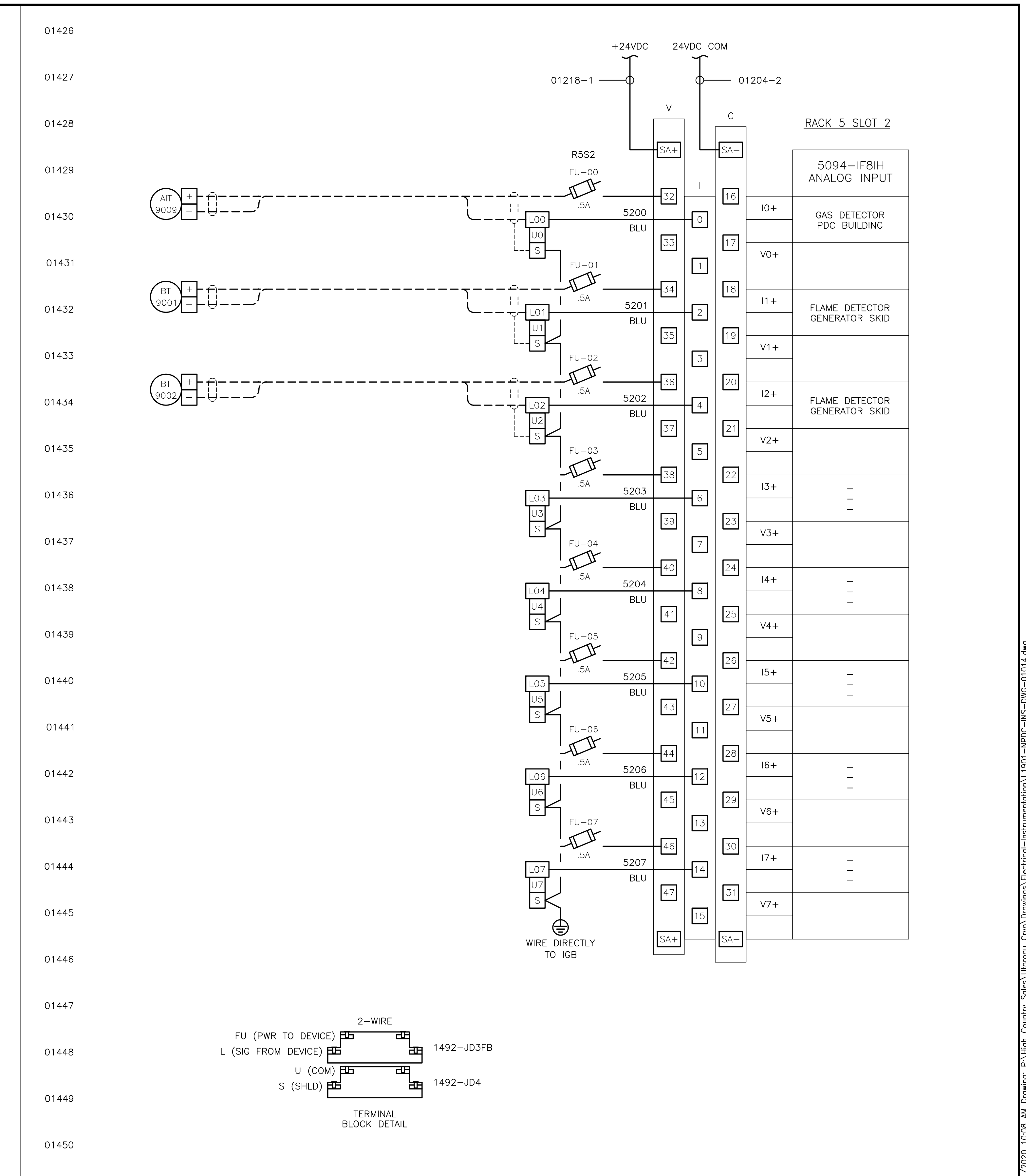
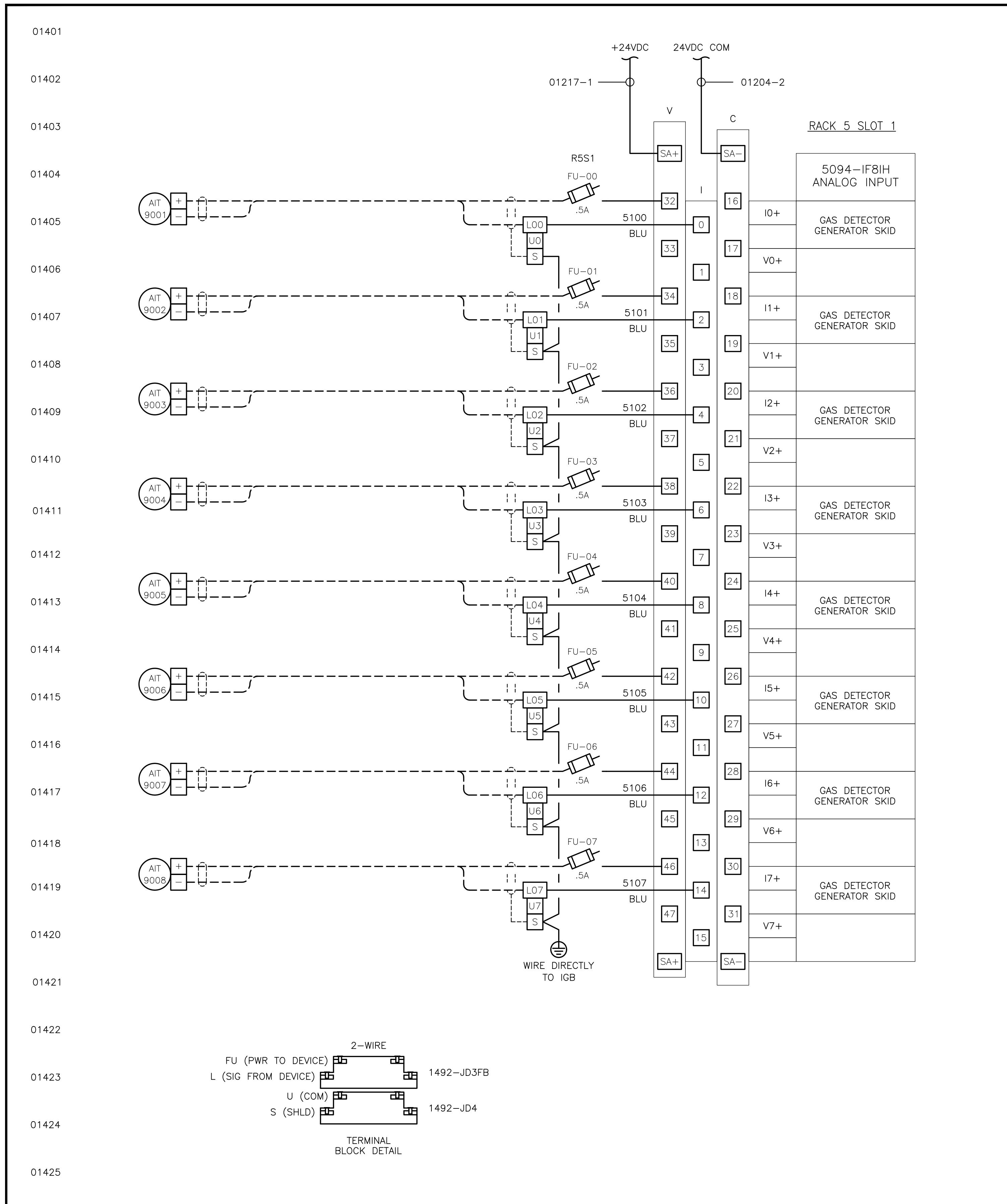
NIGERIAN PETROLEUM DEVELOPMENT COMPANY

LONEB RESOURCES NIG. LTD

UTOROGU GAS EXPANSION PROJECT
UTOROGU, NIGERIA
L1901-NPDC
ESD PLC/RIO-05
POWER DISTRIBUTION

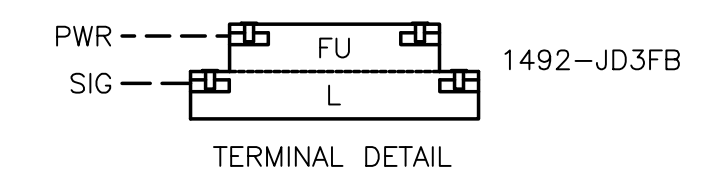
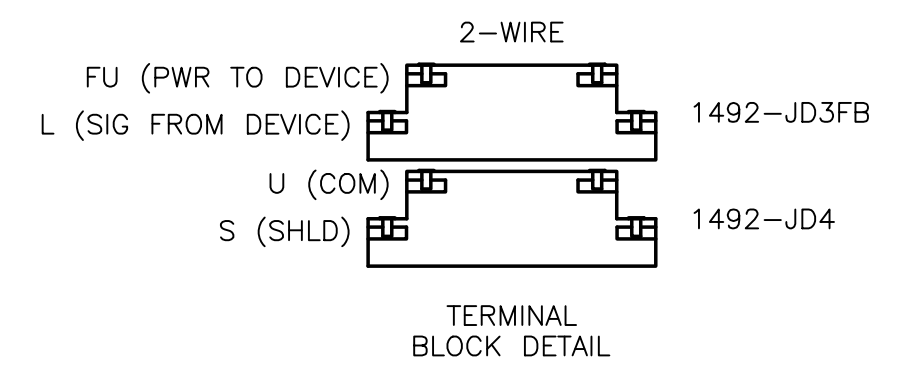
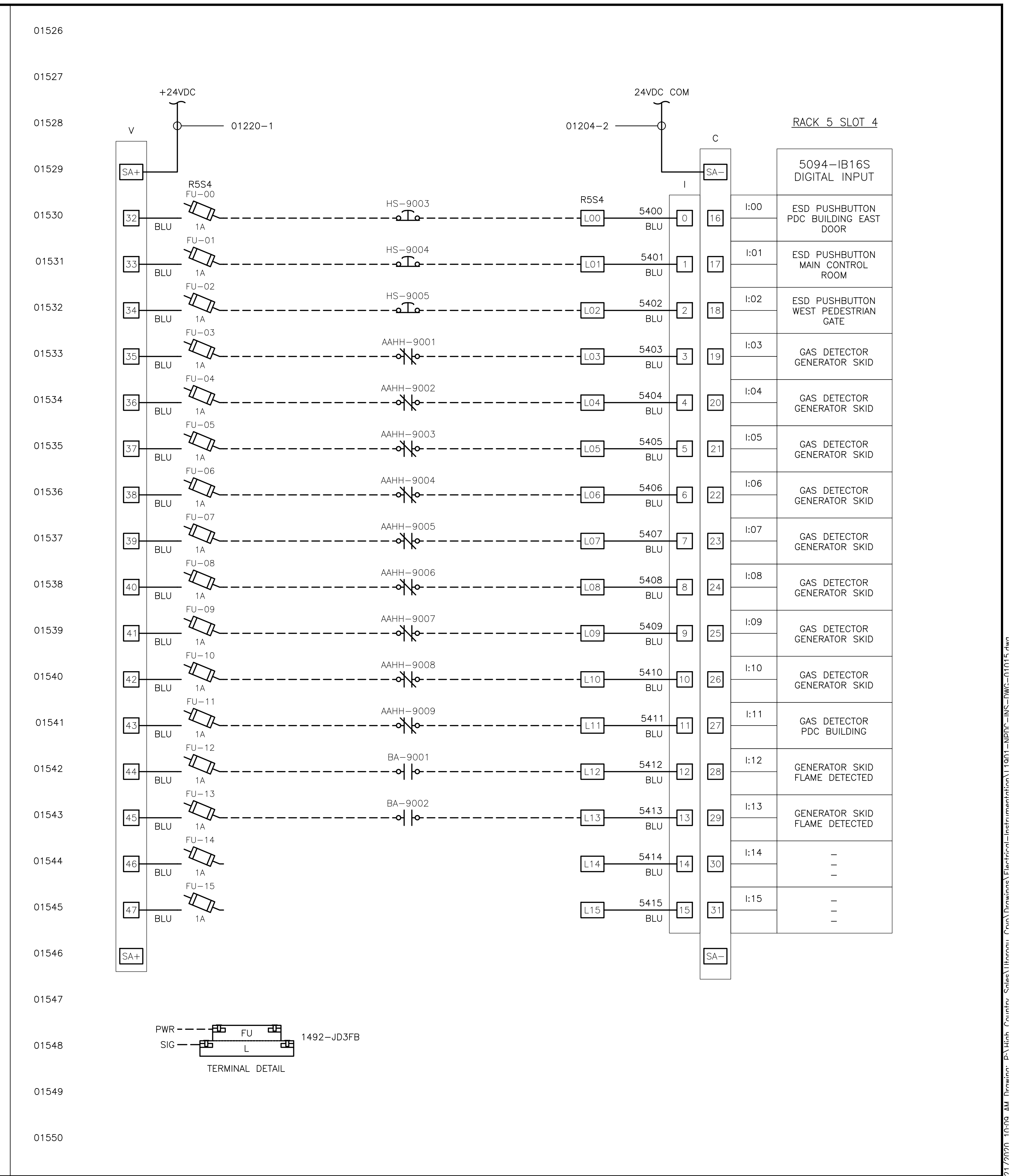
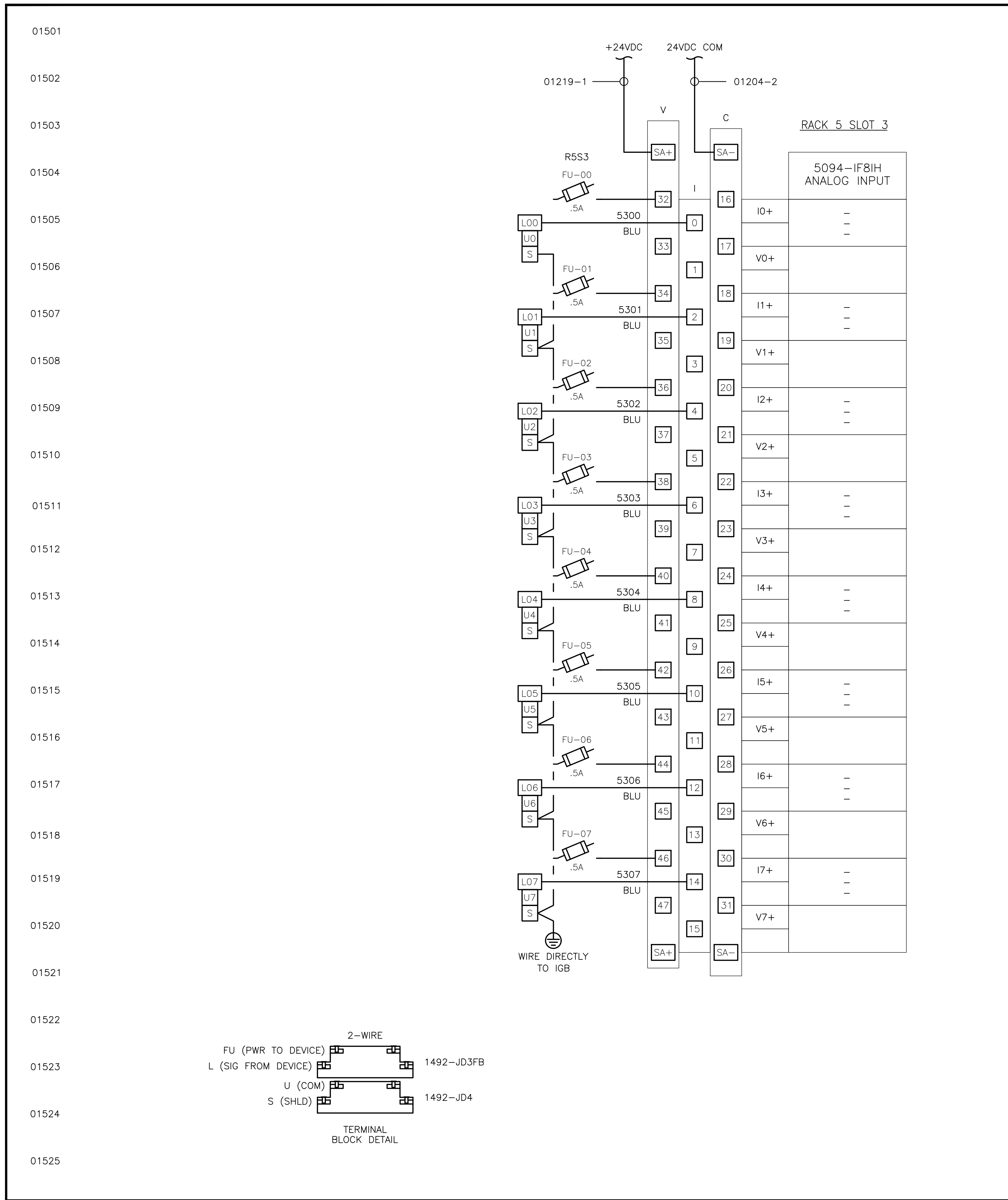
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A. HOGAN	06/08/20	SCALE: NONE	L1901-NPDC-INS-DWG-01012	B

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			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			UTOROGU GAS EXPANSION PROJECT UTOROGU, NIGERIA L1901-NPDC ESD RIO-05 LOOP DRAWING RACK 05, SLOT 1 AND 2		
			 LONE TREE ENGINEERING SERVICES 7007 E PEAKVIEW AVE, STE 100 CENTENNIAL, CO 80111, USA			 LONEB RESOURCES NIG. LTD			DRAWN BY DATE LTES NO: 19016-00 DWG. NO: L1901-NPDC-INS-DWG-01014 REV B A. HOGAN 06/08/20 SCALE: NONE		

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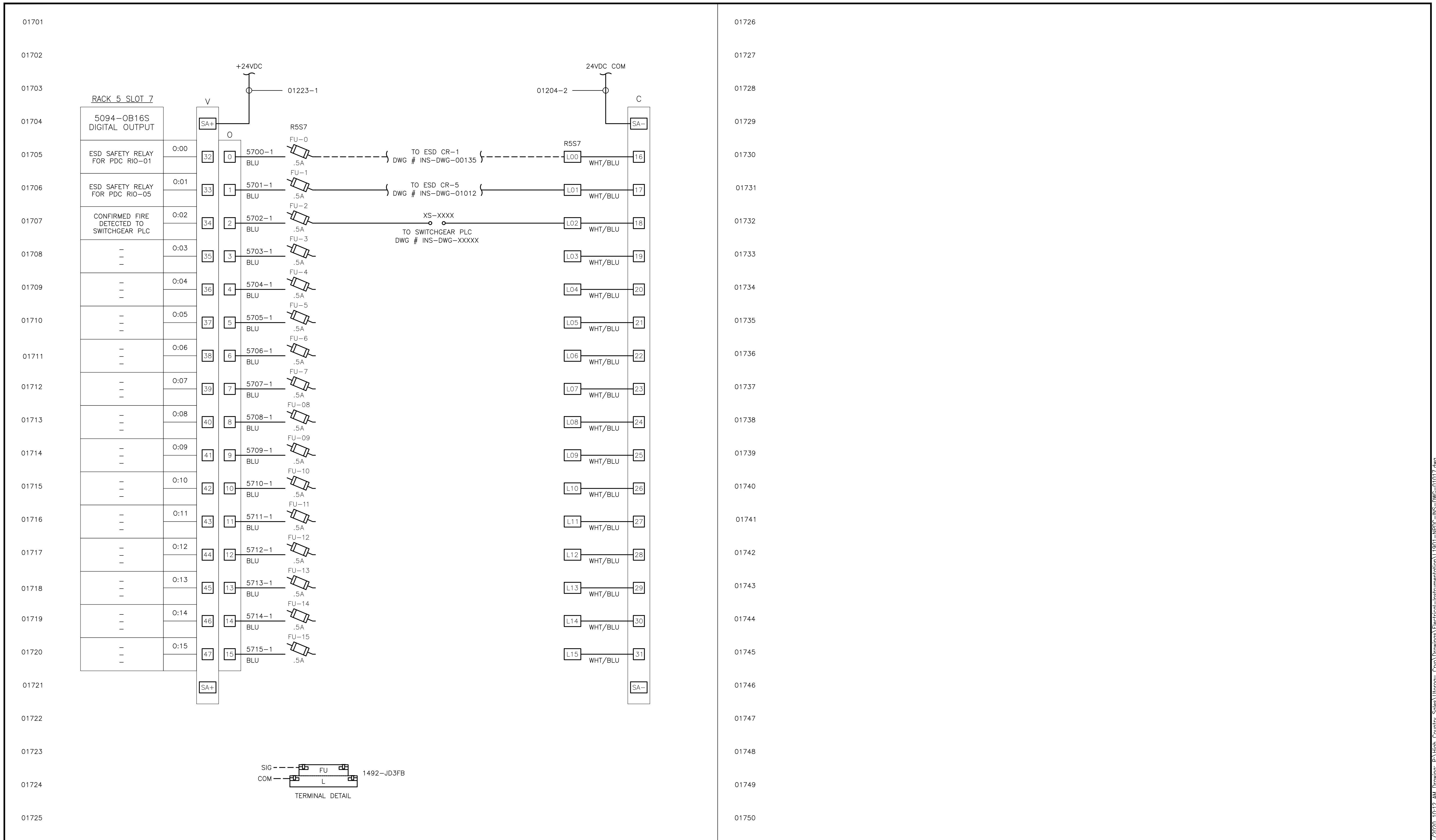


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AUTHORIZED FOR RELEASE			CLIENT	
TITLE	DATE	BY	 NIGERIAN PETROLEUM DEVELOPMENT COMPANY	
LTES PROJECT MANAGER				
LONEB PROJECT MANAGER				

 LONE TREE ENGINEERING SERVICES 7007 E PEAKVIEW AVE, STE 150 CENTENNIAL, CO 80111, USA		 LONEB RESOURCES NIG. LTD	
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UTOROGU GAS EXPANSION PROJECT UTOROGU, NIGERIA L1901-NPDC ESD RIO-05 LOOP DRAWING RACK 05, SLOT 3 AND 4			
DRAWN BY	DATE	LTES NO:	DWG. NO.
A. HOGAN	06/08/20	19016-00	L1901-NPDC-INS-DWG-01015
SCALE: NONE		REV	B



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			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 7007 E PEAKVIEW AVE, STE 100 CENTENNIAL, CO 80111, USA			CLIENT NIGERIAN PETROLEUM DEVELOPMENT COMPANY LONEB RESOURCES NIG. LTD			UTOROGU GAS EXPANSION PROJECT UTOROGU, NIGERIA L1901-NPDC ESD RIO-05 LOOP DRAWING RACK 05, SLOT 7		
DRAWN BY: A. HOGAN		DATE: 06/08/20		LTES NO: 19016-00		DWG. NO: L1901-NPDC-INS-DWG-01017		SCALE: NONE		REV B	

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