

WASHINGTON METROPOLITAN AREA
TRANSIT AUTHORITY
CONTRACT 2Z7042
STAGE SSE-12
OPERATION AND MAINTENANCE MANUAL FOR
TRACTION POWER
SUBSTATION EQUIPMENT

VOLUME III

MANUFACTURED BY;
IMPulse NC, Inc. (24 HOURS)
1229 N. Breazeale Avenue
Mount Olive, North Carolina 28365
919-658-2200

WASHINGTON METROPOLITAN AREA
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CONTRACT 2Z7042
STAGE SSE-12
OPERATION AND MAINTENANCE MANUAL FOR
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VOLUME III

CP-2Z7042-1000-13-0

T. NO. 62

MANUFACTURED BY;
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Mount Olive, North Carolina 28365
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DC SWITCHGEAR

DESCRIPTION

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BY: CHARLES GARTEN

DC FEEDER BREAKER

QUANTITY	VENDOR AND MANUFACTURER #	IMPULSE PART NUMBER	DESIGNATION	DESCRIPTION
1	ANSALDO	0074	172	400- AMP, 1 POLE, 800 VDC, HIGH SPEED CIRCUIT BREAKER, 125 VDC CONTROL
1	IMPULSE NC	0050	150/176	DC OVERCURRENT RELAY, 125 VDC CONTROL
1	CANADIAN SHUNT H-5000-50	3257	SH	5000 AMP, 50 mV DC SHUNT
1	CROMPTON 007-05CA-GMCM	3258	AM	10,000 - 0 - 10,000, 100 mV DC AMMETER
1	GE 116B6708G43R53R4 ET-16 W/LED BULB	3259	R	INDICATING LIGHT, 125 VDC, RED, LED
1	ELECTROSWITCH 2442D	2481	O1/CS	CIRCUIT BREAKER CONTROL SWITCH
1	GOULD 60316J	1370		FUSE BLOCK, 30A, 600V, 1 POLE (FOR CLASS J FUSE)
1	CHROMALOX OT-1225	1178	HTR	HEATER STRIP 240V, 250W
1	GOULD A4J10	1368	FC	FUSE, 10 AMP, 600 VOLT, CLASS J
2	SCHRACK MR201024	3262	201C, 201T	RELAY, 24 VDC COIL, DPDT 8-PIN PLUG-IN
7	CUSTOM CONNECTOR OT08	1042		8-PIN PLUG-IN BASE

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BY: CHARLES GARTEN

DC FEEDER BREAKER

QUANTITY	VENDOR AND MANUFACTURER #	IMPULSE PART NUMBER	DESIGNATION	DESCRIPTION
1	FILNOR A-11S	1410	8	KNIFE SWITCH, 125 VDC, 30 AMP, 2 POLE
1	GE 116B6708G43	3261	W	WHITE INDICATING LIGHT LED, 125 VDC
2	GOULD 60317J	1369		FUSE FLOCK, 30 AMP, 600 VOLT, 2 POLE (FOR CLASS J FUSE)
4	GOULD A4J10	1368	FA, FB	FUSE, 10 AMP, 600 VOLT, CLASS J
8	FERRAZ PSI20X127PRE	1400		FUSE HOLDER, 1500V, 1 POLE
6	GOULD A120X10-IL	2589	FF, FG, FH, FI, FJ	FUSE, 10 AMP, 1000 VDC
2	FERRAZ	1402	FD, FE	FUSE, 25 AMP, 100 VDC
1	ELECTROSWITCH 24902B	3306	43	LOCAL/REMOTE SWITCH
2	IN5408 NEWARK	1404	D1, D2	DIODE, 3A, 1000 PIV
2	SCHRACK MR-201110	2852	01XR, 172X	RELAY, DPDT, 110 VDC COIL 8 PIN PLUG-IN
7	BLACKBURN LCN99	1362		COPPER, LUG, LONG BARREL, ½" STUD 1000, mcm, NEMA 2 POLE
1	IMPULSE NC	0002	$\frac{182}{183}$ HV	HIGH VOLTAGE ASSEMBLY OF AUTOMATIC RECLOSER

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BY: CHARLES GARTEN

DC FEEDER BREAKER

QUANTITY	VENDOR AND MANUFACTURER #	IMPULSE PART NUMBER	DESIGNATION	DESCRIPTION
1	IMPULSE NC	0031	$\frac{182}{183}$ LV	LOW VOLTAGE ASSEMBLY OF AUTO. RECT. 125 VDC, DRAWOUT
1	IMPULSE NC	0001	129	LOAD MEASURING RELAY, 30 AMP, 750 VDC, 125 VDC COIL
1	IPC 14094	2707	LIR	LOAD MEASURING RESISTOR
1	P&B PRD-11DHO-110	3407	4	OPEN TYPE RELAY, DPDT, 110 VDC, WITH BLOWOUT MAGNETS
1	IMPULSE NC	1057	LA	DC LIGHTNING ARRESTER
106	IDEC BNH30W	3298		TERMINAL BLOCK, ADD-ON, PHENOLIC
7	IDEC BNE30W	3299		TERMINAL BLOCK END SECTION
14	IDEC BNL6	3300		UNIVERSAL CHANNEL CLAMP
53 IN.	IDEC BNC230	3302		SEE THROUGH COVER
74 IN.	IDEC BAM1000	3301		ALUMINUM MTG. TRACK
1	MICROSWITCH BZ2RW80-A2	1747	33	BREAKER DOOR INTERLOCK SWITCH
2 SQ. FT.	MAR-BAL	1655		GLASTIC SHEET 1/8" THINK, GPO-3 (14"X20")

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BY: CHARLES GARTEN

DC FEEDER BREAKER

QUANTITY	VENDOR AND MANUFACTURER #	IMPULSE PART NUMBER	DESIGNATION	DESCRIPTION
9 SQ. FT.	MAR-BAL	1386		GLASTIC SHEET, ¼" THICK, GPO-3
2 SQ. FT.	MAR-BAL	1388		GLASTIC SHEET, ½" THICK, GPO-3
4	MAR-BAL 3213-S5	1381		2 1/8" HIGH, 2500 VOLT, INSULATOR
1	GE 116B6708G43G53G4 ET-16 W/LED BULB	3260	G	INDICATING LIGHT, 125 VDC, GREEN LED
1	PIEDMONT 116B6708G43	2261		DOOR HANDLE, POLISHED STAINLESS STEEL
1	PIEDMONT 191045031	1050		3-POINT LATCH, ZINC PLATED
2	SOUTHCO 62-10-113-50	2073		LIFT & TURN DOOR HANDLE & LATCH
1	IDEC RR3BUDC110	1939	O1X	RELAY, 3 PDT, 110 VDC COIL, 11 PIN
1	IDEC SR3B02	1940		11 PIN PLUG-IN BASE
1	IMPULSE NC	0083		BREAKER CUBICLE PARTS
1	CROMPTON 016-02AA-LELE	4194		AMMETER 0-2 AMP

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DC FEEDER BREAKER
ACCELERATION GAP

QUANTITY	VENDOR AN MANUFACTURER #	IMPULSE PART NUMBER	DESIGNATION	DESCRIPTION
1	ANSALDO	0074	172	400- AMP, 1 POLE, 800 VDC, HIGH SPEED CIRCUIT BREAKER, 125 VDC CONTROL
1	CANADIAN SHUNT H-5000-50	3257	SH	5000 AMP, 50 mV DC SHUNT
1	CROMPTON 077-05CA-GMCM	3258	AM	10,000 - 0 - 10,000, 100 mV DC AMMETER
1	GE 116B6708G43R53R4 ET-16 W/LED BULB	3259	R	INDICATING LIGHT, 125 VDC, RED, LED
1	ELECTROSWITCH 2442D	2481	O1/CS	CIRCUIT BREAKER CONTROL SWITCH
1	GOULD 60316J	1370		FUSE BLOCK, 30A, 600V, 1 POLE (FOR CLASS J FUSE)
1	CHROMALOX OT-1225	1178	HTR	HEATER STRIP 240V, 250W
1	GOULD A4J10	1368	FC	FUSE, 10 AMP, 600 VOLT, CLASS J
2	SCHRACK MR-201024	3262	201C, 201T	RELAY, 24 VDC COIL, DPDT 8-PIN PLUG-IN
4	CUSTOM CONNECTOR OT08	1042		8-PIN PLUG-IN BASE
1	FILNOR A-11S	1410	8	KNIFE SWITCH, 125 VDC, 30 AMP, 2 POLE

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BY: CHARLES GARTEN

DC FEEDER BREAKER
ACCELERATION GAP

QUANTITY	VENDOR AN MANUFACTURER #	IMPULSE PART NUMBER	DESIGNATION	DESCRIPTION
1	GE 116B6708G43 ET-16 W/LED BULB	3261	W	WHITE INDICATING LIGHT LED, 125 VDC
2	GOULD 60317J	1369		FUSE FLOCK, 30 AMP, 600 VOLT, 2 POLE (FOR CLASS J FUSE)
4	GOULD A4J10	1368	FA, FB	FUSE, 10 AMP, 600 VOLT, CLASS J
7	FERRAZ PSI20X127PRE	1400		FUSE HOLDER, 1500V, 1 POLE
5	GOULD A120X10-IL	2589	FF, FG, FH, FI, FJ	FUSE, 10 AMP, 1000 VDC
2	FERRAZ	1402	FD, FE	FUSE, 25 AMP, 100 VDC
1	ELECTROSWITCH 24902B	3306	43	LOCAL/REMOTE SWITCH
2	IN5408 NEWARK	1404	D1, D2	DIODE, 3A, 1000 PIV
2	SCHRACK MR-201110	2852	01XR, 172X	RELAY, DPDT, 110 VDC COIL 8 PIN PLUG-IN
7	BLACKBURN LCN99	1362		COPPER, LUG, LONG BARREL, ½" STUD 1000, mcm, NEMA 2 POLE
1	IMPULSE NC	0002	$\frac{182}{183}$ HV	HIGH VOLTAGE ASSEMBLY OF AUTOMATIC RECLOSER

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DC FEEDER BREAKER
ACCELERATION GAP

QUANTITY	VENDOR AN MANUFACTURER #	IMPULSE PART NUMBER	DESIGNATION	DESCRIPTION
1	IMPULSE NC	0031	$\frac{182}{183}$ LV	LOW VOLTAGE ASSEMBLY OF AUTO. RECT. 125 VDC, DRAWOUT
1	IMPULSE NC	0001	129	LOAD MEASURING RELAY, 30 AMP, 750 VDC, 125 VDC COIL
1	IPC 14094	2707	LIR	LOAD MEASURING RESISTOR
1	P&B PRD-11DHO-110	3407	4	OPEN TYPE RELAY, DPDT, 110 VDC, WITH BLOWOUT MAGNETS
1	IMPULSE NC	1057	LA	DC LIGHTNING ARRESTER
106	IDEC BNH30W	3298		TERMINAL BLOCK, ADD-ON, PHENOLIC
7	IDEC BNE30W	3299		TERMINAL BLOCK END SECTION
14	IDEC BNL6	3300		UNIVERSAL CHANNEL CLAMP
53 IN.	IDEC BNC230	3302		SEE THROUGH COVER
74 IN.	IDEC BAM1000	3301		ALUMINUM MTG. TRACK
1	MICROSWITCH BZ2RW80-A2	1747	33	BREAKER DOOR INTERLOCK SWITCH
2 SQ. FT.	MAR-BAL	1655		GLASTIC SHEET 1/8" THINK, GPO-3 (14"X20")

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DC FEEDER BREAKER
ACCELERATION GAP

QUANTITY	VENDOR AN MANUFACTURER #	IMPULSE PART NUMBER	DESIGNATION	DESCRIPTION
2 SQ. FT.	MAR-BAL	1388		GLASTIC SHEET, ½" THICK, GPO-3
4	MAR-BAL 3213-S5	1381		2 1/8" HIGH, 2500 VOLT, INSULATOR
1	GE 116B6708G43G53G4 ET-16 W/LED BULB	3260	G	INDICATING LIGHT, 125 VDC, GREEN LED
1	PIEDMONT 116B6708G	2261		DOOR HANDLE, POLISHED STAINLESS STEEL
1	PIEDMONT 191075031	1050		3-POINT LATCH, ZINC PLATED
2	SOUTHCO 62-10-110-50	2073		LIFT & TURN DOOR HANDLE & LATCH
1	IDEC RR3BUDC110	1939	O1X	RELAY, 3 PDT, 110 VDC COIL, 11 PIN
1	IDEC SR3B02	1940		11 PIN PLUG-IN BASE
1	IMPULSE NC	0083		BREAKER CUBICLE PARTS
1	CROMPTON 016-02AA-LELE	4194		AMMETER 0-2 AMP
3	SIEMENS	3612		CUBICLE MOUNTED SECONDARY DISC.

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BY: CHARLES GARTEN

DC FEEDER BREAKER
4000 AMP (GLENMONT YARD SPECIAL)

QUANTITY	VENDOR AND MANUFACTURER #	IMPULSE PART NUMBER	DESIGNATION	DESCRIPTION
1	ANSALDO	0074	172	400- AMP, 1 POLE, 800 VDC, HIGH SPEED CIRCUIT BREAKER, 125 VDC CONTROL
1	CANADIAN SHUNT H-5000-50	3257	SH	5000 AMP, 50 mV DC SHUNT
1	CROMPTON 077-05CA-GMCM	3258	AM	10,000 - 0 - 10,000, 100 mV DC AMMETER
1	GE 116B6708G43R53R4 ET-16 W/LED BULB	3259	R	INDICATING LIGHT, 125 VDC, RED, LED
1	ELECTROSWITCH 2442D	2481	O1/CS	CIRCUIT BREAKER CONTROL SWITCH
1	GOULD 60316J	1370		FUSE BLOCK, 30A, 600V, 1 POLE (FOR CLASS J FUSE)
1	CHROMALOX OT-1225	1178	HTR	HEATER STRIP 240V, 250W
1	GOULD A4L10	1368	FC	FUSE, 10 AMP, 600 VOLT, CLASS J
2	SCHRACK MR-20110	2852	201C, 201T	RELAY, 110 VDC COIL, DPDT 8-PIN PLUG-IN
4	CUSTOM CONNECTOR OT08	1042		8-PIN PLUG-IN BASE
1	FILNOR A011S	1410	8	KNIFE SWITCH, 125 VDC, 30 AMP, 2 POLE

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BY: CHARLES GARTEN

DC FEEDER BREAKER
4000 AMP (GLENMONT YARD SPECIAL)

QUANTITY	VENDOR AND MANUFACTURER #	IMPULSE PART NUMBER	DESIGNATION	DESCRIPTION
1	GE 116B6708G43 ET-16 W/LED BULB	3261	W	WHITE INDICATING LIGHT LED, 125 VDC
2	GOULD 60317J	1369		FUSE FLOCK, 30 AMP, 600 VOLT, 2 POLE (FOR CLASS J FUSE)
4	GOULD A4J10	1368	FA, FB	FUSE, 10 AMP, 600 VOLT, CLASS J
2	FERRAZ PSI20X127PRE	1400		FUSE HOLDER, 1500V, 1 POLE
2	FERRAZ C1000CPRB20X 127/10	1401	FH, FI	FUSE, 10 AMP, 1000 VDC
1	CROMPTON 016-02AA-LELE	4194		AMMETER 0-2 AMP
1	ELECTROSWITCH 24902B	3306 °	43	LOCAL/REMOTE SWITCH
2		1404	D1, D2	DIODE, 3A, 1000 PIV
2	SCHRACK MR-20110	2852	01XR, 172X	RELAY, DPDT, 110 VDC COIL 8 PIN PLUG-IN
7	BLACKBURN LCN99	1362		COPPER, LUG, LONG BARREL, ½" STUD 1000, mcm, NEMA 2 POLE
1	PIEDMONT 116B6708G43	2261		DOOR HANDLE, POLISHED STAINLESS STEEL

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BY: CHARLES GARTEN

DC FEEDER BREAKER
4000 AMP (GLENMONT YARD SPECIAL)

QUANTITY	VENDOR AND MANUFACTURER #	IMPULSE PART NUMBER	DESIGNATION	DESCRIPTION
1	PIEDMONT 191045031	1050		3-POINT LATCH, ZINC PLATED
2	SOUTHCO 62-10-113-50	2703		LIFT & TURN DOOR HANDLE & LATCH
1	IDEC RR3BUDC110	1939	01X	RELAY, 3 PDT, 110 VDC COIL, 11 PIN
1	IDEC SR3B02	1940		11 PIN PLUG-IN BASE
1	IMPULSE NC	1057	LA	DC LIGHTNING ARRESTER
103	IDEC BNH30W	3298		TERMINAL BLOCK, ADD-ON, PHENOLIC
6	IDEC BNE30W	3299		TERMINAL BLOCK END SECTION
14	IDEC BNL6	3300		UNIVERSAL CHANNEL CLAMP
52 IN.	IDEC BNC230	3302		SEE THROUGH COVER
70 IN.	IDEC BAM1000	3301		ALUMINUM MTG. TRACK
1	MICROSWITCH BZ2RW80-A2	1747	33	BREAKER DOOR INTERLOCK SWITCH
2 SQ. FT.	MAR-BAL	1655		GLASTIC SHEET 1/8" THINK, GPO-3 (14"X20")

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BY: CHARLES GARTEN

DC POSITIVE BUS TIE BREAKER 8000 AMP
(GLENMONT YARD SPECIAL)

QUANTITY	VENDOR AND MANUFACTURER #	IMPULSE PART NUMBER	DESIGNATION	DESCRIPTION
1	IMPULSE NC ANSALDO	0073	72BTP	8000 AMP, 1 POLE, 8000 DC, HIGH SPEED CIRCUIT BREAKER, 125 VDC CONTROL
1	IMPULSE NC	0083		BREAKER CUBICLE PARTS
1	CROMPTON 016-02AA-LELE	4194		AMMETER 0-2 AMP
1	SCHRACK	2852	172AX	RELAY, DPDT, 110 VDC COIL
1	GE 116B6708G43R53R4 ET-16 W/LED BULB	3259	R	INDICATING LIGHT, 125 VDC, RED, LED
1	ELECTROSWITCH 2483D	2481	O1/CS	CIRCUIT BREAKER CONTROL SWITCH
1	GOULD 60316J	1370		FUSE BLOCK, 30A, 600V, 1 POLE (FOR CLASS J FUSE)
1	CHROMALOX OT-1225	1178	HTR	HEATER STRIP 240V, 250W
1	GOULD A4J10	1368	FC	FUSE, 10 AMP, 600 VOLT, CLASS J
2	SCHRACK MR-20110	2852	201C, 201T	RELAY, 110 VDC COIL, DPDT 8-PIN PLUG-IN
4	CUSTOM CONNECTOR OT08	1042		8-PIN PLUG-IN BASE

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BY: CHARLES GARTEN

DC POSITIVE BUS TIE BREAKER 8000 AMP
(GLENMONT YARD SPECIAL)

QUANTITY	VENDOR AND MANUFACTURER #	IMPULSE PART NUMBER	DESIGNATION	DESCRIPTION
1	FILNOR A-11S	1410	8	KNIFE SWITCH, 125 VDC, 30 AMP, 2 POLE
1	GE 116B6708G43 ET-16 W/LED BULB	3261	W	WHITE INDICATING LIGHT LED, 125 VDC
2	GOULD 60317J	1369		FUSE FLOCK, 30 AMP, 600 VOLT, 2 POLE (FOR CLASS J FUSE)
4	GOULD A4J10	1368	FA, FB	FUSE, 10 AMP, 600 VOLT, CLASS J
3	FERRAZ PSI20X127PRE	1400		FUSE HOLDER, 1500V, 1 POLE
3	GOULD A120X10-IL	2589	FF, FG, FH, FI, FJ	FUSE, 10 AMP, 1000 VDC
1	ELECTROSWITCH 24902B	3306	43	LOCAL/REMOTE SWITCH
2	IN5408 NEWARK	1404	D1, D2	DIODE, 3A, 1000 PIV
1	SCHRACK MR-20110	2852	01XR, 172X	RELAY, DPDT, 110 VDC COIL 8 PIN PLUG-IN
1	PIEDMONT 116B6708G43	2261		DOOR HANDLE, POLISHED STAINLESS STEEL
1	PIEDMONT 191045031	1050		3-POINT LATCH, ZINC PLATED

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BY: CHARLES GARTEN

DC POSITIVE BUS TIE BREAKER 8000 AMP
(GLENMONT YARD SPECIAL)

QUANTITY	VENDOR AND MANUFACTURER #	IMPULSE PART NUMBER	DESIGNATION	DESCRIPTION
2	SOUTHCO 62-10-113-50	2073		LIFT & TURN DOOR HANDLE & LATCH
1	MICROSWITCH	1747	33	BREAKER DOOR INTERLOCK SWITCH
112	IDEC BNH30W	3298		TERMINAL BLOCK, ADD-ON, PHENOLIC
7	IDEC BNE30W	3299		TERMINAL BLOCK END SECTION
14	IDEC BNL6	3300		UNIVERSAL CHANNEL CLAMP
56 IN.	IDEC BNC230	3302		SEE THROUGH COVER
77 IN.	IDEC BAM1000	3301		ALUMINUM MTG. TRACK
2 SQ. FT.	MAR-BAL	1655		GLASTIC SHEET 1/8" THICK GPO-3 (14"X20")
9 SQ. FT.	MAR-BAL	1386		GLASTIC SHEET, 1/4" THICK GPO-3
2 SQ. FT.	MAR-BAL	1388		GLASTIC SHEET, 1/2" THICK
4	MAR-BAL 3213-S5	1381		2 1/8" HIGH, 2500 VOLT INSULATOR

DC SWITCHGEAR

MODEL NUMBERS, SERIAL NUMBERS AND WMATA UNIT NUMBERS

PAGE 1

LOCATION	MODEL NUMBER	SERIAL NUMBER	BREAKER DESIGNATION	WMATA NUMBER
FRANCONIA/ SPRINGFIELD TIE BREAKER STATION	00026M0I	1068/5-96	TIE BREAKER #1 TIE BREAKER #2 TIE BREAKER #3 TIE BREAKER #4 TIE BREAKER #5	E-J03-61 E-J03-62 E-J03-63 E-J04-64 E-J04-67
GREENLEAF SUBSTATION	00026M0M	1067DC/11-95	CATHODE BREAKER #1 CATHODE BREAKER #2 FEEDER BREAKER #1 FEEDER BREAKER #2 FEEDER BREAKER #3 FEEDER BREAKER #4 FEEDER BREAKER #5 FEEDER BREAKER #6	E-J03-25 E-J03-26 E-J03-51 E-J03-52 E-J03-53 E-J03-54 E-J03-55 E-J03-56
ROSO TIE BREAKER STATION	00026M0R	1065/01-8-95	TIE BREAKER #1 TIE BREAKER #2 TIE BREAKER #3 TIE BREAKER #4 TIE BREAKER #5 TIE BREAKER #6	E-J03-41 E-J03-42 E-J03-43 E-J03-44 E-J03-45 E-J03-46
TILBURY ROAD SUBSTATION	00026M0M	1066DC/10-95	CATHODE BREAKER #1 CATHODE BREAKER #2 FEEDER BREAKER #1 FEEDER BREAKER #2 FEEDER BREAKER #3 FEEDER BREAKER #4 FEEDER BREAKER #5 FEEDER BREAKER #6	E-J03-21 E-J03-22 E-J03-31 E-J03-32 E-J03-33 E-J03-34 E-J03-35 E-J03-36

DC SWITCHGEAR

MODEL NUMBERS, SERIAL NUMBERS AND WMATA UNIT NUMBERS

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LOCATION	MODEL NUMBER	SERIAL NUMBER	BREAKER DESIGNATION	WMATA NUMBER
FARRINGTON AVENUE TIE BREAKER STATION	00026MOS	1064/01-8-95	TIE BREAKER #1 TIE BREAKER #2 TIE BREAKER #3 TIE BREAKER #4 TIE BREAKER #5 TIE BREAKER #6	E-J02-61 E-J02-62 E-J02-63 E-J02-64 E-J02-65 E-J02-66
GLENMONT YARD SUBSTATION	00026M00	1072/DC-10-96	CATHODE BKR #1 (MNL) CATHODE BKR #2 (MNL) CATHODE BKR #3 (YARD) FEEDER BKR #1 (MNL) FEEDER BKR #2 (MNL) FEEDER BKR #3 (YARD) FEEDER BKR #4 (YARD) FEEDER BKR #5 (YARD) FEEDER BKR #6 (YARD) POSITIVE TIE BREAKER NEGATIVE TIE BREAKER	E-B11-21 E-B11-22 E-B98-22 E-B11-81 E-B11-82 E-B98-34 E-B98-34 E-B98-35 E-B98-36 E-B98-09P E-B98-09N
GLENMONT NORTH TIE BREAKER STATION	00026MOP	1069/01-12-96	TIE BREAKER #1 TIE BREAKER #2 TIE BREAKER #3 TIE BREAKER #4	E-B11-61 E-B11-62 E-B11-63 E-B11-64
HENDERSON AVENUE SUBSTATION	00026MOL	1071/DC-10-96	CATHODE BREAKER #1 CATHODE BREAKER # 2 FEEDER BREAKER #1 FEEDER BREAKER #2 FEEDER BREAKER #3 FEEDER BREAKER #4 FEEDER BREAKER #5 FEEDER BREAKER #6	E-B10-21 E-B10-22 E-B10-51 E-B10-52 E-B10-53 E-B10-54 E-B10-55 E-B10-56

DC SWITCHGEAR

**MODEL NUMBERS, SERIAL NUMBERS AND
WMATA UNIT NUMBERS**

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LOCATION	MODEL NUMBER	SERIAL NUMBER	BREAKER DESIGNATION	WMATA NUMBER
GLENMONT SOUTH TIE BREAKER STATION	00026MOQ	1070/01-12-96	TIE BREAKER #1	E-B11-41
			TIE BREAKER #2	E-B11-42
			TIE BREAKER #3	E-B11-43
			TIE BREAKER #4	E-B11-44
			TIE BREAKER #5	E-B11-45
			TIE BREAKER #6	E-B11-46

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BY: CHARLES GARTEN

DC MAIN CATHODE BREAKER 72-1

QUANTITY	VENDOR AND MANUFACTURER #	IMPULSE PART NUMBER	DESIGNATION	DESCRIPTION
1	ANSALDO	0072	72	8000 AMP, 1 POLE, 800 VDC, HIGH SPEED CIRCUIT BREAKER, 125 VDC CONTROL, WITH REVERSE CURRENT (DEVICE 32)
1	CANADIAN SHUNT H-15000-100	3272	SH	SHUNT, 15,000 AMP, 100 mV
1	CROMPTON 077-05AA-GBCM	3273	AM	15,000 AMP, 100 mV DC AMMETER
1	ELECTROSWITCH 2438D	3305	01/CS	CIRCUIT BREAKER CONTROL SWITCH
1	FILNOR A-11S	1410	8	KNIFE SWITCH, 125 VDC, 30 AMP, 2 POLE
1	CHROMALOX OT-1225	1178	HTR	HEATER, STRIP, 240 VOLT, 250 WATT
1	DAYTON GRAINGER # 2E173	1377	TH	THERMOSTAT, HEATER, 40°F - 80°F
1	IMPULSE NC	0052	CT	CURRENT TRANSDUCER, DC - 100mV TO +100 mV INPUT, SCALE FACTOR 0 TO ± 50 mV = 0 TO ± 1 ma
1	IMPULSE NC	0051	64D/64Y	HIGH RESISTANCE GROUNDED/HOT STRUCTURE RELAY
1	ELECTROSWITCH 7805D	3274	86	LOCKOUT RELAY, 20 CONTACTS 10 N.O. & 10 N.C. CONTACTS 125 VDC COIL
4	CUSTOM CONNECTOR OT08	1042		8 PIN PLUG-IN BASE
1	CROMPTON 016-02AA-LELE	4194	A	HEATER AMMETER, PANEL TYPE 0-2 AMP AC AMMETER SELF-CONTAINED

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DC MAIN CATHODE BREAKER 72-1

QUANTITY	VENDOR AND MANUFACTURER #	IMPULSE PART NUMBER	DESIGNATION	DESCRIPTION
1	GOULD 60316J	1370		FUSE HOLDER, 30 AMP, 600 VOLT, 1 POLE (FOR CLASS J FUSE)
5	GOULD A4J10	1368	FA, FB, FC	FUSE, 10A, 600 VOLT, CLASS J
2	GOULD 60317J	1369		FUSE HOLDER, 30 AMP, 600 VOLT, 2 POLE (FOR CLASS J FUSE)
2	FERRAZ PSI20X127PRE	1400		FUSE HOLDER, 1500 VDC, 1 POLE
2	GOULD A120X10-IL	2589		FUSE, 10 AMP, 1000 VDC, W/O TRIP INDICATOR
4	SCHRACK MR-201110	2852	GFX, 01X, 01XB, 72AX	RELAY, DPDT, 110 VDC COIL, 8 PIN PLUG-IN
1	ABB SPECIAL	3279	K	KIRK KEY INTERLOCK, SPECIAL, FOR ANSALDO BREAKER, KEYED LIKE KNIFE SWITCH IN RECTIFIER, KEYED LIKE P/N 3278
133	IDEC BNH30W	3298		TERMINAL BLOCK, PHENOLIC, ADD-ON
8	IDEC BNE30W	3299	8	TERMINAL BLOCK END SECTION
16	IDEC BNL6	3300		UNIVERSAL CHANNEL CLAMP
64 IN.	IDEC BNC230	3202		SEE THROUGH COVER

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DC MAIN CATHODE BREAKER 72-1

QUANTITY	VENDOR AND MANUFACTURER #	IMPULSE PART NUMBER	DESIGNATION	DESCRIPTION
88 IN.	IDEC BAM1000	3301		ALUMINUM MTG. TRACK
1	ELECTROSWITCH 24902B	3306		MANUAL/AUTO SELECTOR SWITCH
1	MICROSWITCH BZ2RW80-A2	1747	33	BREAKER DOOR INTERLOCK SWITCH
4	MAR-BAL 3213-S5	1381		STANDOFF INSULATOR 2500 VOLT, 2 1/8" HIGH
1	GE 116B6708G43R53R4 ET-16 W/LRD BULB	3259	R	INDICATING LIGHT, 125 VDC, RED, LED
2	GE 116B6708G43G53G4 ET-16 W/LED BULB	3260	G, G2	GREEN INDICATING LIGHT, 125 VDC, LED, "OPEN" & "LOCKOUT RESET"
1	PIEDMONT 320056558	2261		DOOR HANDLE, POLISHED STAINLESS STEEL
1	PIEDMONT 192045031	1050		3-POINT DOOR LATCH, ZINC PLATED
2	SOUTHCO 62-10-113-50	2073		LIFT & TURN DOOR HANDLE & LATCH
1	IMPULSE NC	0077	32	REVERSE CURRENT FOR ANSALDO/BREAKER 500-2000 AMP
1	IMPULSE NC	0083		BREAKER CUBICLE PARTS

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BY: CHARLES GARTEN

DC MAIN CATHODE BREAKER 72-2

QUANTITY	VENDOR AND MANUFACTURER #	IMPULSE PART NUMBER	DESIGNATION	DESCRIPTION
1	ANSALDO	0072	72	8000 AMP, 1 POLE, 800 VDC, HIGH SPEED CIRCUIT BREAKER, 125 VDC CONTROL, WITH REVERSE CURRENT (DEVICE 32)
1	CANADIAN SHUNT H-20000-100	3282	SH	SHUNT, 20,000 AMP, 100 mV
1	CROMPTON 077-05AA-GBCM	3283	AM	20,000 AMP, 100 mV DC AMMETER
1	ELECTROSWITCH 2438D	3305	01/CS	CIRCUIT BREAKER CONTROL SWITCH
1	FILNOR A-11S	1410	8	KNIFE SWITCH, 125 VDC, 30 AMP, 2 POLE
1	CHROMALOX OT-1225	1178	HTR	HEATER, STRIP, 240 VOLT, 250 WATT
1	IMPULSE NC	0052	CT	CURRENT TRANSDUCER, DC - 100mV TO +100 mV INPUT, SCALE FACTOR 0 TO ± 50 mV = 0 TO ± 1 ma
1	IMPULSE NC	0053	WT	WATT TRANSDUCER, DC
1	IMPULSE NC	0054	VT	VOLTAGE TRANSDUCER, DC, 0-1000 VDC INPUT, 0-1ma OUTPUT
1	CROMPTON 016-02AA-LELE	4194	A	HEATER AMMETER, PANEL TYPE 0-2 AMP AC AMMETER SELF-CONTAINED
3	CUSTOM CONNECTOR OT08	1042		8 PIN PLUG-IN BASE
1	ELECTROSWITCH 24902B	3306		MANUAL/AUTO SELECTOR SWITCH

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BY: CHARLES GARTEN

DC MAIN CATHODE BREAKER 72-2

QUANTITY	VENDOR AND MANUFACTURER #	IMPULSE PART NUMBER	DESIGNATION	DESCRIPTION
1	GOULD 603316J	1370		FUSE HOLDER, 30 MAP, 600 VOLT, 1 POLE, (FOR CLASS J FUSE)
5	GOULD A4J10	1368	FA, FB, FC	FUSE, 10A, 600 VOLT, CLASS J
2	GOULD 60317J	1369		FUSE HOLDER, 30 AMP, 600 VOLT, 2 POLE (FOR CLASS J FUSE)
4	FERRAZ PSI20X127PRE	1400		FUSE HOLDER, 1500 VDC, 1 POLE
4	GOULD A120X10-IL	2589		FUSE, 10 AMP, 1000 VDC, W/O TRIP INDICATOR
1	IN5408 NEWARK	1404	D5	DIODE, 3A, 1000 PIV
3	SCHRACK MR-201110	2852	GFX, 01X, 01XB, 72AX	RELAY, DPDT, 110 VDC COIL, 8 PIN PLUG-IN
1	ABB SPECIAL	3287	K	KIRK KEY INTERLOCK, SPECIAL, FOR ANSALDO BREAKER, KEYED LIKE KNIFE SWITCH IN RECTIFIER
93	IDEC BNH30W	3298		TERMINAL BLOCK, PHENOLIC, ADD-ON
7	IDEC BNE30W	3299	8	TERMINAL BLOCK END SECTION
14	IDEC BNL6	3300		UNIVERSAL CHANNEL CLAMP
47 IN.	IDEC BNC230	3202		SEE THROUGH COVER

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DC MAIN CATHODE BREAKER 72-2

QUANTITY	VENDOR AND MANUFACTURER #	IMPULSE PART NUMBER	DESIGNATION	DESCRIPTION
68 IN.	IDEC BAM1000	3301		ALUMINUM MTG. TRACK
1	GE 116B6708G43G53G4 ET-16 W/LED BULB	3260	G	LAMP, INDICATING, 125 VDC, GREEN LED
1	MICROSWITCH BZ2RW80-A2	1747	33	BREAKER DOOR INTERLOCK SWITCH
4	MAR-BAL 3213-S5	1381		STANDOFF INSULATOR 2500 VOLT, 2 1/8" HIGH
1	GE 116B6708G43R53R4 ET-16 W/LRD BULB	3259	R	INDICATING LIGHT, 125 VDC, RED, LED
1	CROMPTON 077-05VA-SNSN	3271	V	VOLTMETER, 0-800 VDC SWITCHBOARD
1	PIEDMONT 320056558	2261		DOOR HANDLE, POLISHED STAINLESS STEEL
1	PIEDMONT 191045031	1050		3-POINT DOOR LATCH, ZINC PLATED
2	SOUTHCO 62-10-113-50	2073		LIFT & TURN DOOR HANDLE & LATCH
1	IMPULSE NC	0077	32	REVERSE CURRENT FOR ANSALDO/BREAKER 500-2000 AMP
1	IMPULSE NC	0083		BREAKER CUBICLE PARTS

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BY: CHARLES GARTEN

DC MAIN CATHODE BREAKER 72-3

QUANTITY	VENDOR AND MANUFACTURER #	IMPULSE PART NUMBER	DESIGNATION	DESCRIPTION
1	ANSALDO	0072	72	8000 AMP, 1 POLE, 800 VDC, HIGH SPEED CIRCUIT BREAKER, 125 VDC CONTROL, WITH REVERSE CURRENT (DEVICE 32)
1	CANADIAN SHUNT H-15000-100	3272	SH	SHUNT, 15,000 AMP, 100 mV
1	CROMPTON 007-05AA-GBCM	3273	AM	15,000 AMP, 100 mV DC AMMETER
1	ELECTROSWITCH 2438D	3305	01/CS	CIRCUIT BREAKER CONTROL SWITCH
1	FILNOR A-11S	1410	8	KNIFE SWITCH, 125 VDC, 30 AMP, 2 POLE
1	CHROMALOX OT1225	1178	HTR	HEATER, STRIP, 240 VOLT, 250 WATT
1	IMPULSE NC	0052	CT	CURRENT TRANSDUCER, DC - 100mV TO +100 mV INPUT, SCALE FACTOR 0 TO ± 50 mV = 0 TO ± 1 ma
1	IMPULSE NC	0053	WT	WATT TRANSDUCER, DC
1	IMPULSE NC	0054	VT	VOLTAGE TRANSDUCER, DC, 0-1000 VDC INPUT, 0-1ma OUTPUT
1	CROMPTON 016-02AA-LELE	4194	A	HEATER AMMETER, PANEL TYPE 0-2 AMP AC AMMETER SELF-CONTAINED
3	CUSTOM CONNECTOR OT08	1042		8 PIN PLUG-IN BASE
1	ELECTROSWITCH 24902B	3306		MANUAL/AUTO SELECTOR SWITCH

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DC MAIN CATHODE BREAKER 72-3

QUANTITY	VENDOR AND MANUFACTURER #	IMPULSE PART NUMBER	DESIGNATION	DESCRIPTION
1	GOULD 60316J	1370		FUSE HOLDER, 30 MAP, 600 VOLT, 1 POLE, (FOR CLASS J FUSE)
5	GOULD A4J10	1368	FA, FB, FC	FUSE, 10A, 600 VOLT, CLASS J
2	GOULD 60317J	1369		FUSE HOLDER, 30 AMP, 600 VOLT, 2 POLE (FOR CLASS J FUSE)
3	FERRAZ PSI20X127PRE	1400		FUSE HOLDER, 1500 VDC, 1 POLE
3	GOULD A120X10-IL	2589		FUSE, 10 AMP, 1000 VDC, W/O TRIP INDICATOR
3	SCHRACK MR-201110	2852	GFX, 01X, 01XB, 72AX	RELAY, DPDT, 110 VDC COIL, 8 PIN PLUG-IN
1	ABB SPECIAL	3286	K	KIRK KEY INTERLOCK, SPECIAL, FOR ANSALDO BREAKER, KEYED LIKE KNIFE SWITCH IN RECTIFIER
93	IDEC BNH30W	3298		TERMINAL BLOCK, PHENOLIC, ADD-ON
7	IDEC BNE30W	3299	8	TERMINAL BLOCK END SECTION
14	IDEC BNL6	3300		UNIVERSAL CHANNEL CLAMP
47 IN.	IDEC BNC230	3202		SEE THROUGH COVER
68 IN.	IDECBAM1000	3301		ALUMINUM MTG. TRACK

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BY: CHARLES GARTEN

DC MAIN CATHODE BREAKER 72-3

QUANTITY	VENDOR AND MANUFACTURER #	IMPULSE PART NUMBER	DESIGNATION	DESCRIPTION
1	GE 116B6708G43G53G4 ET-16 W/LRD BULB	3260	G	LAMP, INDICATING, 125 VDC, GREEN LED
1	MICROSWITCH BZ2RW80-A2	1747	33	BREAKER DOOR INTERLOCK SWITCH
4	MAR-BAL 3213-S5	1381		STANDOFF INSULATOR 2500 VOLT, 2 1/8" HIGH
1	GE 116B6708G43R53R4 ET-16 W/LRD BULB	3259	R	INDICATING LIGHT, 125 VDC, RED, LED
1	PIEDMONT 320056558	2261		DOOR HANDLE, POLISHED STAINLESS STEEL
1	PIEDMONT 191045031	1050		3-POINT DOOR LATCH, ZINC PLATED
2	SOUTHCO 62-10-113-50	2073		LIFT & TURN DOOR HANDLE & LATCH
1	IMPULSE NC	0077	32	REVERSE CURRENT FOR ANSALDO/BREAKER 500-2000 AMP
1	IMPULSE NC	0083		BREAKER CUBICLE PARTS
3	SIEMENS	3612		CUBICLE MOUNTED SECONDARY DISC.

INSTRUCTION MANUALS FOR
750 VOLT DC METAL ENCLOSED SWITCHGEAR

FOR

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

FRANCONIA/SPRINGFIELD TIE BREAKER STATION
GREEN LEAF SUBSTATION
ROSO TIE BREAKER STATION
FARRINGTON AVENUE TIE BREAKER STATION
GLENMONT YARD SUBSTATION
GLENMONT NORTH SUBSTATION
HENDERSON AVENUE SUBSTATION
GLENMONT SOUTH SUBSTATION

WMATA CONTRACT NUMBER. 2Z7042
SSE-12

INSTRUCTION MANUALS

<u>DESCRIPTION</u>	<u>MANUFACTURER</u>	<u>PUBLICATION</u>	<u>TAB</u>
DESCRIPTION OF OPERATION	IMPulse NC	---	1
4000 AMPERE AND 8000 AMPERE DC CIRCUIT BREAKERS	ANSALDO	---	2
SHUNT	CANADIAN SHUNT	CATALOG 9401	3
DC AMMETERS DC VOLTMETERS	CROMPTON	US701 ECI and SWITCHBOARD INSTRUMENTS CATALOG	4
HIGH RESISTANCE GROUND RELAY	IMPulse NC	---	5
LOCKOUT RELAY	ELECTROSWITCH	CATALOG CUT	6
INDICATING LIGHT	GE	CATALOG GEP-1100M PAGE 20-12	7
OVERCURRENT RELAY	IMPulse NC	---	8
CURRENT, VOLTAGE, AND WATT TRANSDUCERS	IMPulse NC	---	9
LOAD MEASURING RELAY	IMPulse NC	---	10
AUXILIARY RELAYS	SCHRACK	CATALOG CUT	11
LOAD MEASURE RESISTOR	IPC	DRAWING NO. 14094	12
THERMOSTAT	DAYTON	CATALOG PG. 1472	13

<u>DESCRIPTION</u>	<u>MANUFACTURER</u>	<u>PUBLICATION</u>	<u>TAB</u>
HEATER STRIP	CHROMALOX	CATALOG CUT PG. 26 AND 3001-INSTALLATION INSTRUCTIONS	14
AUTOMATIC RECLOSING	IMPulse NC	---	15

DESCRIPTION OF OPERATION

CONTRACT 2Z7042

IMPulse NC, Inc.
1229 N. Breazeale Avenue
P.O. Box 232
Mount Olive, North Carolina 28365
919-658-2200

DC CATHODE CIRCUIT BREAKER 72-1

CLOSE/OPEN - AUTOMATIC OPERATION

With the control power (125 VDC) energized, the AC switchgear and DC switchgear lockout relays (Devices 86A and 86D) reset, the 52R1 and the 72-1 breakers in the connected and open position, and the auto/manual control switch in the "auto" position, turn the control switch (CS - Device 01) of the 52R1 breaker to the "close" position. When breaker 52R1 closes, its contact (wired to CC-3 and 4 in the 72-1 control circuit) closes. The 125 VDC control power in the 72-1 control circuit flows through the contacts of 43A, 86A, 86D, 52R (of breaker 52R1), and 33R and will energize 01X. Contact 6-8 of 01X will close and energize the closing coil of the breaker between terminals SD3 and SD5. When the breaker closes, the green open light will become de-energized, and the red closed light will become energized.

To open breaker 72-1, open breaker 52R1 by turning its control switch (CS - Device 01) to the trip position. The contact of 52R1 (wired to CC-6 and 7 in the 72-1 control circuit) closes. The 125 VDC control power then flows through contacts 43A, and 52R and will energize the breaker shunt trip device between terminals SD4 and SD5.

The door interlock switches of the rectifier will also trip and prevent closing of the cathode breaker by way of contact 33R located in the close and trip circuits of the DC breaker.

The trip circuit of the DC breaker can also become energized by the AC lockout relay (Device 86A) associated with breaker 52R, the DC switchgear lockout relay (Device 86D), the reverse current detector (Device 32) which is mounted on the DC breaker input bus and the DC breaker door interlock switch.

The DC switchgear lockout relay (Device 86) is a protective device used to trip all the DC breakers in the event the DC switchgear frame should become energized. This energized condition is detected by the grounded/energized structure relay (Device 64D/64Y).

Visual indications associated with this breaker are:

- 1) Green light "G" - The breaker is in the "open" condition.
- 2) Red light "R" - The breaker is in the "closed" condition.
- 3) Green light "G1" - The DC lockout relay is reset.
- 4) Amber light "A" - The DC lockout relay is tripped.

CLOSE/OPEN - MANUAL OPERATION

With the control power (125 VDC) energized, the AC switchgear and DC switchgear lockout relays (Devices 86A and 86D) reset, the 52R1 and the 72-1 breakers in the connected and open position, and the auto/manual control switch in the "manual" position, turn the control switch (CS - Device 01) of the 72-1 breaker to the "close" position. The 125 VDC control power in the 72-1 control circuit flows through the contacts of 43M, and 01 and will energize 01X. Contact 6-8 of 01X will close and energize the closing coil of the breaker between terminals SD3 and SD2. When the breaker closes, the green open light will become de-energized, and the red closed light will become energized.

To open breaker 72-1, turn the control switch of breaker 72-1 to the "trip" position. The 125 VDC will flow through the contact of 01, through diode D5, and through the contact of 43M. This also will energize the breaker shunt trip device between terminals SD4 and SD5.

The control circuit for the door interlock switches, lockout relays 86A and 86D as described in the "Automatic Operation" also work when the switch is in the "Manual Operation" mode.

CLOSE/OPEN - TEST POSITION

With the breaker in the test position, and open, turn the control switch (Device 01) to the close position and hold it there until the breaker closes. Power will flow through SDT-6, 01 and 33R and will energize 01X. Contact 6-8 of 01X will close and will energize the closing coil of, the breaker terminals SDT-3 and SDT-2. Since the circuit breaker is in the test position and there is no control power wired to terminals 15 and 16 on the test secondary disconnect, there is no voltage applied to the coil of 72aX thus preventing any status change from being sent to central control.

To open the breaker, turn the control switch (Device 01) to the trip position. Power now flows through 01 , through the trip coil (between SDT-4 and SDT-5) of the breaker, and the breaker will open.

When the breaker is in the connected position, central control can monitor the condition of the breaker (open or closed) by the contacts between CC-16-13 and CC-14-15. The contacts between CC-16 and 13 give central the indication that the breaker is either open or in the disconnected position. The contacts between CC-14 and 15 give central the indication that the breaker is in the connected and closed position.

DC CATHODE CIRCUIT BREAKER 72-2 and 72-3

The local and remote close and open circuitry of breakers 72-2 and 72-3 are identical to breaker 72-1. The local indicating lights and the operation of the indications for central control are also the same. Breakers 72-2 and 72-3 are not equipped with the lockout relay (Device 86D) or the grounded/energized structure relay (Device 64D/64Y) that is described in breaker 72-1 since only one each of these devices is required per DC switchgear line-up.

POSITIVE AND NEGATIVE BUS TIE BREAKERS

CLOSE/OPEN - LOCAL OPERATION

With the control power (125 VDC) energized, the positive and negative bus tie breakers in the connected and open position, and the local/remote switch (Device 43) of both breakers in the local position, turn the control switch on the negative bus tie breaker to the close position. The 125 VDC control power will flow through the contacts of O1, 43L, and, 72BTP/b and energize O1X. Control 6-8 of O1X will close and energize the closing coil of the negative bus tie breaker. One of the auxiliary contacts of the 72BTN breaker now closes in the close circuit of 72BTP breaker which will allow 72BTP to close if given the appropriate signal. This interlock scheme ensures that the negative bus tie breaker is closed prior to closing the positive bus tie breaker. To trip the breakers, a trip signal must be given to the positive bus tie breaker first. The 125 VDC control power will flow through O1 and 43L, and energize the trip coil of the positive bus tie breaker (72BTP). When 72BTP opens, its auxiliary contact in the trip circuit of the negative bus tie breaker (72BTN) closes and will allow you to now trip the 72BTN breaker if you give it a trip signal.

CLOSE/OPEN - REMOTE OPERATION

With the control power (125 VDC) energized, the positive and negative bus tie breakers in the connected and open position, and the local/remote switch (Device 43) of both breakers in the remote position, central control initiates one (1) close signal. This allows 24 VDC to flow through the contacts of 43 and energize the coil of relay 201C. The contacts of 201C are in the close circuit of the negative bus tie breaker. The contacts of 201C will close, and 125 VDC will flow through 201C and 72BTP/b and energize O1X. Contact 6-8 of O1X will close and energize the closing coil of the negative bus tie breaker (72BTN). An auxiliary contact from 72BTN will close in the close circuit of the positive bus tie breaker (72BTP), and 125 VDC will flow through 43R, 86D, 72BTN/a, 72BTP/TOC and will energize O1X. Contact 6-8 of O1X will close and energize the closing coil of breaker 72BTP. To trip the breaker, central control initiates a trip signal which allows 24 VDC to flow through 43 and energize the coil of 201T. The contact of 201T will close, and 125 VDC will flow through 201T and energize the trip coil of the positive bus tie breaker. When the positive bus tie breaker trips, its auxiliary contact will close and the time delay relay TDC will become energized. Three (3) seconds later the contacts of TDC change state in the trip circuit of the negative bus tie breaker 72BTN. When this contact closes, 125 VDC will flow through TDC and will energize the trip

circuit of breaker 72BTN. This time delay feature has been included in the event that central initiated a trip signal at the same time a positive to negative fault occurred. This would allow the positive bus tie breaker to trip and would ensure that the negative bus tie breaker would not be trying to interrupt any fault current. This also ensures that the negative rail in the shop does not float up to about 1000 VDC during this interrupt cycle which would be a safety hazard to the personnel in the shop.

TYPICAL DC FEEDER BREAKER 172

CLOSE/OPEN - LOCAL OPERATION

With the control power (125 VDC) energized, the local/remote switch (Device 43) in the local position, the lockout relay (Device 86) on breaker 72-1 reset, and the breaker in the connected and open position, turn the control switch (CS - Device 01) to the "close" position. Its contact 16-17 closes. The 125 VDC control power will flow through contacts 43, 01, 86D, 01XR, 48, 201T, and 69 and energize relay 01X. Relay 01X contact 1-3 will close and seal in this circuit. With the breaker open, the R172b contact will be closed. The 125 VDC control power now flows through the contacts of 172b and 01X to energize the low voltage section of the automatic recloser (Device 182/183LV). The automatic recloser energizes the isolation relay (Device 4) and looks at the voltage on the output bus of the DC breaker. If this voltage is above 500 volts, the recloser circuitry considers this a good condition and energizes the closing relay (Device 172X). Contacts 1-3 of the closing relay (Device 172X) change state and energize the closing coil of the breaker between terminals SD3 and SD2. When the breaker closes, the green open light becomes de-energized, and the red closed light becomes energized.

When the isolation contactor (Device 4) closed, if the voltage had been less than 500 volts, the load measuring part of the circuit would have looked at the condition of the breaker load bus. This would have been done as follows: The load measuring circuit stores the voltage level (if any) on the output bus of the breaker. The load measuring isolation relay (Device 129) then closes and allows 750 volts to flow through fuse FD, contact 129, resistor LMR, and through fuse FE to the breaker output bus. The load measuring circuit now records the voltage on the output bus of the breaker and subtracts the voltage that was previously recorded. If this difference is greater than 21 volts, the load measuring circuit interprets this as a good condition and energizes the closing relay (Device 172X). The breaker now closes as previously described. The 21 volt value was calculated as follows using an 800 ampere dead load pick-up as discussed with WMATA:

$$\begin{aligned} 750 \text{ volts DC} / 32.9 \text{ ohms (load measuring resistor)} &= 22.796 \text{ amps} \\ 750 \text{ volts DC} / 800 \text{ amperes (dead load pick-up)} &= 0.938 \text{ ohms} \\ 22.796 \text{ amperes} \times 0.938 \text{ ohms} &= 21.383 \text{ volts} \end{aligned}$$

To open the breaker, turn the control switch (CS - Device 01) to the "trip" position. Its contacts 22-23 and 11-12 opens and interrupts 125 VDC control power flowing through the breaker holding coil and deenergizes 01XR. The contact 1-3 of 01XR changes state and de-energizes relay 01X thus preventing automatic reclosing.

Once the breaker has been closed by the automatic recloser circuit, it must stay closed for one (1) minute to be considered successful. If it opens within this one (1) minute period, the recloser circuit considers this as abnormal condition and will go to the lockout condition. A close signal must be given to the breaker to have it initiate another close cycle. The recloser circuitry will attempt reclosing four times, if necessary, prior to recloser lock out. These four attempts are part of the internal timing circuit which will lock out the recloser circuit if the breaker does not close.

Once the breaker has successfully closed, if it should open for any reason other than the control switch, central control, the ETS system, or the breaker door interlock switch, the automatic recloser will start the reclosing cycle again since relay 01X has remained energized.

The DC breaker can also be tripped by the following devices:

- 1) 86DC - The DC switchgear lockout relay.
- 2) 176 - This is actually a 150/176 device; the rate of rise/DC overcurrent relay.
- 3) ETS - The track located emergency trip switch energizes this circuit.
- 4) 201T - Remote (central control) trip relay.
- 5) 51BX - Auxiliary to 51B. 51B is the phase overcurrent relay, on AC breaker 52R, which protects the system from faults above the 450% full load level.

Of the above trip devices, only 150/176 and 51BX allow the DC breaker to reclose.

When the breaker is in the connected position, central control can monitor the condition of the breaker (open or closed) by the contacts between CC-12-13 and CC-14-15. The contacts between CC-12 and 13 give central the indication that the breaker is either open or in the disconnected position. The contacts between CC-14 and 15 give central the indication that the breaker is in the connected and closed position.

Visual indications associated with this breaker are:

- 1) White light "W" - The breaker is on "local" control.
- 2) Green light "G" - The breaker is in the "open" condition.
- 3) Red light "R" - The breaker is in the "closed" condition.

The control circuit will prevent reclosing and disconnect the recloser from the 750 VDC bus when the breaker is tripped manually including from ETS circuit, tripping from OCCB, and tripping from local control switch.

CLOSE/OPEN - TEST POSITION

With the breaker in the test position, turn the control switch (Device 01) to the "close" position and hold the switch in the close position until the breaker cycles and closes. Power will flow through 43, 01 and SDT-3 the closing coil (between SDT-3 and SDT-2) of the breaker, and the breaker will close. Since the circuit breaker is in the test position, relay 172aX does not become energized. This prevents any status changes from being sent to central control.

To open the breaker, turn the control switch (Device 01) to the "trip" position. Power is now interrupted from flowing through the breaker holding coil, and the breaker will open.

CLOSE/OPEN - REMOTE OPERATION

With the control power (125 VDC) energized, the local/remote switch (Device 43) in the remote position, the lockout relay (Device 86) reset, and the breaker in the connected and open position, central control initiates a close signal to the breaker. This allows 24 VDC power to flow through the contacts of 43 and energizes relay 201C. The contact 1-3 of 201C changes state, and 125 VDC control power will flow through contacts 201C, 86D, 01XR, 48, 201T, and 69 and energize relay 01X. Contact 1-3 will close and seal in this circuit. With the breaker open, the R172b contact will be closed. The 125 VDC control power now flows through the contacts of R172b and 01X to energize the low voltage section of the automatic recloser (Device 182/183LV). The automatic recloser will now operate as described in the local operation.

To open the breaker, central control initiates a trip command, and 24 VDC power flows through the contact 5-5C of 43 and energizes relay 201T. Its contacts 1-4 and 5-8 change state. Contact 1-4 opens and 125 VDC control power is interrupted from flowing through the breaker holding coil and the breaker will open. The red closed light becomes de-energized, and the green open light becomes energized. Contact 5-8 of 201T opened and de-energized relay 01X, thus preventing automatic reclosing.

ACCELERATION GAP FEEDER BREAKER 172

The acceleration gap feeder breaker operates like the typical feeder breaker in the close, open, local, and remote modes except it is interlocked with two (2) adjacent section feeder breakers in its open and close circuit.

These interlocks operate as follows:

Close operation - once the gap breaker has been given a close signal, its 125 VDC control circuit will not energize the automatic recloser low voltage circuitry (Device 182/183LV) until both appropriate feeder breakers associated with the gap breaker have closed. After this has taken place, the recloser circuit operates like the typical feeder recloser circuit.

Open operation - a set of contacts from two (2) appropriate feeder breakers in series in the trip circuit of the gap breaker. If either of these breakers open for any reason, the gap breaker also opens. It will remain open until both the appropriate feeder breakers have closed before it attempts to reclose.

Automatic reclosure of acceleration gap feeder breakers occurs only if adjacent section feeder breakers are closed.

**DC FEEDER BREAKER 172-3, 4, 5, and 6
GLENMONT YARD TPS**

CLOSE/OPEN - LOCAL OPERATION

With the control power (125 VDC) energized, the local/remote switch (Device 43) in the local position, the lockout relay (Device 86) on breaker 72-1 reset, and the breaker in the connected and open position, turn the control switch (CS - Device 01) to the "close" position. The 125 VDC control power will flow through contacts 01, 43L, 86D, 01XR, and 201T and energize relay 01X. Relay 01X contact 6-7 will close and seal in this circuit. The 125 VDC control power flows through the contacts 1-3 of 01X and energizes the closing coil of the breaker between terminals SD-3, and SD-2. When the breaker closes, the green open light becomes de-energized, and the red closed light becomes energized.

To open the breaker, turn the control switch (CS - Device 01) to the trip position. Its contact opens and interrupts the 125 VDC control power flowing through breaker the holding coil and the breaker opens. Relay 01XR is also deenergized which resets the closing circuit of the breaker by deenergizing relay 01X.

Once the breaker has closed, if it should open for any reason, it must be closed either locally or remotely from the Glenmont Yard Control Room.

The DC breaker can be tripped by the following devices:

- 1) 86DC - The DC switchgear lockout relay.
- 2) ETS - The track located emergency trip switch energizes this circuit.
- 3) 201T - Remote (tower control) trip relay.
- 4) 51BX - Auxiliary to 51B. 51B is the phase overcurrent relay, on AC breaker 52R, which protects the system from faults above the 450% full load level.
- 5) 01/CS - Control switch.

When the breaker is in the connected position, the yard control room can monitor the condition of the breaker (open or closed) by the contacts between CC-12-13 and CC-14-15. The contacts between CC-12 and 13 give central the indication that the breaker is either open or in the disconnected position. The contacts between CC-14 and 15 give central the indication that the breaker is in the connected and closed position.

Visual indications associated with this breaker are:

- 1) White light "W" - The breaker is on "local" control.
- 2) Green light "G" - The breaker is in the "open" condition.
- 3) Red light "R" - The breaker is in the "closed" condition.

CLOSE/OPEN - TEST POSITION

With the breaker in the test position, TOC 3-4 is closed, and TOC 1-2 and TOC 5-6 are open. To close the breaker, turn the control switch (Device 01) to the "close" position. Power will flow through 43L, 01, SDT-3 and energizes relay the closing coil (between SDT-3 and SDT-2) of the breaker, and the breaker will close. Since the circuit breaker is in the test position, relay 172aX does not become energized. This prevents any status changes from being sent to the yard control room.

To open the breaker, turn the control switch (Device 01) to the trip position. Power is interrupted from flowing through the breaker holding coil and the breaker will open.

CLOSE/OPEN - REMOTE OPERATION

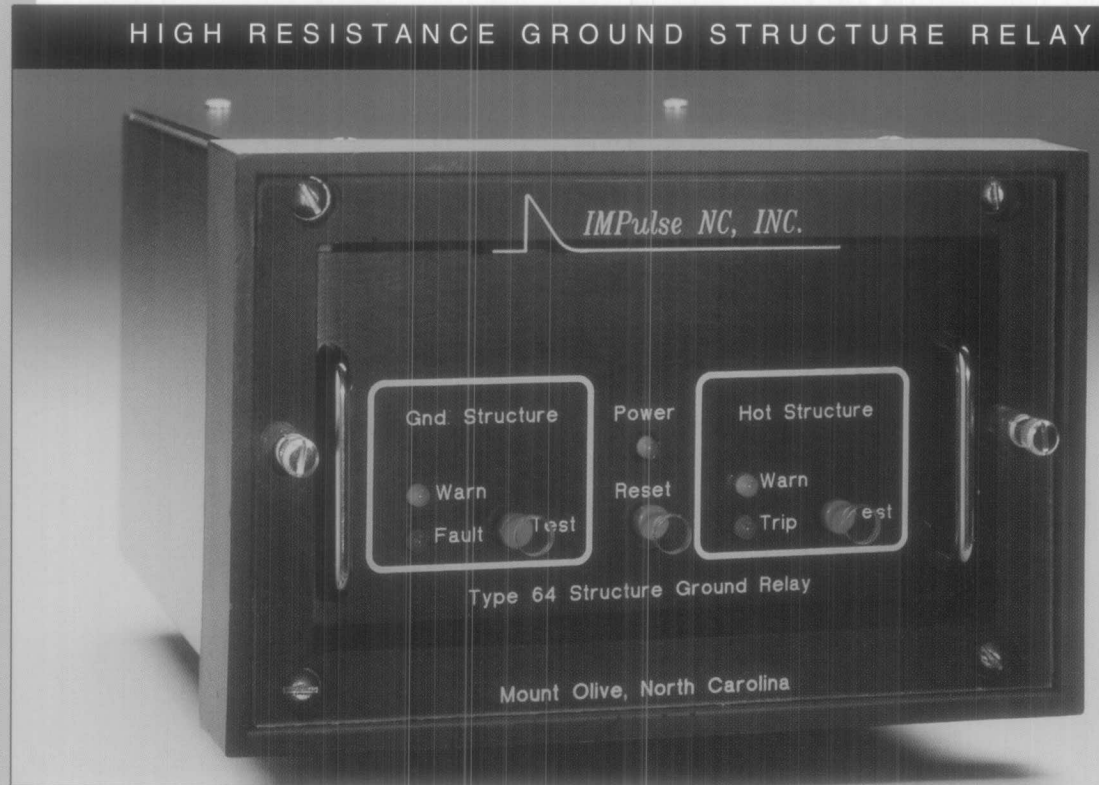
With the control power (125 VDC) energized, the local/remote switch (Device 43) in the remote position, the lockout relay (Device 86) reset, and the breaker in the connected and open position, the yard control room initiates a close signal to the breaker. This allows 125 VDC power to flow through the contacts of 43 and energizes relay 201C. The contact 1-3 of 201C changes state, and 125 VDC control power will flow through contacts 201C, 86D, 01XR, and 201T, and energize relay 01X. Contact 6-7 will close and seal in this circuit. The 125 VDC control power now flows through the contacts of 1-3 of 01X to energize the closing coil of the breaker.

To open the breaker, the yard control room initiates a trip command and 125 VDC power flows through 43 and energizes relay 201T. Its contacts 1-4 and 5-8 change state. Contact 1-4 opens and 125 VDC control power is interrupted from flowing through the breaker coil and the breaker will open. The red closed light becomes de-energized, and the green open light becomes energized. Contact 1-4 of 201T opened and de-energized relay 01X.

P R O D U C T B U L L E T I N

Type 64 Ground Structure Relays from IMPulse NC, Inc., are dual-function protective devices designed to protect equipment enclosures and alert personnel to "ground" and "hot" fault conditions in DC switchgear and rectifiers. These high resistance relays provide maximum performance and operational reliability through solid state components, rugged construction, and a self-diagnostic feature.

HIGH RESISTANCE GROUND STRUCTURE RELAY



Features

- 2.5 to 12.5VDC Ground Trip Setting
- 33 to 64 VDC Hot Trip Setting
- Self-monitoring (loss of power causes annunciation)
- Self-contained 125VDC power supply (other voltage ratings optional)
- Front Panel Indicators and Controls
- Transient surge protection

Description

Type 64 High Resistance Ground Structure Relays alert personnel through visual and alarm output contacts when a DC switchgear structure or rectifier becomes grounded through a breach in the insulation system between the structure and earth ground. Annunciation occurs when the voltage sensing trip system has been by-passed by grounding or when the relay's self-diagnostic feature determines that an internal failure has occurred.

The relay also alerts personnel when a leakage or fault occurs between the bus and structure ("hot structure"). Normally, the output is connected to a lockout relay to automatically de-energize the entire station. The hot structure function detects both AC and DC leakages and faults. Setpoints for ground structure annunciation and hot structure trip are adjustable.

Adjustment is made with screwdriver adjustable potentiometers located on the top side of the drawout assembly. Test buttons for both ground structure annunciation and hot structure tripping are provided on the front panel.

In the event a fault and a lockout condition does not occur, these High Resistance Ground Relays will provide continuous operation without damage to the unit if voltage does not exceed 1000VDC or 800VDC with 600VAC superimposed rectifier fault.

IMPulse NC, INC.

"Innovative Motion Power"

HIGH RESISTANCE GROUND STRUCTURE RELAY

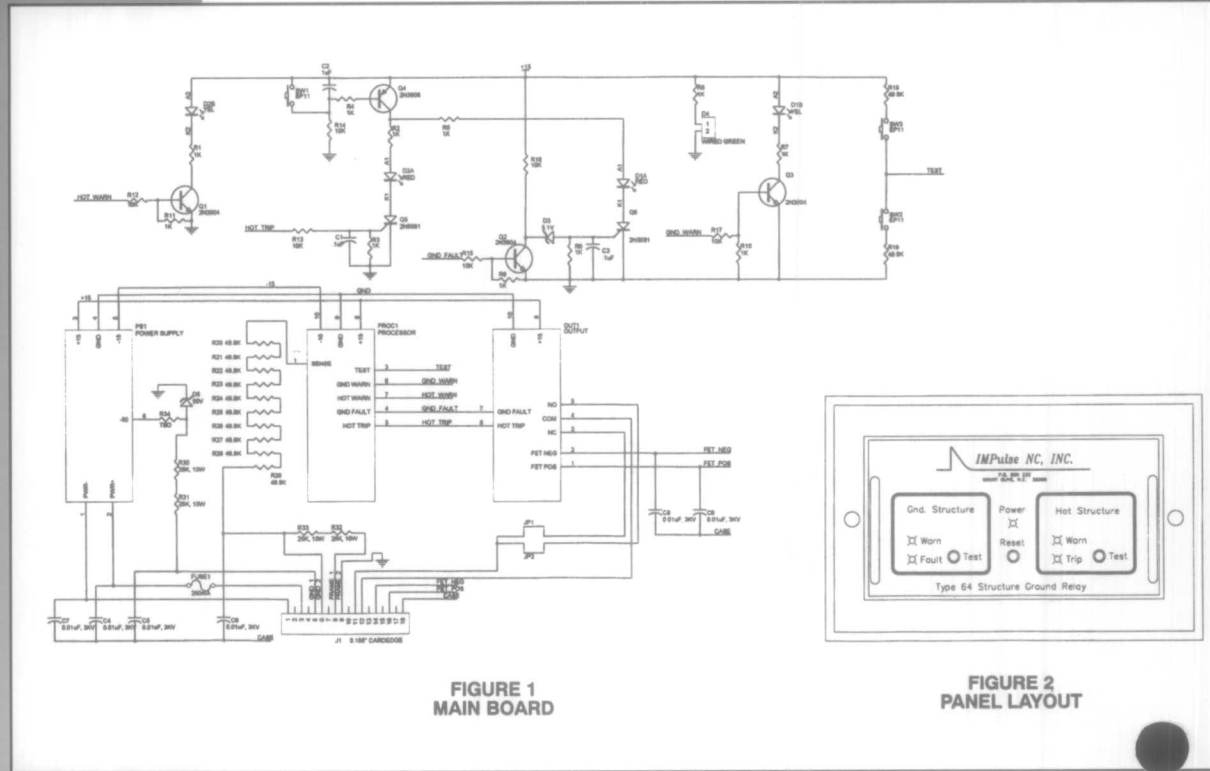


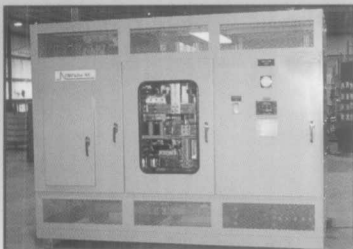
FIGURE 1
MAIN BOARD

FIGURE 2
PANEL LAYOUT

General

Supply voltage (nominal)	125VDC (others on request)
Supply voltage range	70 to 200VDC
Supply current	25mA
Ambient temperature	-20°C to 55°C
Structure applied voltage	25VDC (25 Kohm impedance)
Ground Trip Setting (GTS)	2.5 to 12.5VDC
Ground warning	2 times GTS volts
Output rating - ground	5A carry 0.4A switching @ 125VDC (resistive) 40A surge
Hot Trip Setting (HTS)	33 to 64VDC
Hot trip warning	1/2 HTS
Time delay setting - hot	0 to 40 milliseconds (Inverse time curve in response to structure voltage)
Output rating - hot	5A continuous, 40A surge, 200VDC Power MOSFET

SPECIFICATIONS



Typical 3000 KW Extra Heavy
Traction Power Rectifier



A member of the Marmon Group of companies



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HIGH RESISTANCE GROUND STRUCTURE RELAY

P/N 0051

CALIBRATION AND OPERATION MANUAL

For additional assistance, contact:

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Mount Olive, North Carolina 28365
919-658-2200

OPERATING AND MAINTENANCE

TYPE 64 GROUND STRUCTURE RELAY

1.0 DESCRIPTION

Refer to Figure 1 (front panel layout), Figure 2 (connection block diagram), Figure 3 (cutout and drilling template), and Figure 4 (top panel terminal strip layout). The unit operates from 125 VDC supply (other voltages are available) and operates as a dual function ground structure relay for high-resistance-grounded DC switchgear and rectifier enclosure systems. The first function is "grounded structure" annunciation which is activated by breaching of the insulation system between the structure being monitored and earth ground. This annunciation indicates that the voltage sensing trip system has been bypassed (by grounding) or that a failure within the relay has occurred. The second function is "hot structure" and is activated by leakage or fault between bus and structure. Normally, this output is connected to a lockout relay to de-energize the entire station. The "hot structure" function will detect either an AC or DC leakage or fault. The unit imposes a test voltage on the switchgear structure being monitored and has adjustable threshold for annunciation and trip functions.

2.0 SPECIAL PRECAUTIONS

- 2.1 Voltage Hazard. High voltage may be present at the external terminal strip, at internal connections, and in portions of the relay.
- 2.2 Grounding. The relay case should be grounded to substation frame via case ground at terminal 1 for voltage safety and to reduce susceptibility to R.F. interference.
- 2.3 Dielectric Testing. Remove relay from case when dielectric testing of substation wiring is performed.

3.0 FRONT PANEL INDICATIONS AND CONTROLS

- 3.1 Power. The green light emitting diode (LED) indicates that the detector has power and is operational. If this LED is off, either input power is off or internal 250 mA fuse is blown. In either case, annunciation of "Ground" will occur.
- 3.2 Ground. The ground section consists of a yellow warning LED, a red trip LED, and a test button. When imposed structure voltage drops below the preset level (5-20 volts) and remains for the

set time (10-250 ms), the "Ground" output relay closes (de-energizes) and the red LED latches. This output is normally connected to the annunciator (local and/or remote) to indicate that the structure has been grounded. An imposed structure voltage at a point between set point and normal will light the yellow LED, but no output or latch will occur. Loss of power also closes output contacts.

A test button is also supplied for the ground channel. Depressing this button simulates a grounded structure condition, giving a red latched LED indication and firing the output contacts, activating the substation connected device (annunciator). LED is reset by depressing the "RESET" button.

3.3 Hot Structure. The hot structure section consists of a yellow warning LED, a red trip LED, and a test button. When imposed structure voltage rises above the preset trip level (30-45 volts) DC or AC, and remains for the set time (10-40 ms), the "Hot Structure" output transistor fires and the red LED latches. This output is normally connected to a lockout relay which trips all station breakers. Voltage between the normal 25 volts and the trip preset point will light the yellow LED, but no output or latch will occur.

A test button is also supplied for the Hot Structure. Depressing this button simulates a Hot Structure condition, giving a red latched LED indication, firing the output transistor, and tripping the connected device. The LED is reset by depressing the "RESET" button.

NOTE: The output transistor on the "Hot Structure" channel only is internally latching, and a trip signal will be present until the "RESET" button is manually depressed.

4.0 SPECIFICATIONS

Supply voltage (nominal)	125 VDC
Supply voltage range	100-140 VDC
Low voltage operation - hot output must function	70 VDC
Supply current	25 mA
Ambient temperature	-20 to +55°C
Structure applied voltage	25 VDC
Ground trip setting (GTS)	5 V - 20 VDC

Ground warning	25-1/2 (25 V - GTS)
Hot trip setting (HTS)	30 - 45 VDC
Hot trip warning	25+ 1/2 (HTS - 25)
Time delay setting - ground	10 - 250 ms
Time delay setting - hot	10 - 40 ms
Output rating - ground	350 mA/125 VDC 8 VA maximum (dry reed relay)
Output rating - hot	1 amp continuous 125 VDC

The unit will operate continuously without damage with any of the following structure conditions if voltage is not cleared by lockout (feeder fault):

- 1) 800 VDC
- 2) 700 VDC with 600 VAC superimposed (Rectifier fault)

5.0 SETTINGS

During fault clearing, lightning storms, etc., transients are induced into feeders of switchgear systems which capacitively couple to the structure. The time delay functions of this relay are designed to tolerate such "normal" structure voltages while suppressing outputs. Maximum setting of "Hot Structure" will trip at approximately 10 kohm resistance from structure to ground.

The least sensitive adjustments are recommended for most applications. Trimpots as shown in Figure 2, block diagram on module B, should be adjusted as follows:

Ground Time Delay:	Full CW	250 ms delay
Ground Set :	Full CCW	5 V threshold
Hot Time Delay :	Full CW	40 ms delay
Hot Set :	Full CW	45 V threshold

More sensitive adjustments can be made if desired.

The warning lights are designed to give warning of a developing situation in time to react before a dangerous condition exists.

6.0 CALIBRATION TO 50 VDC POWER SUPPLY

Connect terminals 4 and 5 together and 6 and 7 together and isolate at least one pair from structure or ground so that no external load exists. Connect high impedance DVM between terminal pairs, adjust trimpot on module F2 for 25.0 VDC. This should not need adjustment unless F2 module is replaced or repaired.

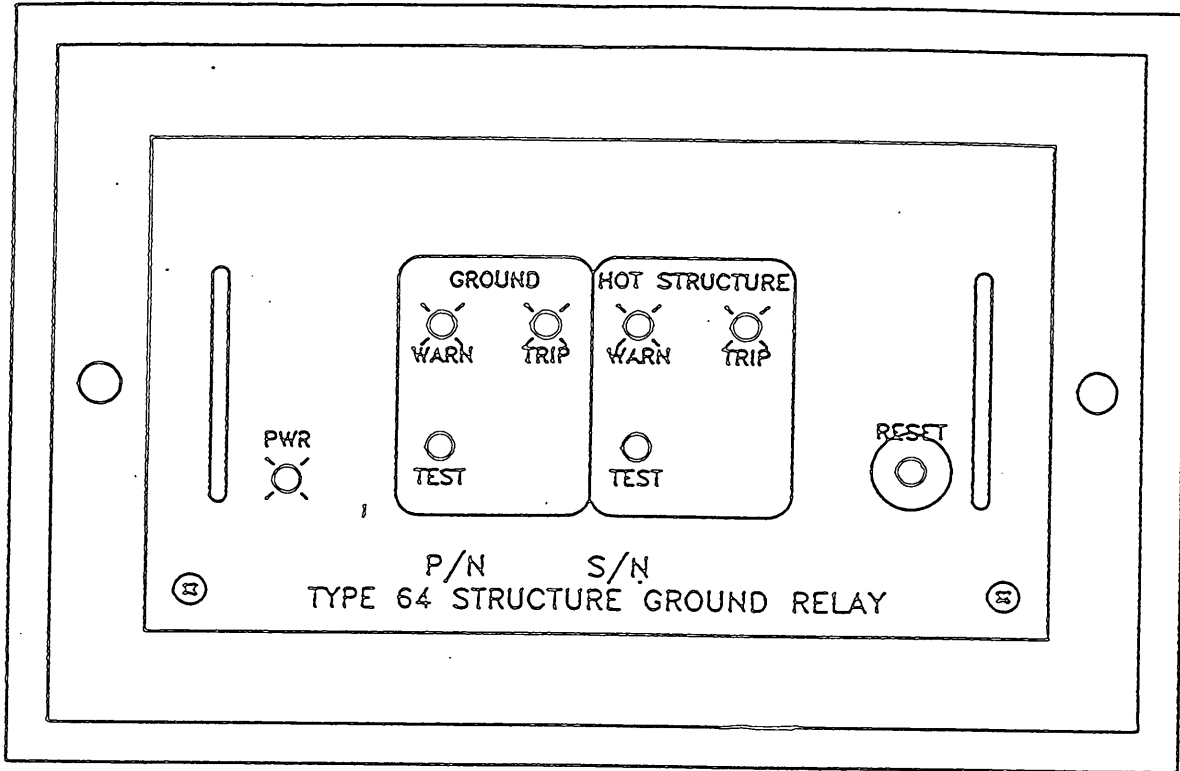


FIGURE 1
FRONT PANEL

NOTE:
RELAY HAS CLEAR FRONT
COVER WITH ACCESS HOLE
FOR RESET ONLY.

TYPE 64 GROUND STRUCTURE RELAY MODULE

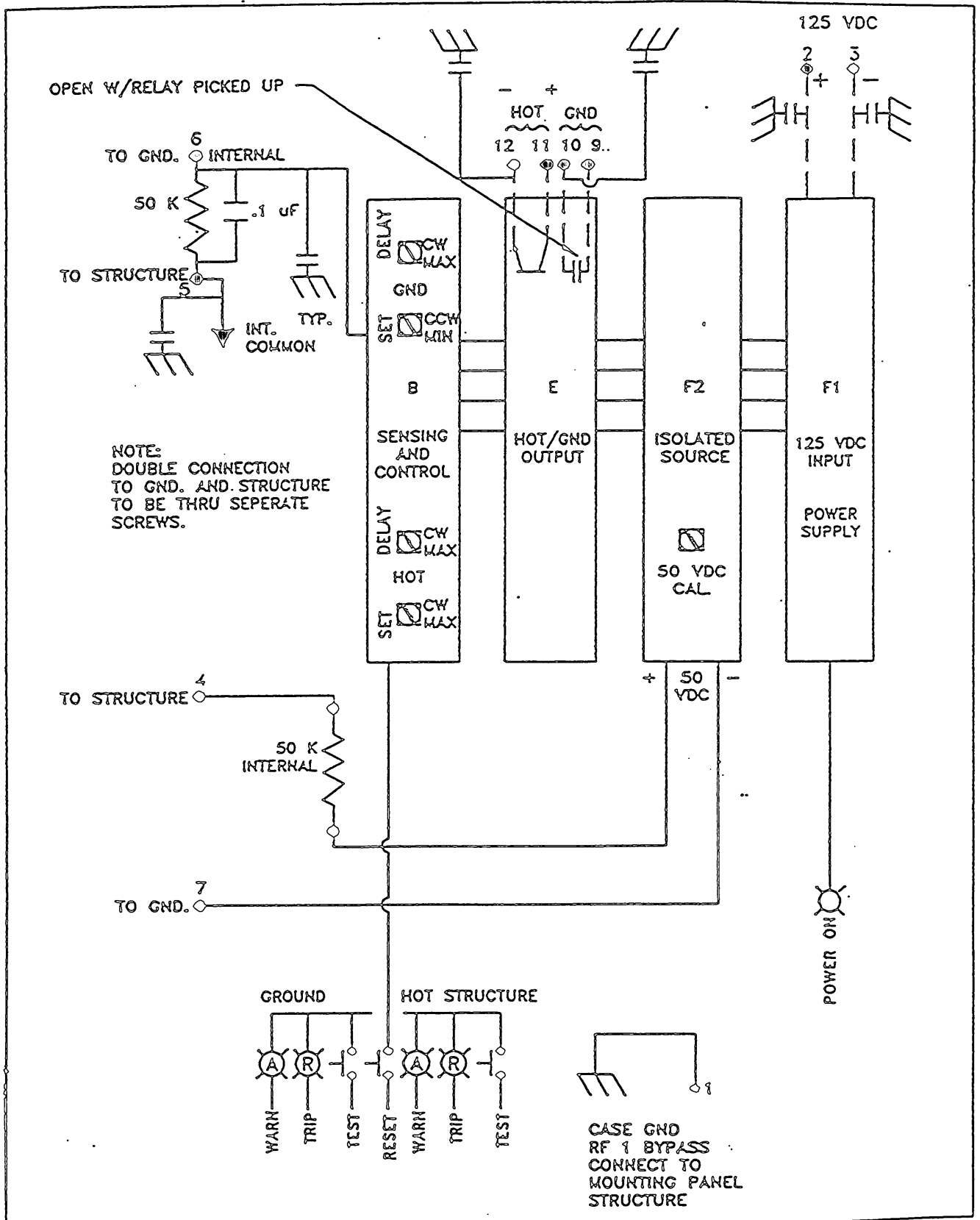


FIGURE 2
BLOCK DIAGRAM

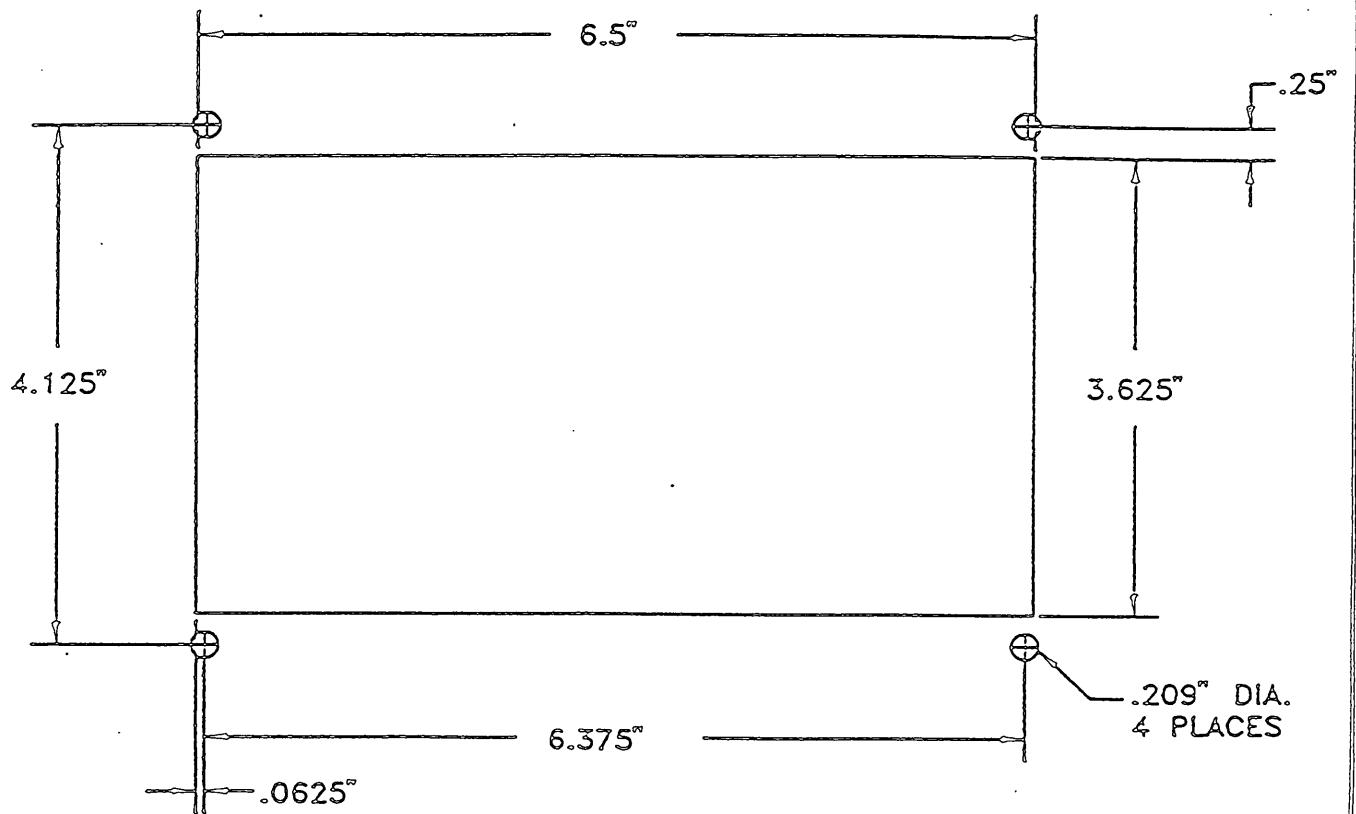
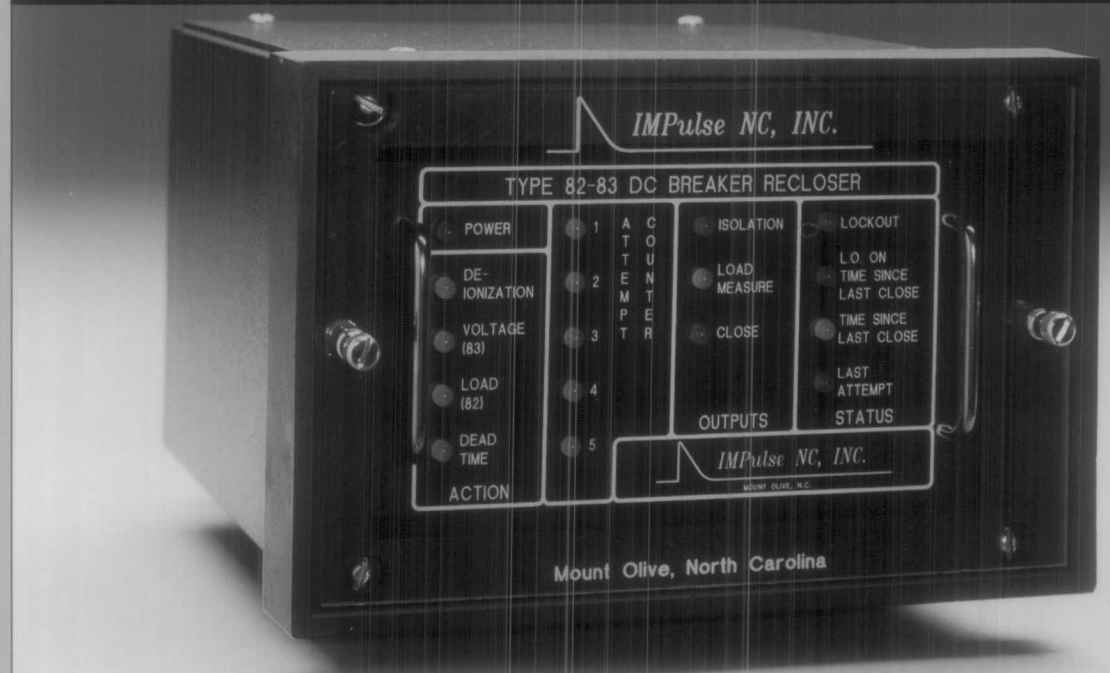


FIGURE 3
PANEL LAYOUT

PRODUCT BULLETIN

The Type 82-83 DC Breaker Recloser is a solid-state, fiberoptic reclosing system that prevents the closing of a DC interrupter on a faulted line. It provides load-side fault verification before the interrupter is closed and automatically recloses the interrupter on a clear line following a fault or overcurrent trip.

TYPE 82-83 BREAKER RECLOSING SYSTEM



Features

- Dielectric isolation >10 KV between DC power bus and control circuits
- Fully adjustable time intervals for each segment of the reclosing cycle
- Fully adjustable voltage pick-up for multi-feed condition and dead load pick-up for stub-feed condition
- Voltage compensating prevents closing on a faulted line in the presence of rail drop voltage from current in an adjacent track
- Indicating lights aid evaluation of track status and condition
- Time-after-close timer prevents "pumping" on a voltage-developing fault
- Modular construction facilitates troubleshooting, installation, and retrofit
- Hand held calibrator provides remote function and setting verification

Description

The Type 82-83 DC Breaker Reclosing System provides load-side fault verification by measuring the load-side voltage and comparing it to the pre-programmed setting for correct system voltage. If there is proper system voltage, it automatically recloses the interrupter following a fault or overcurrent trip.

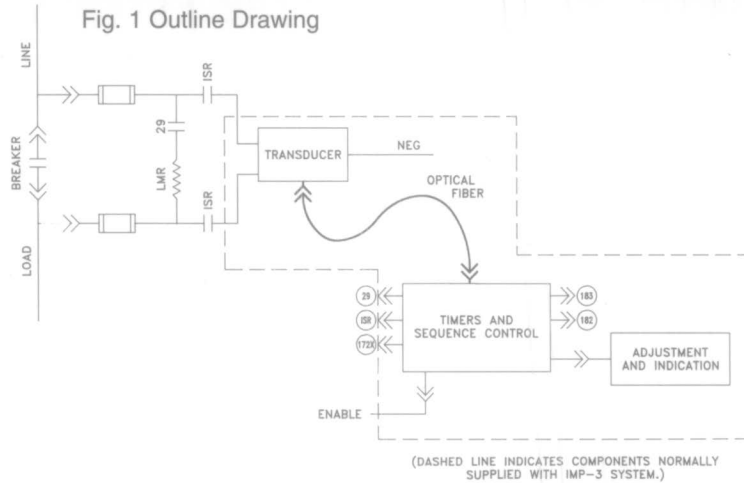
The System consists of two units: a transducer and a control unit. The transducer is a self-powered sending unit that converts bus voltage, properly scaled for reclosing use, into a system of visible light pulses. These pulses are transmitted through an optical fiber to the control unit. The control unit performs the function of voltage measuring, load measuring, sequencing, and indication.

IMPulse NC, INC.

"Innovative Motion Power"

TYPE 82-83 DC BREAKER RECLOSER

Fig. 1 Outline Drawing



DC Voltage Transducer

Self-powered module fed by fused line and load leads from associated breaker. Converts DC voltage (2V - 1000V) to a frequency which is converted to a series of light pulses by an LED. These pulses are transmitted through an optical fiber to the control module for operation of the 82 and 83 relays. This feature allows remote mounting of the control module so that measurements and adjustments can be made without exposure to traction voltage.

Load Measuring Contactor and Resistor

This system is driven by the timing and sequence module and connects the line to the load while limiting current to approximately 25 amperes for load measuring. This system is thermally designed for the worst case multiple load measuring duty cycle.

Timing and Sequence

This unit contains the sequence timers and the receiver for the voltage transducer. Upon initiation, it closes the isolation relay and goes through the steps of de-ionization, voltage measuring, load measuring, attempt counting, and lock out.

DESCRIPTION OF OPERATION

Setting	Range
De-ionization time	5 - 30 seconds
Voltage Measuring Time	2 - 10 seconds
Voltage Measuring Threshold	390 - 625 Volts
Load Measuring Time	1 - 2 seconds
Load Measuring Threshold	200 - 1050 Amps
Dead Time	2 - 30 seconds
Time to Reset	12 - 120 seconds
Number of Attempts	1 - 5 count
Other ranges available for application up to 3000 V and 5000 Amps dead load pick-up.	

Voltage Relay (83)

This relay measures voltage on the line side of the breaker and picks up if the voltage is above its set value (typically 500 V) to close the breaker on a live, healthy line.

Dead Load Pick Up Relay (82)

This relay stores any pre-existing line voltage and measures the differential voltage when the load measuring current is applied. If the differential voltage is above the set value, it closes the breaker. The set value for this relay is the voltage produced by the load measuring current in the minimum acceptable feeder load resistance.

Indication and Adjustment Module

These functions are provided on a separate module. Allows exchange of other modules without affecting settings. Adjustments include time for each step of the sequence, number of attempts, and levels for voltage and dead load pick-up. Adjustments are made using ten-position switches allowing quantitative confirmation settings.



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WASHINGTON METROPOLITAN AREA
TRANSIT AUTHORITY
CONTRACT 2Z7042
STAGE SSE-12
OPERATION AND MAINTENANCE MANUAL FOR
TRACTION POWER
SUBSTATION EQUIPMENT

VOLUME IV

MANUFACTURER:
IMPulse NC, Inc. (24 HOURS)
1229 N. Breazeale Avenue
Mount Olive, North Carolina 28365
919-658-2200

WASHINGTON METROPOLITAN AREA
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SUBSTATION EQUIPMENT

VOLUME IV

CP-2Z 7042-1000-13-0
T. NO. 62

MANUFACTURER:
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Mount Olive, North Carolina 28365
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DRAWING MATRIX

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FARRINGTON AVENUE TIE BREAKER STATION	E
GLENMONT YARD SUBSTATION	F
GLENMONT NORTH TIE BREAKER STATION	G
HENDERSON AVENUE SUBSTATION	H
GLENMONT SOUTH TIE BREAKER STATION	I

Schematic-Franconia-Springfield

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
0026001		A	SUPERVISORY CONTROL IDENTIFICATION NUMBERS
M0026004		A	STANDARD SYMBOLS AND NOMENCLATURE
00026S0R		H	TYPICAL FEEDER BREAKER SCHEMATIC DIAGRAM
00026S1L		A	HIGH RESISTANCE GROUND CIRCUIT
00026S1O		A	4000 AMP CIRCUIT BREAKER SCHEMATIC DIAGRAM
00026S1R		-	DC BREAKER TEST CABINET SCHEMATIC DIAGRAM
00026S1S		C	TIE BREAKER STATION ANNUNCIATOR SCHEMATIC DIAGRAM
00026S0T		E	DC FEEDER CIRCUIT BREAKER (UNIT 1) SCHEMATIC DIAGRAM
00026S0G		A	ONE-LINE DIAGRAM

Wiring-Franconia-Springfield

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
0026W0L		B	FEEDER BREAKER WIRING DIAGRAM
00026W0M		E	TYPICAL FEEDER BREAKER CONTROL COMPARTMENT WIRING DIAGRAM
00026W0R		D	DC FEEDER BREAKER (UNIT 1) CONTROL AREA WIRING DIAGRAM
00026W1E		E	DC SWITCHGEAR INNER CONNECTION DIAGRAM
00026W1S		D	TIE BREAKER STATION ANNUNCIATOR WIRING DIAGRAM
00026W1T		B	DC BREAKER TEST CABINET WIRING DIAGRAM
00026W2J		-	INTERCONNECTIONS DIAGRAM

Mechan.-Franconia-Springfield

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
00026M0D		A	FLOOR PLAN
00026M0T		C	DC SWITCHGEAR FRONT ELEVATION
00026M1L		A	DC SWITCHGEAR PLAN VIEW
00026M2N		E	DC SWITCHGEAR SECTION VIEWS

Schematic-Greenleaf

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
0026001		A	SUPERVISORY CONTROL IDENTIFICATION NUMBERS
M0026004		A	STANDARD SYMBOLS AND NOMENCLATURE
00026S0D		B	34.5KV ONE-LINE DIAGRAM
00026S0K		C	2000KW RECTIFIER CONTROL SCHEMATIC
00026S0L		B	2000KW RECTIFIER ELEMENTARY DIAGRAM
00026S0O		G	72-1 SCHEMATIC DIAGRAM (CATHODE BREAKER)
00026S0P		F	72-2 SCHEMATIC DIAGRAM (CATHODE BREAKER)
00026S0R		H	TYPICAL FEEDER BREAKER SCHEMATIC DIAGRAM
00026S0S		E	ACCELERATION GAP BREAKER SCHEMATIC DIAGRAM
00026S1E		C	AC SCHEMATIC 34.5KV SWITCHGEAR
00026S1G		D	BREAKER 52BT CONTROL SCHEMATIC
00026S1H		D	BREAKER 52L1 CONTROL SCHEMATIC
00026S1I		D	BREAKER 52L2 CONTROL SCHEMATIC
00026S1J		E	BREAKER 52R CONTROL SCHEMATIC
00026S1K		A	34.5KV BREAKER TEST CABINET SCHEMATIC
00026S1L		A	HIGH RESISTANCE GROUND CIRCUIT
00026S1N		C	8000 AMP CIRCUIT BREAKER SCHEMATIC DIAGRAM
00026S1O		A	4000 AMP CIRCUIT BREAKER SCHEMATIC DIAGRAM
00026S1R		-	DC BREAKER TEST CABINET SCHEMATIC DIAGRAM

Wiring-Greenleaf

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
00026W0D			BUS TIE BREAKER 52BT WIRING DIAGRAM
00026W0I		D	2000KW,700VDC WIRING DIAGRAM
00026W0L		B	FEEDER BREAKER WIRING DIAGRAM
00026W0M		E	TYPICAL FEEDER BREAKER CONTROL CAMPARTMENT WIRING DIAGRAM
00026W0N		F	MAIN BREAKER WIRING DIAGRAM
00026W0O		E	ACCELERATION BREAKER WIRING DIAGRAM
00026W0S		G	72-1 CONTROL AREA WIRING DIAGRAM (CATHODE BREAKER)
00026W0T		E	72-2 CONTROL AREA WIRING DIAGRAM (CATHODE BREAKER)
00026W0Y		B	DC SWITCHGEAR INNER CONNECTION DIAGRAM
00026W1H		D	52L1 &52L2 WIRING DIAGRAM
00026W1I		D	BREAKER 52R WIRING DIAGRAM
00026W1L		B	AC INNER CONNECTION DIAGRAM
00026W1T		B	DC BREAKER TEST CABINET WIRING DIAGRAM
00026W1U		A	34.5KV AC BREAKER TEST CABINET WIRING DIAGRAM
00026W1V		A	38KV PT COMPARTMENT WIRING DIAGRAM
00026W1W		B	SUBSTATION ANNUNCIATOR WIRING DIAGRAM
00026W1X		A	INNER CONNECTIONS BETWEEN DPM'S IN AC SWITCHGEAR
00026W2E		-	SUBSTATION INTERCONNECTIONS AC SWITCHGEAR
00026W2F		-	SUBSTATION INTERCONNECTIONS TRANS. 1 & 2 AND RECT. 1 & 2
00026W2G		-	SUBSTATION INTERCONNECTIONS DC SWITCHGEAR
00026W2H		-	SUBSTATION INTERCONNECTIONS ANNUNCIATOR

Mechanical-Greenleaf

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
00026M0E		D	FLOOR PLAN
00026M0I		C	AC SWITCHGEAR FRONT ELEVATION
00026M0M		B	DC SWITCHGEAR FRONT ELEVATION
00026M0W		B	RECTIFIER FRONT ELEVATION
00026M1A		B	AC SWITCHGEAR PLAN VIEW
00026M1E		A	DC SWITCHGEAR PLAN VIEW
00026M1O		-	RECTIFIER PLAN VIEW
00026M1U		A	FRONT VIEW NEGATIVE/DRAINAGE SWITCHGEAR
00026M2A		D	AC BUS DUCT
00026M2B		A	DC NEGATIVE BUS DUCT
00026M2C		-	DC POSITIVE BUS DUCT
00026M2L		D	SECTION VIEW 38KV AC SWITCHGEAR
00026M2M		C	SECTION VIEW 38KV AC SWITCHGEAR
00026M2N		E	DC SWITCHGEAR SECTION VIEWS
00026M2O		E	NEGATIVE DRAINAGE SECTION VIEWS
00026M2P		C	RECTIFIER SECTION VIEWS
00026M8H		-	DC SWITCHGEAR SECTION VIEWS

Schematic-Roso

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
0026001		A	SUPERVISORY CONTROL IDENTIFICATION NUMBERS
M0026004		A	STANDARD SYMBOLS AND NOMENCLATURE
00026S0R		H	TYPICAL FEEDER BREAKER SCHEMATIC DIAGRAM
00026S0S		E	ACCELERATION GAP BREAKER SCHEMATIC DIAGRAM
00026S1L		A	HIGH RESISTANCE GROUND CIRCUIT
00026S1O		A	4000 AMP CIRCUIT BREAKER SCHEMATIC DIAGRAM
00026S1R		-	DC BREAKER TEST CABINET SCHEMATIC DIAGRAM
00026S0F		A	ONE-LINE DIAGRAM
00026S0T		E	DC FEEDER CIRCUIT BREAKER (UNIT 1) SCHEMATIC DIAGRAM
00026S1S		C	TIE BREAKER STATION ANNUNCIATOR SCHEMATIC DIAGRAM

Wiring-Roso

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
00026W0L		B	FEEDER BREAKER WIRING DIAGRAM
00026W0M		E	TYPICAL FEEDER BREAKER CONTROL COMPARTMENT WIRING DIAGRAM
00026W0O		E	ACCELERATION BREAKER WIRING DIAGRAM
00026W0R		D	DC FEEDER BREAKER (UNIT 1) CONTROL AREA WIRING DIAGRAM
00026W1C		A	DC SWITCHGEAR INNER CONNECTION DIAGRAM
00026W1S		D	TIE BREAKER STATION ANNUNCIATOR WIRING DIAGRAM
00026W1T		B	DC BREAKER TEST CABINET WIRING DIAGRAM
00026W2I		-	INTERCONNECTIONS DIAGRAM

Mechanical-Roso

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
00026M0C		A	FLOOR PLAN
00026M0R		B	DC SWITCHGEAR FRONT ELEVATION
00026M1J		A	DC SWITCHGEAR PLAN VIEW
00026M2N		E	DC SWITCHGEAR SECTION VIEWS

Schematic-Tilbury

RAWING NUMBER	SHEET	REV.	DESCRIPTION
M0026001		A	SUPERVISORY CONTROL IDENTIFICATION NUMBERS
M0026004		A	STANDARD SYMBOLS AND NOMENCLATURE
00026S0E		B	34.5KV ONE-LINE DIAGRAM
00026S0K		C	2000KW RECTIFIER CONTROL SCHEMATIC
00026S0L		B	2000KW RECTIFIER ELEMENTARY DIAGRAM
00026S0O		G	72-1 SCHEMATIC DIAGRAM (CATHODE BREAKER)
00026S0P		F	72-2 SCHEMATIC DIAGRAM (CATHODE BREAKER)
00026S0R		H	TYPICAL FEEDER BREAKER SCHEMATIC DIAGRAM
00026S0S		E	ACCELERATION GAP BREAKER SCHEMATIC DIAGRAM
00026S1F		B	AC SCHEMATIC 34.5KV SWITCHGEAR
00026S1G		D	BREAKER 52BT CONTROL SCHEMATIC
00026S1H		D	BREAKER 52L1 CONTROL SCHEMATIC
00026S1I		D	BREAKER 52L2 CONTROL SCHEMATIC
00026S1J		E	BREAKER 52R CONTROL SCHEMATIC
00026S1K		A	34.5KV BREAKER TEST CABINET SCHEMATIC
00026S1L		A	HIGH RESISTANCE GROUND CIRCUIT
00026S1N		C	8000 AMP CIRCUIT BREAKER SCHEMATIC DIAGRAM
00026S1O		A	4000 AMP CIRCUIT BREAKER SCHEMATIC DIAGRAM
00026S1R		-	DC BREAKER TEST CABINET SCHEMATIC DIAGRAM

Wiring-Tilbury

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
00026W0D			BUS TIE BREAKER 52BT WIRING DIAGRAM
00026W0I		D	2000KW,700VDC WIRING DIAGRAM
00026W0L		B	FEEDER BREAKER WIRING DIAGRAM
00026W0M		E	TYPICAL FEEDER BREAKER CONTROL CAMPARTMENT WIRING DIAGRAM
00026W0N		F	MAIN BREAKER WIRING DIAGRAM
00026W0O		E	ACCELERATION BREAKER WIRING DIAGRAM
00026W0S		G	72-1 CONTROL AREA WIRING DIAGRAM (CATHODE BREAKER)
00026W0T		E	72-2 CONTROL AREA WIRING DIAGRAM (CATHODE BREAKER)
00026W0Z		B	DC SWITCHGEAR INNER CONNECTION DIAGRAM
00026W1H		D	52L1 &52L2 WIRING DIAGRAM
00026W1I		D	BREAKER 52R WIRING DIAGRAM
00026W1M		C	AC INNER CONNECTION DIAGRAM
00026W1T		B	DC BREAKER TEST CABINET WIRING DIAGRAM
00026W1U		A	34.5KV AC BREAKER TEST CABINET WIRING DIAGRAM
00026W1V		A	38KV PT COMPARTMENT WIRING DIAGRAM
00026W1W		B	SUBSTATION ANNUNCIATOR WIRING DIAGRAM
00026W1Y		A	INNER CONNECTIONS BETWEEN DPM'S IN AC SWITCHGEAR
00026W1Z		A	SUBSTATION INTERCONNECTIONS AC SWITCHGEAR
00026W2A		A	SUBSTATION INTERCONNECTIONS TRANS. 1 & 2 AND RECT. 1 & 2
00026W2B		A	SUBSTATION INTERCONNECTIONS DC SWITCHGEAR
00026W2C		A	SUBSTATION INTERCONNECTIONS ANNUNCIATOR

Mechanical-Tilbury

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
00026M0F		D	FLOOR PLAN
00026M0J		C	AC SWITCHGEAR FRONT ELEVATION
00026M0N		B	DC SWITCHGEAR FRONT ELEVATION
00026M0V		C	RECTIFIER FRONT ELEVATION
00026M1B		B	AC SWITCHGEAR PLAN VIEW
00026M1F		A	DC SWITCHGEAR PLAN VIEW
00026M1N		-	RECTIFIER PLAN VIEW
00026M1V		A	FRONT VIEW NEGATIVE/DRAINAGE SWITCHGEAR
00026M2D		D	AC BUS DUCT
00026M2E		-	DC NEGATIVE BUS DUCT
00026M2F		A	DC POSITIVE BUS DUCT
00026M2L		D	SECTION VIEW 38KV AC SWITCHGEAR
00026M2M		C	SECTION VIEW 38KV AC SWITCHGEAR
00026M2N		E	DC SWITCHGEAR SECTION VIEWS
00026M2O		E	NEGATIVE DRAINAGE SECTION VIEWS
00026M2P		C	RECTIFIER SECTION VIEWS
00026M8H		-	DC SWITCHGEAR SECTION VIEWS

Schematic-Farrington Ave.

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
0026001		A	SUPERVISORY CONTROL IDENTIFICATION NUMBERS
M0026004		A	STANDARD SYMBOLS AND NOMENCLATURE
00026S0R		H	TYPICAL FEEDER BREAKER SCHEMATIC DIAGRAM
00026S0S		E	ACCELERATION GAP BREAKER SCHEMATIC DIAGRAM
00026S1L		A	HIGH RESISTANCE GROUND CIRCUIT
00026S1O		A	4000 AMP CIRCUIT BREAKER SCHEMATIC DIAGRAM
00026S1R		-	DC BREAKER TEST CABINET SCHEMATIC DIAGRAM
00026S0F		A	ONE-LINE DIAGRAM
00026S1S		C	TIE BREAKER STATION ANNUNCIATOR SCHEMATIC DIAGRAM
00026S1Q		B	ACCELERATION GAP BREAKER (UNIT 1) SCHEMATIC DIAGRAM

Wiring-Farrington Ave.

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
00026W0L		B	FEEDER BREAKER WIRING DIAGRAM
00026W0M		E	TYPICAL FEEDER BREAKER CONTROL COMPARTMENT WIRING DIAGRAM
00026W0O		E	ACCELERATION BREAKER WIRING DIAGRAM
00026W0V		D	ACCELERATION GAP BREAKER (UNIT 1) CONTROL AREA WIRING DIAGRAM
00026W1D		B	DC SWITCHGEAR INNER CONNECTION DIAGRAM
00026W1S		D	TIE BREAKER STATION ANNUNCIATOR WIRING DIAGRAM
00026W1T		B	DC BREAKER TEST CABINET WIRING DIAGRAM
00026W2D		A	INTERCONNECTIONS DIAGRAM

Mechanical-Farrington Ave.

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
00026M0C		A	FLOOR PLAN
00026M0S		B	DC SWITCHGEAR FRONT ELEVATION
00026M1K		A	DC SWITCHGEAR PLAN VIEW
00026M2N		E	DC SWITCHGEAR SECTION VIEWS

Schematic-Glenmont Yard

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
0026001		A	SUPERVISORY CONTROL IDENTIFICATION NUMBERS
M0026004		A	STANDARD SYMBOLS AND NOMENCLATURE
00026S1L		A	HIGH RESISTANCE GROUND CIRCUIT
00026S1O		A	4000 AMP CIRCUIT BREAKER SCHEMATIC DIAGRAM
00026S1R		-	DC BREAKER TEST CABINET SCHEMATIC DIAGRAM
00026S1N		C	8000 AMP CIRCUIT BREAKER SCHEMATIC DIAGRAM
00026S0X		E	BREAKER 52L1 CONTROL SCHEMATIC
00026S0Y		E	BREAKER 52L2 CONTROL SCHEMATIC
00026S0Z		E	BREAKER 52BT CONTROL SCHEMATIC
00026S1A		C	BREAKER 52R CONTROL SCHEMATIC
00026S1C		E	BREAKER 52 CONTROL SCHEMATIC
00026S1D		-	13.8KV BREAKER TEST CABINET SCHEMATIC
00026S1T		A	72-1 SCHEMATIC DIAGRAM (CATHODE BREAKER)
00026S0K		C	2000KW RECTIFIER CONTROL SCHEMATIC
00026S0L		B	2000KW RECTIFIER ELEMENTARY DIAGRAM
00026S0B		C	13.8KV ONE-LINE DIAGRAM
00026S0C		C	13.8KV ONE-LINE DIAGRAM
00026S0I		C	POSITIVE BUS TIE BREAKER CONTROL SCHEMATIC
00026S0J		B	NEGATIVE BUS TIE BREAKER CONTROL SCHEMATIC
00026S0Q		D	72-3 SCHEMATIC DIAGRAM (CATHODE BREAKER)
00026S0V		B	AC SCHEMATIC, 13.8KV SWITCHGEAR
00026S0W		B	AC SCHEMATIC, 13.8KV SWITCHGEAR
00026S1M		C	DC FEEDER BKR. W/O RECL. & RATE OF RISE RELAY SCHEMATIC DIAGRAM
00026S1U		-	72-2 SCHEMATIC DIAGRAM (CATHODE BREAKER)
00026S1X		-	TYPICAL FEEDER BREAKER SCHEMATIC DIAGRAM (MAINLINE TRACK)

Wiring-Glenmont Yard

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
00026W0A		E	BREAKER 52 WIRING DIAGRAM
00026W0B		D	BREAKER 52R WIRING DIAGRAM
00026W0C		B	BREAKER 52L1 & 52L2 WIRING DIAGRAM
00026W0E		B	BUS TIE BREAKER 52BT WIRING DIAGRAM
00026W0F		-	UTILITY METERING CUBICLE WIRING DIAGRAM
00026W0I		D	2000KW,700VDC WIRING DIAGRAM
00026W0L		B	FEEDER BREAKER WIRING DIAGRAM
00026W0M		E	TYPICAL FEEDER BREAKER CONTROL CAMPARTMENT WIRING DIAGRAM
00026W0N		F	MAIN BREAKER WIRING DIAGRAM
00026W0Q		C	FEEDER BKR. CONTROL COMP. (W/O RECL & RATE OF RISE) WIRING DIAG.
00026W0S		G	72-1 CONTROL AREA WIRING DIAGRAM (CATHODE BREAKER)
00026W0U		D	72-3 CONTROL AREA WIRING DIAGRAM (CATHODE BREAKER)
00026W1K		A	AC INNER CONNECTION DIAGRAM
00026W1N		C	POSITIVE AND NEGATIVE TIE BREAKER WIRING DIAGRAM
00026W1O		C	POSITIVE TIE BREAKER CONTROL COMPARTMENT WIRING DIAGRAM
00026W1P		C	NEGATIVE TIE BREAKER CONTROL COMPARTMENT WIRING DIAGRAM
00026W1Q		B	DC SWITCHGEAR INNER CONNECTION DIAGRAM
00026W1R		B	DC SWITCHGEAR INNER CONNECTION DIAGRAM
00026W1T		B	DC BREAKER TEST CABINET WIRING DIAGRAM
00026W2K		-	72-2 CONTROL AREA WIRNG DIAGRAM
00026W2S		A	SUBSTATION INTERCONNECTIONS AC SWITCHGEAR
00026W2T		-	SUBSTATION INTERCONNECTIONS AC SWITCHGEAR
00026W2U		A	SUBSTATION INTERCONNECTIONS TRANS. 1 & 2 AND RECT. 1 & 2
00026W2V		-	SUBSTATION INTERCONNECTIONS TRANS. 3 AND RECT. 3
00026W2W		-	SUBSTATION INTERCONNECTIONS DC SWITCHGEAR
00026W2X		A	SUBSTATION INTERCONNECTIONS DC SWITCHGEAR
00026W2Y		A	SUBSTATION INTERCONNECTIONS DC SWITCHGEAR
00026W2Z		-	SUBSTATION INTERCONNECTIONS ANNUNCIATOR
00026W3A		-	ANNUNCIATOR CABINET WIRING DIAGRAM
00026W3B		-	ANNUNCIATOR CABINET WIRING DIAGRAM-YARD TOWER

Mechanical-Glenmont Yard

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
0026M0G		D	FLOOR PLAN
00026M0K		C	AC SWITCHGEAR FRONT ELEVATION
00026M0O		D	DC SWITCHGEAR FRONT ELEVATION
00026M0X		A	RECTIFIER #1 FRONT ELEVATION
00026M0Y		A	RECTIFIER #2 FRONT ELEVATION
00026M1C		A	AC SWITCHGEAR PLAN VIEW
00026M1G		A	DC SWITCHGEAR PLAN VIEW
00026M1P		-	RECTIFIER #1 & #2 PLAN VIEW
00026M1Q		-	RECTIFIER #3 PLAN VIEW
00026M1W		C	FRONT VIEW NEGATIVE/DRAINAGE SWITCHGEAR
00026M2G		C	AC BUS DUCT
00026M2H		A	DC POSITIVE BUS DUCT
00026M2I		A	DC NEGATIVE BUS DUCT
00026M2J		F	SECTION VIEW 15KV AC SWITCHGEAR
00026M2K		E	SECTION VIEW 15KV AC SWITCHGEAR
00026M2N		E	DC SWITCHGEAR SECTION VIEWS
00026M2O		E	NEGATIVE DRAINAGE SECTION VIEWS
00026M7K		A	15KV INCOMING LINES 1 AND 2 CUSTOMER CONNECTIONS
00026M8H		-	DC SWITCHGEAR SECTION VIEWS
00026M8U		-	RECTIFIER SECTION VIEWS
00026M9B		-	RECTIFIER SECTION VIEWS

Schematic-Glenmont North

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
M0026001		A	SUPERVISORY CONTROL IDENTIFICATION NUMBERS
M0026004		A	STANDARD SYMBOLS AND NOMENCLATURE
00026S0R		H	TYPICAL FEEDER BREAKER SCHEMATIC DIAGRAM
00026S1L		A	HIGH RESISTANCE GROUND CIRCUIT
00026S1O		A	4000 AMP CIRCUIT BREAKER SCHEMATIC DIAGRAM
00026S1R		-	DC BREAKER TEST CABINET SCHEMATIC DIAGRAM
00026S0H		-	ONE-LINE DIAGRAM
00026S1S		C	TIE BREAKER STATION ANNUNCIATOR SCHEMATIC DIAGRAM
00026S1V		B	TIE BREAKER 172-1

Wiring-Glenmont North

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
00026W0L		B	FEEDER BREAKER WIRING DIAGRAM
00026W0M		E	TYPICAL FEEDER BREAKER CONTROL COMPARTMENT WIRING DIAGRAM
00026W0R		D	DC FEEDER BREAKER (UNIT 1) CONTROL AREA WIRING DIAGRAM
00026W1A		C	DC SWITCHGEAR INNER CONNECTION DIAGRAM
00026W1T		B	DC BREAKER TEST CABINET WIRING DIAGRAM
00026W3E		-	INTERCONNECTIONS DIAGRAM

Mechanical-Glenmont North

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
0026M0B		A	FLOOR PLAN
00026M0P		B	DC SWITCHGEAR FRONT ELEVATION
00026M1H		A	DC SWITCHGEAR PLAN VIEW
00026M2N		E	DC SWITCHGEAR SECTION VIEWS

Schematic-Henderson Ave.

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
M0026001		A	SUPERVISORY CONTROL IDENTIFICATION NUMBERS
M0026004		A	STANDARD SYMBOLS AND NOMENCLATURE
00026S0R		H	TYPICAL FEEDER BREAKER SCHEMATIC DIAGRAM
00026S1L		A	HIGH RESISTANCE GROUND CIRCUIT
00026S1O		A	4000 AMP CIRCUIT BREAKER SCHEMATIC DIAGRAM
00026S1R		-	DC BREAKER TEST CABINET SCHEMATIC DIAGRAM
00026S0S		E	ACCELERATION GAP BREAKER SCHEMATIC DIAGRAM
00026S0P		F	72-2 SCHEMATIC DIAGRAM (CATHODE BREAKER)
00026S1N		C	8000 AMP CIRCUIT BREAKER SCHEMATIC DIAGRAM
00026S0A		B	13.8KV ONE-LINE DIAGRAM
00026S0M		B	3000KW RECTIFIER CONTROL SCHEMATIC
00026S0N		C	3000KW RECTIFIER ELEMENTARY DIAGRAM
00026S0U		C	AC SCHEMATIC, 13.8KV SWITCHGEAR
00026S0X		E	BREAKER 52L1 CONTROL SCHEMATIC
00026S0Y		E	BREAKER 52L2 CONTROL SCHEMATIC
00026S0Z		E	BREAKER 52BT CONTROL SCHEMATIC
00026S1A		C	BREAKER 52R CONTROL SCHEMATIC
00026S1C		E	BREAKER 52 CONTROL SCHEMATIC
00026S1D		-	13.8KV BREAKER TEST CABINET SCHEMATIC
00026S1T		A	72-1 SCHEMATIC DIAGRAM (CATHODE BREAKER)

Wiring-Henderson

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
00026W0A		E	BREAKER 52 WIRING DIAGRAM
00026W0B		D	BREAKER 52R WIRING DIAGRAM
00026W0C		B	BREAKER 52L1 & 52L2 WIRING DIAGRAM
00026W0E		B	BUS TIE BREAKER 52BT WIRING DIAGRAM
00026W0F		-	UTILITY METERING CUBICLE WIRING DIAGRAM
00026W0J		E	3000KW,700VDC WIRING DIAGRAM
00026W0K		D	3000KW,700VDC WIRING DIAGRAM
00026W0L		B	FEEDER BREAKER WIRING DIAGRAM
00026W0M		E	TYPICAL FEEDER BREAKER CONTROL CAMPARTMENT WIRING DIAGRAM
00026W0N		F	MAIN BREAKER WIRING DIAGRAM
00026W0O		E	ACCELERATION BREAKER WIRING DIAGRAM
00026W0S		G	72-1 CONTROL AREA WIRING DIAGRAM (CATHODE BREAKER)
00026W0T		E	72-2 CONTROL AREA WIRING DIAGRAM (CATHODE BREAKER)
00026W0W		B	DC SWITCHGEAR INNER CONNECTION DIAGRAM
00026W1J		B	AC INNER CONNECTION DIAGRAM
00026W1S		D	TIE BREAKER STATION ANNUNCIATOR WIRING DIAGRAM
00026W1T		B	DC BREAKER TEST CABINET WIRING DIAGRAM
00026W2L		-	INNER CONNECTIONS BETWEEN DPM'S IN AC SWITCHGEAR
00026W2M			INNER CONNECTIONS BETWEEN DPM'S IN AC SWITCHGEAR
00026W2N		A	SUBSTATION INTERCONNECTIONS AC SWITCHGEAR
00026W2O		-	SUBSTATION INTERCONNECTIONS AC SWITCHGEAR
00026W2P		-	SUBSTATION INTERCONNECTIONS TRANS. 1 & 2 AND RECT. 1 & 2
00026W2Q		-	SUBSTATION INTERCONNECTIONS DC SWITCHGEAR
00026W2R		-	SUBSTATION INTERCONNECTIONS ANNUNCIATOR
00026W3C		-	SUBSTATION INTERCONNECTIONS AUXILIARY TRANSFORMER
00026W3G		-	ANNUNCIATOR CABINET WIRING DIAGRAM

Mechanical-Henderson Avenue

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
00026M0A		D	FLOOR PLAN
00026M0H		D	AC SWITCHGEAR FRONT ELEVATION
00026M0L		B	DC SWITCHGEAR FRONT ELEVATION
00026M0U		B	RECTIFIER FRONT ELEVATION
00026M0Z		A	AC SWITCHGEAR PLAN VIEW
00026M1D		B	DC SWITCHGEAR PLAN VIEW
00026M1M		-	RECTIFIER PLAN VIEW
00026M1R		A	FRONT VIEW NEGATIVE/DRAINAGE SWITCHGEAR
00026M1X		C	AC BUS DUCT
00026M1Y		A	DC NEGATIVE BUS DUCT
00026M1Z		A	DC POSITIVE BUS DUCT
00026M2J		F	SECTION VIEW 15KV AC SWITCHGEAR
00026M2K		E	SECTION VIEW 15KV AC SWITCHGEAR
00026M2N		E	DC SWITCHGEAR SECTION VIEWS
00026M2O		E	NEGATIVE DRAINAGE SECTION VIEWS
00026M5Z		A	15KV AC UTILITY METERING COMPARTMENT SECTIONAL VIEWS
00026M6A		-	15KV AC UTILITY METERING COMPARTMENT SECTIONAL VIEWS
00026M7K		A	15KV INCOMING LINES 1 AND 2 CUSTOMER CONNECTIONS
00026M7K		A	RECTIFIER SECTION VIEWS
00026M8D		A	AC BUS DUCT LAYOUT

Schematic-Glenmont South

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
M0026001		A	SUPERVISORY CONTROL IDENTIFICATION NUMBERS
M0026004		A	STANDARD SYMBOLS AND NOMENCLATURE
00026S0R		H	TYPICAL FEEDER BREAKER SCHEMATIC DIAGRAM
00026S1L		A	HIGH RESISTANCE GROUND CIRCUIT
00026S1O		A	4000 AMP CIRCUIT BREAKER SCHEMATIC DIAGRAM
00026S1R		-	DC BREAKER TEST CABINET SCHEMATIC DIAGRAM
00026S1S		C	TIE BREAKER STATION ANNUNCIATOR SCHEMATIC DIAGRAM
00026S0S		E	ACCELERATION GAP BREAKER SCHEMATIC DIAGRAM
00026S0F		A	ONE-LINE DIAGRAM
00026S1W		A	TIE BREAKER 172-1

Wiring-Glenmont South

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
00026W0L		B	FEEDER BREAKER WIRING DIAGRAM
00026W0M		E	TYPICAL FEEDER BREAKER CONTROL COMPARTMENT WIRING DIAGRAM
00026W0O		E	ACCELERATION BREAKER WIRING DIAGRAM
00026W0R		D	DC FEEDER BREAKER (UNIT 1) CONTROL AREA WIRING DIAGRAM
00026W1B		B	DC SWITCHGEAR INNER CONNECTION DIAGRAM
00026W1T		B	DC BREAKER TEST CABINET WIRING DIAGRAM
00026W3F		-	INTERCONNECTIONS DIAGRAM

Mechanical-Glenmont South

DRAWING NUMBER	SHEET	REV.	DESCRIPTION
0026M0B		A	FLOOR PLAN
00026M0Q		C	DC SWITCHGEAR FRONT ELEVATION
00026M1I		A	DC SWITCHGEAR PLAN VIEW
00026M2N		E	DC SWITCHGEAR SECTION VIEWS

REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHKD. BY	APP. BY
A	CORRECTED SPELLING ERRORS	CEG	08/26/94		

SUBSTATIONS

TIE BREAKER STATIONS

HENDERSON AVENUE SUBSTATION

GLENMONT NORTH TIE BREAKER STATION

D.C. SWITCHGEAR	
UNIT	SUPV. CONTROL IDENT. NO.
CATHODE BKR. NO. 1	E-B10-21
CATHODE BKR. NO. 2	E-B10-22
FEEDER NO. 1	E-B10-51
FEEDER NO. 2	E-B10-52
FEEDER NO. 3	E-B10-53
FEEDER NO. 4	E-B10-54
FEEDER NO. 5	E-B10-55
FEEDER NO. 6	E-B10-56

A.C. SWITCHGEAR	
UNIT	SUPV. CONTROL IDENT. NO.
INC. LINE NO. 1	E-B10-01
INC. LINE NO. 2	E-B10-02
BUS TIE	E-B10-03
RECT. FDR. NO.1	E-B10-11
RECT. FDR. NO. 2	E-B10-12

D.C. SWITCHGEAR	
UNIT	SUPV. CONTROL IDENT. NO.
TIE BREAKER NO. 1	E-B11-61
TIE BREAKER NO. 2	E-B11-62
TIE BREAKER NO. 3	E-B11-63
TIE BREAKER NO. 4	E-B11-64

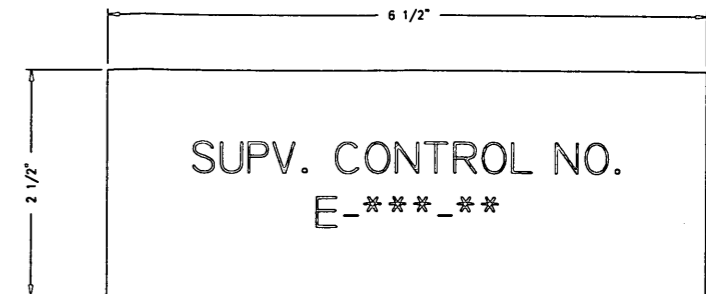
GLENMONT YARD SUBSTATION

GLENMONT SOUTH TIE BREAKER STATION

D.C. SWITCHGEAR	
UNIT	SUPV. CONTROL IDENT. NO.
CATHODE BKR. NO. 1 (MNL)	E-B11-21
CATHODE BKR. NO. 2 (MNL)	E-B1-22
CATHODE BKR. NO. 3 (YARD)	E-B98-22
FEEDER NO. 1 (MNL)	E-B11-81
FEEDER NO. 2 (MNL)	E-B11-82
FEEDER NO. 3 (YARD)	E-B98-33
FEEDER NO. 4 (YARD)	E-B98-34
FEEDER NO. 5 (YARD)	E-B98-35
FEEDER NO. 6 (YARD)	E-B98-36
POSITIVE TIE BKR.	E-B98-09P
NEGATIVE TIE BKR.	E-B98-09N

A.C. SWITCHGEAR	
UNIT	SUPV. CONTROL IDENT. NO.
INC. LINE NO. 1	E-B11-01
INC. LINE NO. 2	E-B11-02
BUS TIE	E-B11-03
RECT. FDR. NO.1 (MNL)	E-B11-11
RECT. FDR. NO. 2 (MNL)	E-B11-12
RECT. FDR. NO. 3 (YARD)	E-B98-13

D.C. SWITCHGEAR	
UNIT	SUPV. CONTROL IDENT. NO.
TIE BREAKER NO. 1	E-B11-41
TIE BREAKER NO. 2	E-B11-42
TIE BREAKER NO. 3	E-B11-43
TIE BREAKER NO. 4	E-B11-44
TIE BREAKER NO. 5	E-B11-45
TIE BREAKER NO. 6	E-B11-46



TYPICAL TAG ENGRAVING

ROSO STREET TIE BREAKER STATION

D.C. SWITCHGEAR	
UNIT	SUPV. CONTROL IDENT. NO.
TIE BREAKER NO. 1	E-J03-41
TIE BREAKER NO. 2	E-J03-42
TIE BREAKER NO. 3	E-J03-43
TIE BREAKER NO. 4	E-J03-44
TIE BREAKER NO. 5	E-J03-45
TIE BREAKER NO. 6	E-J03-46

NOTES:

1. * IS INDICATED IN TIE BREAKER STATIONS AND SUBSTATIONS CHARTS.

GREENLEAF SUBSTATION

FARRINGTON AVENUE TIE BREAKER STATION

D.C. SWITCHGEAR	
UNIT	SUPV. CONTROL IDENT. NO.
CATHODE BKR. NO. 1	E-J03-25
CATHODE BKR. NO. 2	E-J03-26
FEEDER NO. 1	E-J03-51
FEEDER NO. 2	E-J03-52
FEEDER NO. 3	E-J03-53
FEEDER NO. 4	E-J03-54
FEEDER NO. 5	E-J03-55
FEEDER NO. 6	E-J03-56

A.C. SWITCHGEAR	
UNIT	SUPV. CONTROL IDENT. NO.
INC. LINE NO. 1	E-J03-4
INC. LINE NO. 2	E-J03-5
BUS TIE	E-J03-6
RECT. FDR. NO.1	E-J03-15
RECT. FDR. NO. 2	E-J03-16

D.C. SWITCHGEAR	
UNIT	SUPV. CONTROL IDENT. NO.
TIE BREAKER NO. 1	E-J02-61
TIE BREAKER NO. 2	E-J02-62
TIE BREAKER NO. 3	E-J02-63
TIE BREAKER NO. 4	E-J02-64
TIE BREAKER NO. 5	E-J02-65
TIE BREAKER NO. 6	E-J02-66

TILBURY ROAD SUBSTATION

FRANCONIA-SPRINGFIELD TIE BREAKER STATION

D.C. SWITCHGEAR	
UNIT	SUPV. CONTROL IDENT. NO.
CATHODE BKR. NO. 1	E-J03-21
CATHODE BKR. NO. 2	E-J03-22
FEEDER NO. 1	E-J03-31
FEEDER NO. 2	E-J03-32
FEEDER NO. 3	E-J03-33
FEEDER NO. 4	E-J03-34
FEEDER NO. 5	E-J03-35
FEEDER NO. 6	E-J03-36

A.C. SWITCHGEAR	
UNIT	SUPV. CONTROL IDENT. NO.
INC. LINE NO. 1	E-J03-1
INC. LINE NO. 2	E-J03-2
BUS TIE	E-J03-3
RECT. FDR. NO.1	E-J03-11
RECT. FDR. NO. 2	E-J03-12

D.C. SWITCHGEAR	
UNIT	SUPV. CONTROL IDENT. NO.
TIE BREAKER NO. 1	E-J03-61
TIE BREAKER NO. 2	E-J03-62
TIE BREAKER NO. 3	E-J03-63
TIE BREAKER NO. 4	E-J03-64
TIE BREAKER NO. 5	E-J03-67










SUBSTATION	JOB NO.
TILBURY ROAD	1066
GREENLEAF	1067
HENDERSON AVENUE	1071
GLENMONT YARD	1072
TIE BREAKER STATION	JOB NO.
FARRINGTON AVENUE	1064
ROSO STREET	1065
FRANCONIA-SPRINGFIELD	1068
GLENMONT NORTH	1069
GLENMONT SOUTH	1070

DWN. CFJ	DATE 7/22/94	<p>1229 N. STATEDALE AVENUE P.O. BOX 213 LEWISTON, N.C. 27033</p>
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER		SUPERVISORY CONTROL IDENTIFICATION NUMBERS
WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		DWG. NO. M0026001
CONTRACT NO. 227042	DWG. SIZE D	JOB NO. SEE CHART
	SCALE	REV. A

Jackson Wed Jul 2 10:53:31 1997 - E:\00026\M0026001

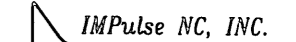
Jackson Wed Jul 2 10:53:58 1997 - E:\00026\W0026004

REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D.	APP'D.
A	REVISED PER CUSTOMER COMMENTS	CFJ	11/8/94		

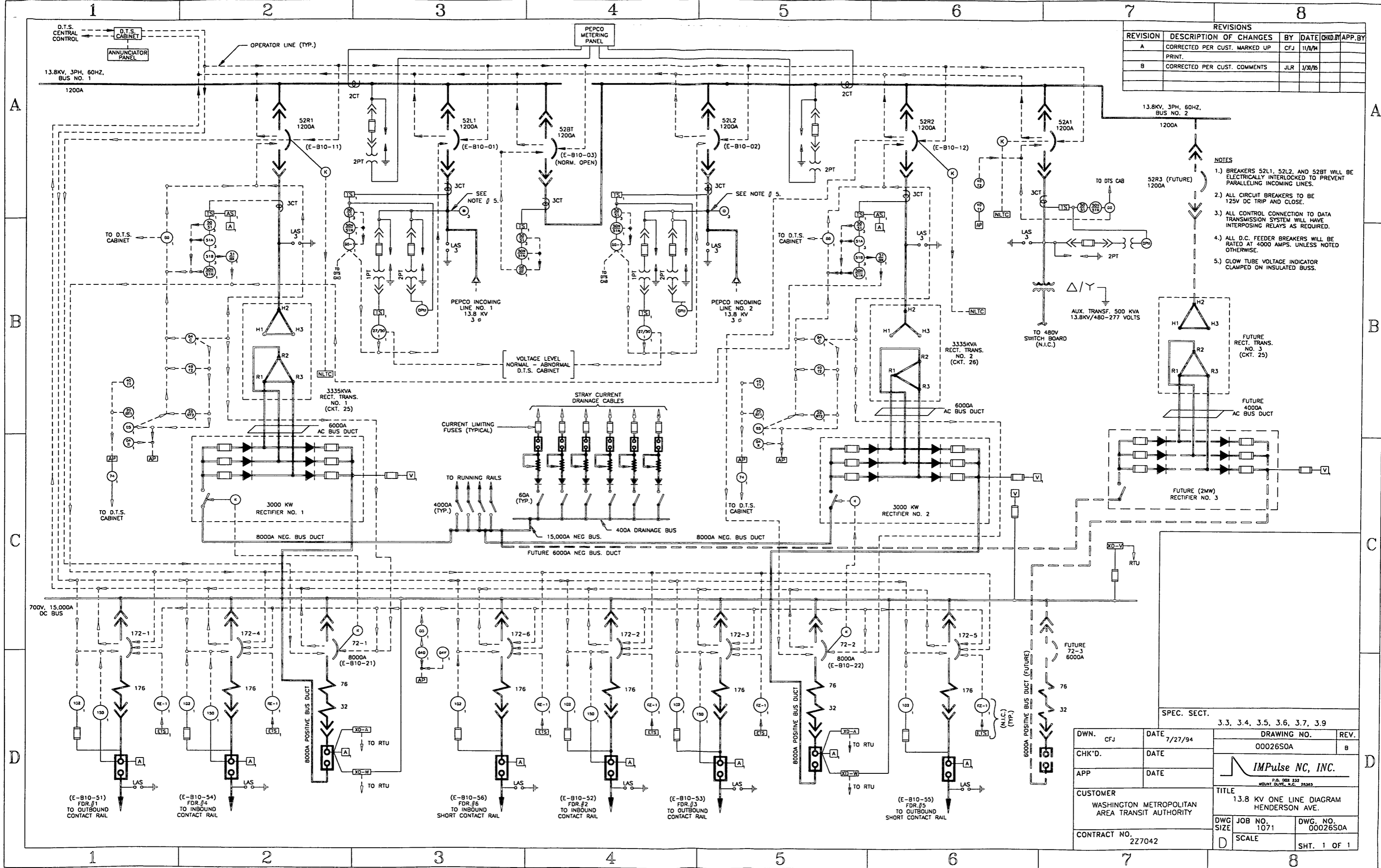
RTU	REMOTE TERMINAL UNIT
AP	LOCAL ANNUNCIATOR PANEL
AS	AMMETER SWITCH
CT	CURRENT TRANSFORMER
ETS	EMERGENCY TRIP STATION AT TRACKSIDE
PT	POTENTIAL TRANSFORMER
RE-1	AUXILIARY RELAY
TS	TEST SWITCH
V	VOLTMETER
A	AMMETER
26RT1	RECTIFIER OVERTEMP. DEVICE 1st STAGE
26RT2	RECTIFIER OVERTEMP. DEVICE 2st STAGE
DTS	DATA TRANSMISSION SYSTEM
27/59	UNDERVOLTAGE & OVERTVOLTAGE RELAY
32	CATHODE BRK. REVERSE CURRENT TRIP DEVICE
33	DOOR INTERLOCK SWITCH
49T1	TRANS. WINDING OVERTEMP. DEVICE 1st STAGE
49T2	TRANS. WINDING OVERTEMP. DEVICE 2nd STAGE
50/51	AC OVERCURRENT PHASE RELAY & TIME
50N/51N	AC OVERCURRENT GRD. RELAY INST. & TIME
51A	AC OVERCURRENT PHASE RELAY TIME
51B	AC OVERCURRENT PHASE RELAY TIME
51BX	AUX. TO DEVICE 51B
52	AC CKT. BREAKER
52BT	BUS TIE AC CKT. BREAKER
52R	RECTIFIER FEEDER BREAKER
52L	INCOMING LINE AC CKT. BREAKER
63MR	TRANS. EXPL. DIAPHRAGM DEVICE
63QL	TRANS. LOW OIL LEVEL DEVICE
63SP	TRANS. SUDDEN PRESSURE RELAY
64C	RECT. GRD. RELAY HOT STRUCTURE
64X	RECT. GRD. RELAY GRD. STRUCTURE
64D	DC SWGR. GRD. RELAY HOT STRUCTURE
64Y	DC SWGR. GRD. RELAY GRD. STRUCTURE
72	DC CATHODE AIR CKT. BREAKER
74	ALARM RELAY
76	CATHODE BREAKER FORWARD CURRENT TRIP DEVICE
	NO LOAD TAP CHANGER
86	LOCK-OUT RELAY HAND RESET
95	DIODE FAILURE DEVICE
150	DC RATE-OF-RISE RELAY
172	DC AIR CKT. BREAKER (FEEDER)
176	DC BREAKER SERIES TRIP DEVICE
182	DC LOAD MEASURING RELAY
	KNIFE SWITCH
	DIODE
	SHUNT
	VARIABLE RESISTOR
	KEY INTERLOCK
	POT. TRANS. FUSE GROUNDING CONTACT
	NEON GLOW TUBE HIGH VOLTAGE INDICATOR
	LIGHTNING ARRESTER (FOR SURGE PROTECTION)
XD-A	CURRENT TRANSDUCER
XD-V	VOLTAGE TRANSDUCER
XD-W	WATT TRANSDUCER
DPM	DIGITAL POWER METER

APPLIES TO:

SUBSTATION	JOB NO.
1.) HENDERSON AVENUE TPS	1071
2.) GLENMONT YARD TPS	1072
3.) GREENLEAF TPS	1067
4.) TILBURY ROAD TPS	1066

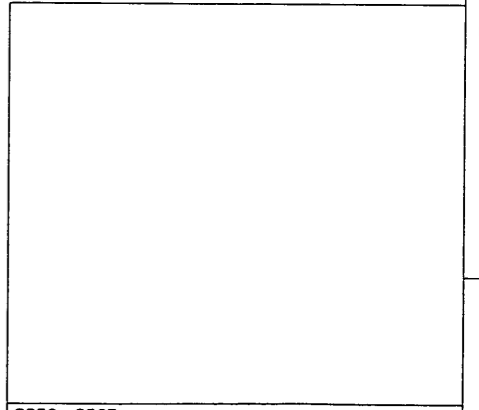
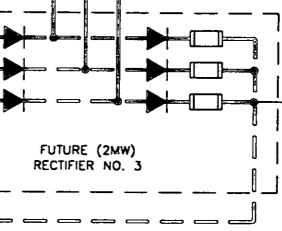
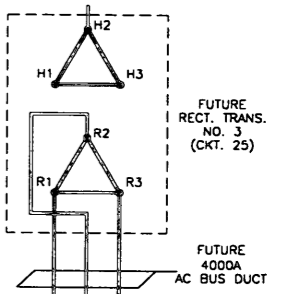
DWN. CFJ	DATE 8/29/94	 1220 H. BRADSHAW AVENUE P.O. BOX 234 WELLS RIVER, N.C. 27385
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER		STANDARD SYMBOLS AND NOMENCLATURE
WASHINGTON AREA TRANSIT AUTHORITY		DWG. NO. M0026004
CONTRACT NO. 227042	DWG. SIZE D	JOB NO. SEE CHART
	SCALE	REV. A

Jackson Met 2 10:54:44 1997 - E:\00026\0002650A



REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D.	APP. BY
A	CORRECTED PER CUST. MARKED UP PRINT.	CFJ	11/8/94		
B	CORRECTED PER CUST. COMMENTS	JLR	3/30/95		

- NOTES
- 1.) BREAKERS 52L1, 52L2, AND 52B1 WILL BE ELECTRICALLY INTERLOCKED TO PREVENT PARALLELING INCOMING LINES.
 - 2.) ALL CIRCUIT BREAKERS TO BE 125V DC TRIP AND CLOSE.
 - 3.) ALL CONTROL CONNECTION TO DATA TRANSMISSION SYSTEM WILL HAVE INTERPOSING RELAYS AS REQUIRED.
 - 4.) ALL D.C. FEEDER BREAKERS WILL BE RATED AT 4000 AMPS, UNLESS NOTED OTHERWISE.
 - 5.) GLOW TUBE VOLTAGE INDICATOR CLAMPED ON INSULATED BUSS.

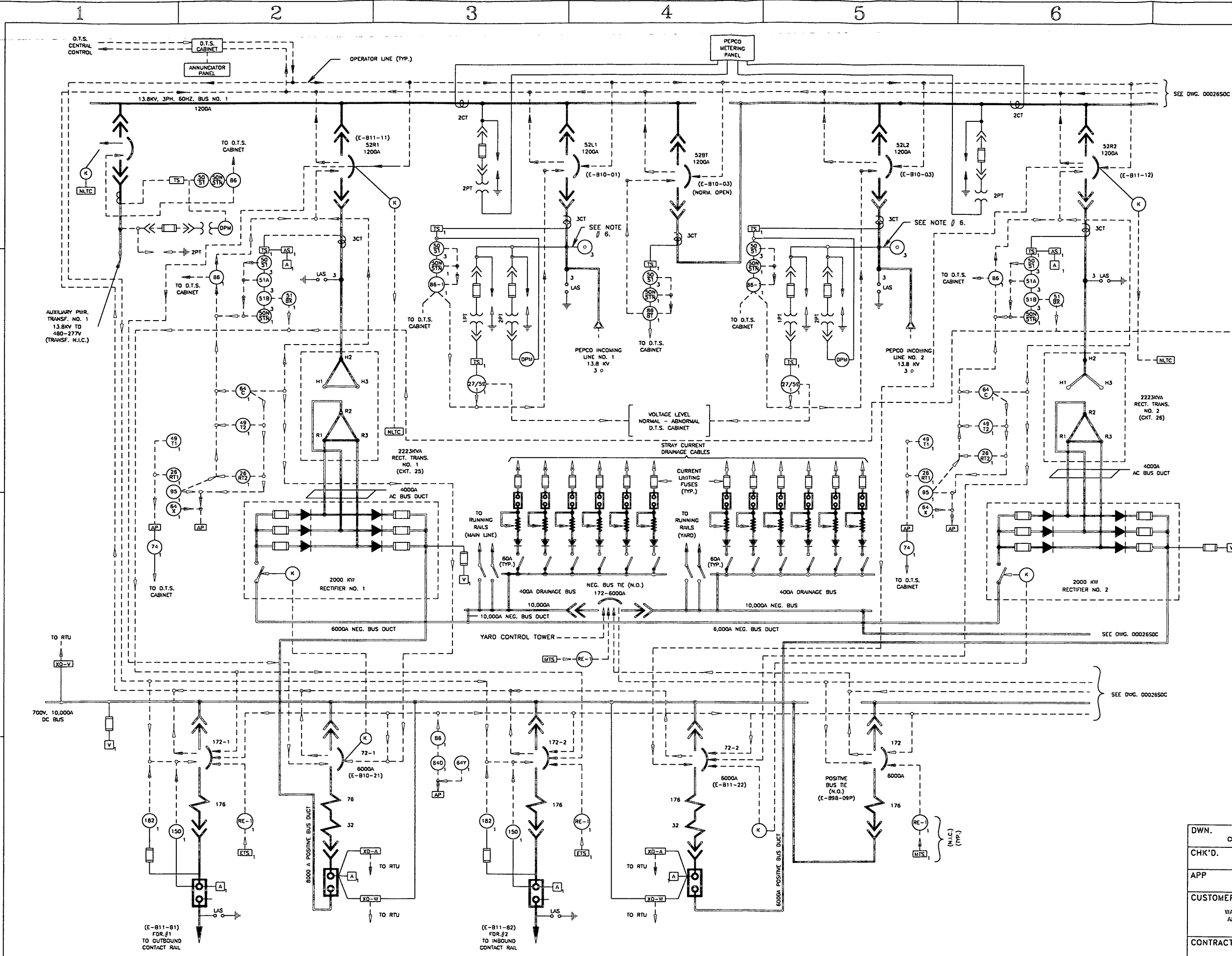


SPEC. SECT. 3.3, 3.4, 3.5, 3.6, 3.7, 3.9

DWN. CFJ	DATE 7/27/94	DRAWING NO. 0002650A	REV. B
CHK'D.	DATE	IMPulse NC, INC.	
APP	DATE	P.O. BOX 232 MOUNTAIN VIEW, N.C. 28555	
CUSTOMER WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY	TITLE 13.8 KV ONE LINE DIAGRAM HENDERSON AVE.		
CONTRACT NO. 227042	DWG. NO. 1071	DWG. NO. 0002650A	SHT. 1 OF 1
	SCALE		

Jackson Wed Jul 1 2 10:56:05 1997 - E:\00026\0002650B

REVISIONS				
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHKD. BY APP. BY
A	REVISED PER CUSTOMER COMMENTS	RLS	11/8/94	
B	REVISED PER CUSTOMER COMMENTS	JLR	3/30/95	
C	CORRECTED DRAWING	RLS	10/30/96	



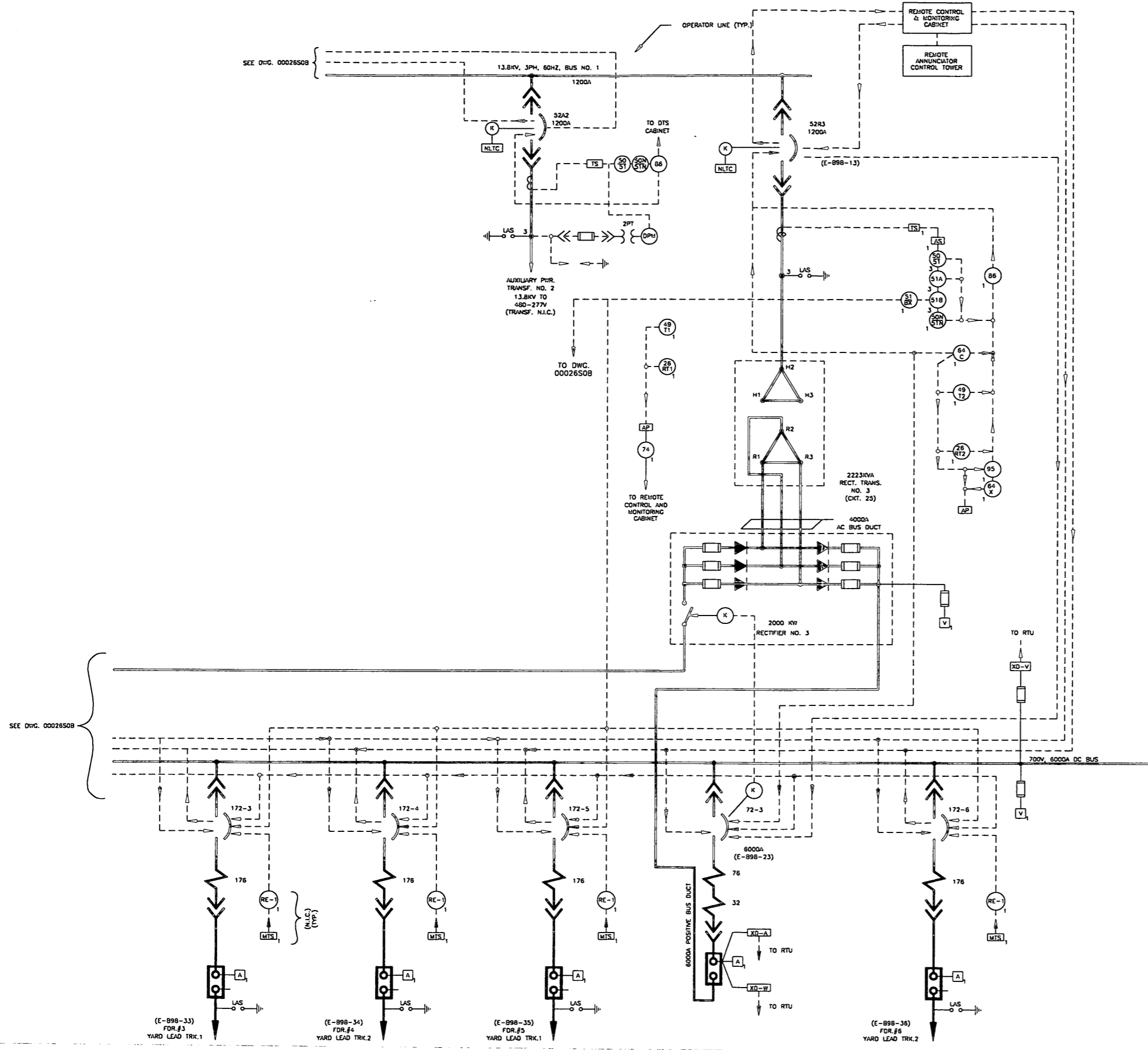
- NOTES
- 1.) BREAKERS 52L1, 52L2, AND 52B2 WILL BE ELECTRICALLY INTERLOCKED TO PREVENT PARALLELING INCOMING LINES.
 - 2.) ALL CIRCUIT BREAKERS TO BE 125V DC TRIP AND CLOSE.
 - 3.) ALL CONTROL CONNECTION TO DATA TRANSMISSION SYSTEM WILL HAVE INTERPOSING RELAYS AS REQUIRED.
 - 4.) ALL D.C. FEEDER BREAKERS WILL BE RATED AT 4000 AMPS, UNLESS NOTED OTHERWISE.
 - 5.) REF. DRAWING 0002650C
 - 6.) GLOW TUBE VOLTAGE INDICATOR CLAMPED ON INSULATED BUSS.

DWN. OF J	DATE 8/26/94	 1220 N. BEECHDALE AVENUE P.O. BOX 233 MOUNT OLIVE, N.C. 27555
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER		ONE LINE DIAGRAM GLENMONT YARD
WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		DWG. NO. 0002650B
CONTRACT NO. 227042	SCALE	REV. c

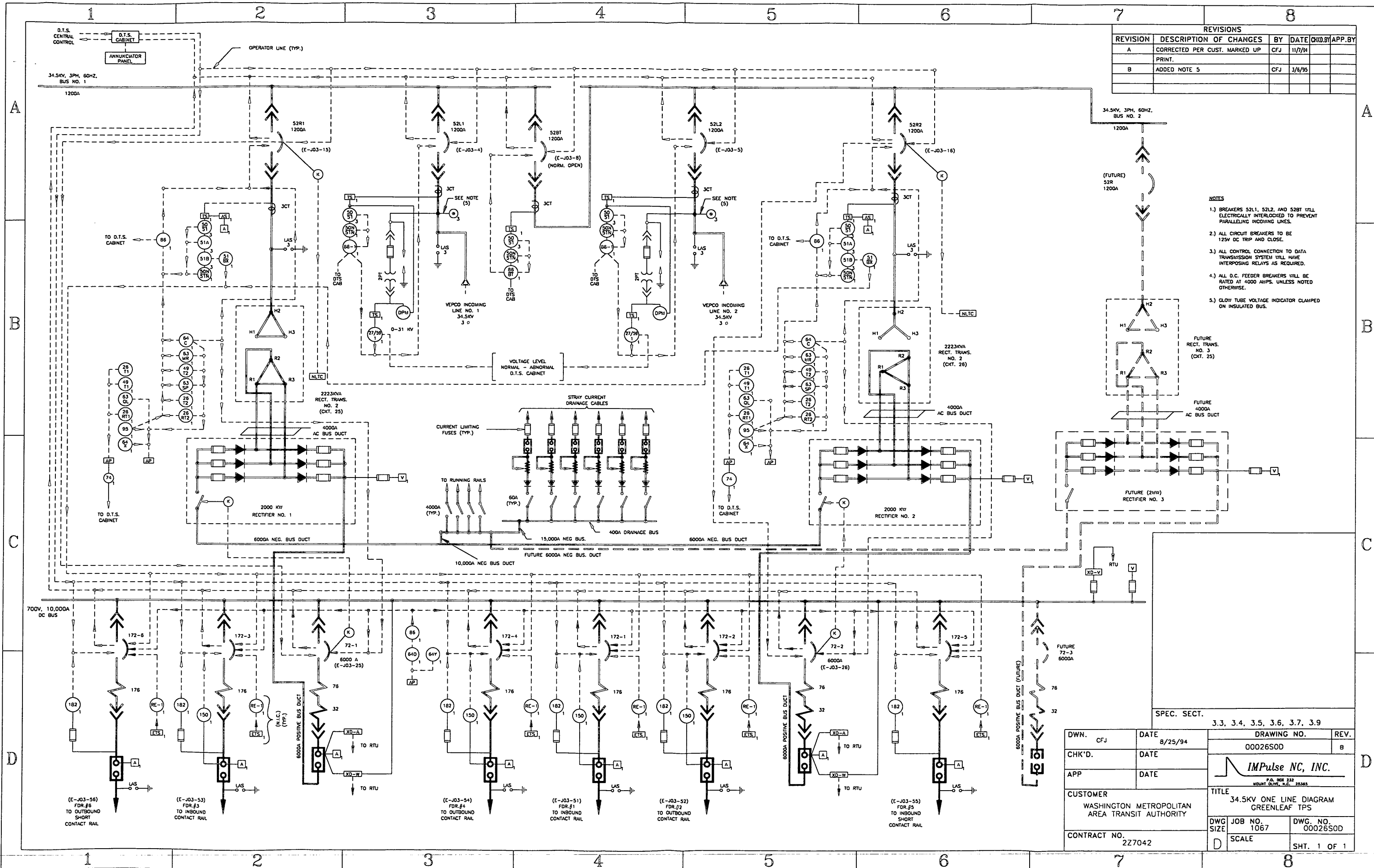
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REVISIONS				
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY APP. BY
A	REVISED PER CUSTOMER COMMENTS	RLS	11/8/94	
B	REVISED PER CUSTOMER COMMENTS	JLR	3/20/95	
C	CORRECTED DRAWING	RLS	11/20/95	

- NOTES
- 1.) BREAKERS 52L1, 52L2, AND 52BT WILL BE ELECTRICALLY INTERLOCKED TO PREVENT PARALLELING INCOMING LINES.
 - 2.) ALL CIRCUIT BREAKERS TO BE 125V DC TRIP AND CLOSE.
 - 3.) ALL CONTROL CONNECTION TO DATA TRANSMISSION SYSTEM WILL HAVE INTERPOSING RELAYS AS REQUIRED.
 - 4.) ALL D.C. FEEDER BREAKERS WILL BE RATED AT 4000 AMPS, UNLESS NOTED OTHERWISE.
 - 5.) REF. DRAWING 0002650B

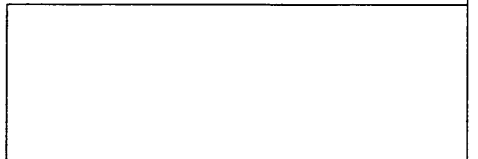
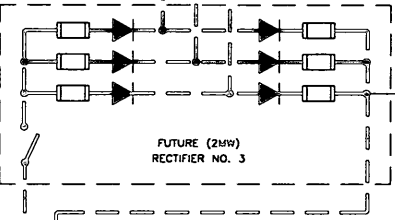
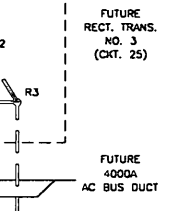


DWN. CFJ	DATE 7/27/94	<p>1220 N. BRADDALE AVENUE P.O. BOX 232 MOUNT CLIVE, N.C. 27355</p>
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER		ONE LINE DIAGRAM GLENMONT YARD
WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		
DWG. SIZE D	JOB NO. 1072	DWG. NO. 0002650C
CONTRACT NO. 227042	SCALE	REV. c



REVISIONS				
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHKD. BY APP. BY
A	CORRECTED PER CUST. MARKED UP PRINT.	CFJ	11/7/94	
B	ADDED NOTE 5	CFJ	3/6/95	

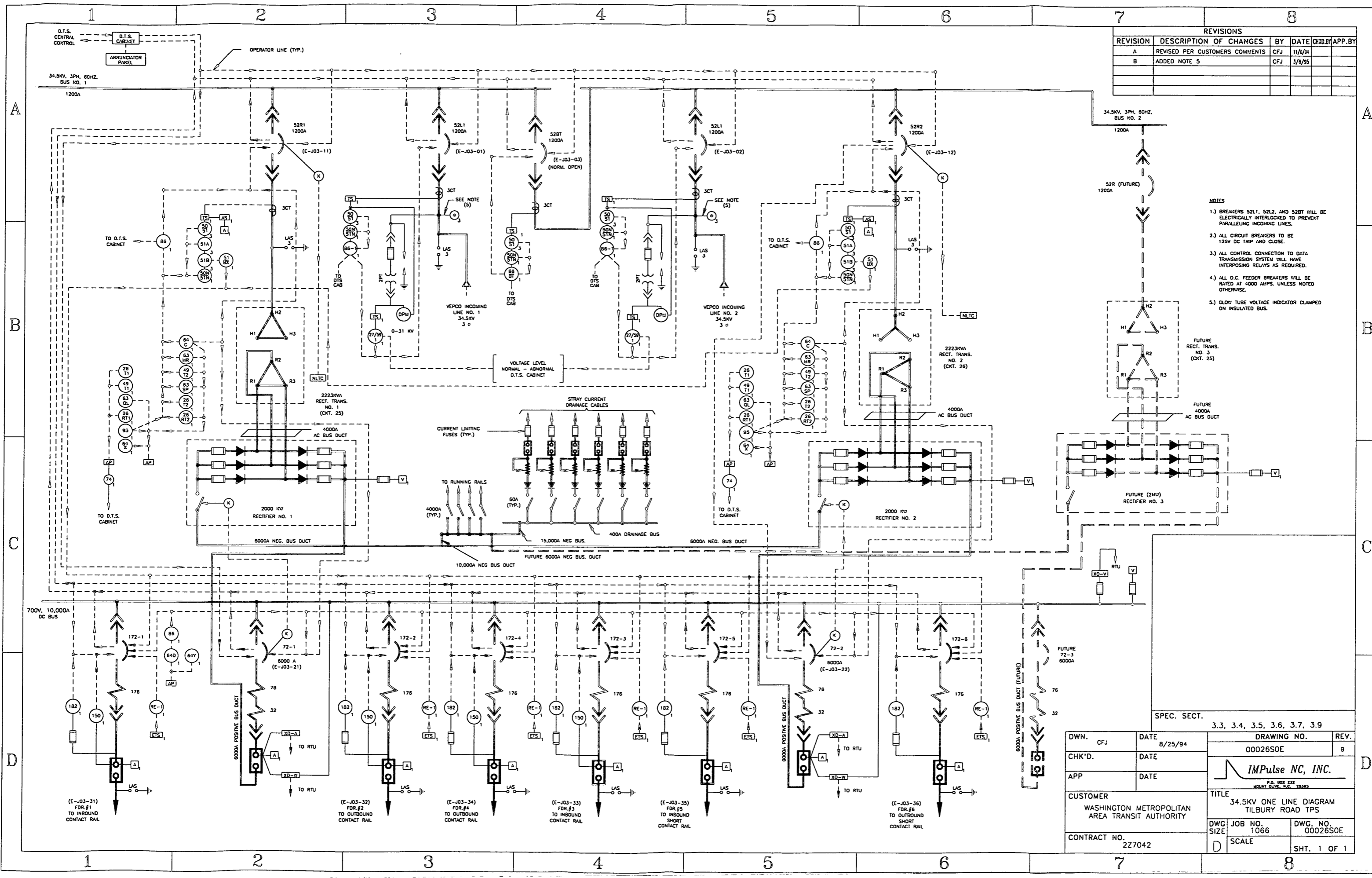
- NOTES**
- 1.) BREAKERS 52L1, 52L2, AND 52BT WILL ELECTRICALLY INTERLOCKED TO PREVENT PARALLELING INCOMING LINES.
 - 2.) ALL CIRCUIT BREAKERS TO BE 125V DC TRIP AND CLOSE.
 - 3.) ALL CONTROL CONNECTION TO DATA TRANSMISSION SYSTEM WILL HAVE INTERPOSING RELAYS AS REQUIRED.
 - 4.) ALL D.C. FEEDER BREAKERS WILL BE RATED AT 4000 AMPS, UNLESS NOTED OTHERWISE.
 - 5.) CLOW TUBE VOLTAGE INDICATOR CLAMPED ON INSULATED BUS.



SPEC. SECT. 3.3, 3.4, 3.5, 3.6, 3.7, 3.9

DWN. CFJ	DATE 8/25/94	DRAWING NO. 00026S0D	REV. B
CHK'D.	DATE	IMPulse NC, INC. P.O. BOX 232 MOUNT OLIVE, W.V. 26365	
APP	DATE	TITLE 34.5KV ONE LINE DIAGRAM GREENLEAF TPS	
CUSTOMER WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY	DWG SIZE D	JOB NO. 1067	DWG. NO. 00026S0D
CONTRACT NO. 227042	SCALE	SHT. 1 OF 1	

Jackson Wed Jul 1 2 10:58:23 1997 - E:\00026\00026S0E



REVISIONS				
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHKD. BY / APP. BY
A	REVISED PER CUSTOMERS COMMENTS	CFJ	11/8/94	
B	ADDED NOTE 5	CFJ	3/8/95	

- NOTES
- 1.) BREAKERS S2L1, S2L2, AND S2B2 WILL BE ELECTRICALLY INTERLOCKED TO PREVENT PARALLELING INCOMING LINES.
 - 2.) ALL CIRCUIT BREAKERS TO BE 125V DC TRIP AND CLOSE.
 - 3.) ALL CONTROL CONNECTION TO DATA TRANSMISSION SYSTEM WILL HAVE INTERPOSING RELAYS AS REQUIRED.
 - 4.) ALL D.C. FEEDER BREAKERS WILL BE RATED AT 4000 AMPS, UNLESS NOTED OTHERWISE.
 - 5.) GLOW TUBE VOLTAGE INDICATOR CLAMPED ON INSULATED BUS.

FUTURE RECT. TRANS. NO. 3 (CKT. 25)

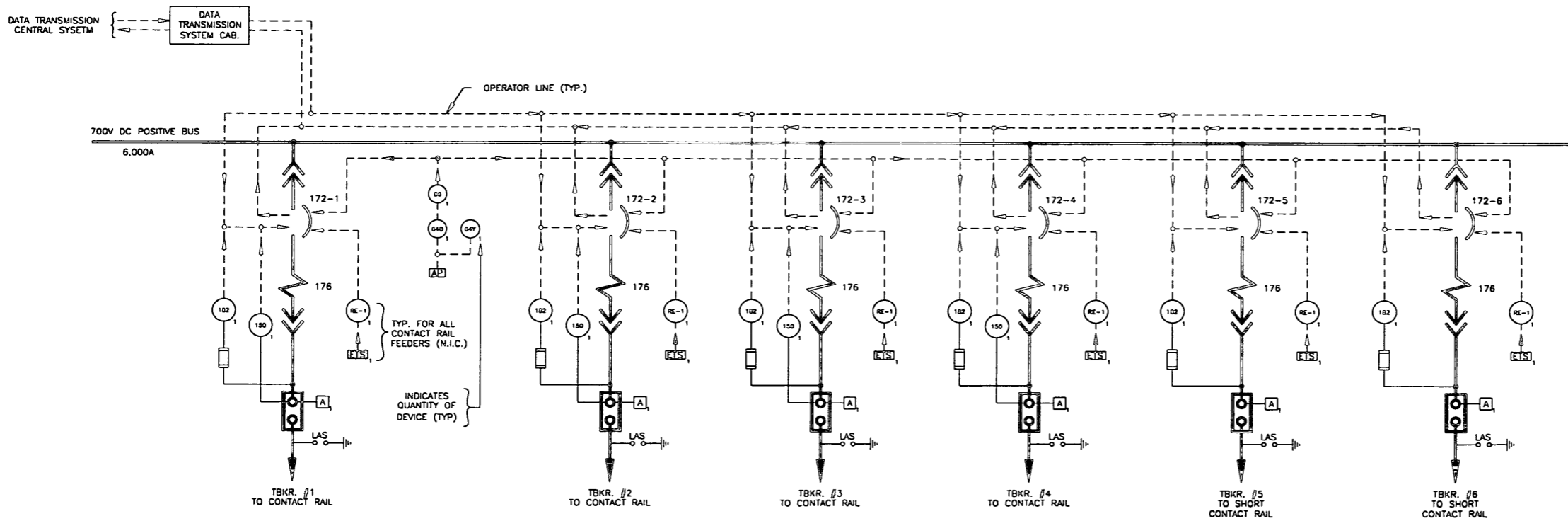
FUTURE 4000A AC BUS DUCT

FUTURE (24W) RECTIFIER NO. 3

SPEC. SECT. 3.3, 3.4, 3.5, 3.6, 3.7, 3.9

DWN. CFJ	DATE 8/25/94	DRAWING NO. 00026S0E	REV. B
CHK'D.	DATE		
APP	DATE		
CUSTOMER WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY	TITLE 34.5KV ONE LINE DIAGRAM TILBURY ROAD TPS		
CONTRACT NO. 227042	DWG. NO. 1066	DWG. NO. 00026S0E	
	SCALE	SHT. 1 OF 1	

REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHKD. BY	APP. BY
A	CORRECTED PER CUST. MARKED UP PRINT	CFJ	11/7/94		



- NOTES**
- 1.) ALL CIRCUIT BREAKERS TO BE 125V DC TRIP AND CLOSE.
 - 2.) ALL CONTROL CONNECTIONS TO DATA TRANSMISSION SYSTEM WILL HAVE INTERPOSING RELAYS AS REQUIRED.
 - 3.) BREAKERS WILL BE RATED AT 4000 AMPS.
 - 4.) FOR SUPERVISORY CONTROL NUMBERS SEE TABLE 3.1-2 IN SPECIFICATIONS.

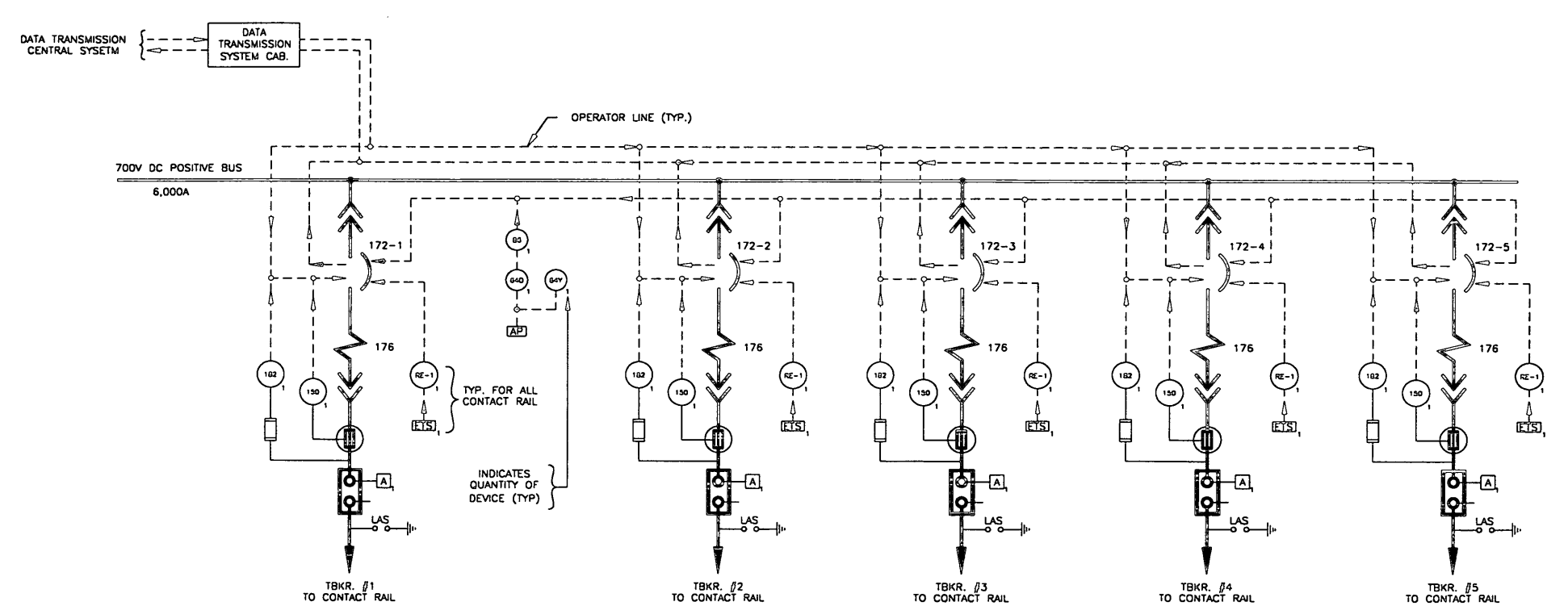
APPLIES TO	
TIE BREAKER STATION	JOB NO.
1.) GLENMONT SOUTH	1070
2.) ROSO STREET	1065
3.) FARRINGTON AVENUE	1064

SPEC. SECT. 3.3, 3.4, 3.5, 3.6, 3.7, 3.9

OWN. CFJ	DATE 7/27/94	DRAWING NO. 00026SOF	REV. A
CHK'D.	DATE	 <small>P.O. BOX 332 MOUNTAIN VIEW, N.C. 28343</small>	
APP	DATE		
CUSTOMER WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		TITLE ONE LINE DIAGRAM FOR (6) TIE BREAKER STATION (TYPICAL)	
CONTRACT NO. 227042	DWG. SIZE D	JOB NO. SEE ABOVE	DWG. NO. 00026SOF
	SCALE		SHT. 1 OF 1

Jackson Med Jul 2 10:59:08 1997 - E:\00026\00026SOF

REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D.	APP. BY
A	CORRECTED THE BREAKER #5	RLS	9/29/96		



- NOTES**
- 1.) ALL CIRCUIT BREAKERS TO BE 125V DC TRIP AND CLOSE.
 - 2.) ALL CONTROL CONNECTIONS TO DATA TRANSMISSION SYSTEM WILL HAVE INTERPOSING RELAYS AS REQUIRED.
 - 3.) BREAKERS WILL BE RATED AT 4000 AMPS.
 - 4.) FOR SUPERVISORY CONTROL NUMBERS SEE TABLE 3.1-2 IN SPECIFICATIONS.

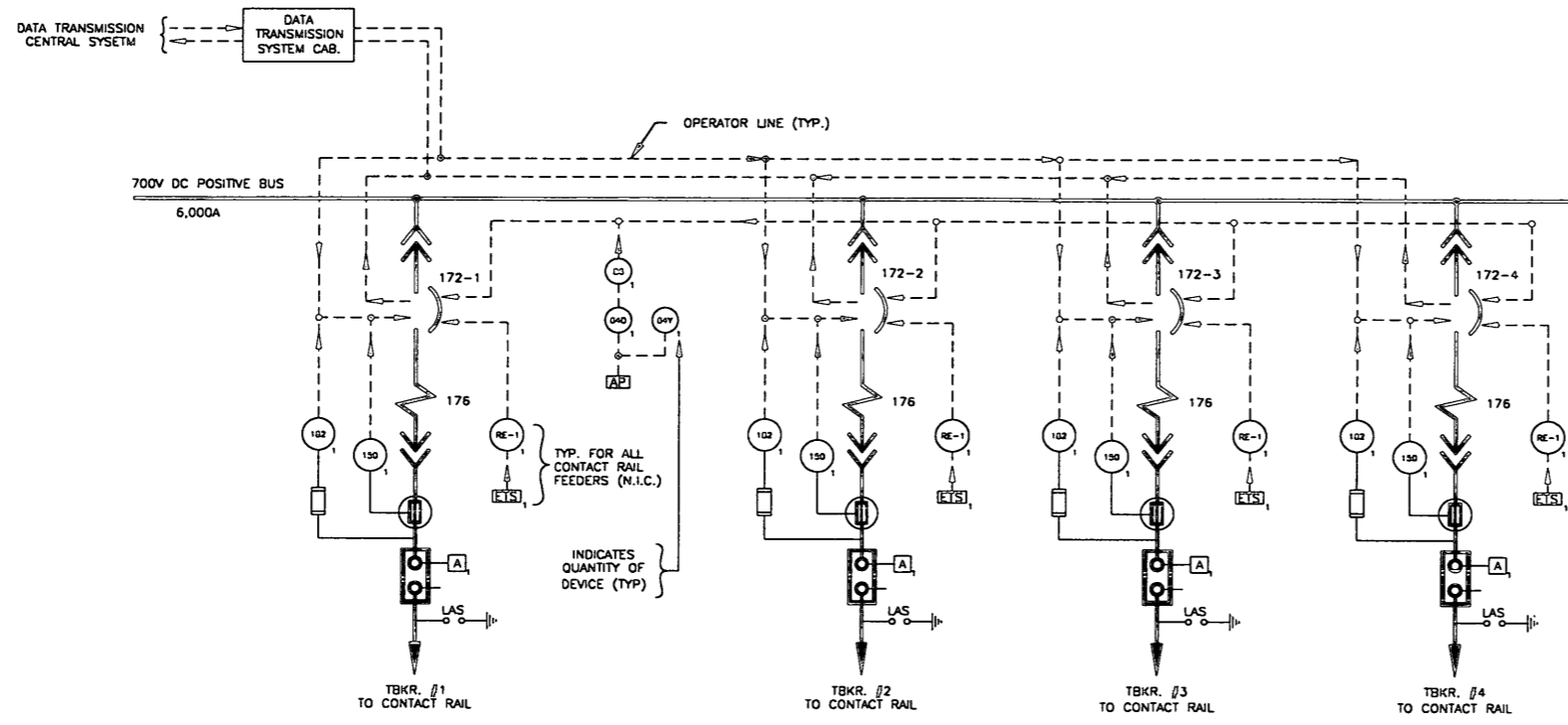
APPLIES TO

TIE BREAKER STATION	JOB NO.
1.) FRANCONIA-SPRINGFIELD	1068

DWN. CFJ	DATE 8/24/94	<p>1229 N. BREAKWALK AVENUE P.O. BOX 239 MOUNT OLIVE, N.C. 28365</p>
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER		ONE LINE DIAGRAM (5) TIE BREAKER STATION (TYPICAL)
WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		DWG. NO. 0002650G
CONTRACT NO. 227042	SCALE	REV. A

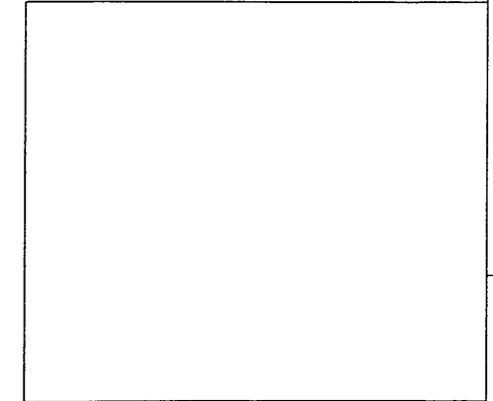
Jackson Wed Jul 2 10:59:28 1997 - E:\00026\00026S0G

REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHKD. BY	APP. BY



- NOTES**
- 1.) ALL CIRCUIT BREAKERS TO BE 125V DC TRIP AND CLOSE.
 - 2.) ALL CONTROL CONNECTIONS TO DATA TRANSMISSION SYSTEM WILL HAVE INTERPOSING RELAYS AS REQUIRED.
 - 3.) BREAKERS WILL BE RATED AT 4000 AMPS.
 - 4.) FOR SUPERVISORY CONTROL NUMBERS SEE TABLE 3.1-2 IN SPECIFICATIONS.

APPLIES TO	
TIE BREAKER STATION	JOB NO.
1.) GLENMONT NORTH	1069



SPEC. SECT. 3.3, 3.4, 3.5, 3.6, 3.7, 3.9

DWN. CFJ	DATE 8/25/94	DRAWING NO. 00026SOH	REV.
CHK'D.	DATE	IMPulse NC, INC. P.O. BOX 232 MOUNT OLIVE, N.C. 27345	
APP	DATE	TITLE ONE LINE DIAGRAM FOR (4) TIE BREAKER STATION (TYPICAL)	
CUSTOMER WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		DWG. NO. 00026SOH	DWG. SIZE D
CONTRACT NO. 227042	SCALE	JOB NO. SEE ABOVE	SHT. 1 OF 1

Jackson Wed Jul 2 10:59:53 1997 - E:\00026\00026SOH

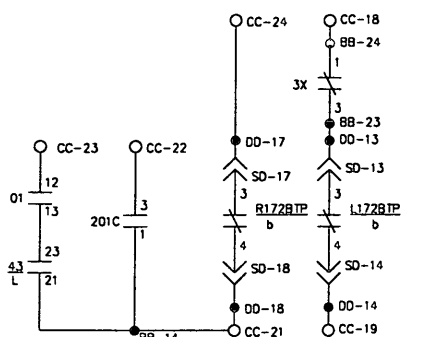
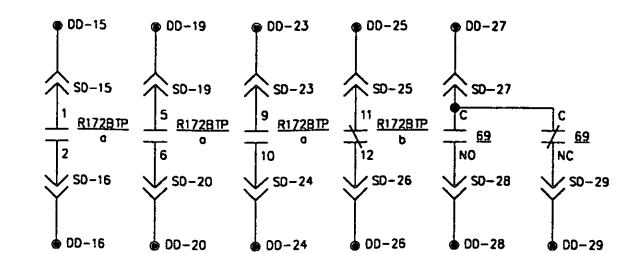
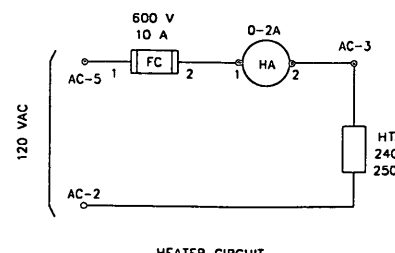
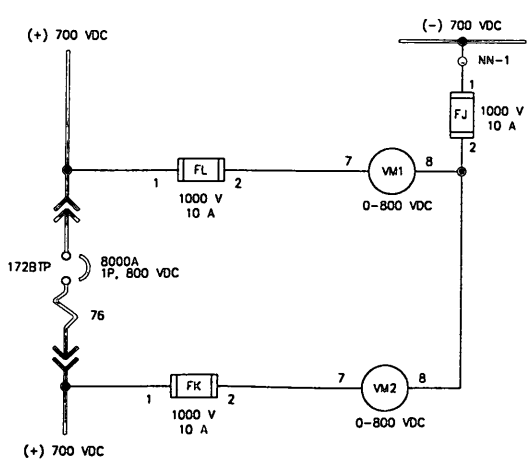
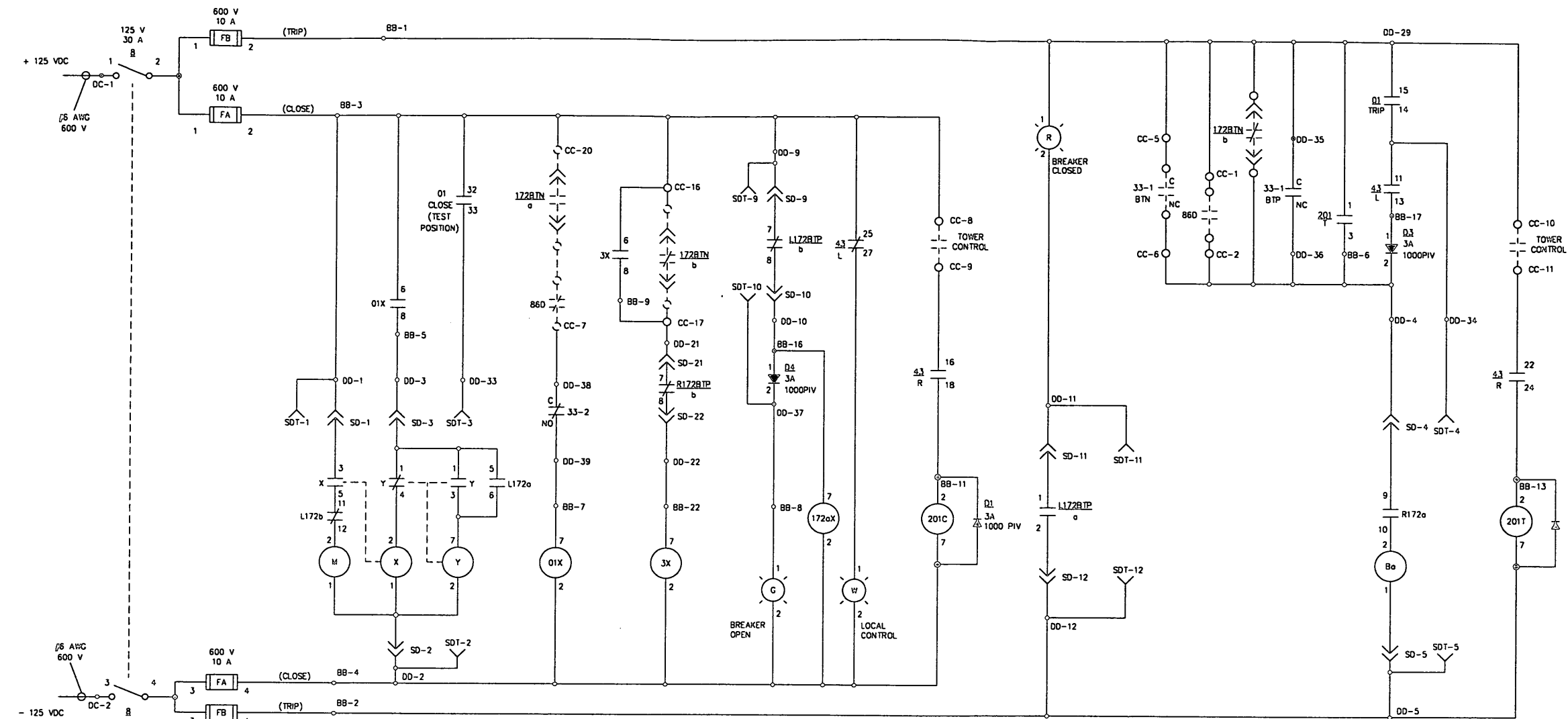
REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D.	APP. BY
A	REVISED PER CUSTOMER COMMENTS	RLS	12/6/94		
B	CORRECTED DRAWING	WJH	9/16/95		
C	AS BUILT CORRECTIONS	RLS	10/31/95		

NOTES

- BREAKERS SHOWN IN THE CONNECTED & OPEN POSITION.
- 43 LOCAL/REMOTE SWITCH SHOWN IN LOCAL POSITION.
- 860 LOCKOUT RELAY SHOWN IN THE RESET POSITION
- 33 DOOR SWITCH IS SHOWN WITH DOOR CLOSED.

LEGEND

- CS CONTROL SWITCH; C (CLOSE), T (TRIP)
- G OPEN POSITION INDICATING LIGHT (GREEN)
- R CLOSED POSITION INDICATING LIGHT (RED)
- 43 LOCAL/REMOTE SWITCH
- 172BTP BUS TIE POSITIVE
- 172BTN BUS TIE NEGATIVE
- 8 DISCONNECT SWITCH, 2 POLE, 125V, 30A.
- | | ○ REMOTE LOCATED CONTACT
- 33-1, 33-2 BREAKER DOOR INTERLOCK SWITCH
- 201T REMOTE CONTROL TRIPPING RELAY
- 201C REMOTE CONTROL CLOSE RELAY
- 69 PERMISSIVE CONTROL CONTACT ON MANUAL TRIP BUTTON
- 860 DC SWITCHGEAR ENERGIZED STRUCTURE LOCKOUT RELAY
- O1 CONTROL SWITCH
- O1X AUXILIARY RELAY TO DEVICE O1
- M CLOSING MOTOR
- X CLOSING CONTACTOR
- Y ANTI-PUMPING RELAY
- Ba TRIPPING COIL
- FA,FB,FC CONTROL FUSES
- JX INTERLOCKING RELAY



APPLIES TO:
GLENMONT YARD SUBSTATION

DWN.	RLS	DATE	8/25/94
CHK'D.		DATE	
APP		DATE	
CUSTOMER	WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		
CONTRACT NO.	227042		

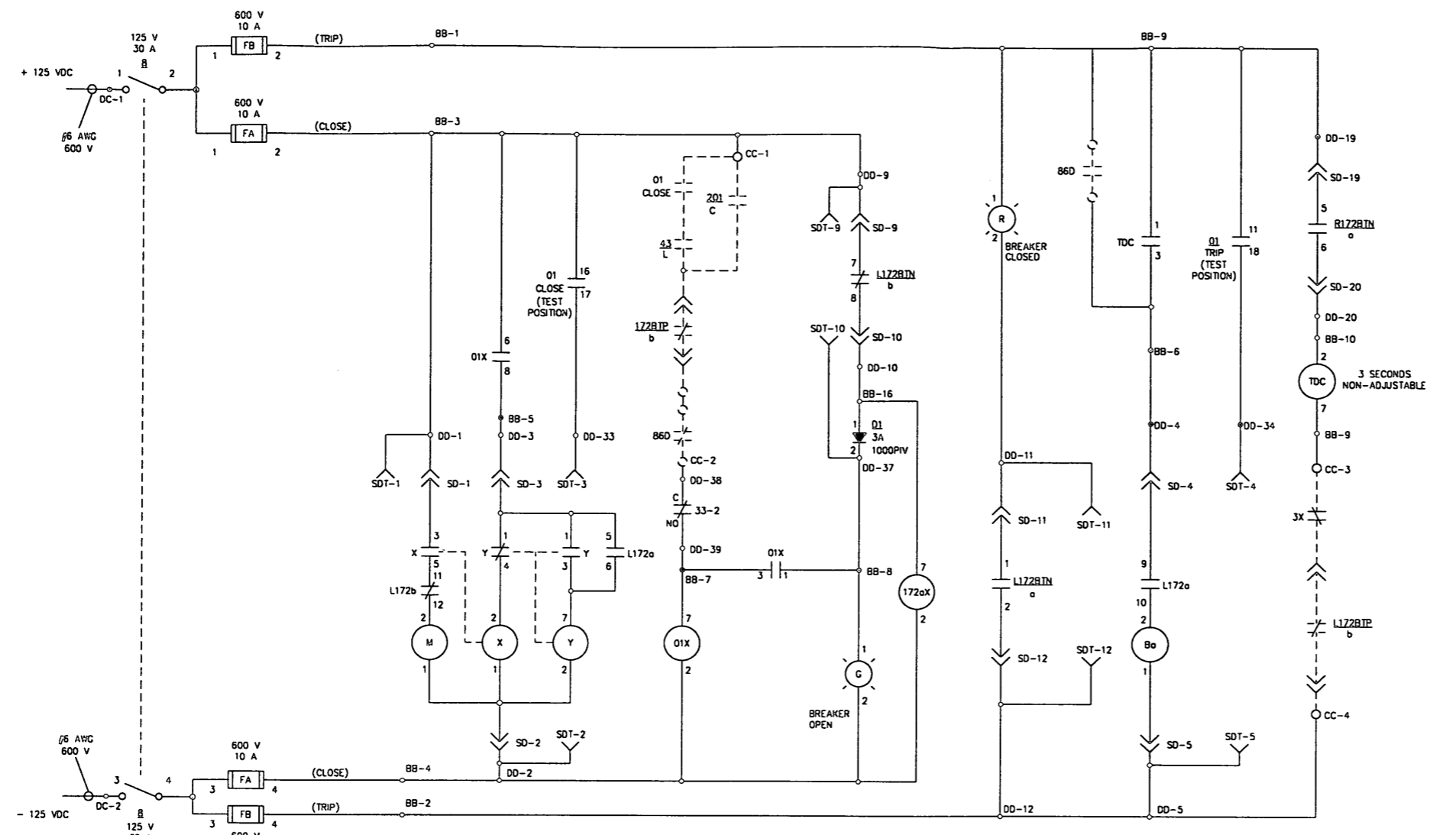
IMPULSE NC, INC.
1229 N. BREAZEALE AVENUE
MOUNT OLIVE, N.C. 28365

TITLE
POSITIVE BUS TIE CIRCUIT BREAKER CONTROL SCHEMATIC

DWG. NO.	1072	DWG. NO.	00026501
SCALE		REV.	c

Jackson Wed Jul 1 2 11:00:17 1997 - E:\00026\00026501

REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D. BY	APP. BY
A	CORRECTED DRAWING	WJH	9/17/95		
B	AS BUILT CORRECTIONS	RLS	10/31/95		

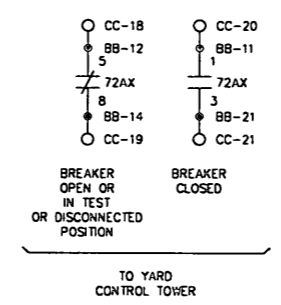
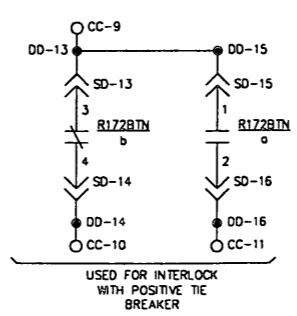
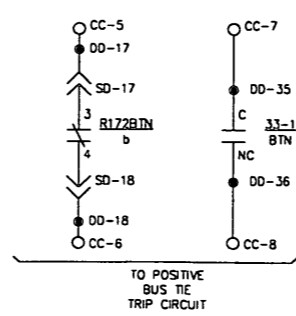
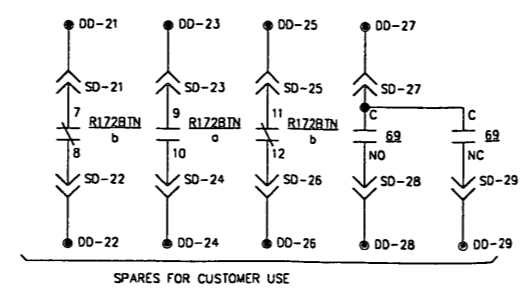
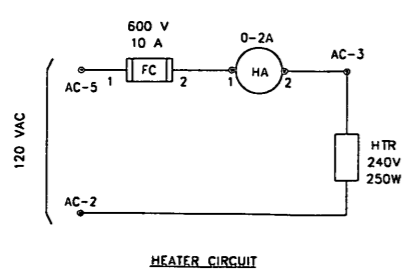
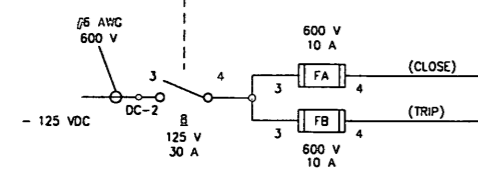


NOTES

- BREAKERS SHOWN IN THE CONNECTED & OPEN POSITION.
- TIME DELAY RELAY (TDC) USED IN INTERLOCKING SCHEME TO ENSURE THAT POSITIVE BUS TIE BREAKER HAS OPENED PRIOR TO OPENING THE NEGATIVE BUS TIE BREAKER.
- 43 LOCAL/REMOTE SWITCH SHOWN IN LOCAL POSITION.
- 33 DOOR SWITCH IS SHOWN WITH DOOR CLOSED.

LEGEND

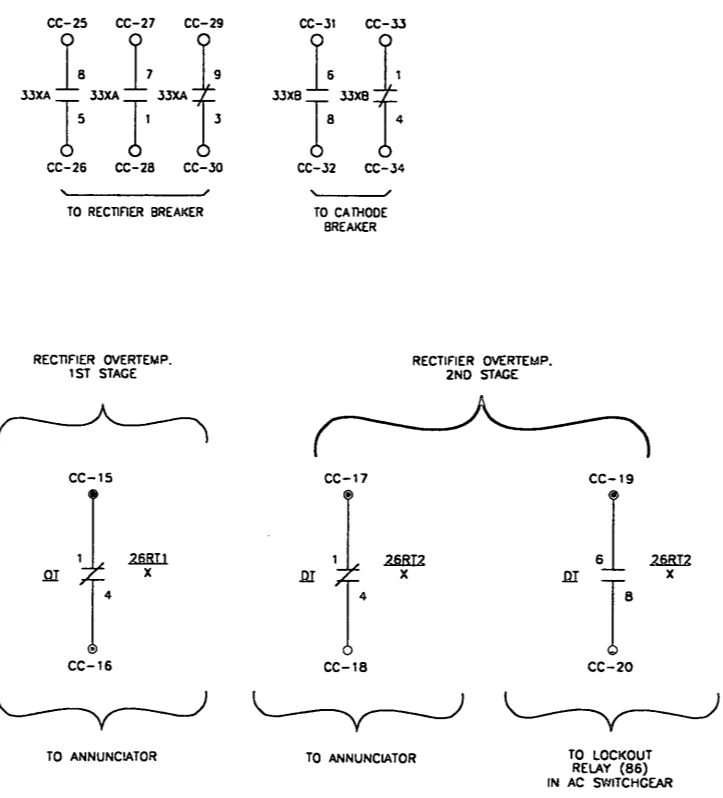
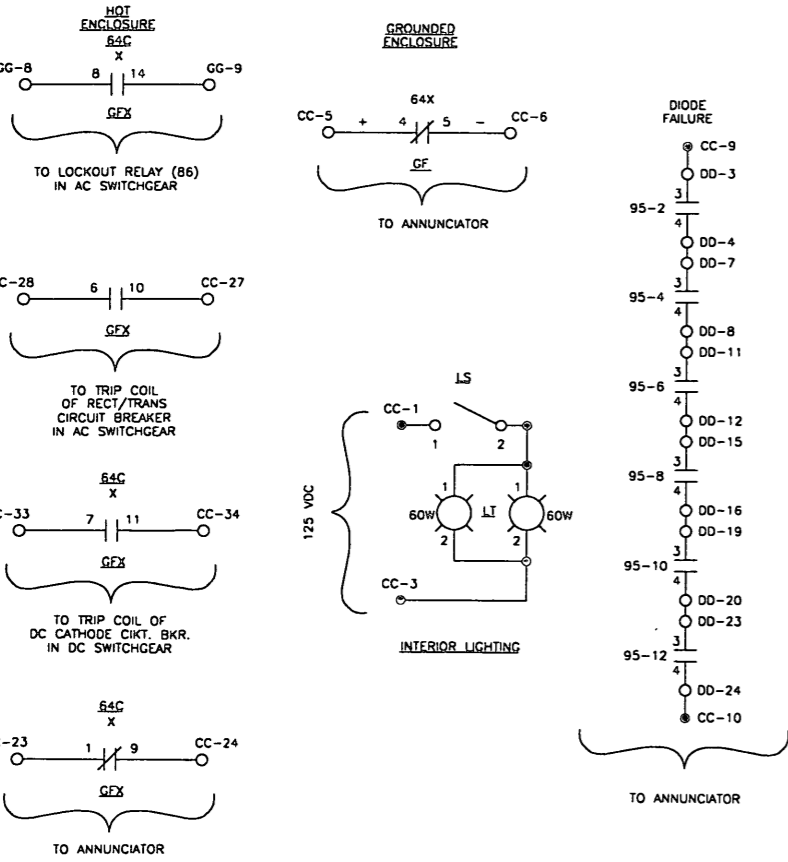
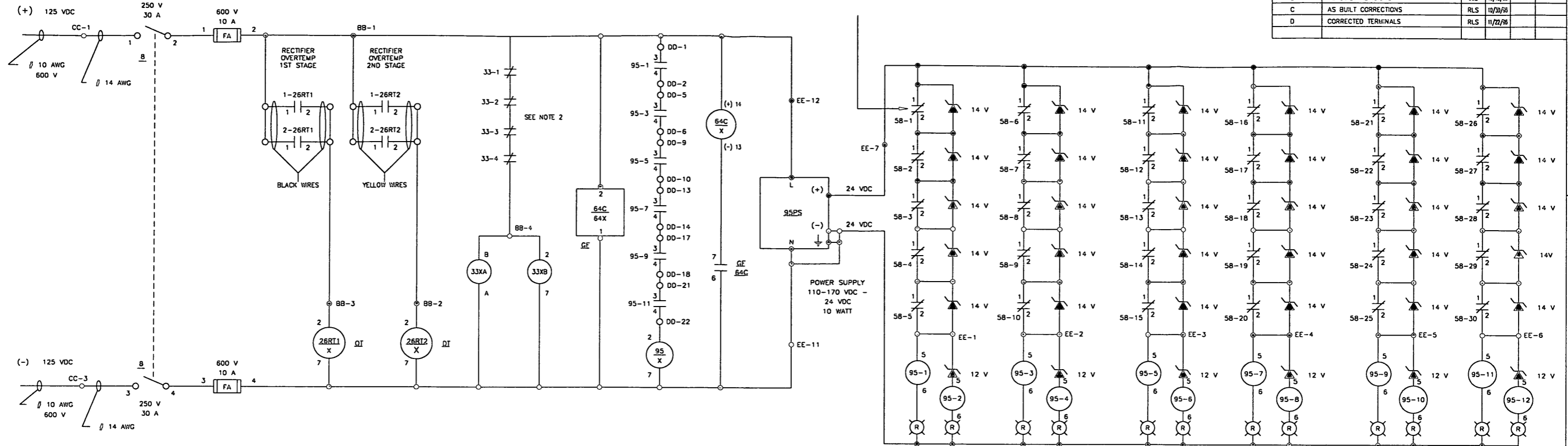
- CS CONTROL SWITCH; C (CLOSE), T (TRIP)
- G OPEN POSITION INDICATING LIGHT (GREEN)
- R CLOSED POSITION INDICATING LIGHT (RED)
- 43 LOCAL/REMOTE SWITCH
- 172BTP BUS TIE POSITIVE
- 172BTN BUS TIE NEGATIVE
- 8 DISCONNECT SWITCH, 2 POLE, 125V, 30A.
- |/|-○ REMOTE LOCATED CONTACT
- 33-1, 33-2 BREAKER DOOR INTERLOCK SWITCH
- 201T REMOTE CONTROL TRIPPING RELAY
- 201C REMOTE CONTROL CLOSE RELAY
- 69 PERMISSIVE CONTROL CONTACT ON MANUAL TRIP BUTTON
- 86D DC SWITCHGEAR ENERGIZED STRUCTURE LOCKOUT RELAY
- O1 CONTROL SWITCH
- O1X AUXILIARY RELAY TO DEVICE O1
- M CLOSING MOTOR
- X CLOSING CONTACTOR
- Y ANTI-PUMPING RELAY
- Bo TRIPPING COIL
- FA,FB,FC CONTROL FUSES
- JX INTERLOCKING RELAY
- TDC TIME DELAY RELAY



APPLIES TO: GLENMONT YARD SUBSTATION		DATE 8/25/94		 1229 N. BREAZEALE AVENUE P.O. BOX 238 MOUNT OLIVE, N.C. 27063	
DWN. RLS	DATE	TITLE NEGATIVE BUS TIE CIRCUIT BREAKER CONTROL SCHEMATIC			
CHK'D.	DATE	DWG. NO. 1072		DWG. NO. 0002650J	
APP	DATE	SCALE		REV. B	
CUSTOMER WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		CONTRACT NO. 227042			

Jackson Wed Jul 2 11:00:45 1997 - E:\00026\0002650J

REVISIONS				
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHKD. BY APP. BY
A	CORRECTED PER CUSTOMER COMMENTS	RLS	8/5/95	
B	AS BUILT REVISIONS	JLL	10/15/95	
C	AS BUILT CORRECTIONS	RLS	10/20/95	
D	CORRECTED TERMINALS	RLS	11/27/95	



LEGEND:

- 26RT1 - RECTIFIER OVERTEMP 1ST STAGE
- 26RT1 X - AUXILIARY TO 26RT1
- 26RT2 - RECTIFIER OVERTEMP 2ND STAGE
- 26RT2 X - AUXILIARY TO 26RT2
- 33-1, 33-2, ... - RECTIFIER DOOR AND SIDE COVER INTERLOCK SWITCHES
- 58 - DIODE/FUSE FAILURE INDICATION DEVICE
- 64C - RECT. GND. RELAY HOT STRUCTURE
- 64C X - AUXILIARY TO 64C
- 64X - RECT. GND. RELAY GROUNDED STRUCTURE
- B - CONTROL POWER DISCONNECTING DEVICE
- 86 - LOCKOUT RELAY
- 95 - DIODE FAILURE DEVICE
- 95PS - POWER SUPPLY TO 95 CIRCUIT
- 95X - AUXILIARY TO 95
- FA, FB, ... - FUSES
- 12 V - 12 VOLT ZENER DIODE
- (R) - RED LED
- 14 V - 14 VOLT ZENER DIODE
- LS - LIGHT SWITCH
- LT - INTERIOR LIGHT

- NOTES:**
- CONTACTS ARE ACTIVATED BY FAILURE OF FUSE PROTECTING RECTIFIER DIODES.
 - DOOR AND SIDE COVER INTERLOCK SWITCHES SHOWN WITH DOOR CLOSED.
 - PROVIDES ENERGIZED STRUCTURE (64C) TRIP FUNCTION IN LOCKOUT RELAY (86) CIRCUIT OF TRANS/RECT BREAKER (52R) LOCATED IN AC SWITCHGEAR.
 - 125 VDC CONTROL POWER OFF.

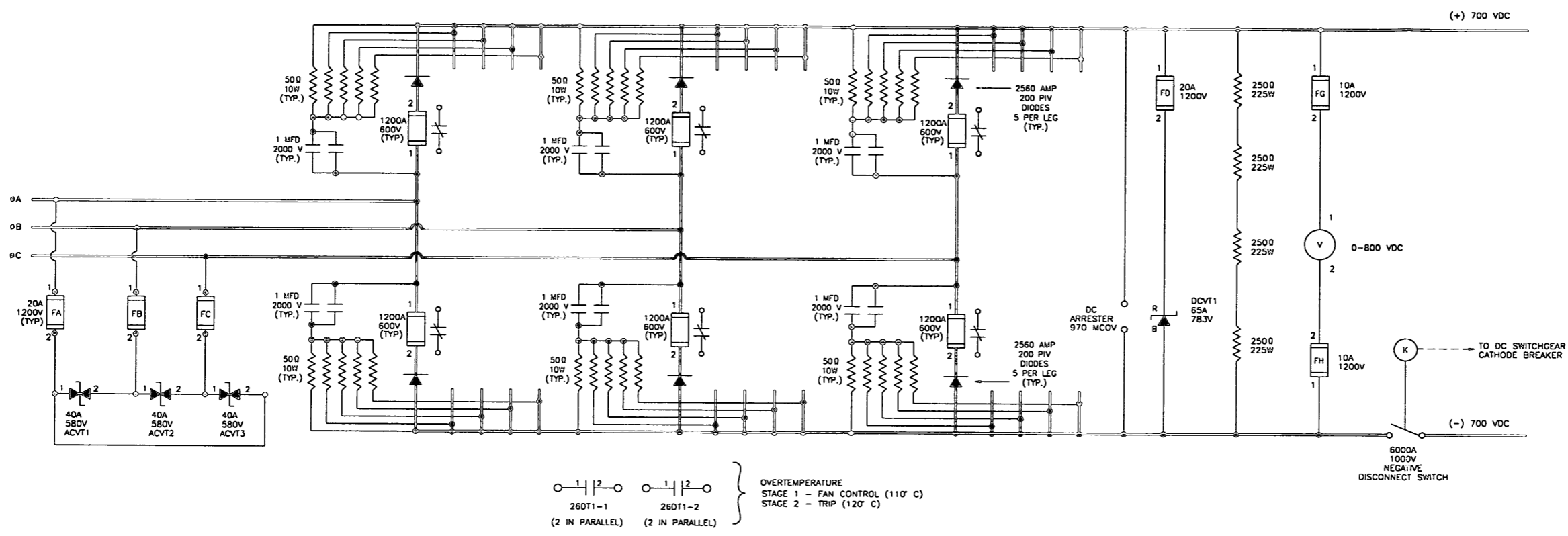
APPLIES TO:

SUBSTATION	JOB NO.
1.) GLENMONT YARD SUBSTATION	1072
2.) GREENLEAF SUBSTATION	1067
3.) TILBURY ROAD SUBSTATION	1066

DWN. RLS	DATE 8/25/94	
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER		2000 KW, 700 VDC RECTIFIER CONTROL SCHEMATIC
WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		DWG. NO. 0002650K
CONTRACT NO. 227042	SCALE	REV. 0

Jackson Wed Jul 2 11:01:24 1997 - E:\00026\0002650K

REVISIONS				
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHKD. BY / APP. BY
A	DRAWING REVISED PER ENGINEERING CHANGES	RLS	8/1/95	
B	AS BUILT CORRECTIONS	RLS	10/30/95	
C	UPDATED DRAWING	CFJ	7/2/97	



26DT1-1
 26DT1-2
 (2 IN PARALLEL) (2 IN PARALLEL)

} OVERTEMPERATURE
 STAGE 1 - FAN CONTROL (110° C)
 STAGE 2 - TRIP (120° C)

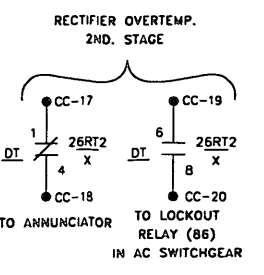
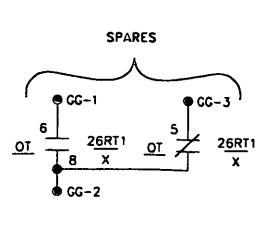
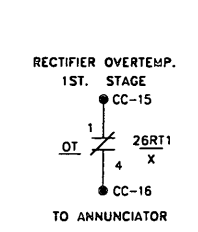
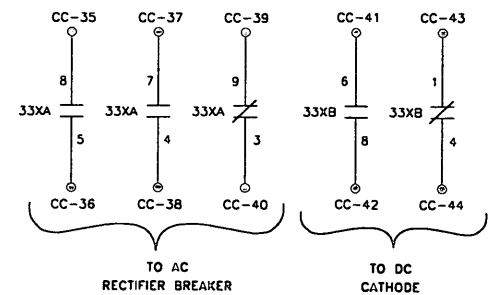
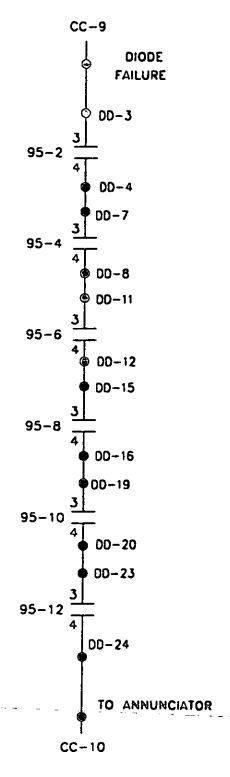
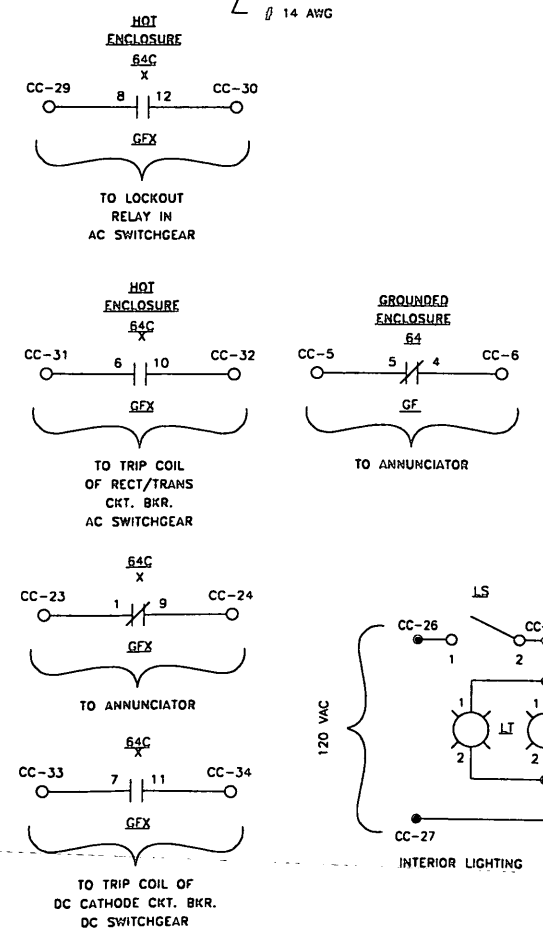
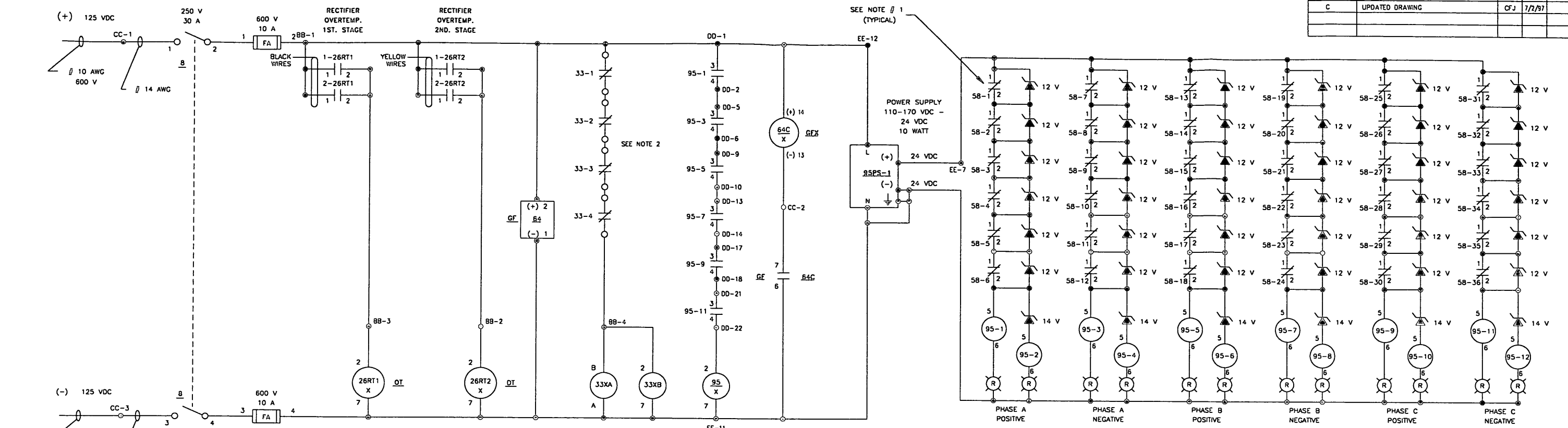
APPLIES TO:

SUBSTATION	JOB #
1) GLENMONT YARD SUBSTATION	1072
2) GREENLEAF SUBSTATION	1067
3) TILBURY ROAD SUBSTATION	1066

DWN. RLS	DATE 8/26/94	 1229 N. GREATDALE AVENUE P.O. BOX 233 MOUNT OLIVE, N.C. 27565
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER		2000 KW, 700 VDC RECTIFIER ELEMENTARY DIAGRAM
WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		
CONTRACT NO. 227042	DWG. NO. 0002650L	DWG. NO. 0002650L
	SCALE	REV. c

Jackson Wed Jul 2 11:02:04 1997 - E:\00026\0002650L

REVISIONS				
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY APP. BY
A	REVISED SCHEMATIC	WJH	8/5/94	
B	CORRECTED DRAWING	RLS	10/31/96	
C	UPDATED DRAWING	CFJ	7/2/97	



- NOTES:**
- CONTACTS ARE ACTIVATED BY FAILURE OF FUSE PROTECTING RECTIFIER DIODES.
 - DOOR AND SIDE COVER INTERLOCK SWITCHES SHOWN WITH DOOR CLOSED.
 - 125 VDC CONTROL POWER OFF.

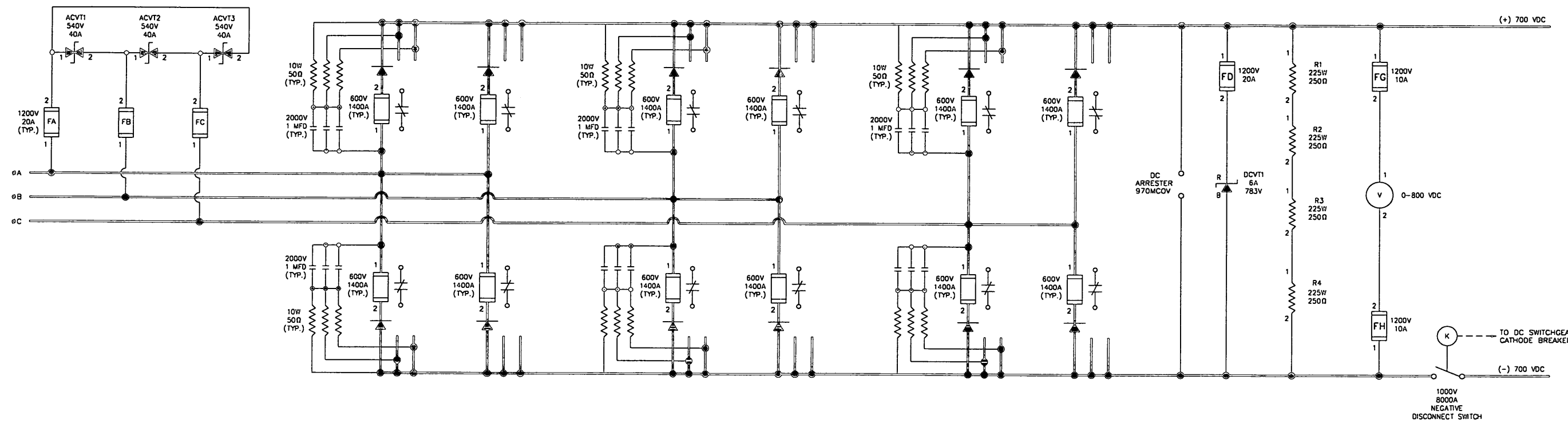
LEGEND:

- 26RT1 - RECT. OVERTEMP. 1ST STAGE
- 26RT1 X - AUXILIARY TO 26RT1
- 26RT2 - RECT. OVERTEMP. 2ND STAGE
- 26RT2 X - AUXILIARY TO 26RT2
- 33-1, 33-2, ... - RECTIFIER DOOR AND SIDE COVER INTERLOCK SWITCHES
- 58 - DIODE/FUSE FAILURE INDICATION DEVICE
- 64C - RECT. GND. RELAY HOT STRUCTURE
- 64C X - AUXILIARY TO 64C
- 64X - RECT. GND. RELAY GROUNDED STRUCTURE
- 8 - CONTROL POWER DISCONNECTING DEVICE
- 86 - LOCKOUT RELAY
- 95 - DIODE FAILURE DEVICE
- 95PS - POWER SUPPLY TO 95 CIRCUIT
- 95X - AUXILIARY TO 95
- FA, FB, ... - FUSES
- 12 V - 12 VOLT ZENER DIODE
- 14 V - 14 VOLT ZENER DIODE
- LS - LIGHT SWITCH
- LT - INTERIOR LIGHT

DWN.	RLS	DATE	8/25/94	
CHK'D.		DATE		
APP		DATE		TITLE 3000 KW, 700 VDC RECTIFIER CONTROL SCHEMATIC
CUSTOMER	WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY			
CONTRACT NO.	227042	DWG SIZE	D	JOB NO. 1071
		SCALE		DWG. NO. 0002650M
				REV. c

Jackson Wed Jul 2 11:02:30 1997 - E:\00026\0002650M

REVISIONS				
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHECKED BY / APP. BY
A	CORRECTED DRAWING	JRP	5/9/85	
B	CORRECTED DRAWING	WJM	8/7/85	
C	CORRECTED DRAWING	RLS	10/17/85	
D	UPDATED DRAWING	CFJ	7/2/97	



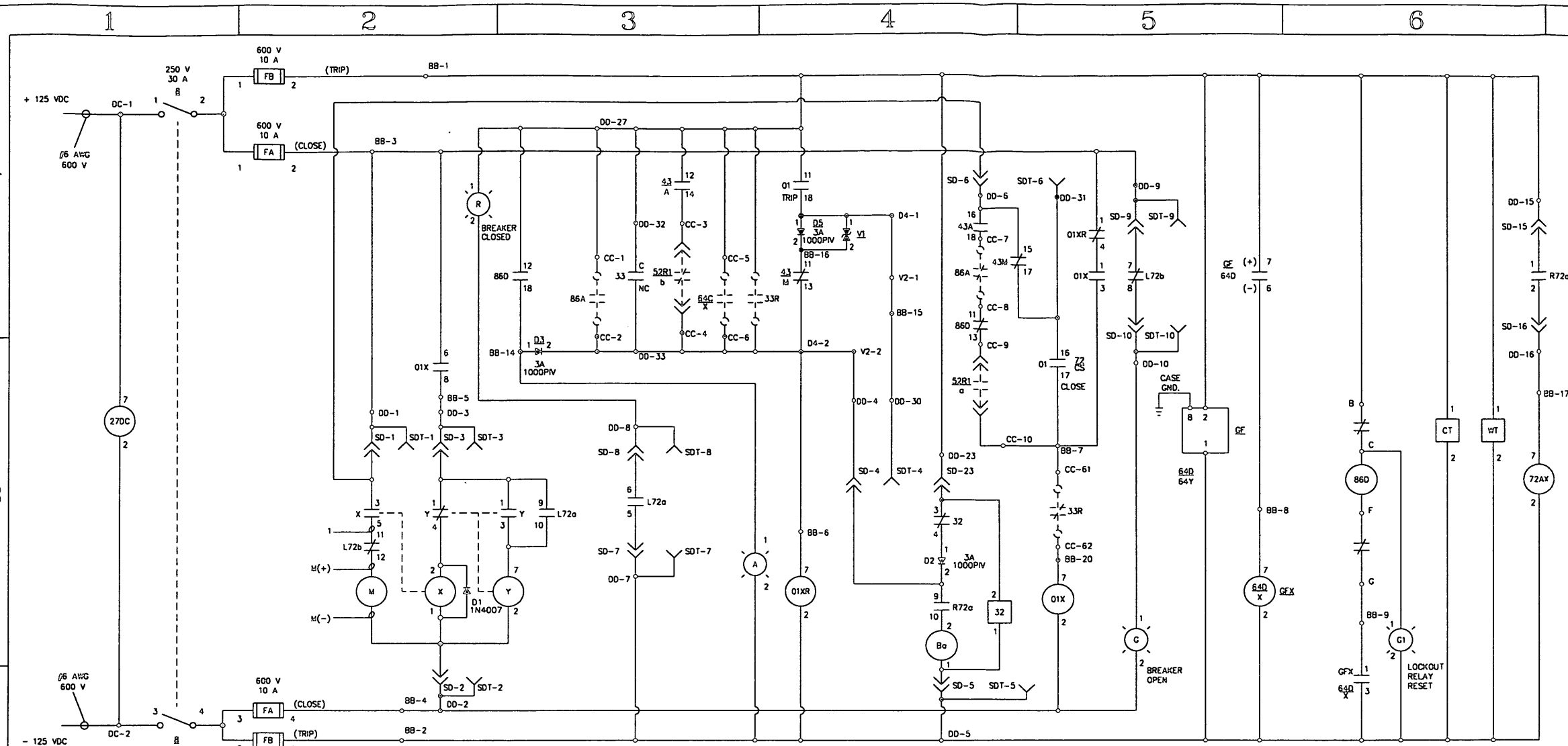
26DT1-1 (2 IN PARALLEL)
 26DT1-2 (2 IN PARALLEL)

} OVERTEMPORATURE
 STAGE 1 - FAN CONTROL (110° C) BLACK WIRES
 STAGE 2 - TRIP (120° C) YELLOW WIRES

DWN.	RLS	DATE	8/26/94	 1229 N. BRISBAKE AVENUE P.O. BOX 232 MOUNT GUY, N.C. 27555
CHK'D.		DATE		
APP		DATE		TITLE
CUSTOMER				3000 KW, 700 VDC RECTIFIER ELEMENTARY DIAGRAM
WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY				DWG. NO.
CONTRACT NO. 227042				1071
				DWG. NO.
				0002650N
				SCALE
				REV.
				D

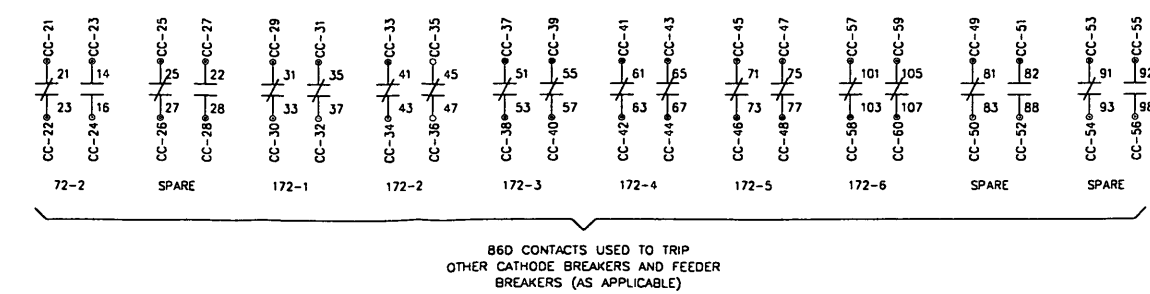
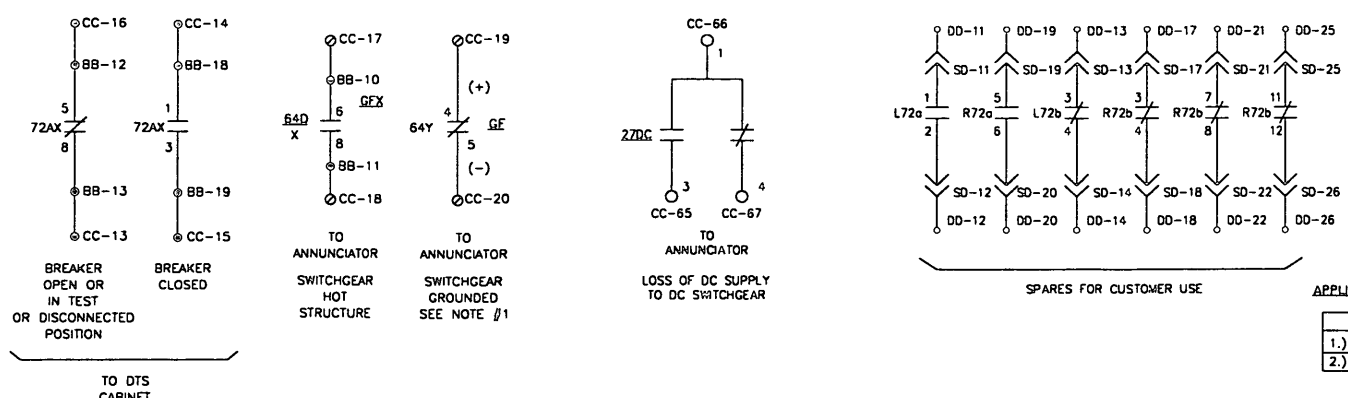
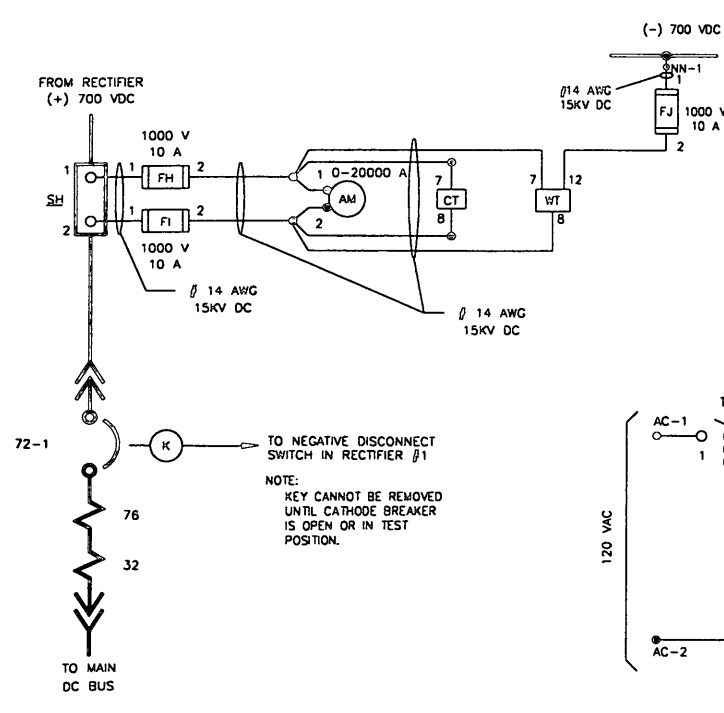
Jackson Wed Jul 2 11:04:06 1997 - E:\00026\0002650N

REVISIONS				
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY
F	REVISED	RLS	9/10/93	
G	ADDED 27DC RELAY	RLS	10/25/93	



- LEGEND:**
- 01 - CONTROL SWITCH
 - 32 - REVERSE CURRENT RELAY
 - 33 - BREAKER CUBICLE DOOR INTERLOCK SWITCH
 - 33R - RECTIFIER DOOR INTERLOCK SWITCH
 - 52R - RECTIFIER/TRANSFORMER FEEDER CIRCUIT BREAKER
 - 64D - ENERGIZED (HOT) ENCLOSURE
 - 64D/X - AUXILIARY TO 64D
 - 64Y - GROUNDED ENCLOSURE
 - 72 - MAIN DC CIRCUIT BREAKER
 - 72a - CATHODE BREAKER NORMALLY OPEN AUXILIARY SWITCH
 - 72b - CATHODE BREAKER NORMALLY CLOSED AUXILIARY SWITCH
 - 76 - DC OVERCURRENT RELAY
 - 8 - CONTROL POWER DISCONNECTING DEVICE
 - 8A - AC LOCKOUT RELAY
 - 8B - DC LOCKOUT RELAY
 - FA, FB, ... - FUSES
 - CT - CURRENT TRANSDUCER
 - AM - AMMETER, DC
 - (K) - KIRK KEY INTERLOCK
 - WT - WATT TRANSDUCER
 - TH - THERMOSTAT
 - HTR - HEATER
 - HM - AMMETER, HEATER
 - SH - SHUNT
 - TOC - TRUCK OPERATED CONTACT (POSITION INDICATED)
 - (R) - INDICATING LIGHT (LETTER DENOTES COLOR)
 - M - CLOSING MOTOR
 - X - CLOSING CONTACTOR
 - Y - ANTI-PUMPING RELAY
 - Ba - TRIPPING COIL
 - 01X - AUXILIARY RELAY TO DEVICE 01 (ENABLE)
 - Y - AUXILIARY RELAY TO DEVICE 01 (RESET)
 - 64D/C - RECTIFIER ENERGIZED (HOT) ENCLOSURE
 - SD - SECONDARY DISCONNECT (CONNECTED POSITION)
 - SDT - SECONDARY DISCONNECT (TEST POSITION)
 - 72AX - AUXILIARY RELAY TO DEVICE 72

- NOTE:**
- 1.) CONTACTS OPEN WHEN CONTROL POWER IS APPLIED TO DEVICE 64D/64Y.
 - 2.) BREAKER SHOWN IN CONNECTED POSITION & OPEN.
 - 3.) 125 VDC CONTROL POWER IS DE-ENERGIZED.
 - 4.) LOCKOUT RELAY IS SHOWN IN THE RESET POSITION.
 - 5.) ALL WIRE # 14 SIS UNLESS OTHERWISE NOTED.
 - 6.) DEVICE 33 CONTACTS SHOWN WITH DOOR CLOSED.



APPLIES TO:

SUBSTATION	JOB NO.
1.) GREENLEAF SUBSTATION	1066
2.) TILBURY SUBSTATION	1067

DWN. RLS	DATE 8/26/94	
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER		72-1 CATHODE CIRCUIT BREAKER SCHEMATIC DIAGRAM
CONTRACT NO.	227042	DWG. NO. 00026500
		SCALE - REV. c

Jackson Wed Jul 2 11:04:49 1997 - E:\00026\00026500

REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY	APP. BY
F	CORRECTED ERROR	RLS	10/31/93		

LEGEND:

- 01 - CONTROL SWITCH
- 32 - REVERSE CURRENT RELAY
- 33 - BREAKER CUBICLE DOOR INTERLOCK SWITCH
- 52R - RECTIFIER/TRANSFORMER FEEDER CIRCUIT BREAKER
- 64C - RECTIFIER ENCLOSURE HOT STRUCTURE
- 64C/X - AUXILIARY TO 64C
- 72 - MAIN DC CIRCUIT BREAKER
- 72a - CATHODE BREAKER NORMALLY OPEN AUXILIARY SWITCH
- 72b - CATHODE BREAKER NORMALLY CLOSED AUXILIARY SWITCH
- B - CONTROL POWER DISCONNECTING DEVICE
- B6A - AC LOCKOUT RELAY
- B6D - DC LOCKOUT RELAY
- FA, FB, ... - FUSES
- CT - CURRENT TRANSDUCER
- AM - AMMETER, DC
- (K) - KIRK KEY INTERLOCK
- WT - WATT TRANSDUCER
- VT - VOLTAGE TRANSDUCER
- HTR - HEATER
- SH - SHUNT
- TOC - TRUCK OPERATED CONTACT (POSITION INDICATED)
- (R) - INDICATING LIGHT (LETTER DENOTES COLOR)
- M - CLOSING MOTOR
- X - CLOSING CONTACTOR
- Y - ANTI-PUMPING RELAY
- Ba - TRIPPING COIL
- SD - SECONDARY DISCONNECT (CONNECTED POSITION)
- SDT - SECONDARY DISCONNECT (TEST POSITION)
- 72AX - AUXILIARY RELAY TO DEVICE 72

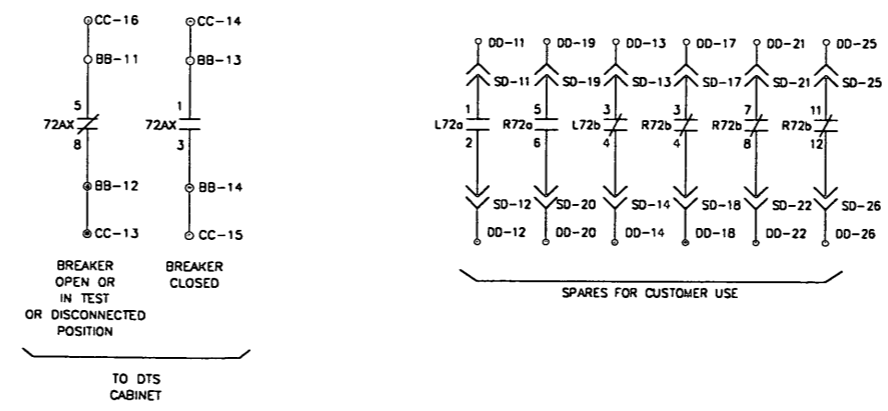
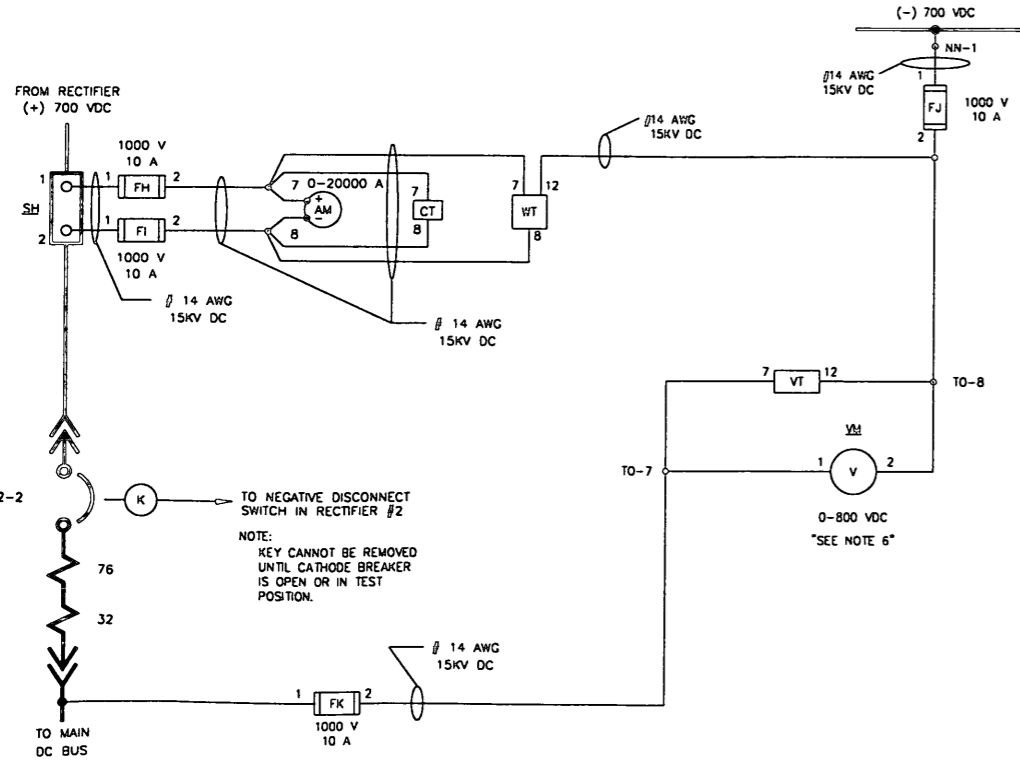
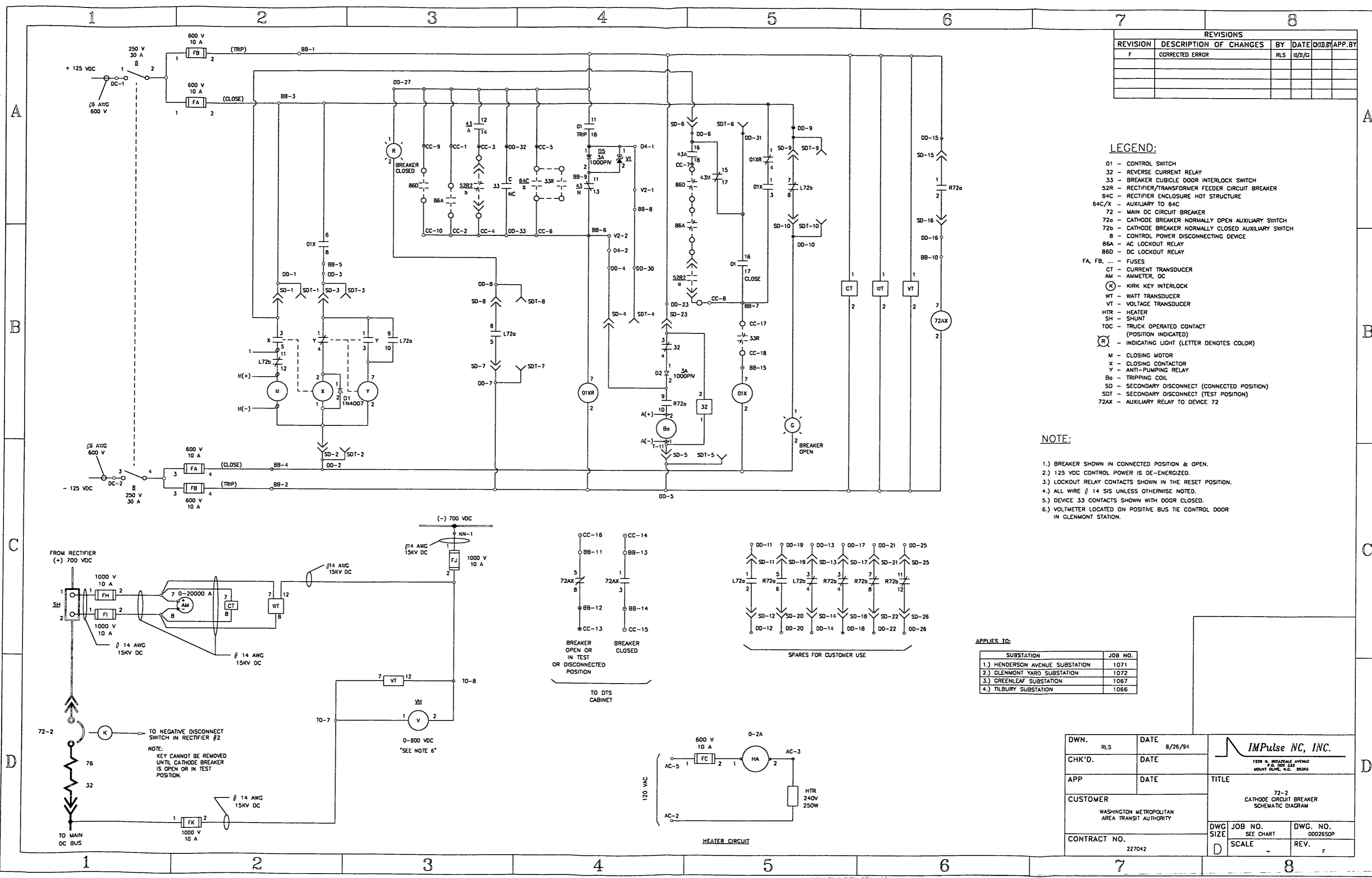
NOTE:

- 1.) BREAKER SHOWN IN CONNECTED POSITION & OPEN.
- 2.) 125 VDC CONTROL POWER IS DE-ENERGIZED.
- 3.) LOCKOUT RELAY CONTACTS SHOWN IN THE RESET POSITION.
- 4.) ALL WIRE # 14 SIS UNLESS OTHERWISE NOTED.
- 5.) DEVICE 33 CONTACTS SHOWN WITH DOOR CLOSED.
- 6.) VOLTMETER LOCATED ON POSITIVE BUS TIE CONTROL DOOR IN GLENMONT STATION.

APPLIES TO:

SUBSTATION	JOB NO.
1.) HENDERSON AVENUE SUBSTATION	1071
2.) GLENMONT YARD SUBSTATION	1072
3.) GREENLEAF SUBSTATION	1067
4.) TILBURY SUBSTATION	1066

DWN. RLS	DATE 8/26/94	
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER		72-2 CATHODE BREAKER SCHEMATIC DIAGRAM
WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		
CONTRACT NO.	227042	DWG. NO. 0002650P
		SCALE -
		REV. F



Jackson Wed Jul 2 11:05:39 1997 - E:\00026\0002650P

REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHKD. BY	APP. BY
A	REVISED PER CUSTOMER COMMENTS	RLS	11/7/94		
B	BREAKER INTERNALS CORRECTED	GRM	9/7/95		
C	CORRECTED	RLS	9/7/95		
D	CORRECTED ERROR	RLS	10/3/95		

LEGEND:

- 01 - CONTROL SWITCH
- 32 - REVERSE CURRENT RELAY
- 33 - BREAKER CUBICLE DOOR INTERLOCK SWITCH
- 52R - RECTIFIER/TRANSFORMER FEEDER CIRCUIT BREAKER
- 64C - RECTIFIER ENCLOSURE HOT STRUCTURE
- 64C/X - AUXILIARY TO 64C
- 72 - MAIN DC CIRCUIT BREAKER
- 72a - CATHODE BREAKER NORMALLY OPEN AUXILIARY SWITCH
- 72b - CATHODE BREAKER NORMALLY CLOSED AUXILIARY SWITCH
- B - CONTROL POWER DISCONNECTING DEVICE
- 86A - AC LOCKOUT RELAY
- 86D - DC LOCKOUT RELAY
- FA, FB, ... - FUSES
- CT - CURRENT TRANSDUCER
- AM - AMMETER, DC
- (K) - KIRK KEY INTERLOCK
- WT - WATT TRANSDUCER
- VT - VOLTAGE TRANSDUCER
- HTR - HEATER
- SH - SHUNT
- TOC - TRUCK OPERATED CONTACT (POSITION INDICATED)
- (R) - INDICATING LIGHT (LETTER DENOTES COLOR)
- M - CLOSING MOTOR
- X - CLOSING CONTACTOR
- Y - ANTI-PUMPING RELAY
- Ba - TRIPPING COIL
- SD - SECONDARY DISCONNECT (CONNECTED POSITION)
- SDT - SECONDARY DISCONNECT (TEST POSITION)
- 72AX - AUXILIARY RELAY TO DEVICE 72

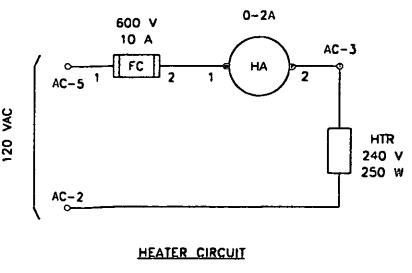
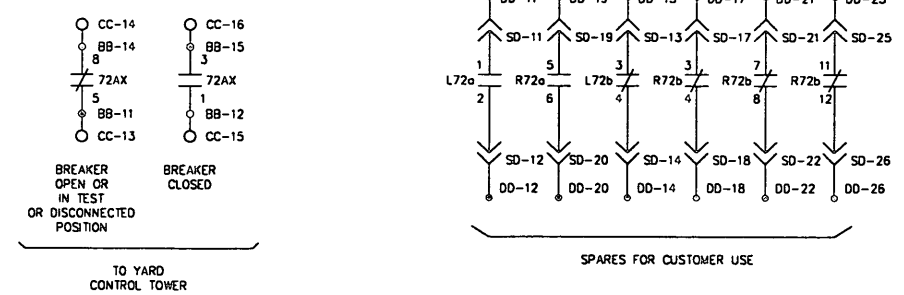
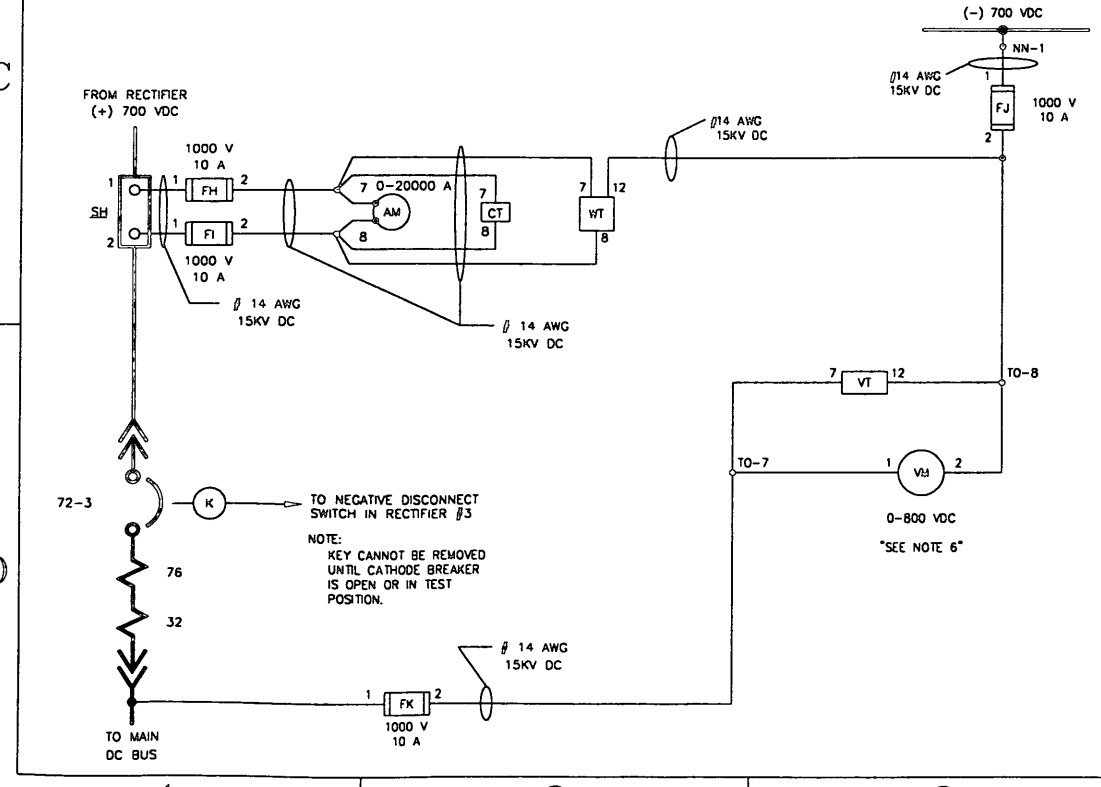
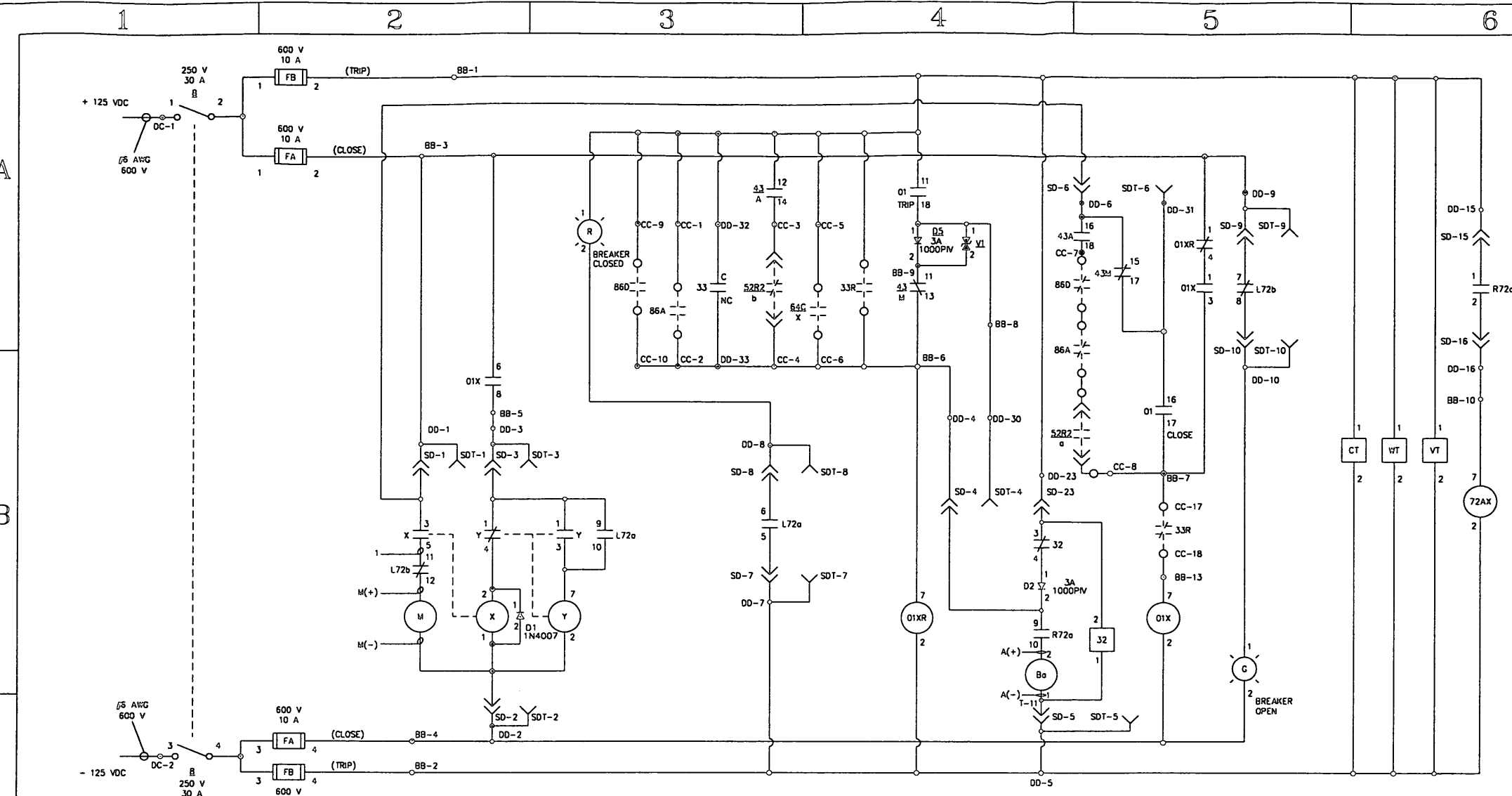
NOTE:

- 1.) BREAKER SHOWN IN CONNECTED POSITION & OPEN.
- 2.) 125 VDC CONTROL POWER IS DE-ENERGIZED.
- 3.) LOCKOUT RELAY CONTACTS SHOWN IN THE RESET POSITION.
- 4.) ALL WIRE # 14 SIS UNLESS OTHERWISE NOTED.
- 5.) DEVICE 33 CONTACTS SHOWN WITH DOOR CLOSED.
- 6.) VOLTMETER LOCATED ON POSITIVE BUS TIE CONTROL DOOR

APPLIES TO:

SUBSTATION	JOB NO.
1.) GLENMONT YARD SUBSTATION	1072

DWN. RLS	DATE 8/26/94	
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER		72-3 CATHODE BREAKER SCHEMATIC DIAGRAM
WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		DWG. NO. 00026500
CONTRACT NO. 227042	SCALE	REV. 0



Jackson Wed Jul 2 11:06:07 1997 - E:\00026\00026500

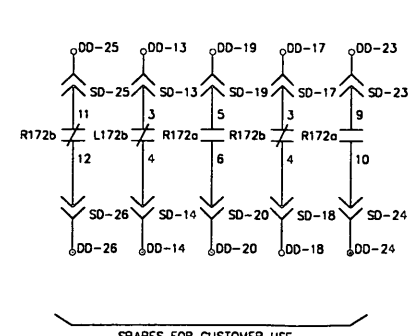
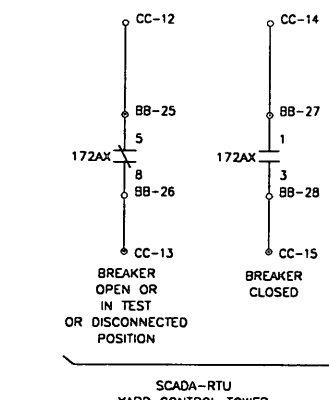
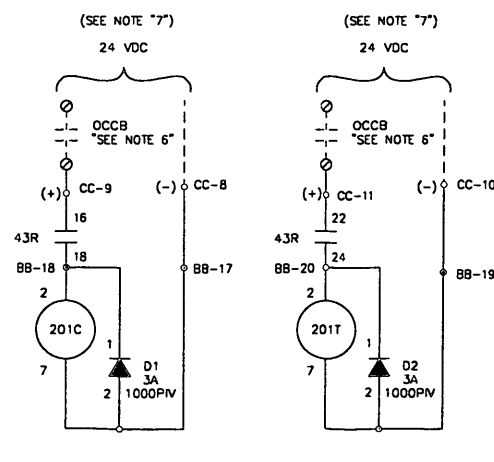
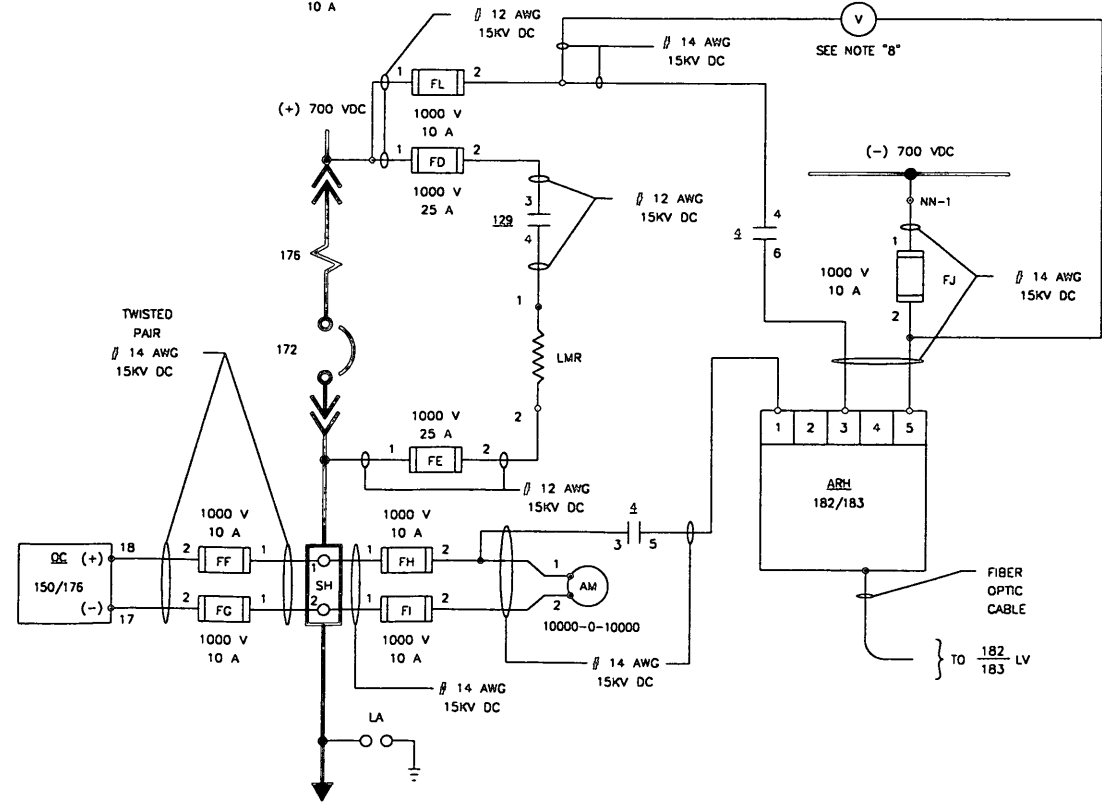
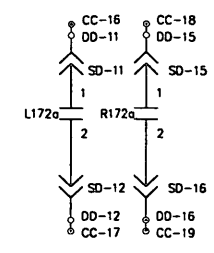
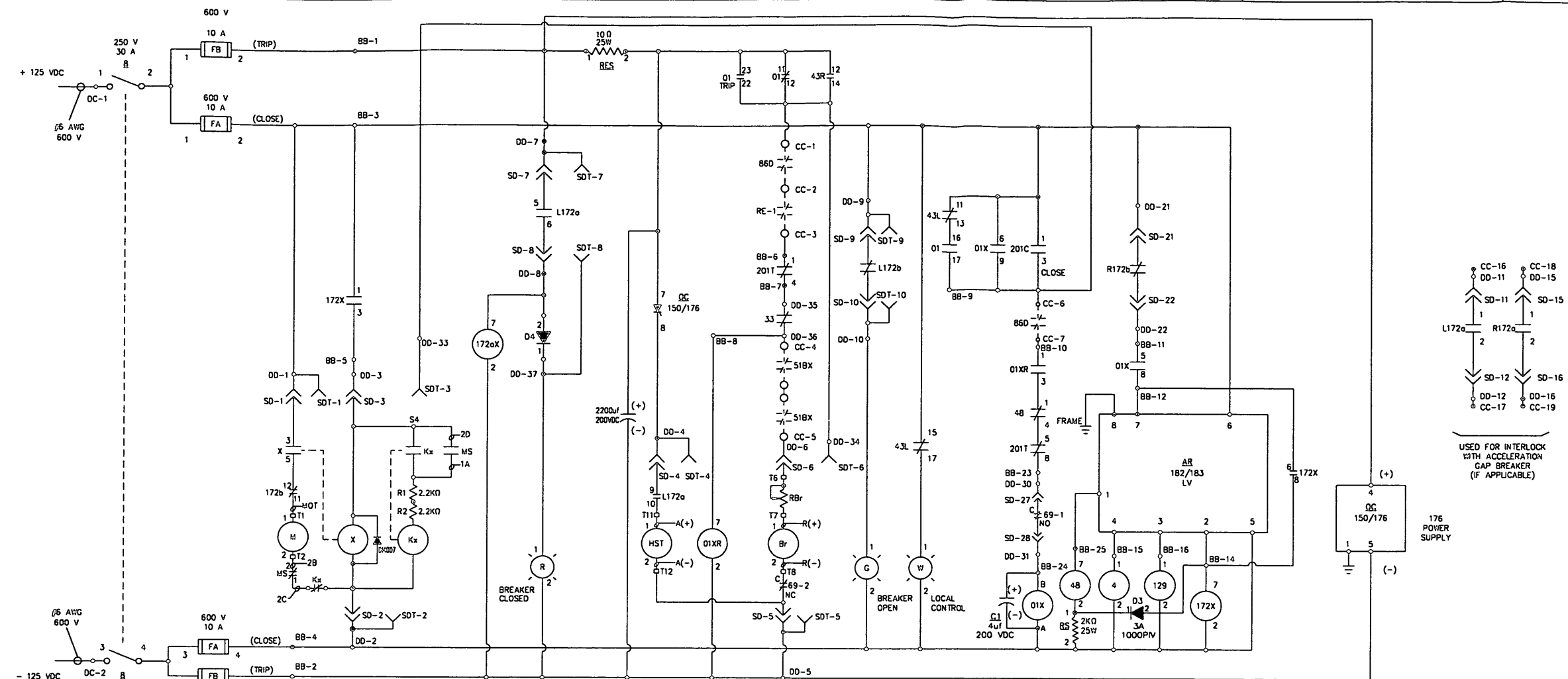
REVISIONS				
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY APP. BY
F	CORRECTED 69-1 CONTACT LABEL	JRP	5/9/96	
G	CORRECTED ERRORS	RLS	9/30/96	
H	DOES NOT APPLY TO GLENMONT YARD	RLS	1/6/97	

LEGEND:

- 01 - CONTROL SWITCH
- 01X - AUXILIARY TO 01
- 01XR - RESET AND TRIPPING RELAY
- 201C - REMOTE CONTROL CLOSE RELAY
- 201T - REMOTE CONTROL TRIP RELAY
- OCCB - CENTRAL CONTROL
- RE-1 - EMERGENCY TRIP RELAY
- 33 - BREAKER CUBICLE DOOR INTERLOCK SWITCH
- 43R - REMOTE CONTROL CONTACT
- 43L - LOCAL CONTROL CONTACT
- 51BX - AUXILIARY RELAY TO 51B (450% OVERLOAD) RELAY
- 8 - CONTROL POWER DISCONNECTING DEVICE
- 172 - DC CIRCUIT BREAKER
- 172b - BREAKER NORMALLY CLOSED AUXILIARY SWITCH
- 172o - BREAKER NORMALLY OPEN AUXILIARY SWITCH
- 172X - CLOSING RELAY
- M - CLOSING MOTOR
- X - CLOSING CONTACTOR
- Y - ANTI-PUMPING RELAY
- Br - HOLDING COIL
- HST - HIGH SPEED TRIP COIL
- TOC - TRUCK OPERATED CONTACT (POSITION INDICATED)
- 86 - LOCKOUT RELAY
- 150 - RATE OF RISE RELAY
- 176 - DC OVERCURRENT RELAY
- 182/183 - LOAD MEASURING/VOLTAGE SENSING CIRCUIT
- LMR - LOAD MEASURING RESISTOR
- 4 - ISOLATION CONTACTOR
- 129 - LOAD MEASURING CONTACTOR
- D1, D2 - DIODES
- FA, FB, ... - FUSES
- AM - AMMETER, DC
- SH - SHUNT
- HTR - HEATER
- (R) - INDICATING LIGHT (LETTER DENOTES COLOR)
- LA - LIGHTNING ARRESTER
- 48 - INCOMPLETE SEQUENCE RELAY
- 69 - MANUAL TRIP AUX. SWITCH
- SD - SECONDARY DISCONNECT (CONNECTED POSITION)
- SDT - SECONDARY DISCONNECT (TEST POSITION)

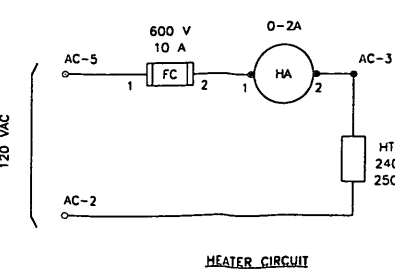
NOTE:

1. ALL WIRE # 14 SIS UNLESS OTHERWISE NOTED.
2. BREAKER SHOWN IN CONNECTED POSITION & OPEN.
3. LOCAL/REMOTE SWITCH (43) SHOWN IN THE LOCAL POSITION.
4. LOCKOUT RELAY CONTACTS SHOWN IN THE RESET POSITION.
5. 51BX CONTACTS APPEAR ONLY IN SUBSTATION APPLICATIONS.
6. TOWER CONTROL ON GLENMONT YARD STATION.
7. 125 VDC CIRCUIT ON GLENMONT YARD STATION.
8. APPLIES TO ROSO STREET, FRANCONIA-SPRINGFIELD, AND GLENMONT NORTH TIE BREAKER STATIONS UNIT #2 ONLY.



APPLIES TO:

SUBSTATION	JOB NO.
HENDERSON AVENUE SUBSTATION	1071
GREENLEAF SUBSTATION	1067
TILBURY ROAD SUBSTATION	1066
TIE BREAKER STATIONS	JOB #
GLENMONT NORTH TIE BREAKER	1069
GLENMONT SOUTH TIE BREAKER	1070
ROSO STREET TIE BREAKER	1065
FARRINGTON AVE. TIE BREAKER	1084
FRANCONIA-SPRINGFIELD TIE BREAKER	1068



DWN. RLS	DATE 8/26/94	
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER		TYPICAL FEEDER CIRCUIT BREAKER WITH RECLOSER AND RATE OF RISE RELAY SCHEMATIC DIAGRAM
CONTRACT NO. 227042	WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY	DWG. NO. 0002650R
SCALE	JOB NO. SEE CHART	DWG. NO. 0002650R
		REV. H

Jackson Wed Jul 2 11:06:50 1997 - E: V0026V0002650R

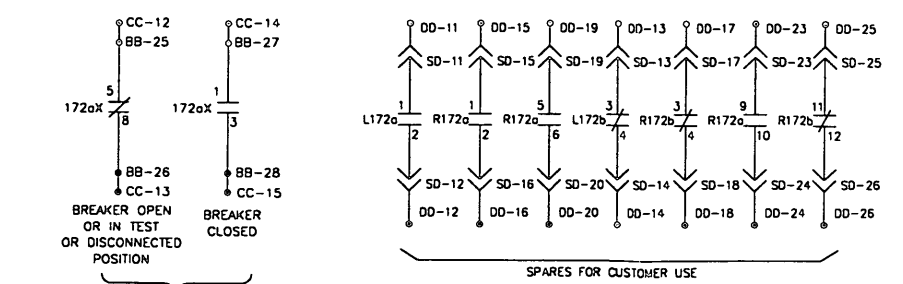
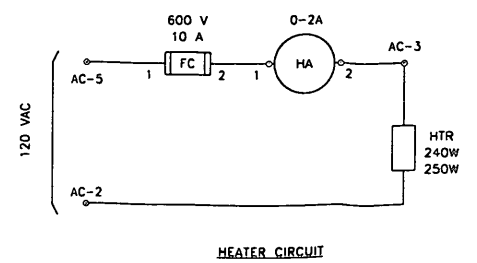
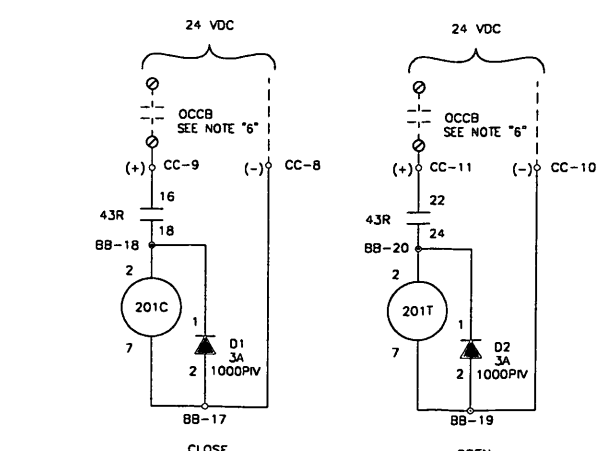
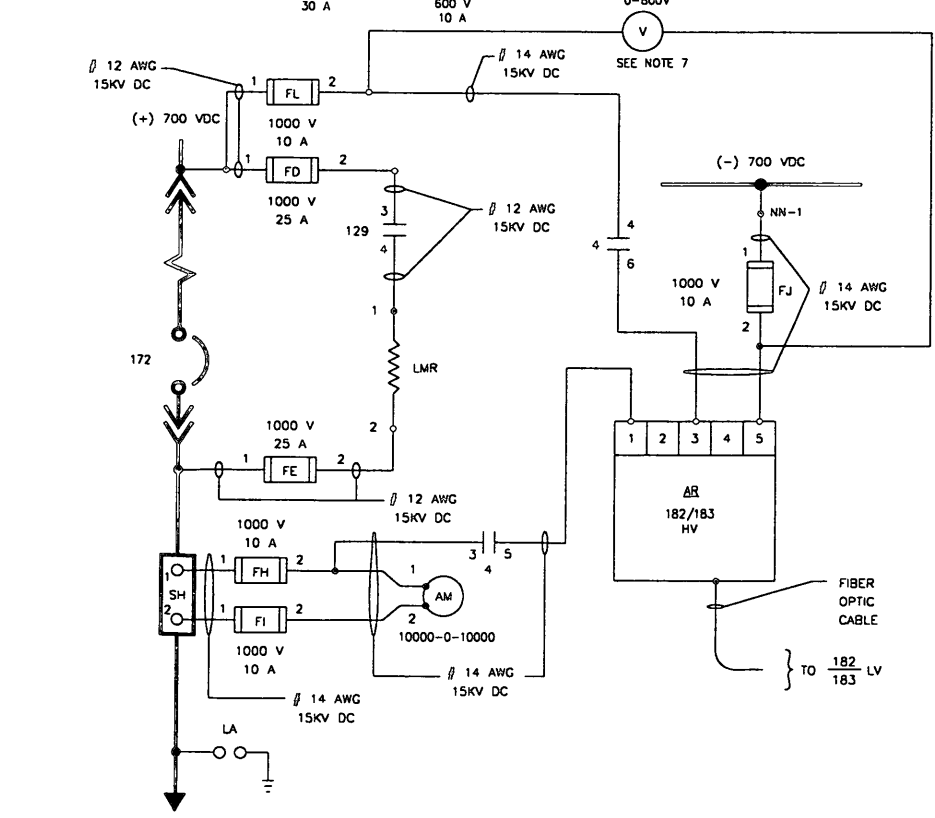
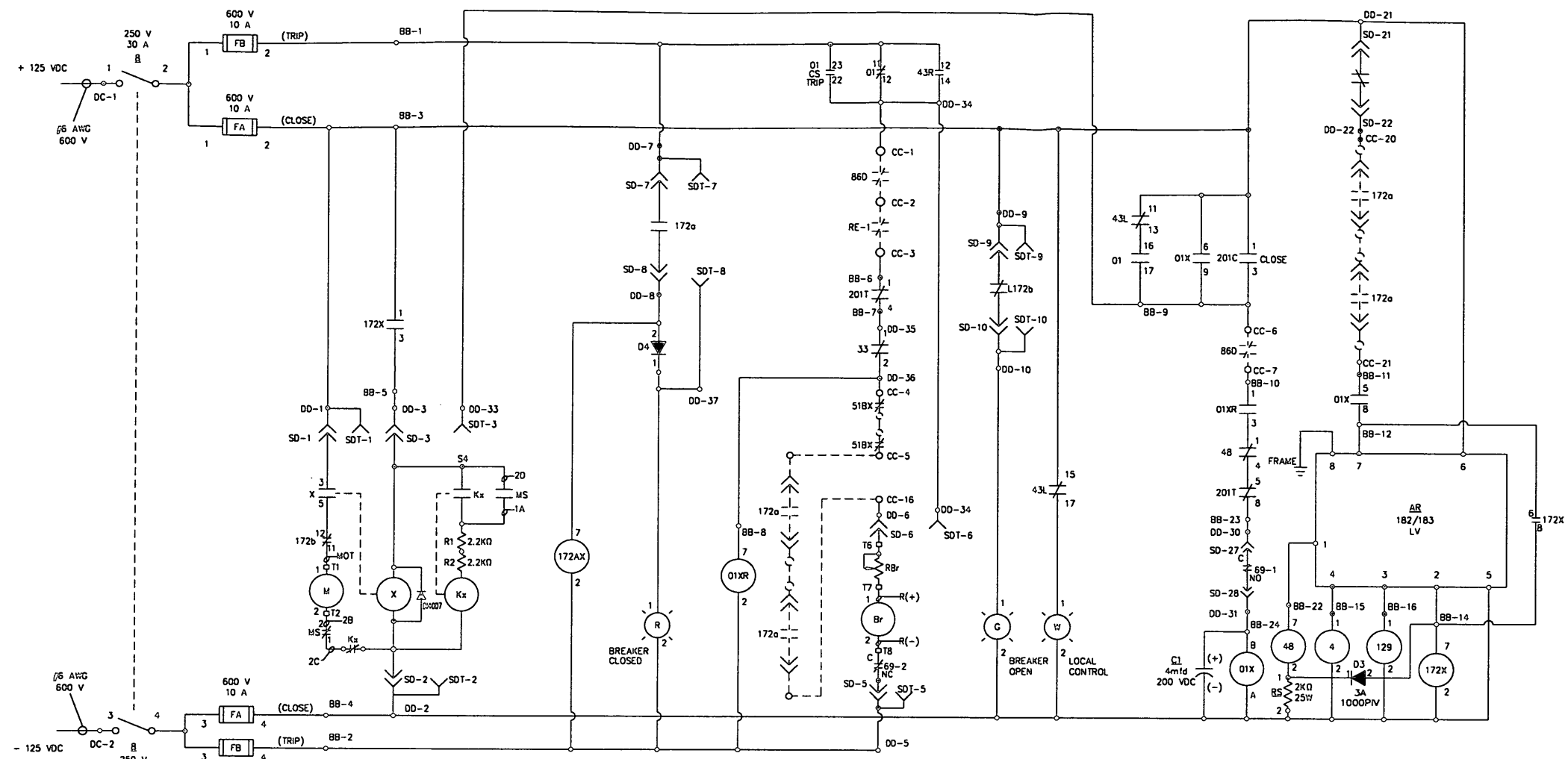
REVISIONS				
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY APP. BY
A	REVISED PER CUSTOMER COMMENTS	RLS	11/7/94	
B	REVISED PER CUSTOMER COMMENTS	JLR	3/29/95	
C	REVISED PER CUSTOMER COMMENTS	JLL	6/13/95	
D	O1X RELAY, BKR INTERNALS CORRECTED	RLS	8/1/95	
E	CORRECTED ERRORS	RLS	10/4/95	

LEGEND:

- O1 - CONTROL SWITCH
- O1X - AUXILIARY TO O1
- O1XR - RESET AND TRIPPING RELAY
- 201C - REMOTE CONTROL CLOSE RELAY
- 201T - REMOTE CONTROL TRIP RELAY
- OCCB - CENTRAL CONTROL
- RE-1 - EMERGENCY TRIP RELAY
- 33 - BREAKER CUBICLE DOOR INTERLOCK SWITCH
- 43R - REMOTE CONTROL CONTACT
- 43L - LOCAL CONTROL CONTACT
- 8 - CONTROL POWER DISCONNECTING DEVICE
- 172 - DC CIRCUIT BREAKER
- 172b - BREAKER NORMALLY CLOSED AUXILIARY SWITCH
- 172c - BREAKER NORMALLY OPEN AUXILIARY SWITCH
- 172X - CLOSING RELAY
- M - CLOSING MOTOR
- X - CLOSING CONTACTOR
- Y - ANTI-PUMPING RELAY
- Br - HOLDING COIL
- TOC - TRUCK OPERATED CONTACT (POSITION INDICATED)
- 860 - LOCKOUT RELAY, DC 72-1
- 182/183 - LOAD MEASURING/VOLTAGE SENSING CIRCUIT
- LMR - LOAD MEASURING RESISTOR
- 4 - ISOLATION CONTACTOR
- 129 - LOAD MEASURING CONTACTOR
- D1, D2 - DIODES
- FA, FB, ... - FUSES
- AM - AMMETER, DC
- SH - SHUNT
- HTR - HEATER
- (R) - INDICATING LIGHT (LETTER DENOTES COLOR)
- LA - LIGHTNING ARRESTER
- 48 - INCOMPLETE SEQUENCE RELAY
- 69 - MANUAL TRIP AUX. SWITCH
- 51BX - AUXILIARY RELAY TO 51B (450% OVERLOAD) RELAY
- SD - SECONDARY DISCONNECT (CONNECTED POSITION)
- SOT - SECONDARY DISCONNECT (TEST POSITION)

NOTE:

- 1.) ALL WIRE # 14 SIS UNLESS OTHERWISE NOTED.
- 2.) BREAKER SHOWN IN CONNECTED POSITION & OPEN.
- 3.) LOCAL/REMOTE SWITCH (43) SHOWN IN THE LOCAL POSITION.
- 4.) LOCKOUT RELAY CONTACTS SHOWN IN THE RESET POSITION.
- 5.) 51BX CONTACTS APPEAR ONLY IN SUBSTATION APPLICATIONS.
- 6.) TOWER CONTROL ON GLENMONT YARD STATION.
- 7.) APPLIES TO GLENMONT SOUTH AND FARRINGTON AVE. TIE BREAKER STATIONS UNIT #2 ONLY.



APPLIES TO:

SUBSTATION	
HENDERSON AVENUE SUBSTATION	1071
GREENLEAF SUBSTATION	1067
TILBURY ROAD SUBSTATION	1066
TIE BREAKER STATIONS	JOB #
GLENMONT SOUTH TIE BREAKER	1070
ROSSO STREET TIE BREAKER	1065
FARRINGTON AVE. TIE BREAKER	1064

DWN.	RLS	DATE	8/26/94
CHK'D.		DATE	
APP		DATE	
CUSTOMER	WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		
CONTRACT NO.	227042		

1229 N. BRITAIN AVE P.O. BOX 211 MOUNTAIN VIEW, N.C. 28543	
TITLE	ACCELERATION GAP CIRCUIT BREAKER WITHOUT RATE OF RISE RELAY SCHEMATIC DIAGRAM
DWG. NO.	00026S05
JOB NO. SEE CHART	
SCALE	
REV.	E

Jackson Wed Jul 2 11:07:26 1997 - E:\00026\00026S05

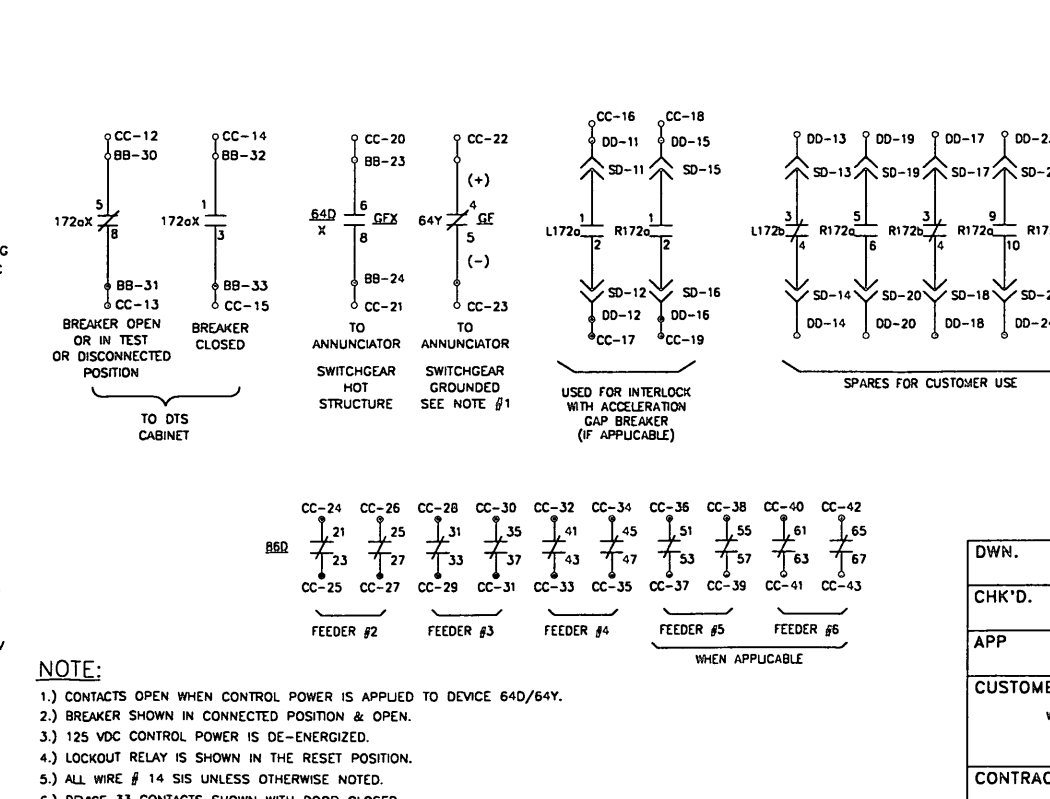
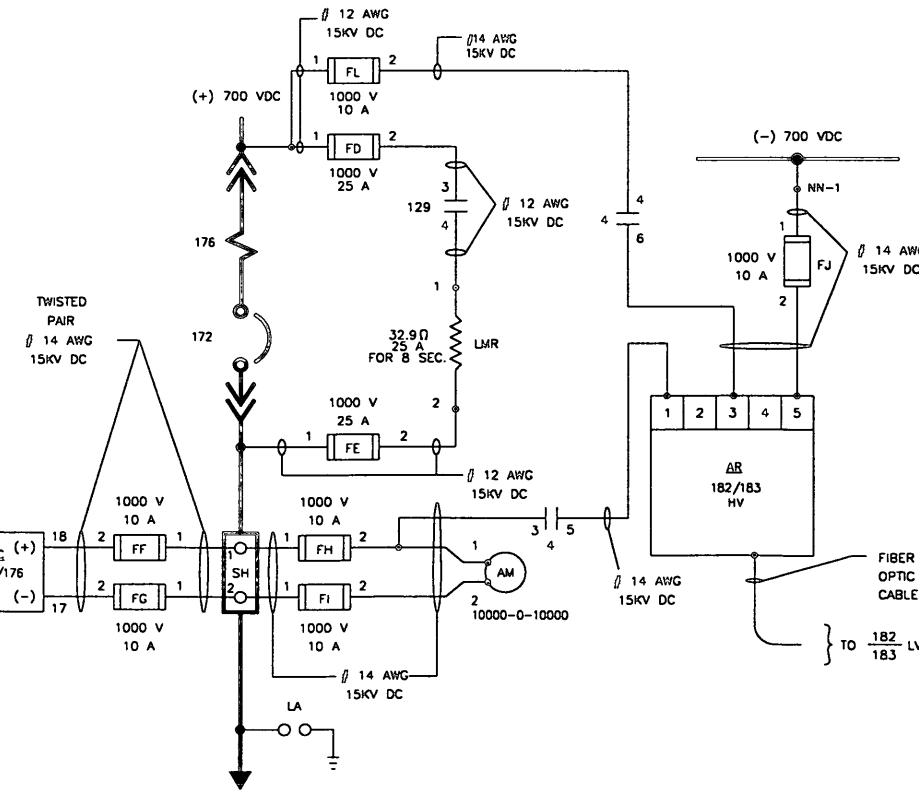
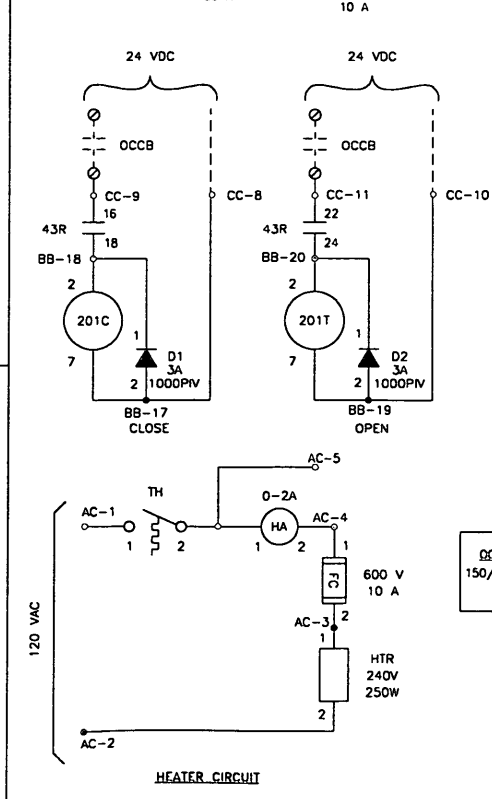
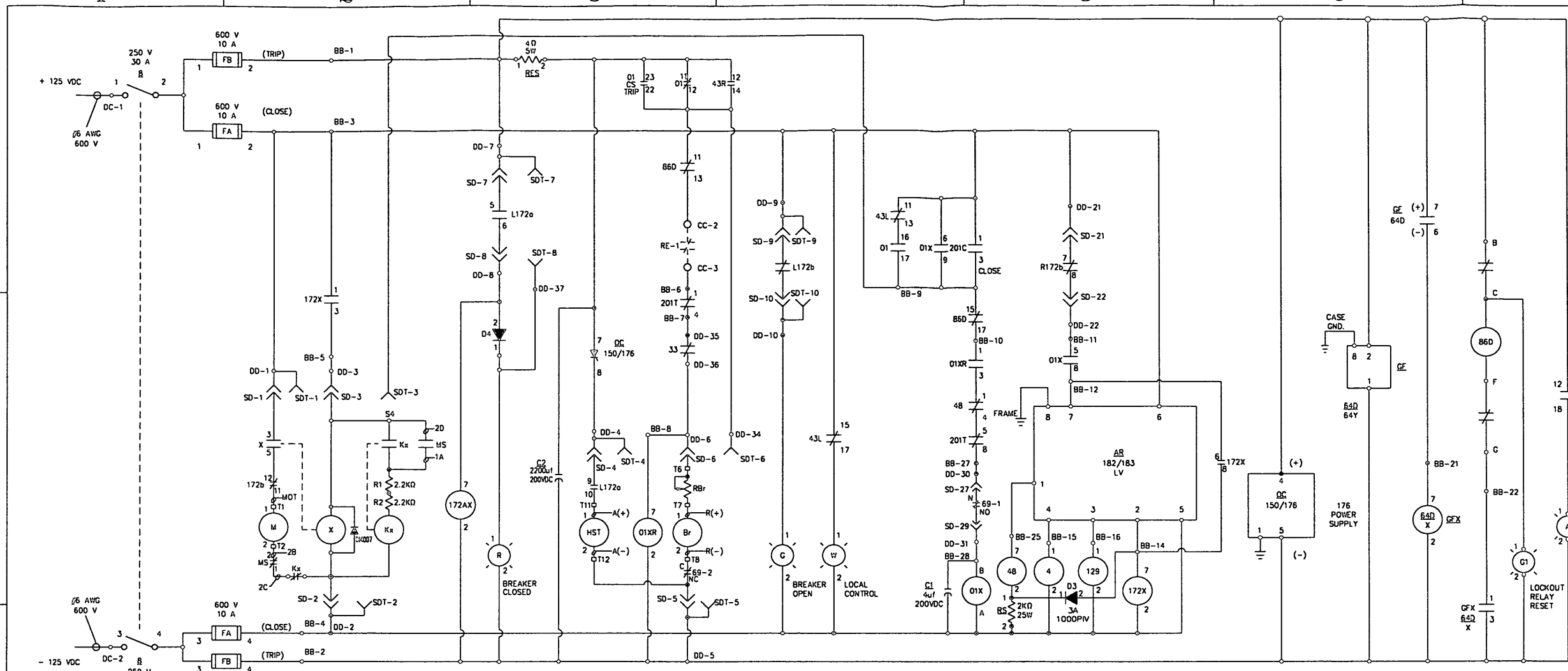
Jackson Wed 2 12:54:40 1997 - E: \00026\00026501

REVISIONS				
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHKD BY / APP. BY
B	REVISED PER CUSTOMER COMMENTS	JLR	3/20/95	
C	REVISED PER CUSTOMER COMMENTS	JLR	6/13/95	
D	1X RELAY, BKR INTERNALS CORRECTED	RLS	8/2/95	
E	CORRECTED ERROR	RLS	9/30/95	
F	UPDATED DRAWING	CFJ	7/2/97	

- LEGEND:**
- O1 - CONTROL SWITCH
 - O1X - AUXILIARY TO O1
 - O1XR - RESET AND TRIPPING RELAY
 - 201C - REMOTE CONTROL CLOSE RELAY
 - 201T - REMOTE CONTROL TRIP RELAY
 - OCCB - CENTRAL CONTROL
 - RE-1 - EMERGENCY TRIP RELAY
 - 33 - BREAKER CUBICLE DOOR INTERLOCK SWITCH
 - 43R - REMOTE CONTROL CONTACT
 - 43L - LOCAL CONTROL CONTACT
 - B - CONTROL POWER DISCONNECTING DEVICE
 - 172 - DC CIRCUIT BREAKER
 - 172b - BREAKER NORMALLY CLOSED AUXILIARY SWITCH
 - 172o - BREAKER NORMALLY OPEN AUXILIARY SWITCH
 - 172X - CLOSING RELAY
 - M - CLOSING MOTOR
 - X - CLOSING CONTACTOR
 - Y - ANTI-PUMPING RELAY
 - Br - HOLDING COIL
 - HST - HIGH SPEED TRIP COIL
 - TOC - TRUCK OPERATED CONTACT (POSITION INDICATED)
 - 86D - LOCKOUT RELAY
 - 150 - RATE OF RISE RELAY
 - 176 - DC OVERCURRENT RELAY
 - 182/183 - LOAD MEASURING/VOLTAGE SENSING CIRCUIT
 - LMR - LOAD MEASURING RESISTOR
 - 4 - ISOLATION CONTACTOR
 - 129 - LOAD MEASURING CONTACTOR
 - O1, O2 - DIODES
 - FA, FB, ... - FUSES
 - AM - AMMETER, DC
 - SH - SHUNT
 - HTR - HEATER
 - (R) - INDICATING LIGHT (LETTER DENOTES COLOR)
 - LA - LIGHTNING ARRESTER
 - 69 - MANUAL TRIP AUX. SWITCH
 - 48 - INCOMPLETE SEQUENCE RELAY
 - SD - SECONDARY DISCONNECTS (CONNECTED POSITION)
 - SOT - SECONDARY DISCONNECTS (TEST POSITION)

APPLIES TO:

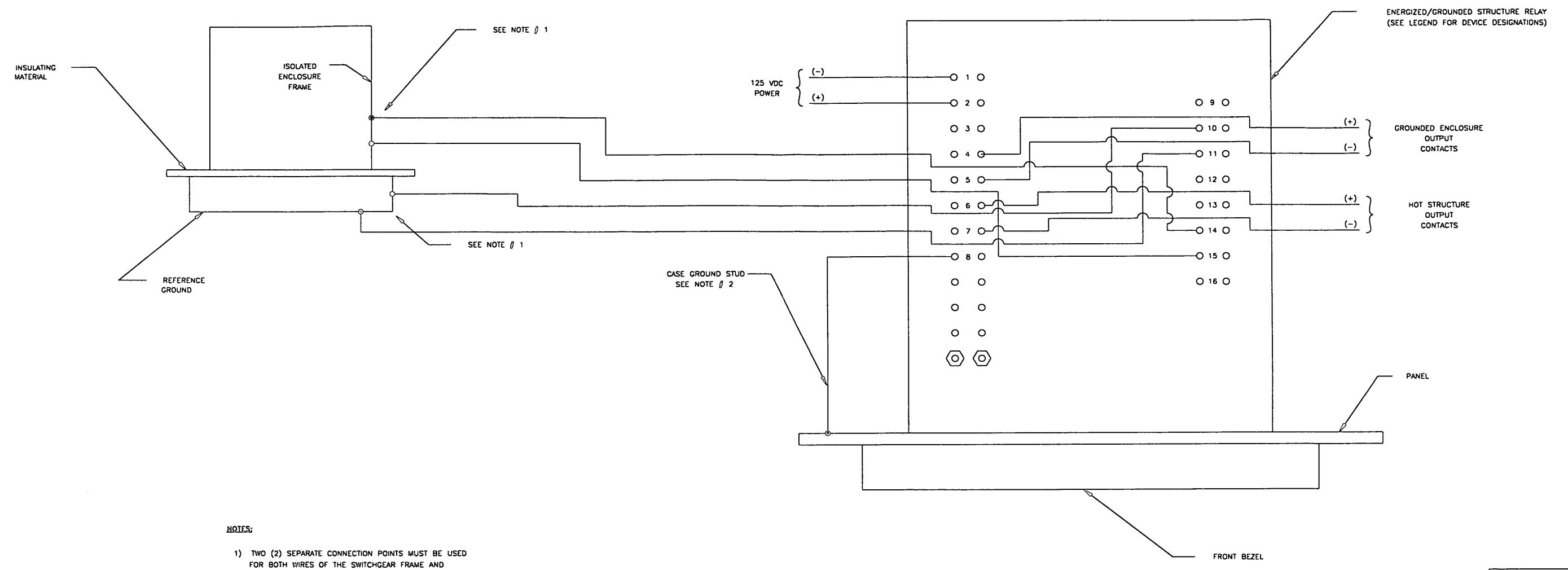
THE BREAKER STATIONS	JOB #
ROSO STREET THE BREAKER	1065
FRANCONIA-SPRINGFIELD THE BREAKER	1068



- NOTE:**
- CONTACTS OPEN WHEN CONTROL POWER IS APPLIED TO DEVICE 64D/64Y.
 - BREAKER SHOWN IN CONNECTED POSITION & OPEN.
 - 125 VDC CONTROL POWER IS DE-ENERGIZED.
 - LOCKOUT RELAY IS SHOWN IN THE RESET POSITION.
 - ALL WIRE # 14 SIS UNLESS OTHERWISE NOTED.
 - DEVICE 33 CONTACTS SHOWN WITH DOOR CLOSED.

DWN.	RLS	DATE	8/26/94	<p>1229 N. BREATHALE AVENUE P.O. BOX 233 MOUNT OLIVE, N.C. 28555</p>
CHK'D.		DATE		
APP		DATE		TITLE
CUSTOMER				THE BREAKER STATION DC FEEDER CIRCUIT BREAKER (UNIT-1) SCHEMATIC DIAGRAM
WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY				
CONTRACT NO.	227042	DWG. NO.	00026501	DWG. NO. 00026501 SCALE ~ REV. F
		SCALE		

REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY	APP. BY
A	CORRECTED DRAWING	JRP	4/25/96		



- NOTES:**
- 1) TWO (2) SEPARATE CONNECTION POINTS MUST BE USED FOR BOTH WIRES OF THE SWITCHGEAR FRAME AND REFERENCE GROUND.
 - 2) THE RELAY CASE SHOULD BE GROUNDED TO THE SUBSTATION FRAME FOR VOLTAGE SAFETY AND TO REDUCE SUSCEPTIBILITY TO R.F. INTERFERENCE.

APPLIES TO:

SUBSTATION	JOB NO.
1.) HENDERSON AVENUE SUBSTATION	1071
2.) GLENMONT YARD SUBSTATION	1072
3.) GLENMONT NORTH TIE BREAKER	1069
4.) GLENMONT SOUTH TIE BREAKER	1070
5.) ROSO STREET TIE BREAKER	1065
6.) FARRINGTON AVENUE TIE BREAKER	1064
4.) FRANCONIA-SPRINGFIELD TIE BREAKER	1068
5.) GREENLEAF SUBSTATION	1067
6.) TILBURY SUBSTATION	1066

LEGEND:

64C	- RECTIFIER GND. RELAY (HOT STRUCTURE)
64D	- DC SWITCHGEAR GND. RELAY (HOT STRUCTURE)
64X	- RECTIFIER GND. RELAY (GROUNDED STRUCTURE)
64Y	- DC SWITCHGEAR GND. RELAY (GROUNDED STRUCTURE)

DWN. RLS	DATE 8/27/94	 1230 N. GREAZEALE AVENUE P.O. BOX 238 MOUNT GUY, W.V. 26365
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER		HIGH RESISTANCE GROUND CIRCUIT
WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		DWG. NO. 0002651L
CONTRACT NO. 227042	DWG. SIZE D	JOB NO. SEE CHART
	SCALE	REV. A

Jackson Wed Jul 2 11:20:48 1997 - E:\00026\0002651L

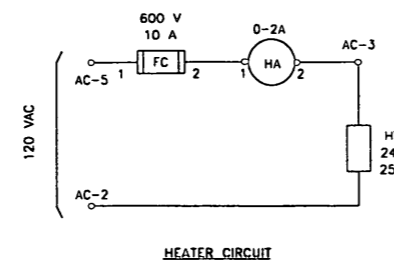
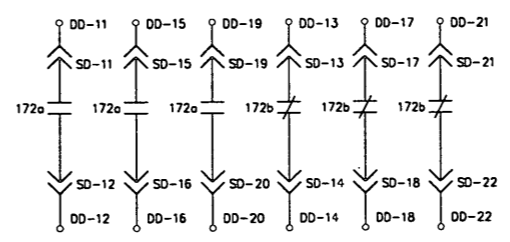
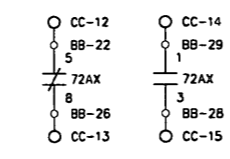
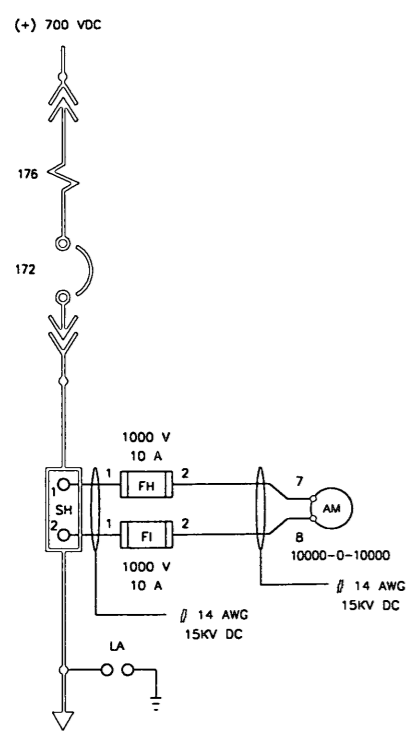
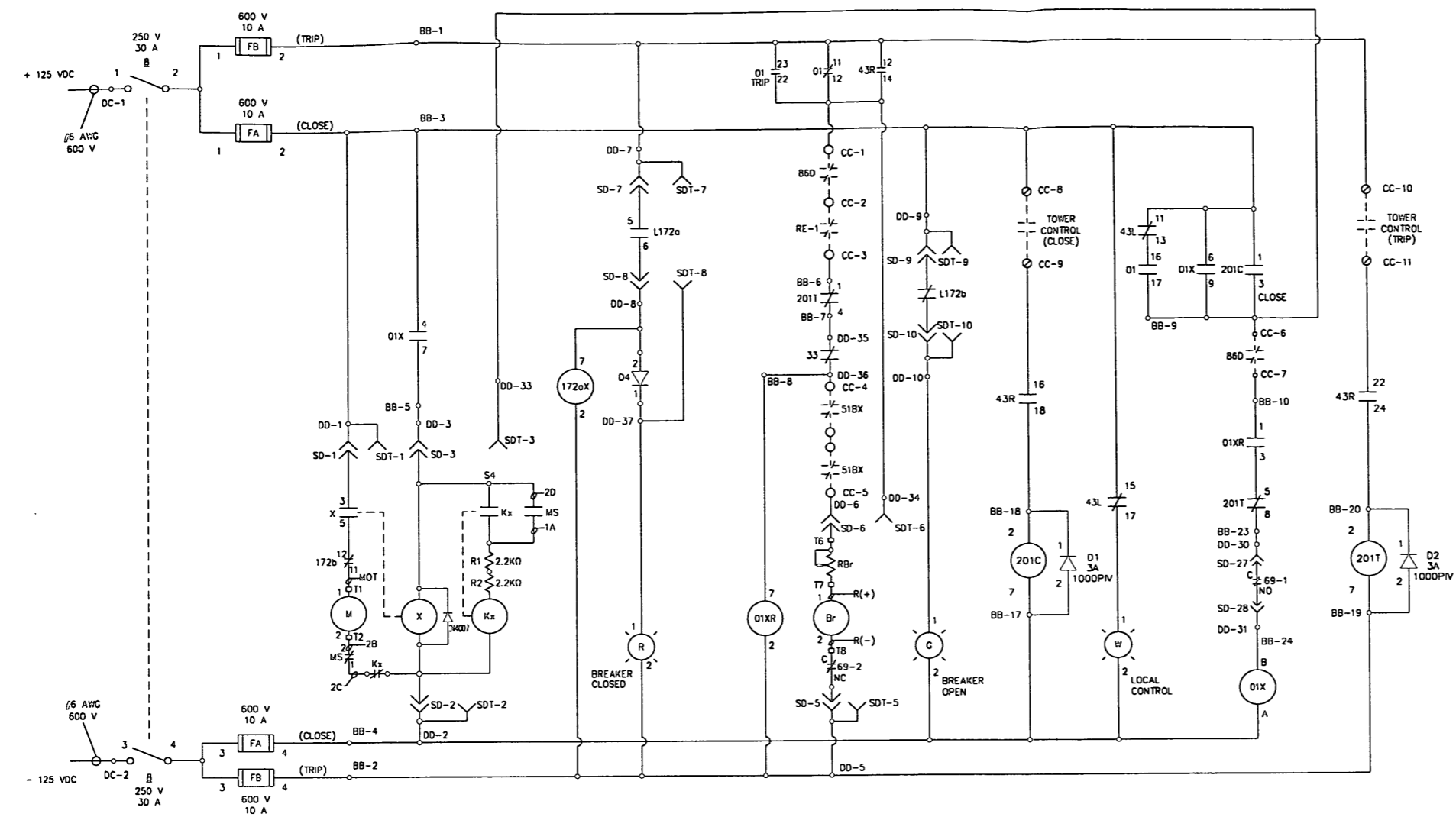
REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D.	APP. BY
A	REVISED PER CUSTOMER COMMENTS	RLS	11/2/94		
B	CORRECTED DRAWING	RLS	9/12/95		
C	AS BUILT CORRECTIONS	RLS	10/3/95		

LEGEND:

- O1 - CONTROL SWITCH
- O1X - AUXILIARY TO O1
- O1XR - RESET AND TRIPPING RELAY
- 201C - REMOTE CONTROL TRIPPING RELAY
- 201T - REMOTE CONTROL TRIP RELAY
- RE-1 - EMERGENCY TRIP RELAY
- 33 - BREAKER CUBICLE DOOR INTERLOCK SWITCH
- 43R - REMOTE CONTROL CONTACT
- 43L - LOCAL CONTROL CONTACT
- B - CONTROL POWER DISCONNECTING DEVICE
- 172 - DC CIRCUIT BREAKER
- 172b - BREAKER NORMALLY CLOSED AUXILIARY SWITCH
- 172a - BREAKER NORMALLY OPEN AUXILIARY SWITCH
- M - CLOSING MOTOR
- X - CLOSING CONTACTOR
- Y - ANTI-PUMPING RELAY
- Br - HOLDING COIL
- TOC - TRUCK OPERATED CONTACT (POSITION INDICATED)
- 86 - LOCKOUT RELAY
- 176 - DC OVERCURRENT RELAY
- D1, D2 - DIODES
- FA, FB, ... - FUSES
- AM - AMMETER, DC
- SH - SHUNT
- HTR - HEATER
- (R) - INDICATING LIGHT (LETTER DENOTES COLOR)
- LA - LIGHTNING ARRESTER
- 51BX - AUXILIARY RELAY TO 51B (450% OVERLOAD) RELAY

NOTE:

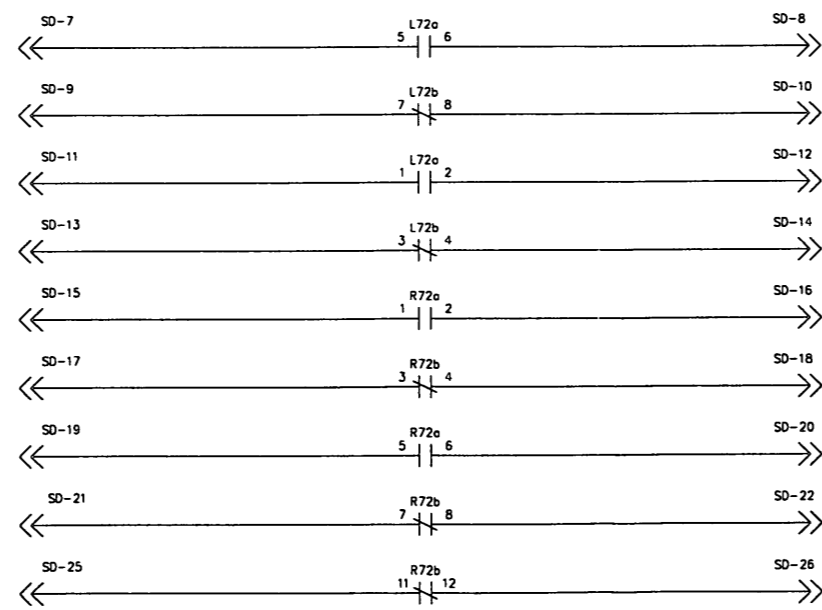
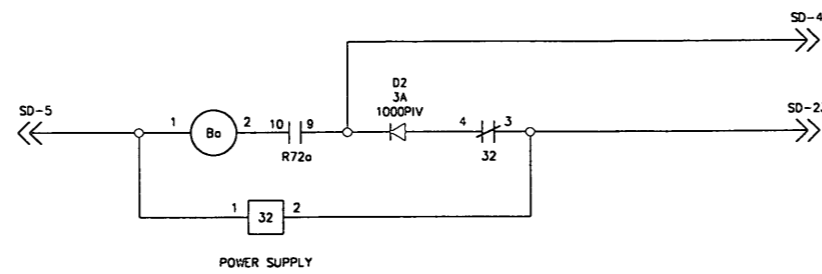
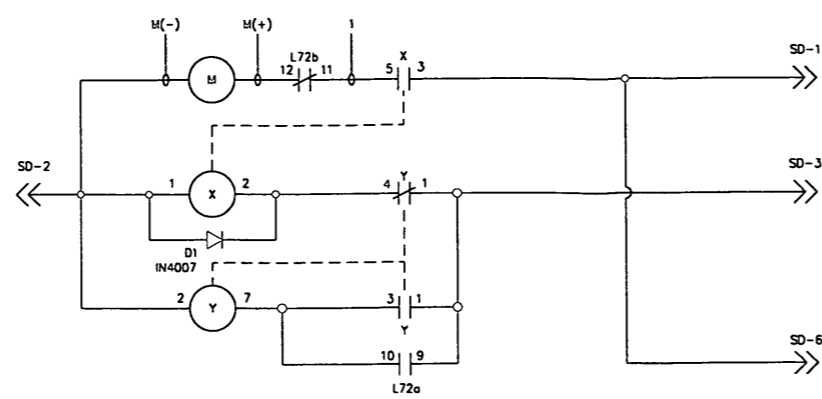
- 1.) ALL WIRE # 14 SIS UNLESS OTHERWISE NOTED.
- 2.) BREAKER SHOWN IN CONNECTED POSITION & OPEN.
- 3.) LOCAL/REMOTE SWITCH (43) SHOWN IN THE LOCAL POSITION.
- 4.) LOCKOUT RELAY CONTACTS SHOWN IN THE RESET POSITION.



DWN. RLS	DATE 8/26/94	
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER		DC FEEDER CIRCUIT BREAKER 172-3, 172-4, 172-5, AND 172-6 W/O RECLOSER AND RATE OF RISE RELAY SCHEMATIC DIAGRAM
CONTRACT NO. 227042	WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY	DWG. NO. 0002651M
		SCALE ~
		REV. c

Jackson Wed Jul 2 11:21:07 1997 - E:\00026\0002651M

REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHECKED BY	APP. BY
A	CORRECTED BREAKER SCHEMATIC	GRM	9/18/95		
B	REVISED PER FIELD CORRECTIONS	JRP	1/25/96		
C	AS BUILT CORRECTIONS	RLS	10/21/96		



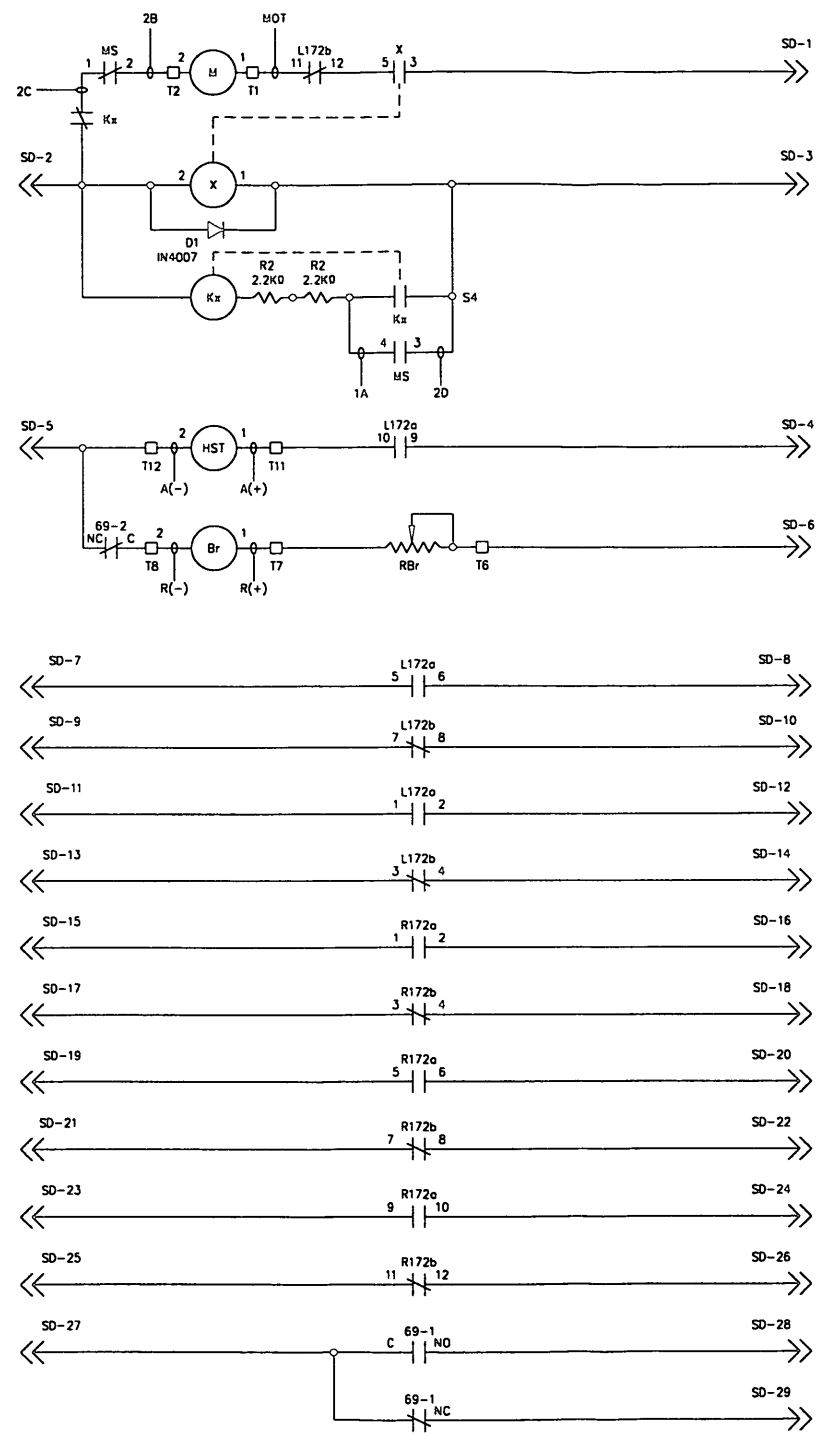
LEGEND

- M CLOSING MOTOR
- X CLOSING CONTACTOR
- Y ANTI-PUMPING RELAY
- Bo TRIPPING COIL
- 32 REVERSE CURRENT SENSOR

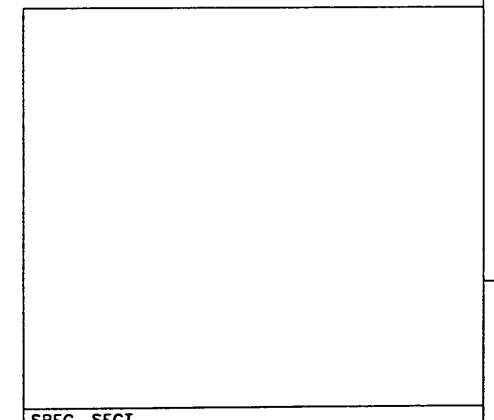
DWN. RLS	DATE 11/12/94	 1230 EL CAMARILLAS AVENUE P.O. BOX 235 COUNTY CLAY, MO. 64503
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER		8000A CIRCUIT BREAKER SCHEMATIC DIAGRAM
WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		DWG. NO. 0002651N
CONTRACT NO. 227042	SCALE ~	REV. c

Jackson Wed Jul 2 11:21:25 1997 - E:\00026\0002651N

REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY	APP. BY
A	CORRECTED BREAKER SCHEMATIC	GRM	9/16/95		



- LEGEND**
- M CLOSING MOTOR
 - X CLOSING CONTACTOR
 - Kx ANTI-PUMPING RELAY
 - Br HOLDING COIL
 - HST HIGH SPEED TRIP COIL
 - SD SECONDARY DISCONNECT
 - RBr ADJUSTABLE RESISTOR
 - MS BREAKER POSITION MICRO SWITCH



SPEC. SECT. 3.5

DWN. RLS	DATE 11/12/94	DRAWING NO. 00026S10	REV. A
CHK'D.	DATE	 P.O. BOX 232 WASHINGTON, D.C. 20009	
APP	DATE		
CUSTOMER WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		TITLE 4000A CIRCUIT BREAKER SCHEMATIC DIAGRAM	
DWG. SIZE D	JOB NO.	DWG. NO. 00026S10	
CONTRACT NO. 227042	SCALE -	SHT. 1 OF 1	

Jackson Wed Jul 2 11:21:38 1997 - E:\00026\00026S10

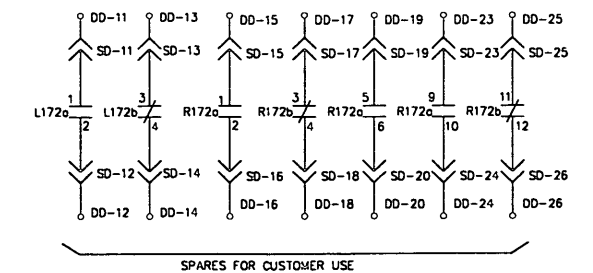
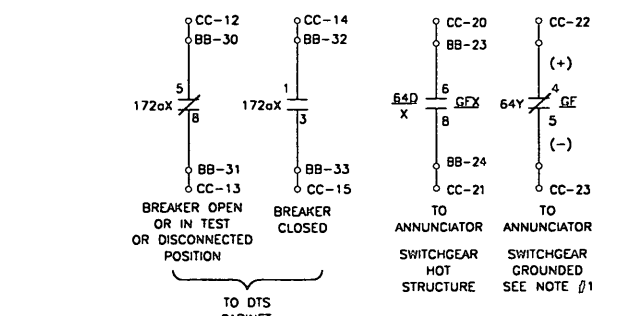
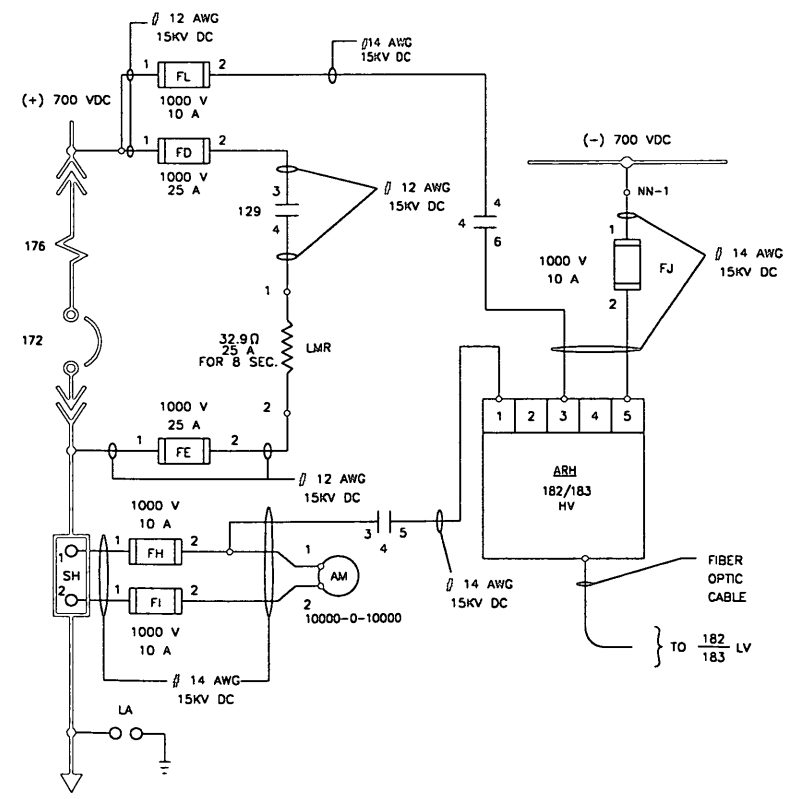
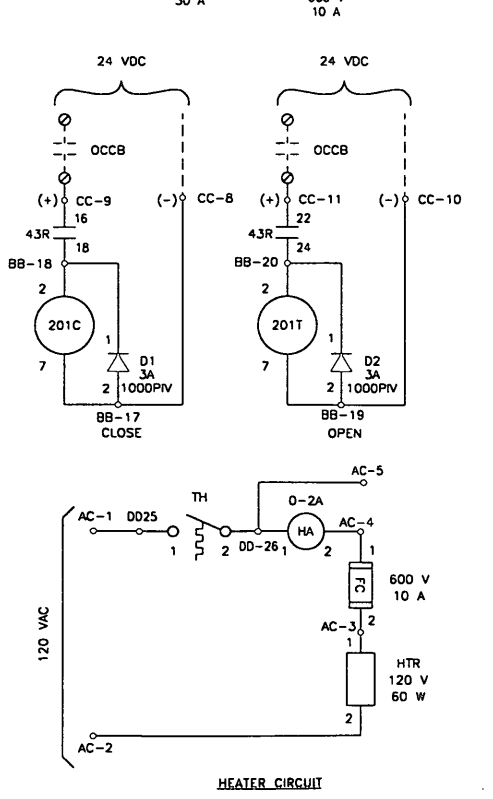
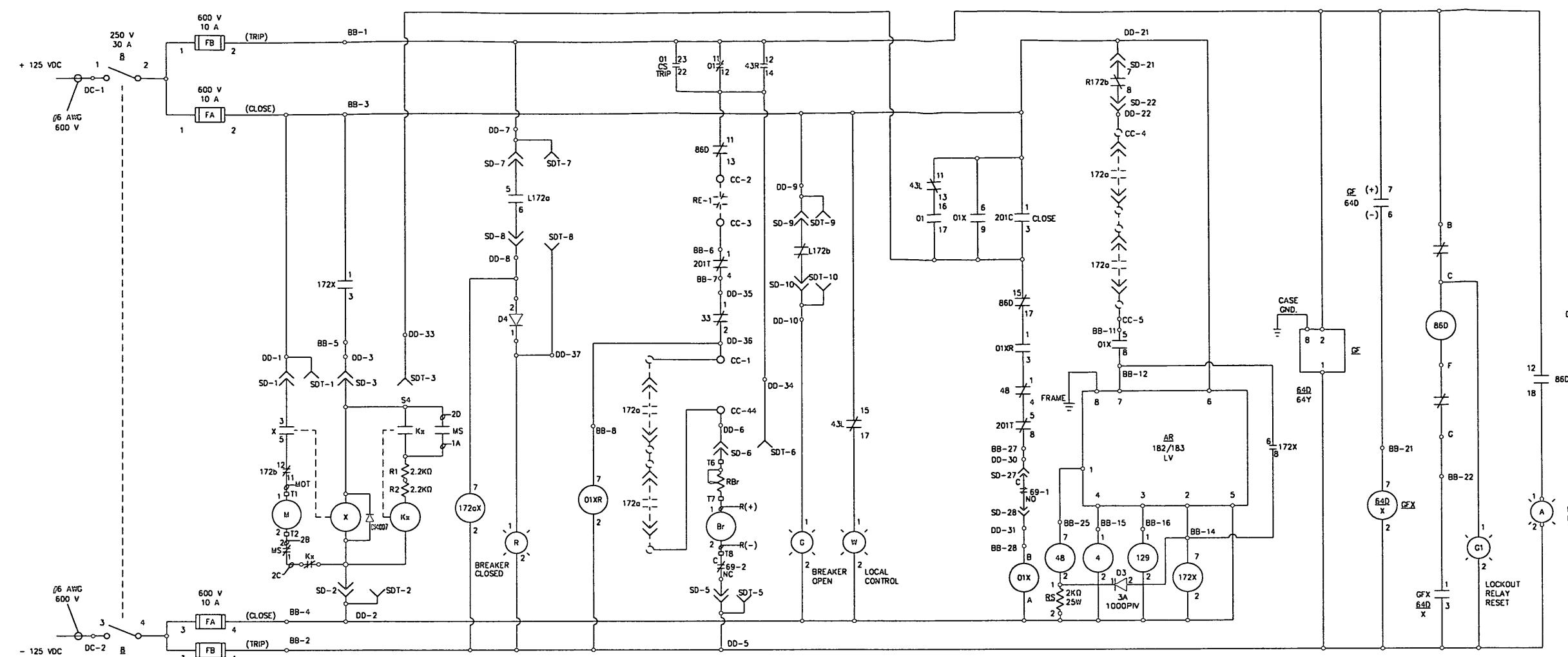
REVISIONS				
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY APP. BY
A	REVISED PER CUSTOMER COMMENTS	JLL	5/13/95	
B	D1X RELAY, BKR INTERNALS CORRECTED	RLS	8/2/95	
C	CORRECTED HEATER CKT	RLS	11/7/95	

LEGEND:

- O1 - CONTROL SWITCH
- O1X - AUXILIARY TO O1
- O1XR - RESET AND TRIPPING RELAY
- 201C - REMOTE CONTROL CLOSE RELAY
- 201T - REMOTE CONTROL TRIP RELAY
- OCCB - CENTRAL CONTROL
- RE-1 - EMERGENCY TRIP RELAY
- 33 - BREAKER CUBICLE DOOR INTERLOCK SWITCH
- 43R - REMOTE CONTROL CONTACT
- 43L - LOCAL CONTROL CONTACT
- B - CONTROL POWER DISCONNECTING DEVICE
- 172 - DC CIRCUIT BREAKER
- 172b - BREAKER NORMALLY CLOSED AUXILIARY SWITCH
- 172o - BREAKER NORMALLY OPEN AUXILIARY SWITCH
- 172X - CLOSING RELAY
- M - CLOSING MOTOR
- X - CLOSING CONTACTOR
- Y - ANTI-PUMPING RELAY
- Br - HOLDING COIL
- HST - HIGH SPEED TRIP COIL
- TOC - TRUCK OPERATED CONTACT (POSITION INDICATED)
- B6D - LOCKOUT RELAY
- 182/183 - LOAD MEASURING/VOLTAGE SENSING CIRCUIT
- LMR - LOAD MEASURING RESISTOR
- 4 - ISOLATION CONTACTOR
- 129 - LOAD MEASURING CONTACTOR
- D1, D2 - DIODES
- FA, FB, ... - FUSES
- AM - AMMETER, DC
- SH - SHUNT
- HTR - HEATER
- (R) - INDICATING LIGHT (LETTER DENOTES COLOR)
- LA - LIGHTNING ARRESTER
- 48 - INCOMPLETE SEQUENCE RELAY
- 69 - MANUAL TRIP AUX. SWITCH
- SD - SECONDARY DISCONNECT (CONNECTED POSITION)
- SDT - SECONDARY DISCONNECT (TEST POSITION)

APPLIES TO:

TIE BREAKER STATIONS	JOB #
FARRINGTON AVE. TIE BREAKER	1064



- NOTE:**
- CONTACTS OPEN WHEN CONTROL POWER IS APPLIED TO DEVICE 64D/64Y.
 - BREAKER SHOWN IN CONNECTED POSITION & OPEN.
 - 125 VDC CONTROL POWER IS DE-ENERGIZED.
 - LOCKOUT RELAY IS SHOWN IN THE RESET POSITION.
 - ALL WIRE # 14 SIS UNLESS OTHERWISE NOTED.
 - DEVICE 33 CONTACTS SHOWN WITH DOOR CLOSED.

DWN.	DATE	IMPulse NC, INC.	
RLS	8/26/94	1820 N. CENTRAL AVENUE P.O. BOX 334 COLUMBIA, S.C. 29308	
CHK'D.	DATE	TITLE	
		TIE BREAKER STATION ACCELERATION GAP CKT. BREAKER (UNIT-1) SCHEMATIC DIAGRAM	
APP	DATE	DWG. NO.	DWG. NO.
		1064	00026510
CUSTOMER		SCALE	REV.
WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY			c
CONTRACT NO.			
227042			

Jackson Wed Jul 2 11:22:04 1997 - E:\00026\00026510

Jackson Wed Jul 2 11:24:18 1997 - E:\00026\00026S11

REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY	APP. BY
A	REMOVED FIRE ALARM CONTACT	RLS	1/6/97		

LEGEND:

- 01 - CONTROL SWITCH
- 32 - REVERSE CURRENT RELAY
- 33 - BREAKER CUBICLE DOOR INTERLOCK SWITCH
- 33R - RECTIFIER DOOR INTERLOCK SWITCH
- 52R - RECTIFIER/TRANSFORMER FEEDER CIRCUIT BREAKER
- 64D - ENERGIZED (HOT) ENCLOSURE
- 64D/X - AUXILIARY TO 64D
- 64Y - GROUNDED ENCLOSURE
- 72 - MAIN DC CIRCUIT BREAKER
- 72a - CATHODE BREAKER NORMALLY OPEN AUXILIARY SWITCH
- 72b - CATHODE BREAKER NORMALLY CLOSED AUXILIARY SWITCH
- 76 - DC OVERCURRENT RELAY
- 8 - CONTROL POWER DISCONNECTING DEVICE
- 8A - AC LOCKOUT RELAY
- 8B - DC LOCKOUT RELAY
- FA, FB, ... - FUSES
- CT - CURRENT TRANSDUCER
- AM - AMMETER, DC
- (K) - KIRK KEY INTERLOCK
- WT - WATT TRANSDUCER
- TH - THERMOSTAT
- HTR - HEATER
- HM - AMMETER, HEATER
- SH - SHUNT
- TOC - TRUCK OPERATED CONTACT (POSITION INDICATED)
- (R) - INDICATING LIGHT (LETTER DENOTES COLOR)
- M - CLOSING MOTOR
- X - CLOSING CONTACTOR
- Y - ANTI-PUMPING RELAY
- Bo - TRIPPING COIL
- 01X - AUXILIARY RELAY TO DEVICE 01 (ENABLE)
- Y - AUXILIARY RELAY TO DEVICE 01 (RESET)
- 64C - RECTIFIER ENERGIZED (HOT) ENCLOSURE
- SD - SECONDARY DISCONNECT (CONNECTED POSITION)
- SDT - SECONDARY DISCONNECT (TEST POSITION)
- 72AX - AUXILIARY RELAY TO DEVICE 72

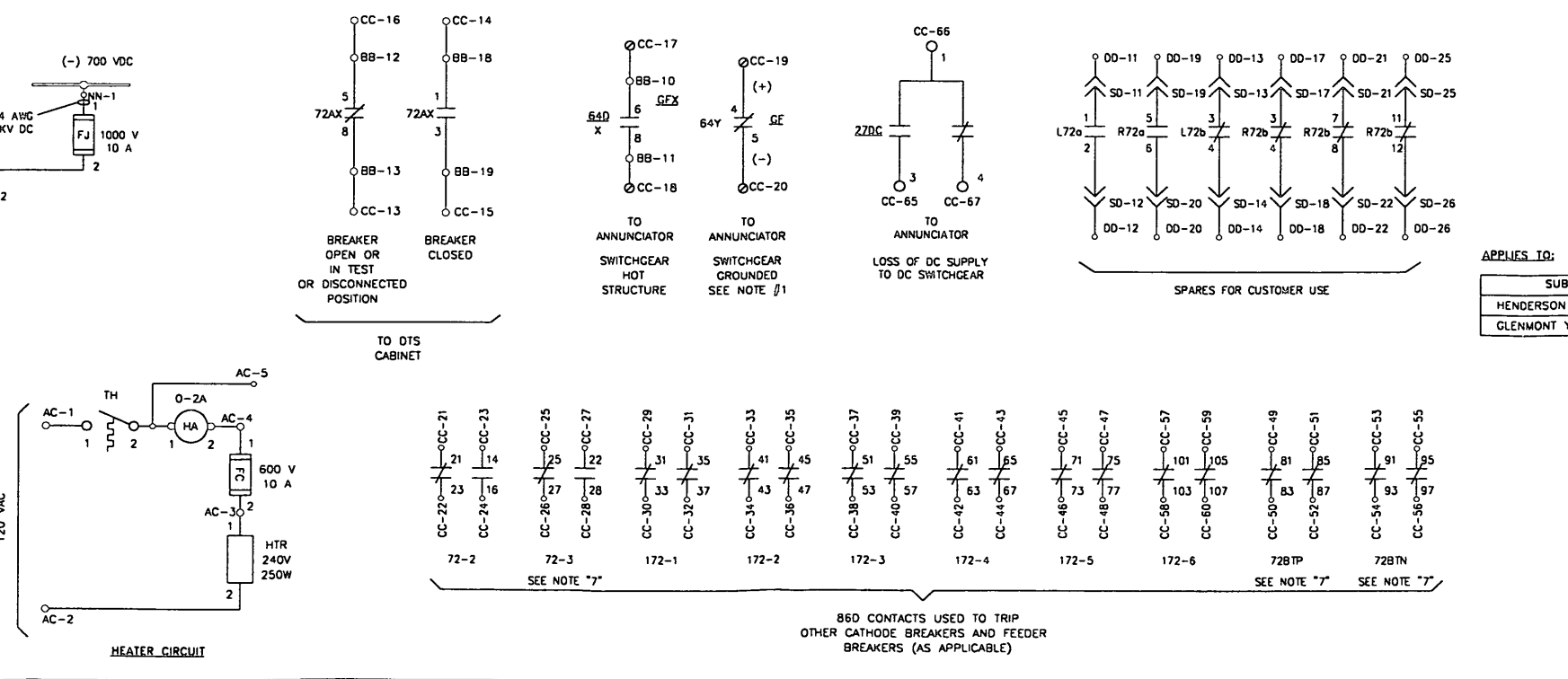
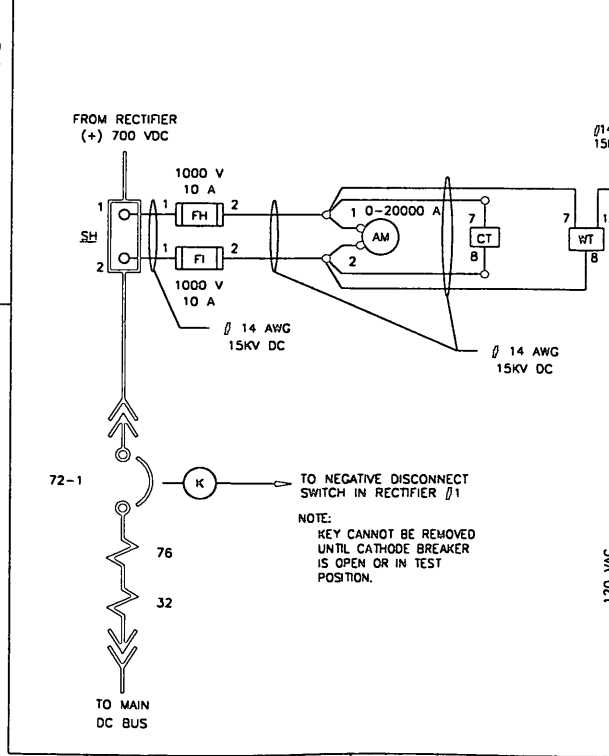
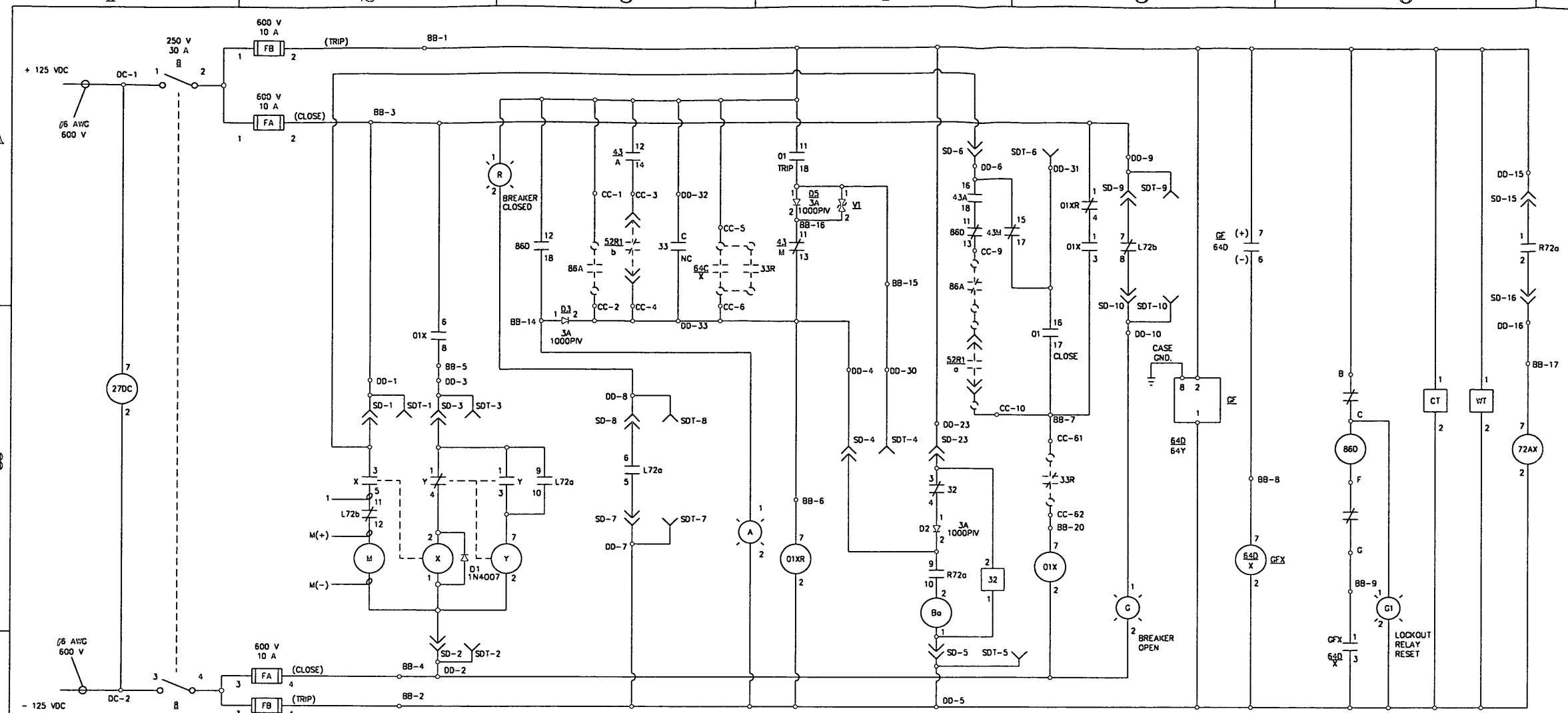
NOTE:

- 1.) CONTACTS OPEN WHEN CONTROL POWER IS APPLIED TO DEVICE 64D/64Y.
- 2.) BREAKER SHOWN IN CONNECTED POSITION & OPEN.
- 3.) 125 VDC CONTROL POWER IS DE-ENERGIZED.
- 4.) LOCKOUT RELAY IS SHOWN IN THE RESET POSITION.
- 5.) ALL WIRE # 14 SIS UNLESS OTHERWISE NOTED.
- 6.) DEVICE 33 CONTACTS SHOWN WITH DOOR CLOSED.
- 7.) APPLIES TO GLENMONT YARD SUBSTATION ONLY.

APPLIES TO:

SUBSTATION	JOB NO.
HENDERSON AVENUE SUBSTATION	1071
GLENMONT YARD SUBSTATION	1072

DWN.	RLS	DATE	7/11/96	<p>1320 N. CRENSHAW AVENUE P.O. BOX 233 LITTLE ROCK, AR 72205</p>
CHK'D.		DATE		
APP		DATE		TITLE
CUSTOMER				72-1 CATHODE CIRCUIT BREAKER SCHEMATIC DIAGRAM
WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY				DWG SIZE
CONTRACT NO.				JOB NO. SEE CHART
227042				DWG. NO. 00026S11
				SCALE
				REV. A



86D CONTACTS USED TO TRIP OTHER CATHODE BREAKERS AND FEEDER BREAKERS (AS APPLICABLE)

REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHKD. BY	APP. BY

LEGEND:

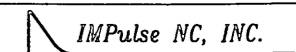
- 01 - CONTROL SWITCH
- 32 - REVERSE CURRENT RELAY
- 33 - BREAKER CUBICLE DOOR INTERLOCK SWITCH
- 52R - RECTIFIER/TRANSFORMER FEEDER CIRCUIT BREAKER
- 64C - RECTIFIER ENCLOSURE HOT STRUCTURE
- 64C/X - AUXILIARY TO 64C
- 72 - MAIN DC CIRCUIT BREAKER
- 72a - CATHODE BREAKER NORMALLY OPEN AUXILIARY SWITCH
- 72b - CATHODE BREAKER NORMALLY CLOSED AUXILIARY SWITCH
- 8 - CONTROL POWER DISCONNECTING DEVICE
- 86A - AC LOCKOUT RELAY
- 86D - DC LOCKOUT RELAY
- FA, FB, ... - FUSES
- CT - CURRENT TRANSDUCER
- AM - AMMETER, DC
- (K) - KIRK KEY INTERLOCK
- WT - WATT TRANSDUCER
- VT - VOLTAGE TRANSDUCER
- HTR - HEATER
- SH - SHUNT
- TOC - TRUCK OPERATED CONTACT (POSITION INDICATED)
- (R) - INDICATING LIGHT (LETTER DENOTES COLOR)
- M - CLOSING MOTOR
- X - CLOSING CONTACTOR
- Y - ANTI-PUMPING RELAY
- Ba - TRIPPING COIL
- SD - SECONDARY DISCONNECT (CONNECTED POSITION)
- SDT - SECONDARY DISCONNECT (TEST POSITION)
- 72AX - AUXILIARY RELAY TO DEVICE 72

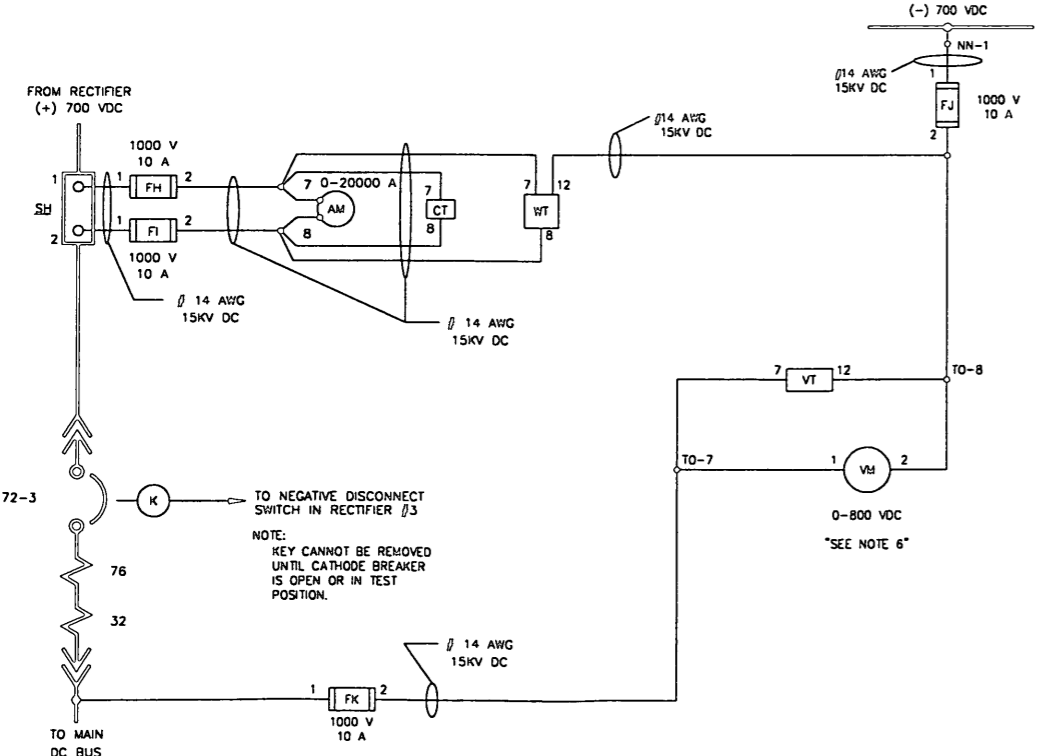
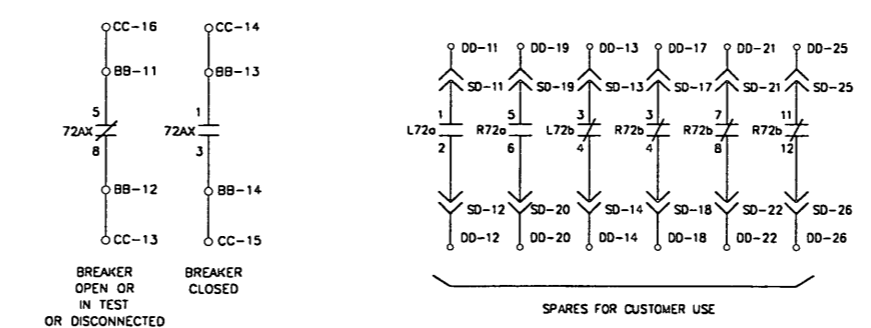
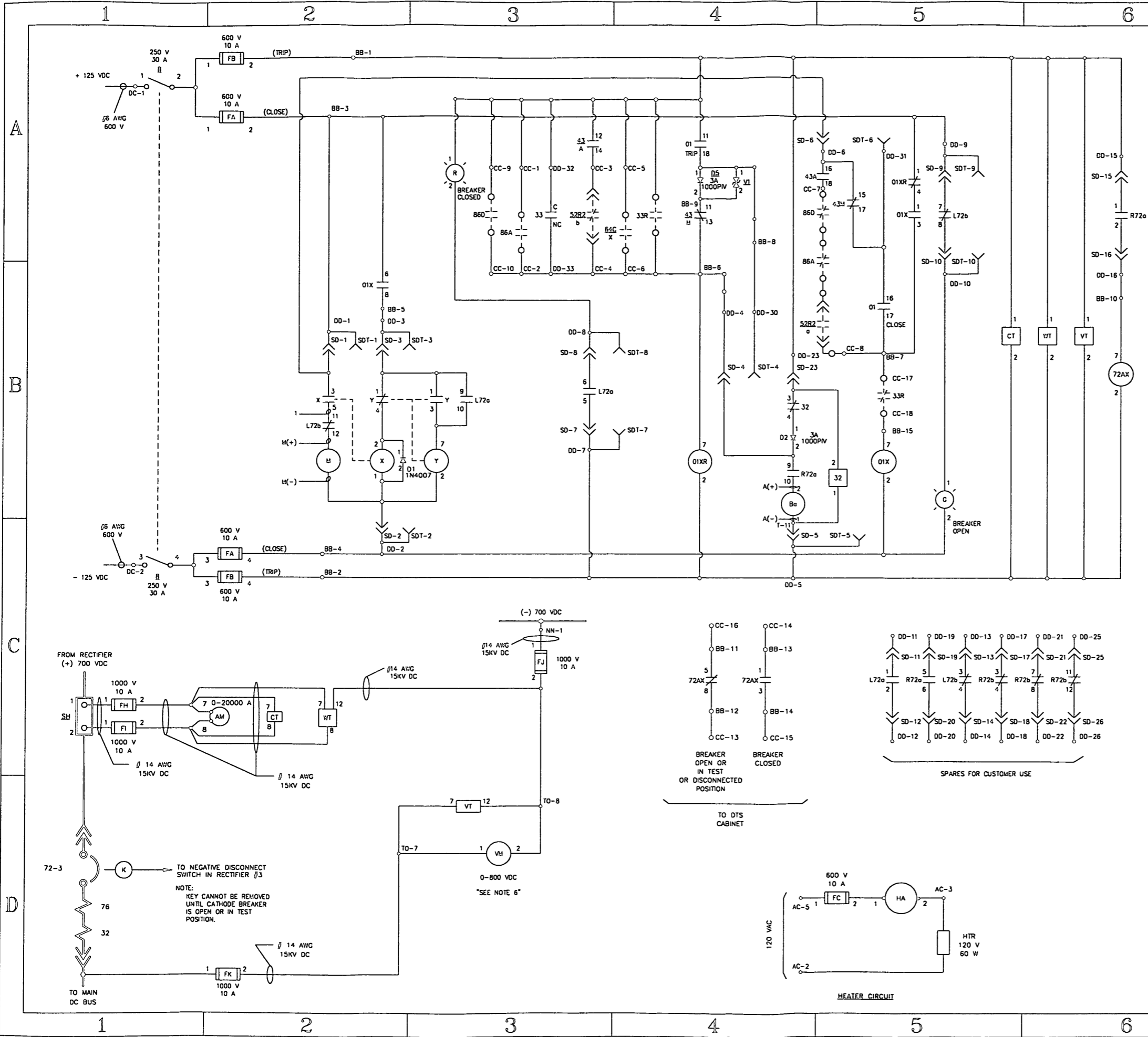
NOTE:

- 1.) BREAKER SHOWN IN CONNECTED POSITION & OPEN.
- 2.) 125 VDC CONTROL POWER IS DE-ENERGIZED.
- 3.) LOCKOUT RELAY CONTACTS SHOWN IN THE RESET POSITION.
- 4.) ALL WIRE # 14 SIS UNLESS OTHERWISE NOTED.
- 5.) DEVICE 33 CONTACTS SHOWN WITH DOOR CLOSED.
- 6.) VOLTMETER LOCATED ON POSITIVE BUS TIE CONTROL DOOR

APPLIES TO:

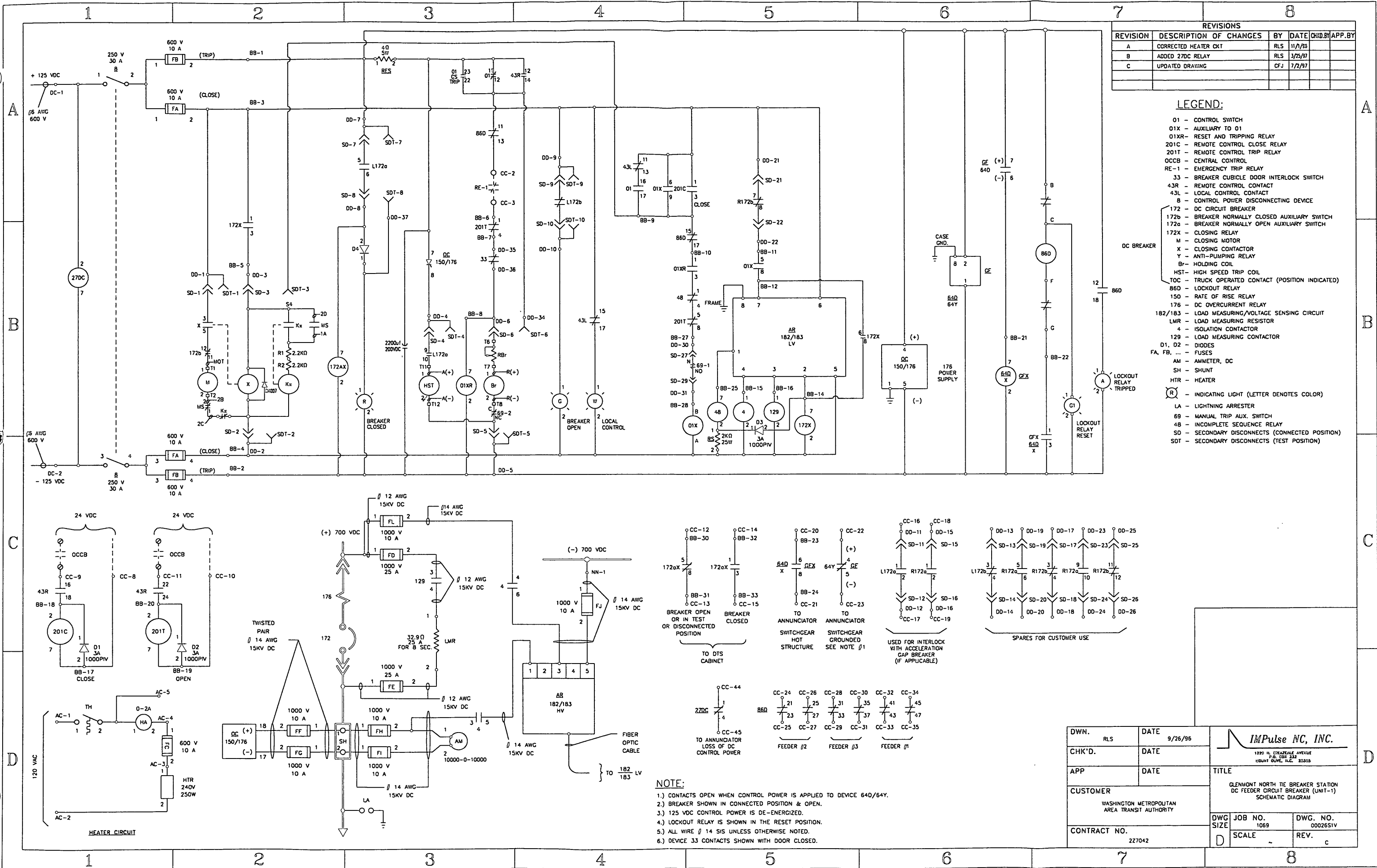
SUBSTATION	JOB NO.
GLENMONT YARD SUBSTATION	1072

DWN. RLS	DATE 9/18/96	 <small>1220 N. CENTRALE AVENUE P.O. BOX 233 LENOIR, N.C. 28655</small>
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER		72-2 CATHODE CIRCUIT BREAKER SCHEMATIC DIAGRAM
CONTRACT NO.	227042	DWG. NO. 0002651U
SCALE	REV.	



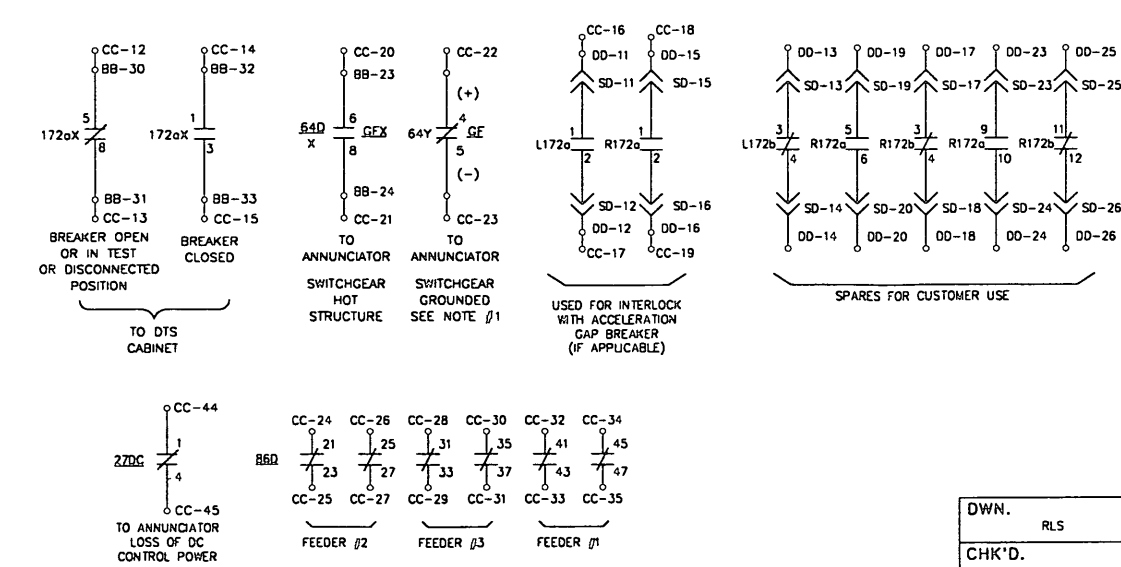
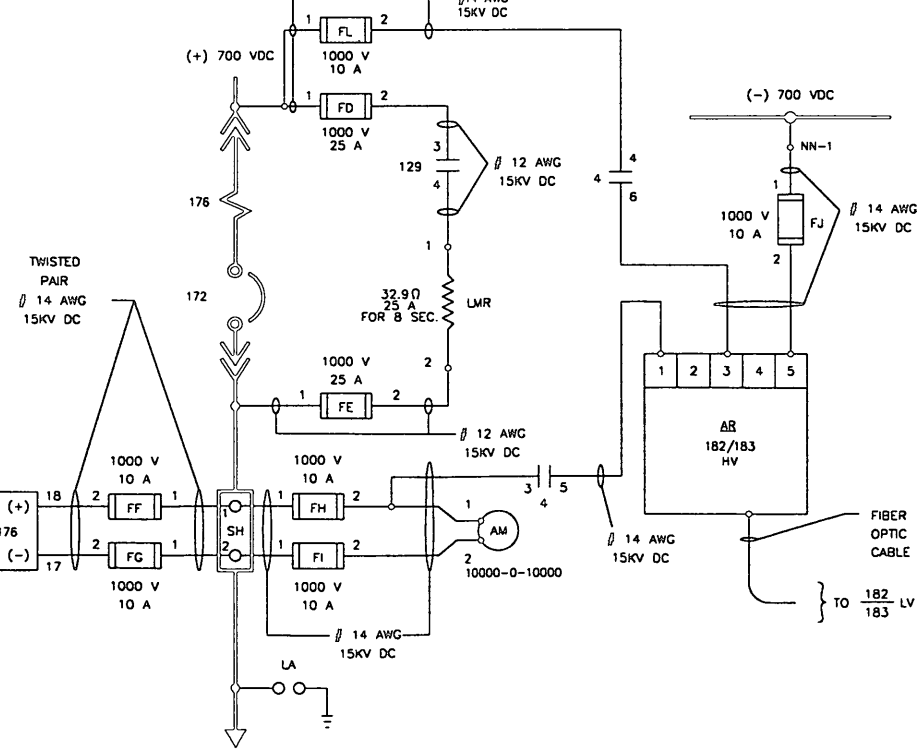
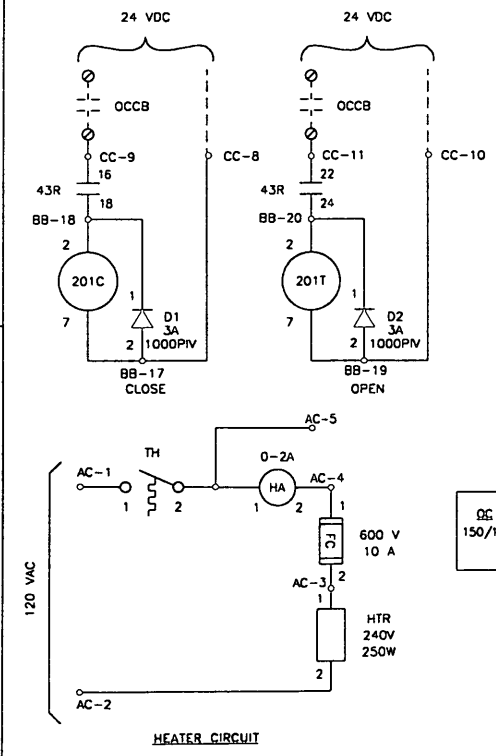
JACKSON Web Jul 2 13:02:46 1997 - E: \00026\0002651U

Jackson Wed Jul 2 11:29:13 1997 - E:\00026\00026S1V



REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY	APP. BY
A	CORRECTED HEATER CKT	RLS	11/1/85		
B	ADDED 27DC RELAY	RLS	3/25/97		
C	UPDATED DRAWING	CFJ	7/2/97		

- LEGEND:**
- O1 - CONTROL SWITCH
 - O1X - AUXILIARY TO O1
 - O1XR - RESET AND TRIPPING RELAY
 - 201C - REMOTE CONTROL CLOSE RELAY
 - 201T - REMOTE CONTROL TRIP RELAY
 - OCCB - CENTRAL CONTROL
 - RE-1 - EMERGENCY TRIP RELAY
 - 33 - BREAKER CUBICLE DOOR INTERLOCK SWITCH
 - 43R - REMOTE CONTROL CONTACT
 - 43L - LOCAL CONTROL CONTACT
 - B - CONTROL POWER DISCONNECTING DEVICE
 - 172 - DC CIRCUIT BREAKER
 - 172b - BREAKER NORMALLY CLOSED AUXILIARY SWITCH
 - 172a - BREAKER NORMALLY OPEN AUXILIARY SWITCH
 - 172X - CLOSING RELAY
 - M - CLOSING MOTOR
 - X - CLOSING CONTACTOR
 - Y - ANTI-PUMPING RELAY
 - Br - HOLDING COIL
 - HST - HIGH SPEED TRIP COIL
 - TOC - TRUCK OPERATED CONTACT (POSITION INDICATED)
 - 860 - LOCKOUT RELAY
 - 150 - RATE OF RISE RELAY
 - 176 - DC OVERCURRENT RELAY
 - 182/183 - LOAD MEASURING/VOLTAGE SENSING CIRCUIT
 - LMR - LOAD MEASURING RESISTOR
 - 4 - ISOLATION CONTACTOR
 - 129 - LOAD MEASURING CONTACTOR
 - D1, D2 - DIODES
 - FA, FB, ... - FUSES
 - AM - AMMETER, DC
 - SH - SHUNT
 - HTR - HEATER
 - (R) - INDICATING LIGHT (LETTER DENOTES COLOR)
 - LA - LIGHTNING ARRESTER
 - 69 - MANUAL TRIP AUX. SWITCH
 - 48 - INCOMPLETE SEQUENCE RELAY
 - SD - SECONDARY DISCONNECTS (CONNECTED POSITION)
 - SOT - SECONDARY DISCONNECTS (TEST POSITION)



- NOTE:**
- 1.) CONTACTS OPEN WHEN CONTROL POWER IS APPLIED TO DEVICE 640/64Y.
 - 2.) BREAKER SHOWN IN CONNECTED POSITION & OPEN.
 - 3.) 125 VDC CONTROL POWER IS DE-ENERGIZED.
 - 4.) LOCKOUT RELAY IS SHOWN IN THE RESET POSITION.
 - 5.) ALL WIRE # 14 SIS UNLESS OTHERWISE NOTED.
 - 6.) DEVICE 33 CONTACTS SHOWN WITH DOOR CLOSED.

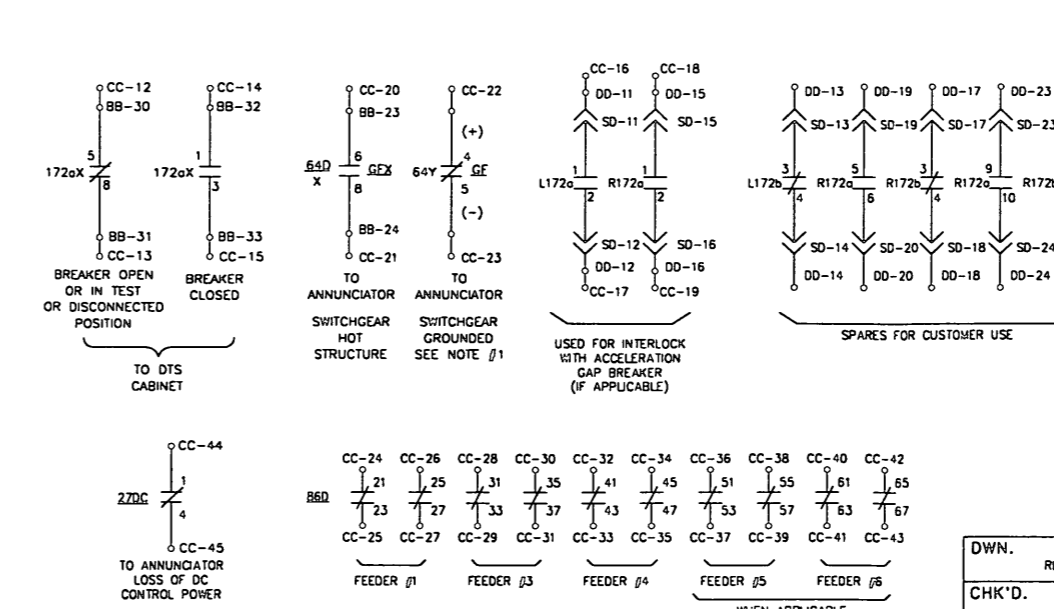
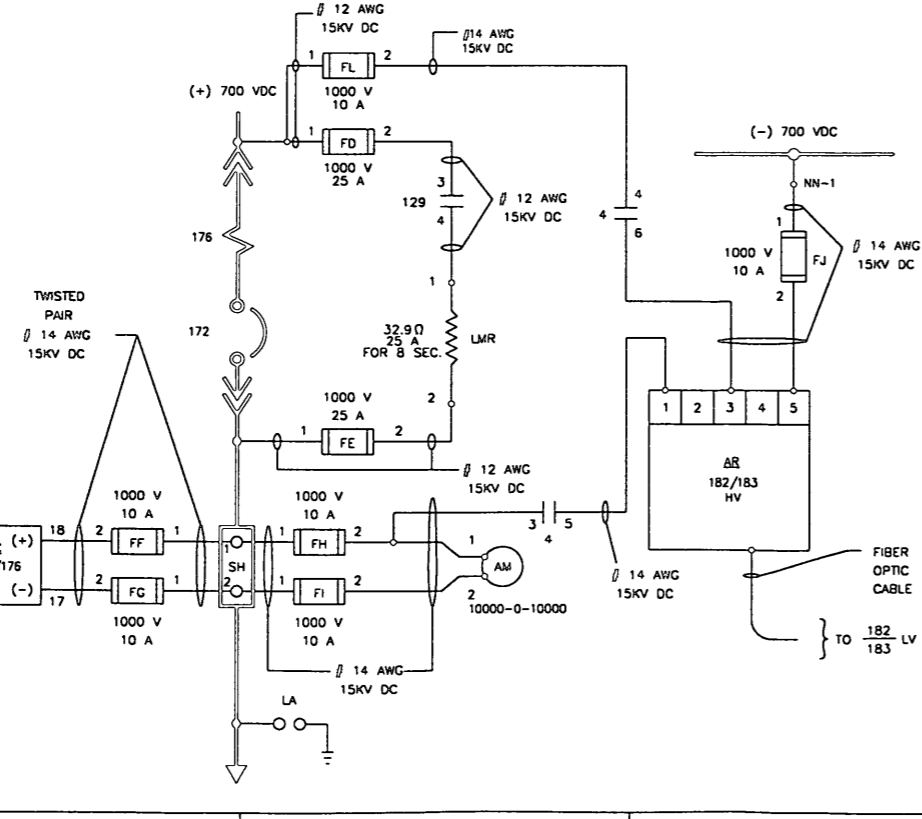
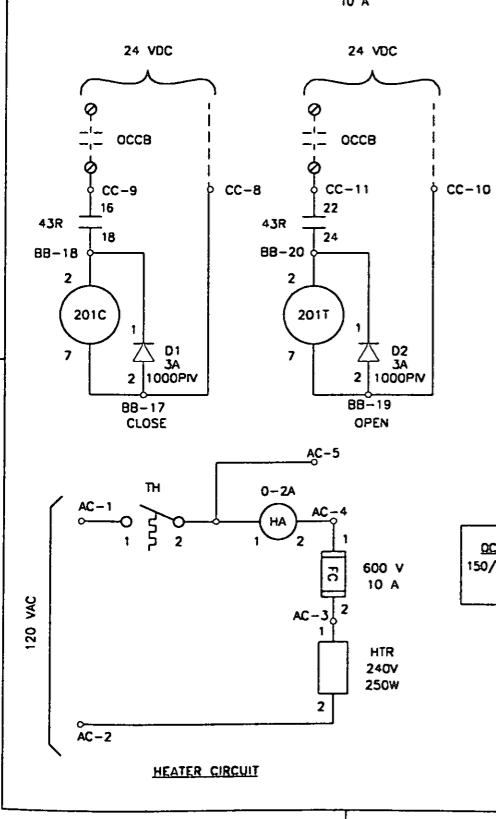
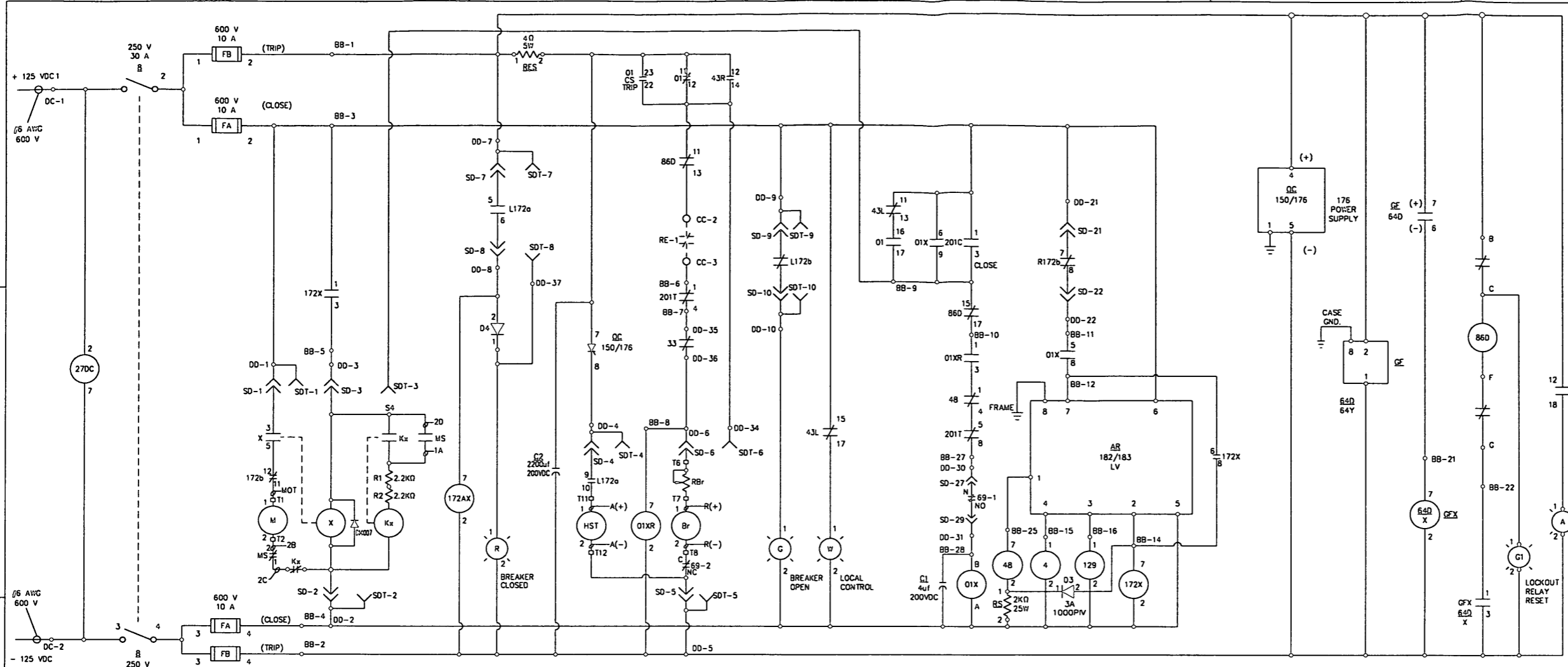
DWN.	RLS	DATE	9/26/96	<p>1290 N. CHARLESTON AVENUE P.O. BOX 233 LOUISVILLE, KY 40203</p>
CHK'D.		DATE		
APP		DATE		TITLE
CUSTOMER				GLENMONT NORTH DC BREAKER STATION DC FEEDER CIRCUIT BREAKER (UNIT-1) SCHEMATIC DIAGRAM
WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY				
CONTRACT NO.	227042	DWG. NO.	1069	DWG. NO.
		SCALE		REV.
				c

Jackson Wed Jul 2 11:29:53 1997 - E:\00026\00026S1W

REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHKD BY	APP BY
A	ADDED 27DC RELAY	RLS	3/24/97		
B	UPDATED DRAWING	CFJ	7/2/97		

LEGEND:

- O1 - CONTROL SWITCH
- O1X - AUXILIARY TO O1
- O1XR - RESET AND TRIPPING RELAY
- 201C - REMOTE CONTROL CLOSE RELAY
- 201T - REMOTE CONTROL TRIP RELAY
- OCCB - CENTRAL CONTROL
- RE-1 - EMERGENCY TRIP RELAY
- 27DC - UNDERVOLTAGE RELAY
- 33 - BREAKER CUBICLE DOOR INTERLOCK SWITCH
- 43R - REMOTE CONTROL CONTACT
- 43L - LOCAL CONTROL CONTACT
- B - CONTROL POWER DISCONNECTING DEVICE
- 172 - DC CIRCUIT BREAKER
- 172b - BREAKER NORMALLY CLOSED AUXILIARY SWITCH
- 172a - BREAKER NORMALLY OPEN AUXILIARY SWITCH
- 172X - CLOSING RELAY
- M - CLOSING MOTOR
- X - CLOSING CONTACTOR
- Y - ANTI-PUMPING RELAY
- Br - HOLDING COIL
- HST - HIGH SPEED TRIP COIL
- TOC - TRUCK OPERATED CONTACT (POSITION INDICATED)
- 86D - LOCKOUT RELAY
- 150 - RATE OF RISE RELAY
- 176 - DC OVERCURRENT RELAY
- 182/183 - LOAD MEASURING/VOLTAGE SENSING CIRCUIT
- LMR - LOAD MEASURING RESISTOR
- 4 - ISOLATION CONTACTOR
- 129 - LOAD MEASURING CONTACTOR
- D1, D2 - DIODES
- FA, FB, ... - FUSES
- AM - AMMETER, DC
- SH - SHUNT
- HTR - HEATER
- (R) - INDICATING LIGHT (LETTER DENOTES COLOR)
- LA - LIGHTNING ARRESTER
- 69 - MANUAL TRIP AUX. SWITCH
- 48 - INCOMPLETE SEQUENCE RELAY
- SD - SECONDARY DISCONNECTS (CONNECTED POSITION)
- SOT - SECONDARY DISCONNECTS (TEST POSITION)

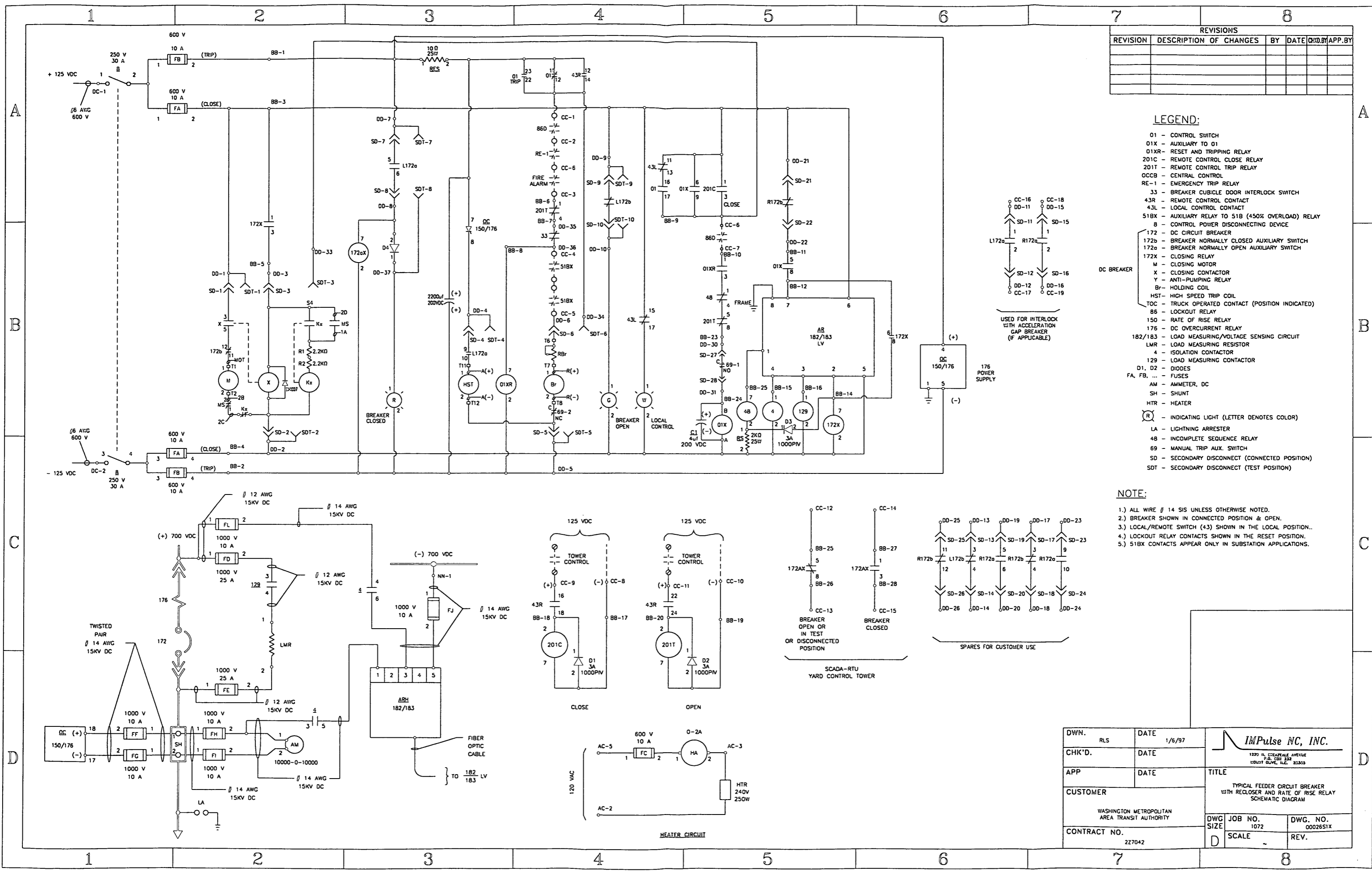


NOTE:

- CONTACTS OPEN WHEN CONTROL POWER IS APPLIED TO DEVICE 64D/64Y.
- BREAKER SHOWN IN CONNECTED POSITION & OPEN.
- 125 VDC CONTROL POWER IS DE-ENERGIZED.
- LOCKOUT RELAY IS SHOWN IN THE RESET POSITION.
- ALL WIRE # 14 SIS UNLESS OTHERWISE NOTED.
- DEVICE 33 CONTACTS SHOWN WITH DOOR CLOSED.

DWN. RLS	DATE	11/26/96	<p>1970 N. CRENSHAW AVENUE P.O. BOX 213 LIGHT HOUSE, ILL. 60453</p>
CHK'D.	DATE		
APP	DATE		TITLE
CUSTOMER	WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		GLENMONT SOUTH TIE BREAKER STATION DC FEEDER CIRCUIT BREAKER (UNIT-1) SCHEMATIC DIAGRAM
CONTRACT NO.	227042	DWG. NO.	00026S1W
		SCALE	REV. B

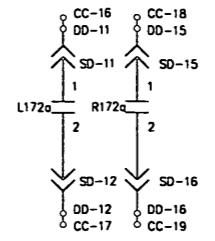
Jackson Wed Jul 2 11:30:39 1997 - E:\00026\00026S1X



REVISIONS				
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY / APP. BY

LEGEND:

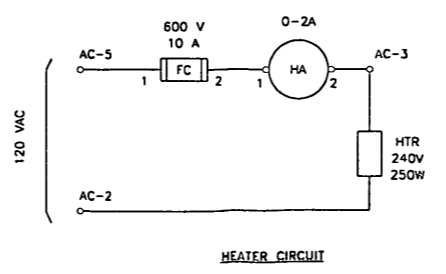
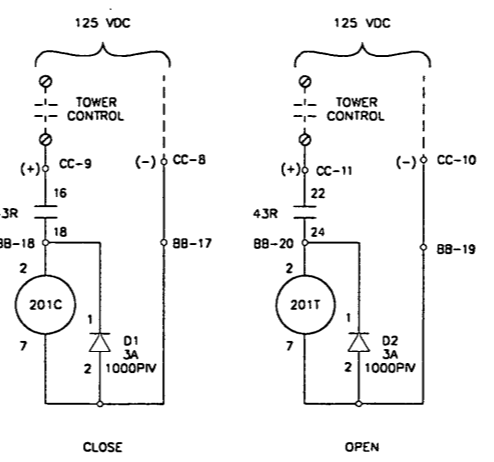
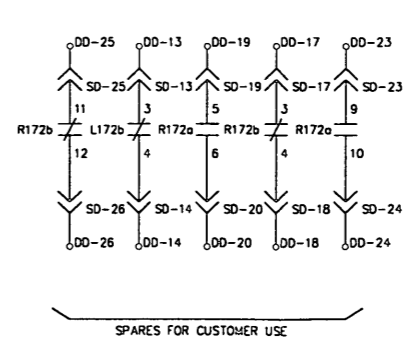
- 01 - CONTROL SWITCH
- 01X - AUXILIARY TO 01
- 01XR - RESET AND TRIPPING RELAY
- 201C - REMOTE CONTROL CLOSE RELAY
- 201T - REMOTE CONTROL TRIP RELAY
- OCB - CENTRAL CONTROL
- RE-1 - EMERGENCY TRIP RELAY
- 33 - BREAKER CUBICLE DOOR INTERLOCK SWITCH
- 43R - REMOTE CONTROL CONTACT
- 43L - LOCAL CONTROL CONTACT
- 518X - AUXILIARY RELAY TO 518 (450% OVERLOAD) RELAY
- 8 - CONTROL POWER DISCONNECTING DEVICE
- 172 - DC CIRCUIT BREAKER
- 172b - BREAKER NORMALLY CLOSED AUXILIARY SWITCH
- 172a - BREAKER NORMALLY OPEN AUXILIARY SWITCH
- 172X - CLOSING RELAY
- M - CLOSING MOTOR
- X - CLOSING CONTACTOR
- Y - ANTI-PUMPING RELAY
- Br - HOLDING COIL
- HST - HIGH SPEED TRIP COIL
- TOC - TRUCK OPERATED CONTACT (POSITION INDICATED)
- 86 - LOCKOUT RELAY
- 150 - RATE OF RISE RELAY
- 176 - DC OVERCURRENT RELAY
- 182/183 - LOAD MEASURING/VOLTAGE SENSING CIRCUIT
- LMR - LOAD MEASURING RESISTOR
- 4 - ISOLATION CONTACTOR
- 129 - LOAD MEASURING CONTACTOR
- D1, D2 - DIODES
- FA, FB, ... - FUSES
- AM - AMMETER, DC
- SH - SHUNT
- HTR - HEATER
- (R) - INDICATING LIGHT (LETTER DENOTES COLOR)
- LA - LIGHTNING ARRESTER
- 48 - INCOMPLETE SEQUENCE RELAY
- 69 - MANUAL TRIP AUX. SWITCH
- SD - SECONDARY DISCONNECT (CONNECTED POSITION)
- SOT - SECONDARY DISCONNECT (TEST POSITION)



USED FOR INTERLOCK WITH ACCELERATION GAP BREAKER (IF APPLICABLE)

NOTE:

- 1.) ALL WIRE # 14 SIS UNLESS OTHERWISE NOTED.
- 2.) BREAKER SHOWN IN CONNECTED POSITION & OPEN.
- 3.) LOCAL/REMOTE SWITCH (43) SHOWN IN THE LOCAL POSITION..
- 4.) LOCKOUT RELAY CONTACTS SHOWN IN THE RESET POSITION.
- 5.) 518X CONTACTS APPEAR ONLY IN SUBSTATION APPLICATIONS.

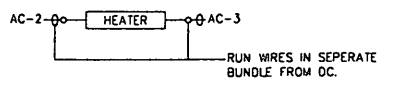
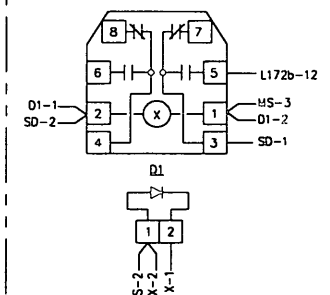
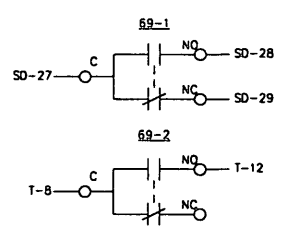
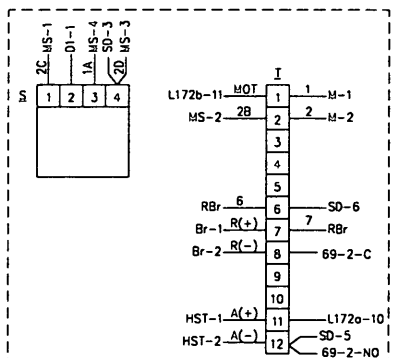
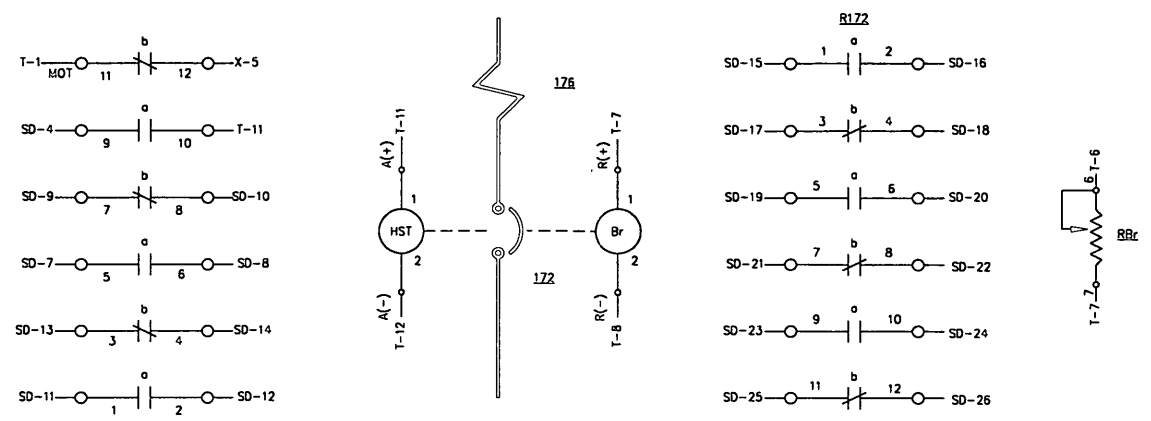
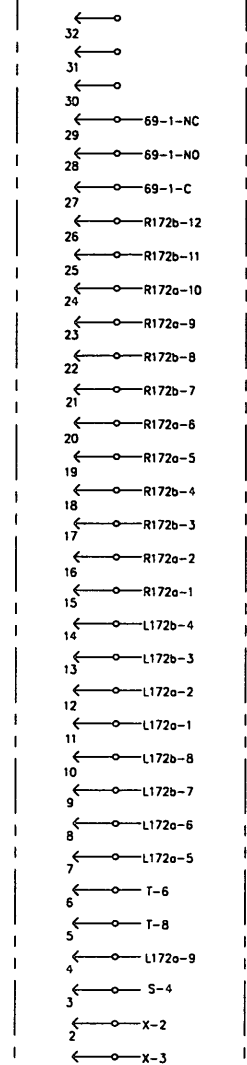
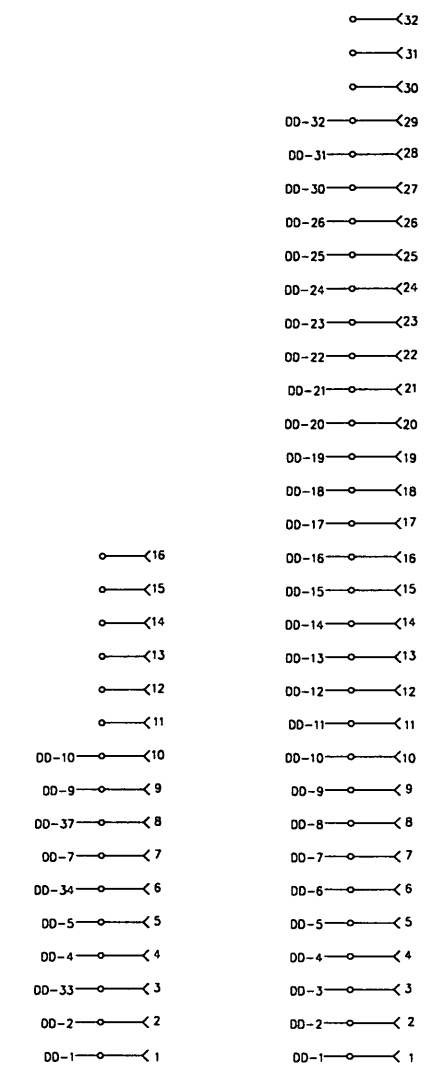


DWN. RLS	DATE	1/6/97	
CHK'D.	DATE		
APP	DATE		TITLE
CUSTOMER	WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		TYPICAL FEEDER CIRCUIT BREAKER WITH RECLOSER AND RATE OF RISE RELAY SCHEMATIC DIAGRAM
CONTRACT NO.	227042	DWG. NO.	1072
		DWG. NO.	00026S1X
		SCALE	REV.

REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY	APP. BY
A	CORRECTED BREAKER INTERNAL WIRING	RLS	8/18/95		
B	CORRECTED ERROR	RLS	9/20/95		

APPLIES TO:

SUBSTATION	JOB #
HENDERSON AVENUE SUBSTATION	1071
GREENLEAF SUBSTATION	1067
TILBURY ROAD SUBSTATION	1066
GLENMONT YARD SUBSTATION	1072
TIE BREAKER STATIONS	
TIE BREAKER STATIONS	JOB #
GLENMONT NORTH TIE BREAKER	1069
GLENMONT SOUTH TIE BREAKER	1070
ROSO STREET TIE BREAKER	1065
FARRINGTON AVE. TIE BREAKER	1064
FRANCONIA-SPRINGFIELD TIE BREAKER	1068

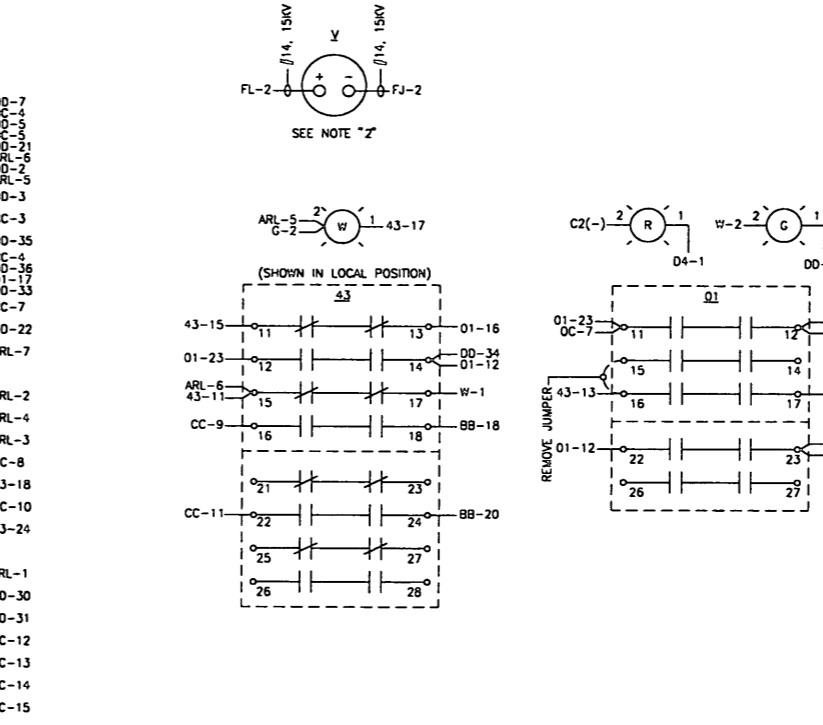
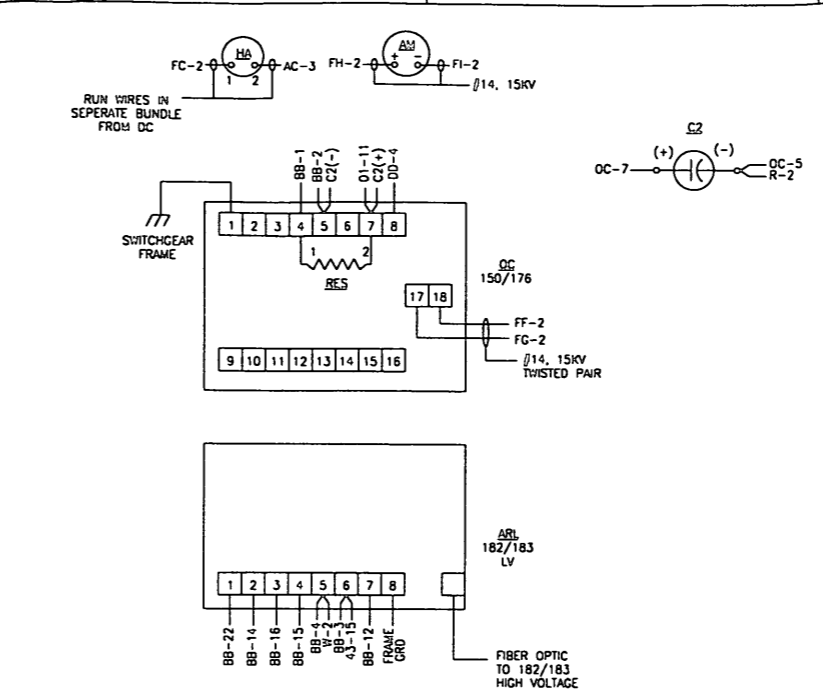
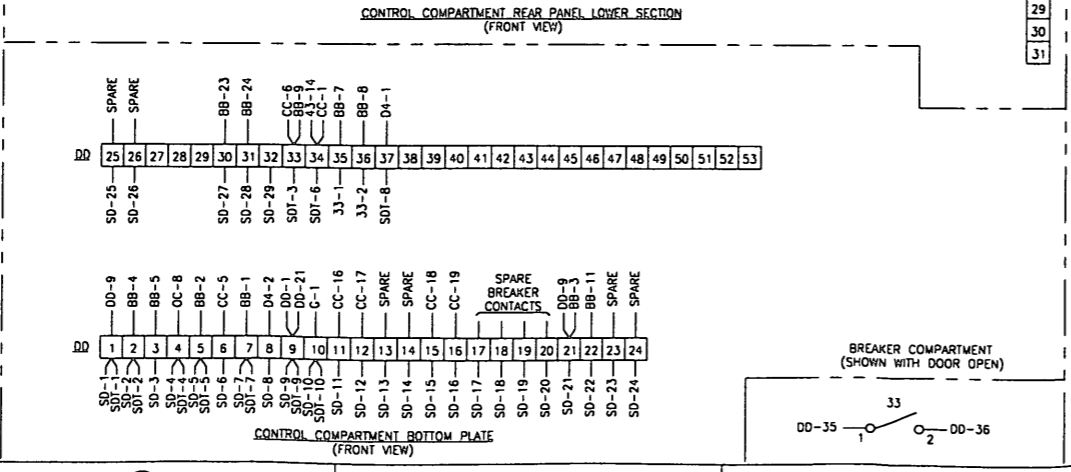
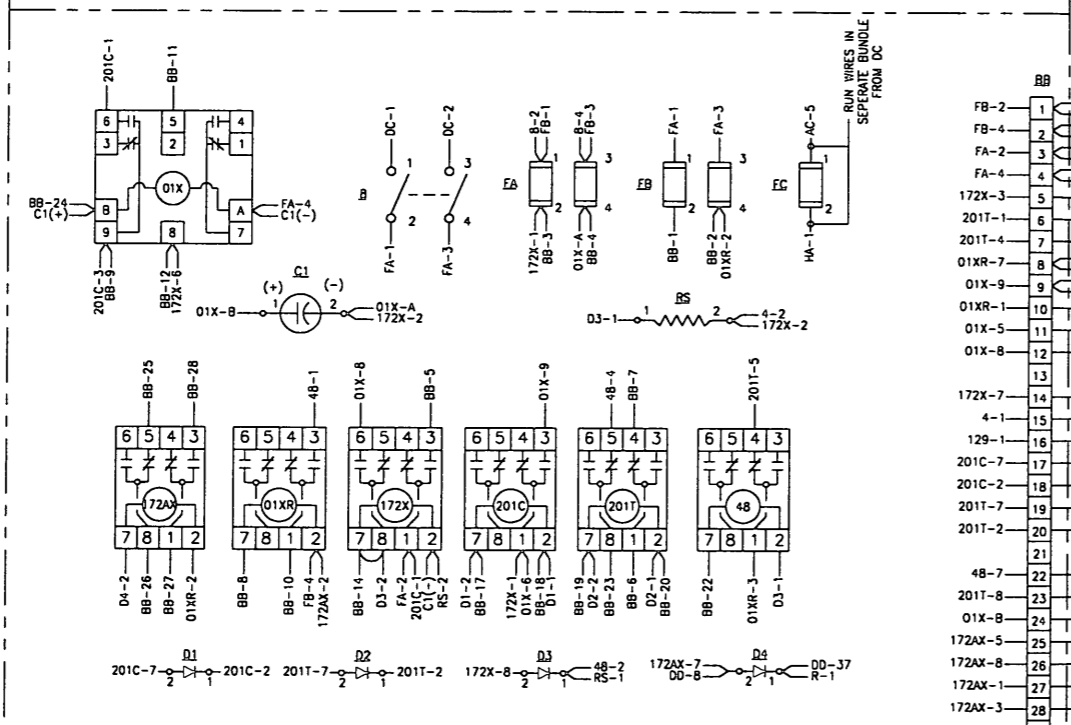
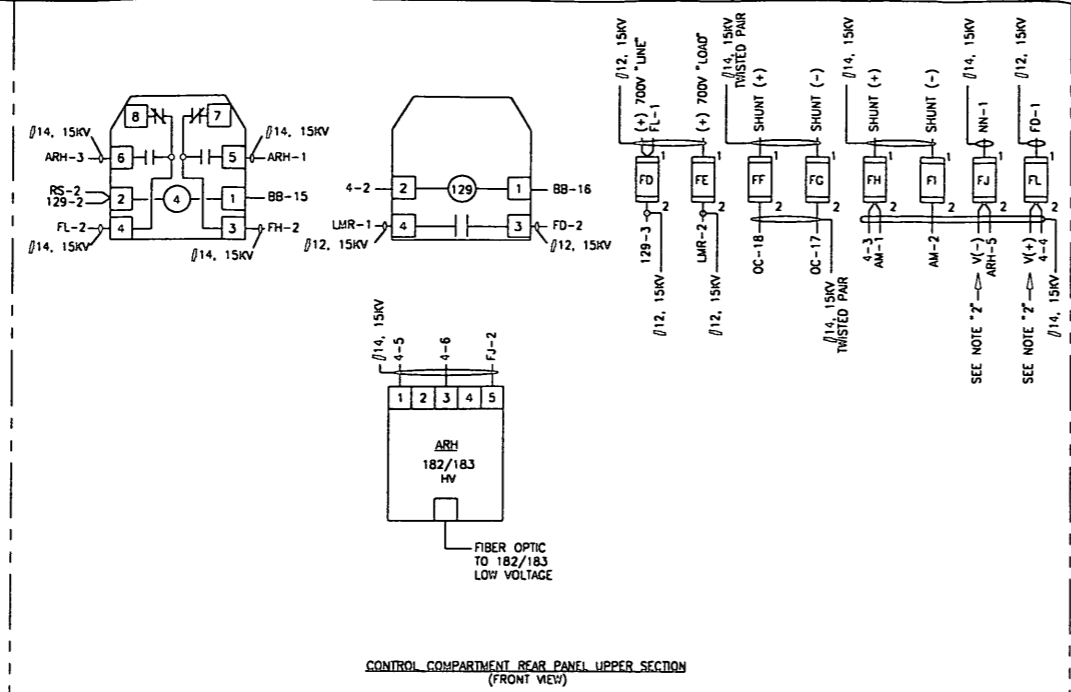


RUN WIRES IN SEPERATE BUNDLE FROM DC.

DWN. RLS	DATE 11/15/94	 <small>1320 N. CHARLENE AVENUE P.O. BOX 233 LIGHT HOUSE, N.C. 27555</small>
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER		TYPICAL FEEDER CIRCUIT BREAKER WIRING DIAGRAM
WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		DWG. NO. 00026WOL
CONTRACT NO. 227042	SCALE	REV. B

Jackson Wed Jul 2 11:36:40 1997 - E:\00026\00026WOL

REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D.	APP. BY
A	CORRECTED PER CUSTOMER COMMENTS	RLS	2/21/95		
B	REVISED TO MATCH SCHEMATICS	JLL	6/13/95		
C	CORRECTED O1X RELAY	RLS	8/2/95		
D	AS BUILT CORRECTIONS	RLS	8/2/95		
E	CORRECTED ERROR	RLS	9/29/95		



- NOTE:
- SEE DRAWING NUMBER 00026WOL FOR THE WIRING DIAGRAM OF THE BREAKER COMPARTMENT.
 - VOLTMETER ON ROSO STREET, FRANCONIA-SPRINGFIELD AND GLENMONT NORTH TIE BREAKER STATIONS ONLY.

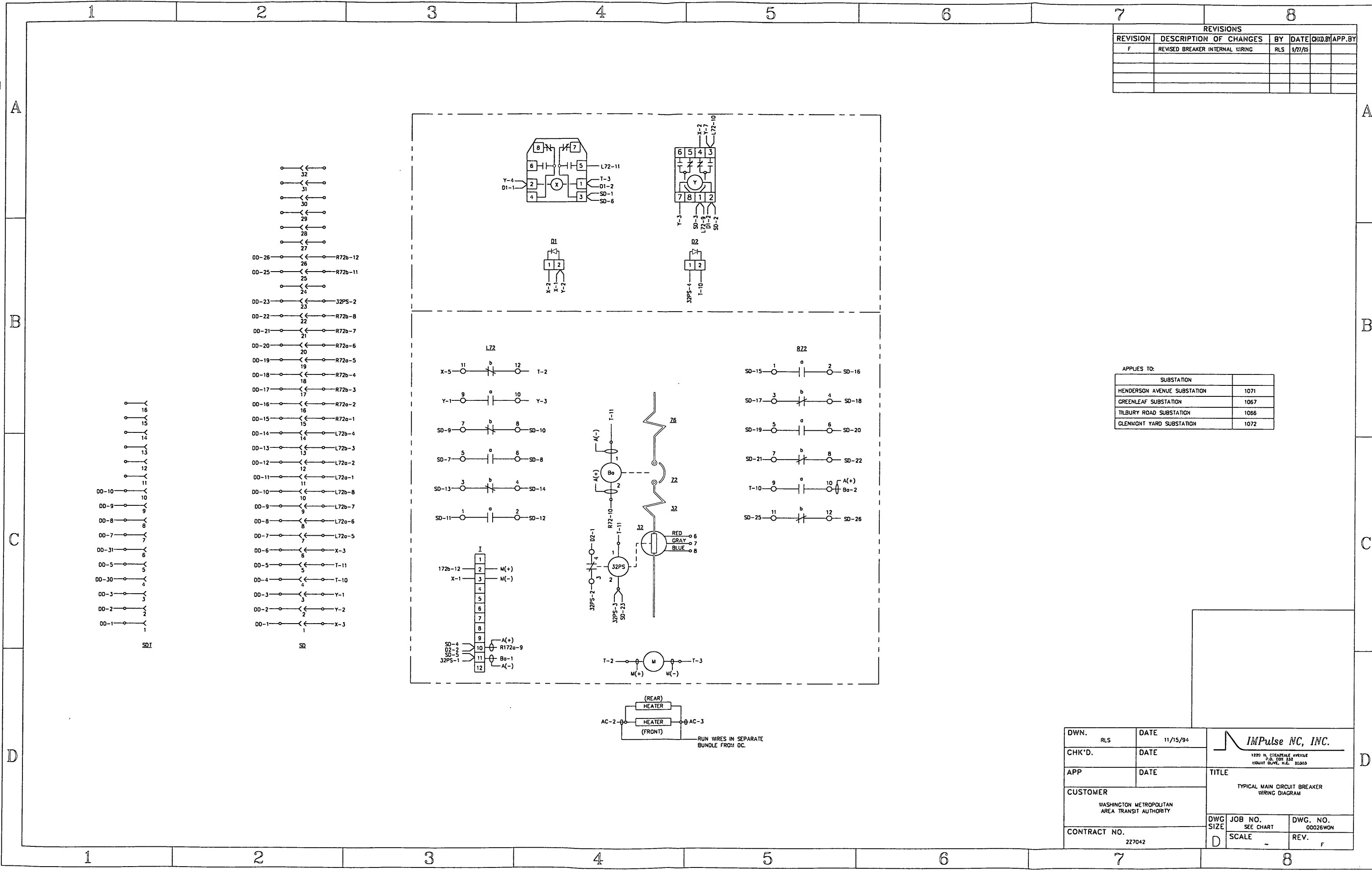
APPLIES TO:

SUBSTATION	
HENDERSON AVENUE SUBSTATION	1071
GREENLEAF SUBSTATION	1067
TILBURY ROAD SUBSTATION	1066
GLENMONT YARD SUBSTATION	1072
TIE BREAKER STATIONS	JOB 0
GLENMONT SOUTH TIE BREAKER	1070
ROSO STREET TIE BREAKER	1065
FARRINGTON AVE. TIE BREAKER	1064
FRANCONIA-SPRINGFIELD TIE BREAKER	1068

DWN. RLS	DATE 11/12/94	<p>1220 N. COLUMBIANA AVENUE P.O. BOX 233 COLUMBIANA, N.C. 28038</p>
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER	WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY	
CONTRACT NO. 227042	DWG. NO. 00026WOM	DWG. NO. 00026WOM
	SCALE	REV. E

Jackson Wed Jul 2 11:37:44 1997 - E:\00026\00026W0N

REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D.	APP. BY
F	REVISED BREAKER INTERNAL WIRING	RLS	9/27/95		

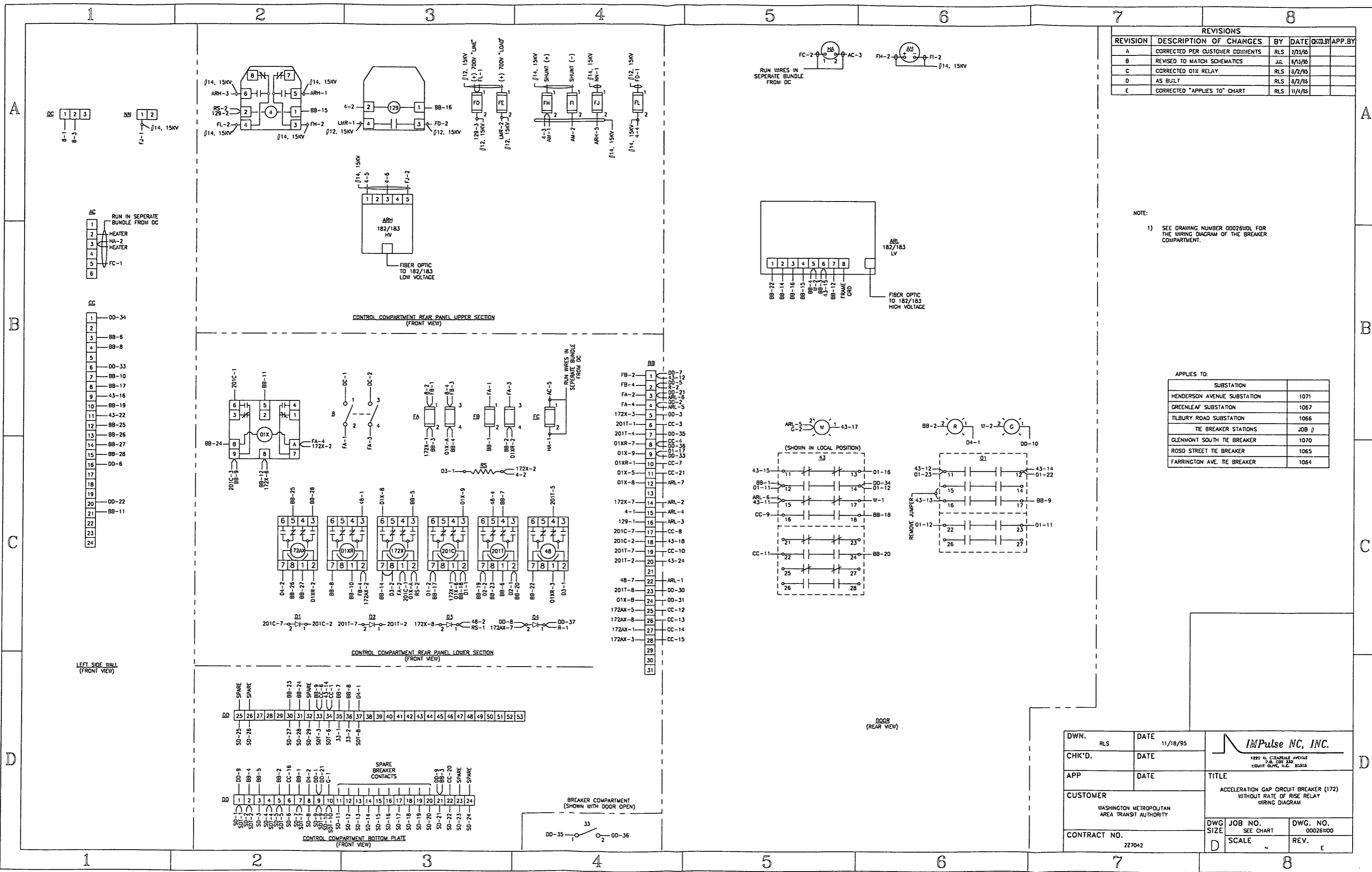


APPLIES TO:

SUBSTATION	
HENDERSON AVENUE SUBSTATION	1071
GREENLEAF SUBSTATION	1067
TILBURY ROAD SUBSTATION	1066
GLENMONT YARD SUBSTATION	1072

DWN. RLS	DATE 11/15/94	 <small>1920 N. CENTRALE AVENUE P.O. BOX 232 EDMONT ALABAMA 35865</small>
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER		TYPICAL MAIN CIRCUIT BREAKER WIRING DIAGRAM
WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		
DWG SIZE	JOB NO. SEE CHART	DWG. NO. 00026W0N
CONTRACT NO. 227042	SCALE -	REV. F

Jackson Wed Jul 2 13:10:37 1997 - E:\00026\00026W00

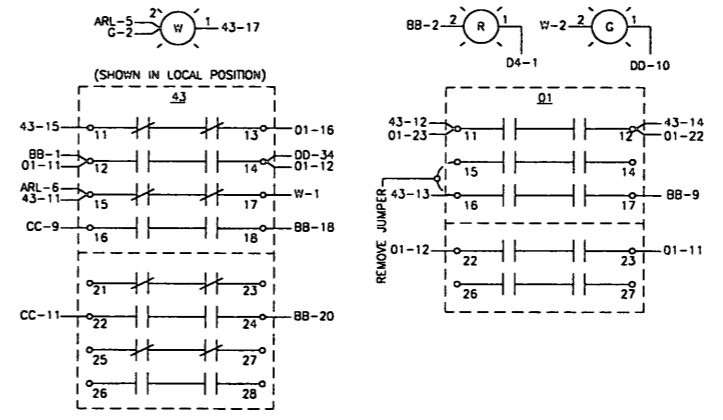
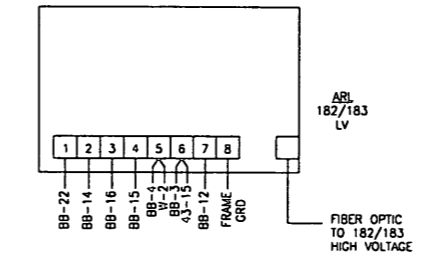


REVISIONS				
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY APP. BY
A	CORRECTED PER CUSTOMER COMMENTS	RLS	2/23/95	
B	REVISED TO MATCH SCHEMATICS	JLL	6/13/95	
C	CORRECTED OIX RELAY	RLS	8/2/95	
D	AS BUILT	RLS	8/2/95	
E	CORRECTED "APPLIES TO" CHART	RLS	11/1/95	

NOTE:
1) SEE DRAWING NUMBER 00026W04 FOR THE WIRING DIAGRAM OF THE BREAKER COMPARTMENT.

APPLIES TO:

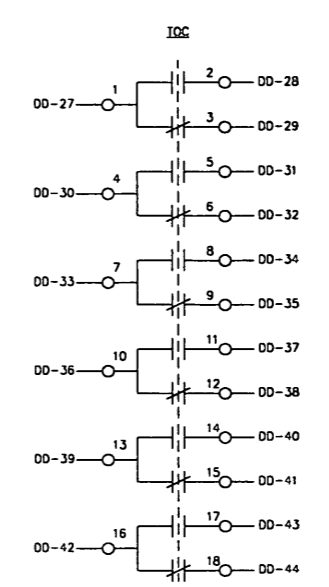
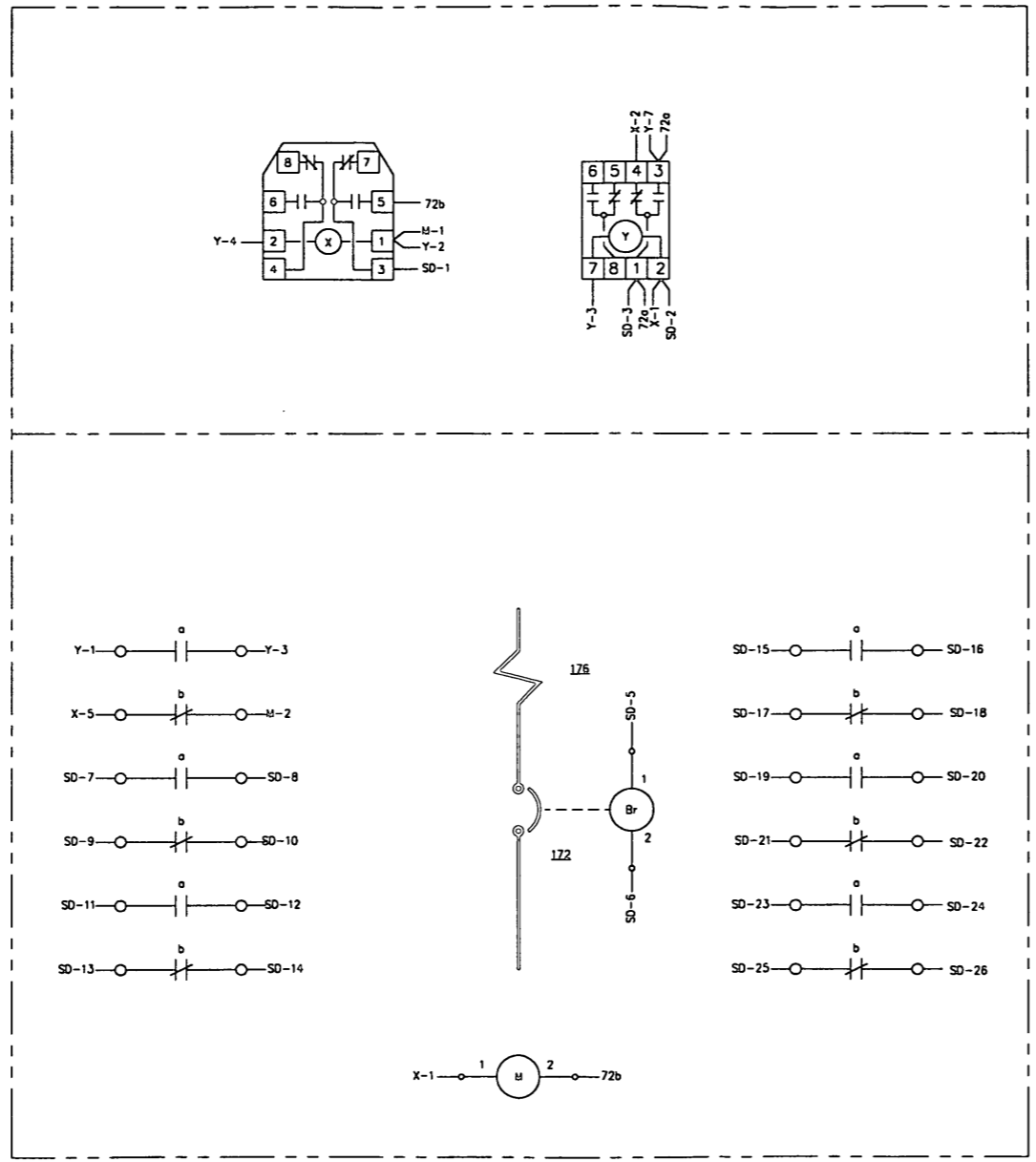
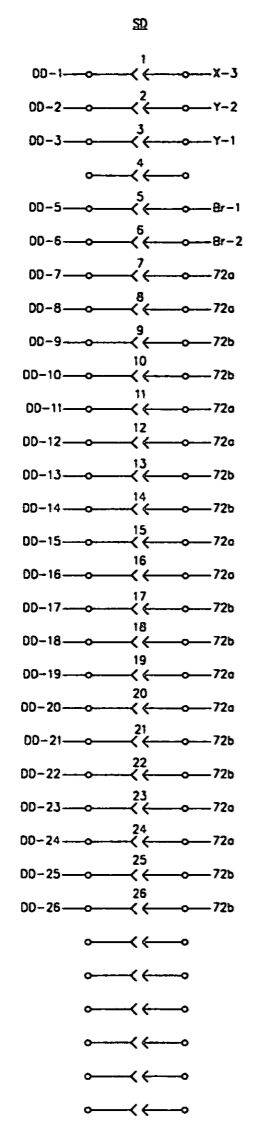
SUBSTATION	
HENDERSON AVENUE SUBSTATION	1071
GREENLEAF SUBSTATION	1067
TILBURY ROAD SUBSTATION	1066
THE BREAKER STATIONS	
GLENMONT SOUTH TIE BREAKER	1070
ROSO STREET TIE BREAKER	1065
FARRINGTON AVE. TIE BREAKER	1064



DWN. RLS	DATE 11/18/95	<p>1220 EL CREEKDALE AVENUE P.O. BOX 334 LOUPTON OLIVE, N.C. 28349</p>
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER		ACCELERATION GAP CIRCUIT BREAKER (172) WITHOUT RATE OF RISE RELAY WIRING DIAGRAM
CONTRACT NO. 227042	DWG. SIZE D	JOB NO. SEE CHART
	SCALE	DWG. NO. 00026W00
		REV. E

Jackson Wed Jul 2 13:12:22 1997 - E:\00026\00026W0P

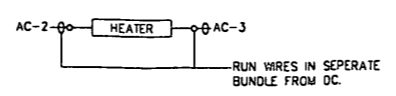
REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY	APP. BY
A	COLLECTED PER CUSTOMER COMMENTS	JLR	5/11/95		



APPLIES TO:

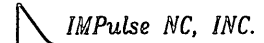
SUBSTATION	JOB #
GLENMONT YARD SUBSTATION	1072

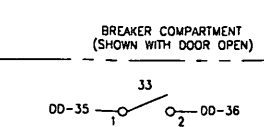
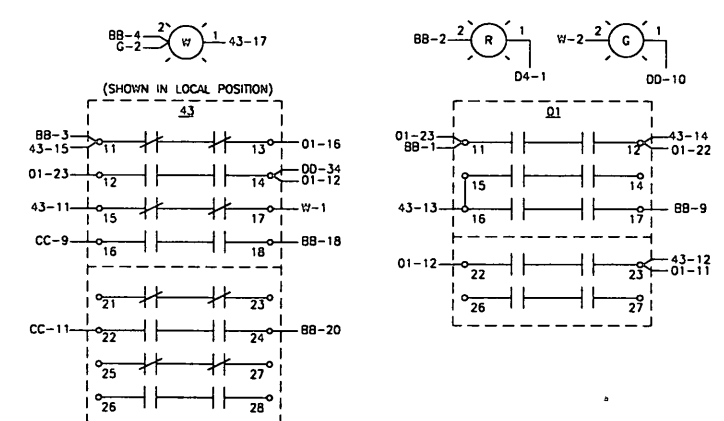
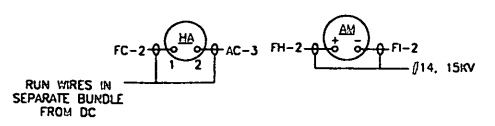
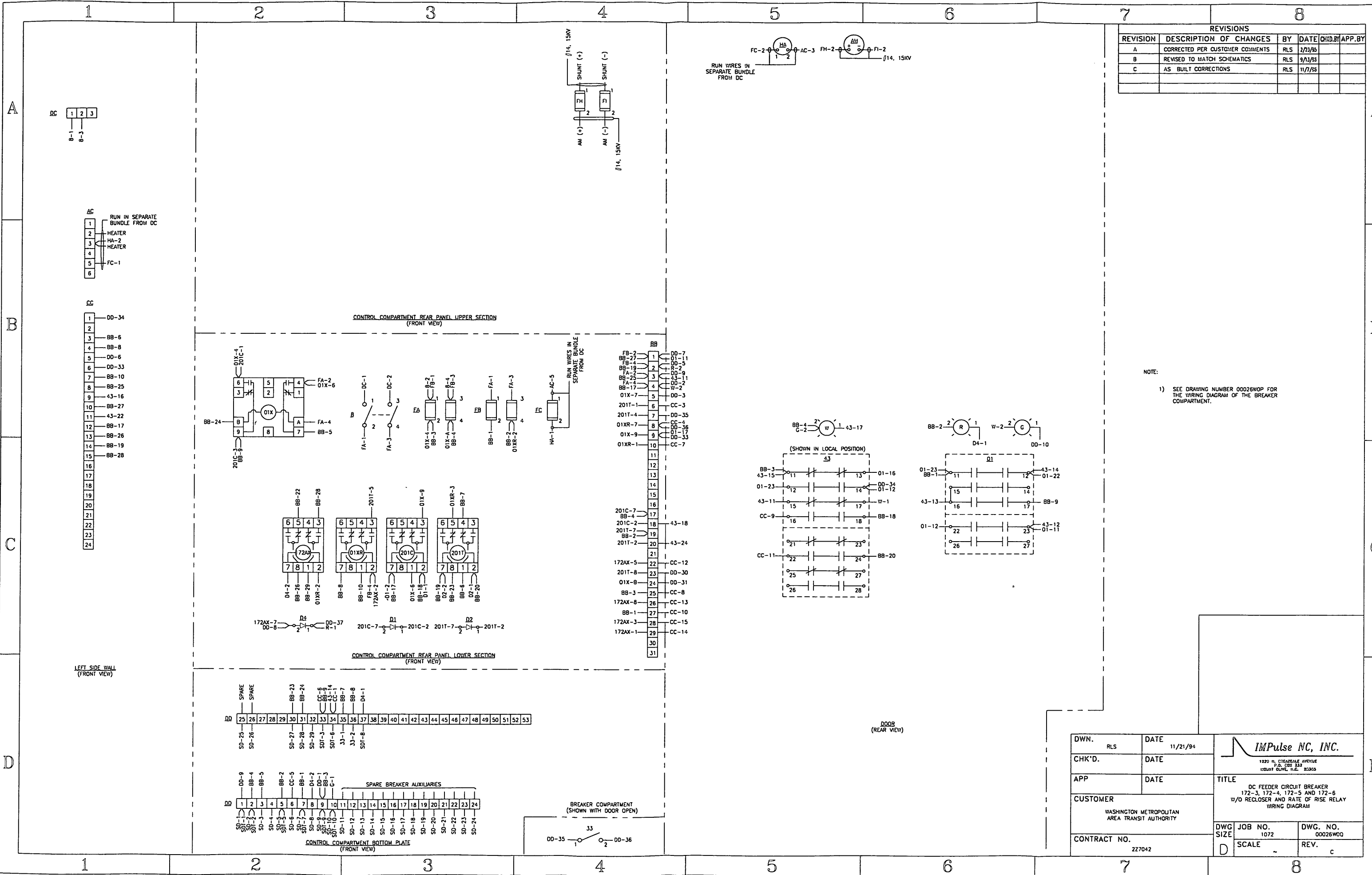
DWN. RLS	DATE 11/21/94	DRAWING NO. 00026W0P	REV. A
CHK'D.	DATE		
APP	DATE	<small>P.O. BOX 232 VIRGAT, OHIO, U.S.A. 43083</small>	
CUSTOMER WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		TITLE FEEDER CIRCUIT BREAKER WITHOUT RATE OF RISE RELAY WIRING DIAGRAM	
CONTRACT NO. 227042	DWG. NO. 00026W0P	JOB NO.	DWG. NO. 00026W0P
	SCALE ~	SHT. 1 OF 1	



REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY	APP. BY
A	CORRECTED PER CUSTOMER COMMENTS	RLS	1/23/95		
B	REVISED TO MATCH SCHEMATICS	RLS	9/13/95		
C	AS BUILT CORRECTIONS	RLS	11/7/95		

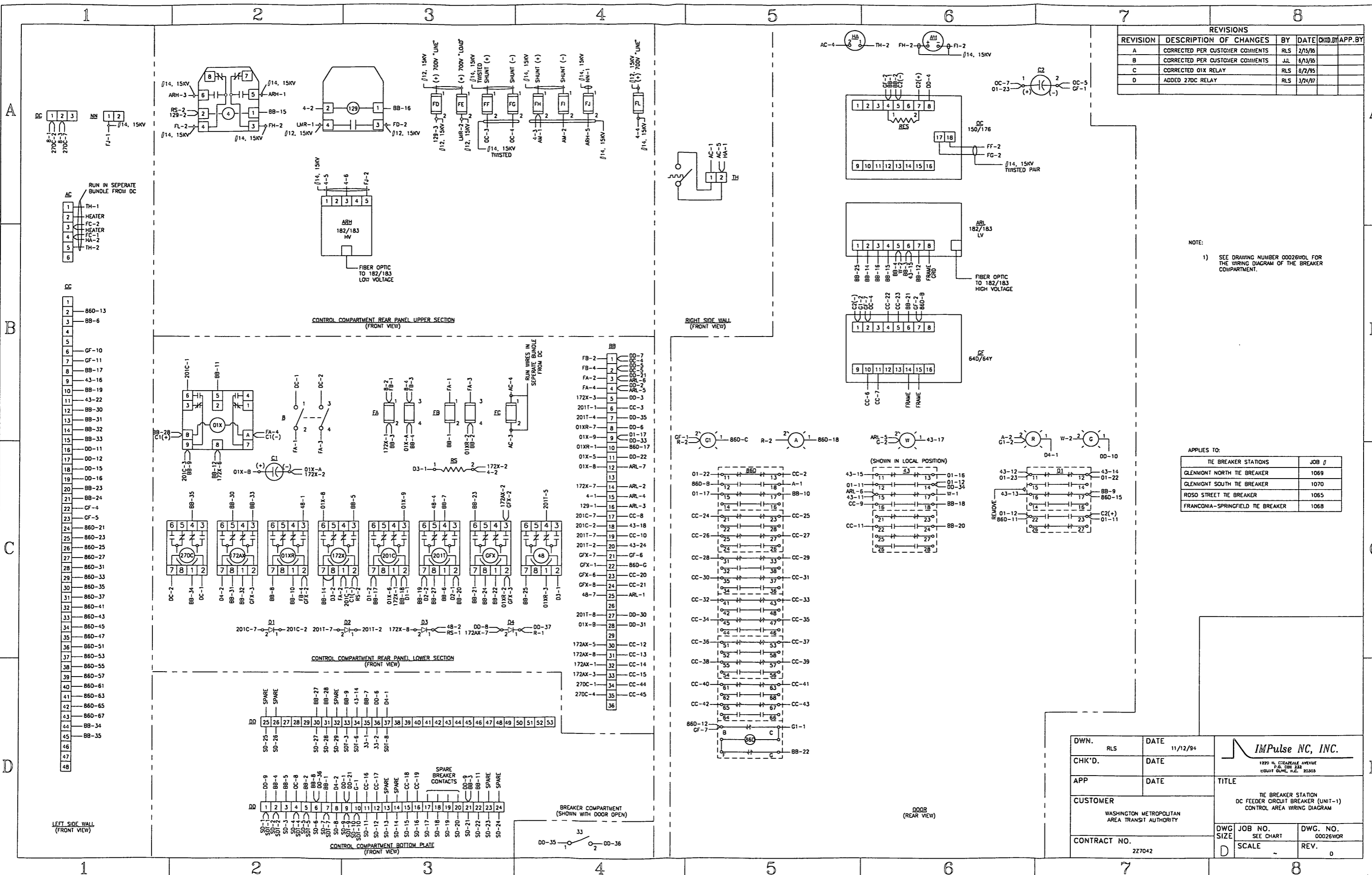
NOTE:
1) SEE DRAWING NUMBER 00026W0P FOR THE WIRING DIAGRAM OF THE BREAKER COMPARTMENT.

DWN.	RLS	DATE	11/21/94	 <small>1220 N. ESTABLISH AVENUE P.O. BOX 233 LISHTON OHIO, U.S.A. 43033</small>
CHK'D.		DATE		
APP		DATE		TITLE
CUSTOMER				DC FEEDER CIRCUIT BREAKER 172-3, 172-4, 172-5 AND 172-6 W/O RECLOSER AND RATE OF RISE RELAY WIRING DIAGRAM
CONTRACT NO.				DWG. NO.
227042				1072
D				SCALE
				REV.
				c



DOOR (REAR VIEW)

REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D.	APP. BY
A	CORRECTED PER CUSTOMER COMMENTS	RLS	2/15/95		
B	CORRECTED PER CUSTOMER COMMENTS	JLL	6/13/95		
C	CORRECTED OIX RELAY	RLS	8/7/95		
D	ADDED 27DC RELAY	RLS	3/7/97		



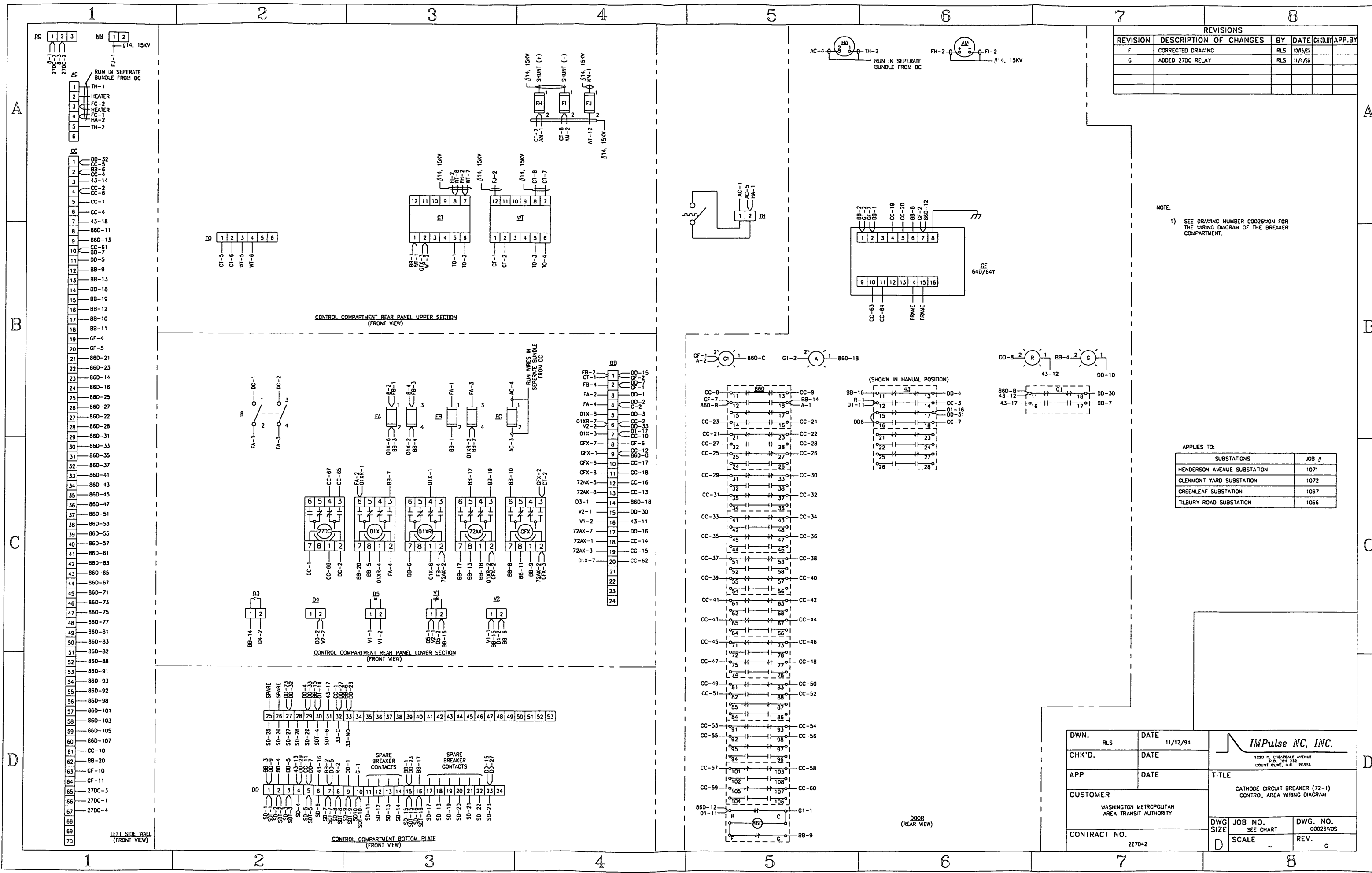
NOTE:
1) SEE DRAWING NUMBER 00026WDL FOR THE WIRING DIAGRAM OF THE BREAKER COMPARTMENT.

APPLIES TO:

THE BREAKER STATIONS	JOB #
GLENMONT NORTH THE BREAKER	1069
GLENMONT SOUTH THE BREAKER	1070
ROSDO STREET THE BREAKER	1065
FRANCONIA-SPRINGFIELD THE BREAKER	1068

DWN.	RLS	DATE	11/12/94	<p>1920 W. CECILIALE AVENUE P.O. BOX 232 GUILFORD, N.C. 27435</p>
CHK'D.		DATE		
APP		DATE		TITLE
CUSTOMER	WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY			THE BREAKER STATION DC FEEDER CIRCUIT BREAKER (UNIT-1) CONTROL AREA WIRING DIAGRAM
CONTRACT NO.	227042	DWG. NO.	00026WDR	JOB NO. SEE CHART SCALE - REV. 0

Jackson Wed Jul 2 11:42:07 1997 - E:\00026\00026W05



REVISIONS				
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY APP. BY
F	CORRECTED DRAWING	RLS	10/15/93	
G	ADDED 27DC RELAY	RLS	11/4/93	

NOTE:
1) SEE DRAWING NUMBER 00026W0N FOR THE WIRING DIAGRAM OF THE BREAKER COMPARTMENT.

APPLIES TO:

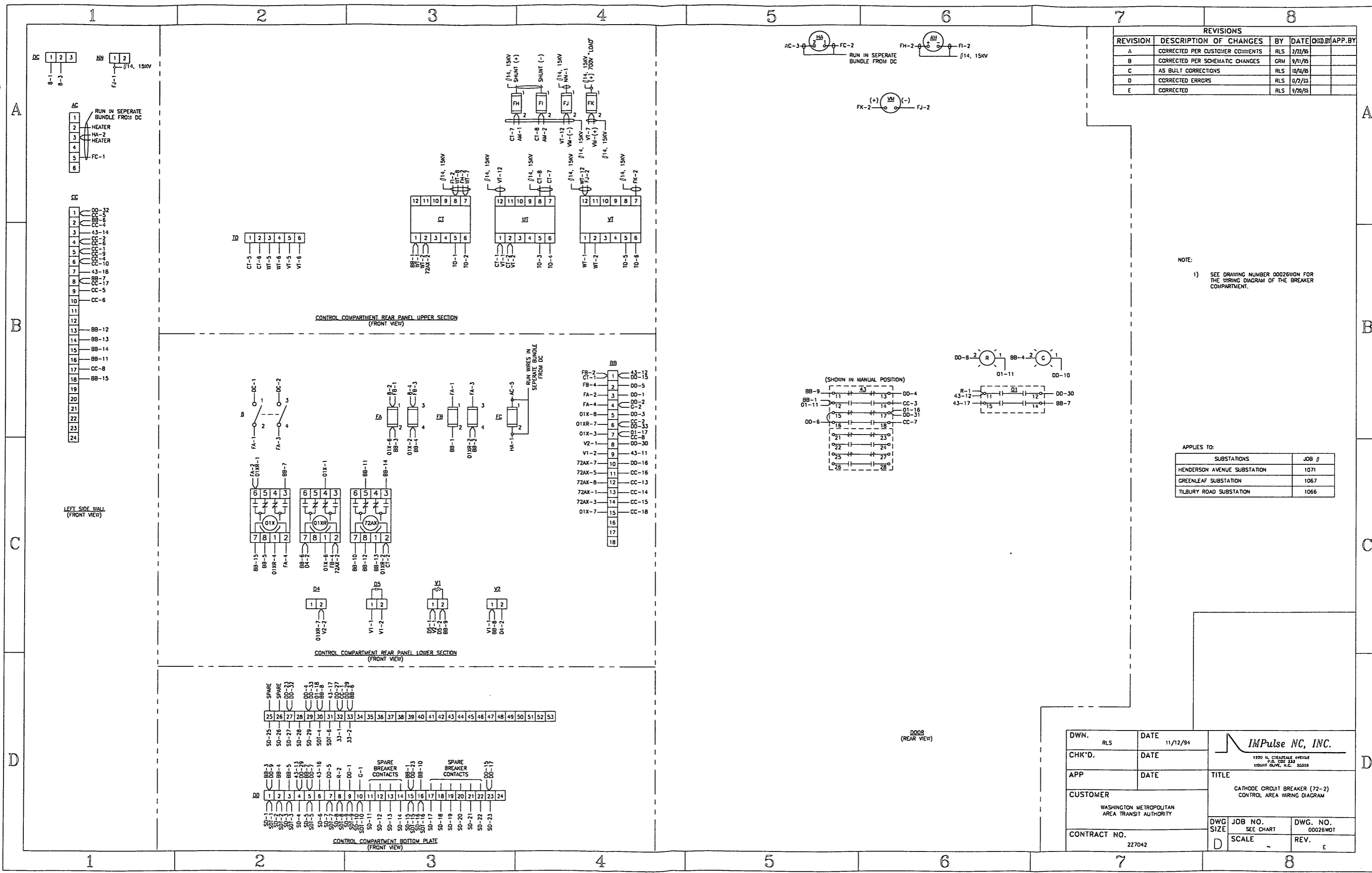
SUBSTATIONS	JOB #
HENDERSON AVENUE SUBSTATION	1071
GLENMONT YARD SUBSTATION	1072
GREENLEAF SUBSTATION	1067
TILBURY ROAD SUBSTATION	1066

DWN. RLS	DATE 11/12/94	 <small>1220 N. GREENLEAF AVENUE P.O. BOX 232 DUBLIN, N.C. 27033</small>
CHK'D.	DATE	
APP	DATE	TITLE CATHODE CIRCUIT BREAKER (72-1) CONTROL AREA WIRING DIAGRAM
CUSTOMER WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		DWG. NO. 00026W05
CONTRACT NO. 227042	SCALE -	DWG. NO. 00026W05 REV. G

LEFT SIDE WALL
(FRONT VIEW)

DOOR
(REAR VIEW)

Jackson Wed Jul 2 11:42:30 1997 - E:\00026\00026W01



REVISIONS				
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY APP. BY
A	CORRECTED PER CUSTOMER COMMENTS	RLS	7/22/95	
B	CORRECTED PER SCHEMATIC CHANGES	GRM	9/11/95	
C	AS BUILT CORRECTIONS	RLS	10/18/95	
D	CORRECTED ERRORS	RLS	8/2/95	
E	CORRECTED	RLS	9/20/95	

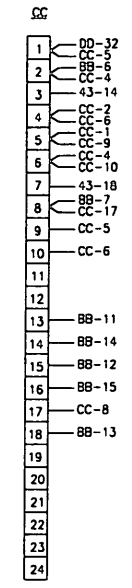
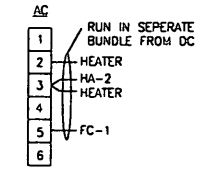
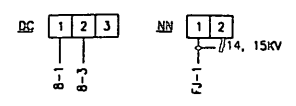
NOTE:
1) SEE DRAWING NUMBER 00026W0N FOR THE WIRING DIAGRAM OF THE BREAKER COMPARTMENT.

APPLIES TO:

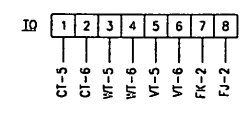
SUBSTATIONS	JOB #
HENDERSON AVENUE SUBSTATION	1071
GREENLEAF SUBSTATION	1067
TILBURY ROAD SUBSTATION	1066

DWN. RLS	DATE 11/12/94	 1220 H. GREENLEAF AVENUE P.O. BOX 234 LIGHT OLIVE, N.C. 28055
CHK'D.	DATE	
APP.	DATE	TITLE CATHODE CIRCUIT BREAKER (72-2) CONTROL AREA WIRING DIAGRAM
CUSTOMER WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		DWG. NO. 00026W01
CONTRACT NO. 227042	SCALE -	REV. E

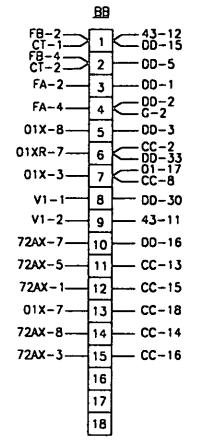
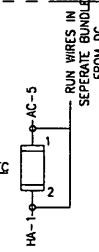
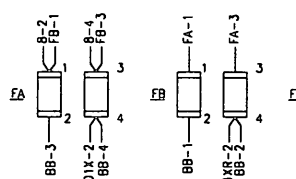
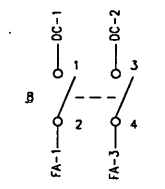
Jackson Wed Jul 2 11:42:50 1997 - E:\00026\00026W0U



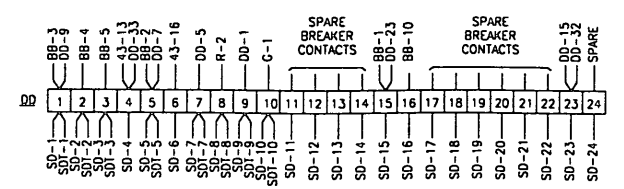
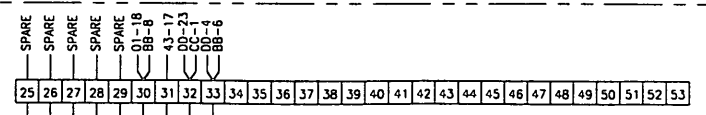
LEFT SIDE WALL (FRONT VIEW)



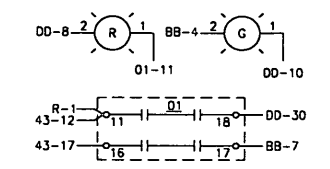
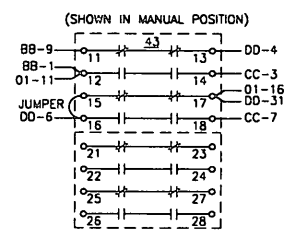
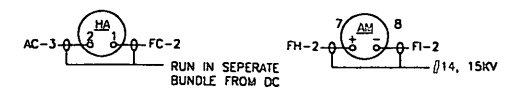
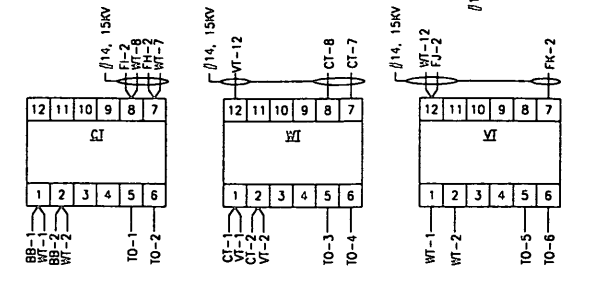
CONTROL COMPARTMENT REAR PANEL UPPER SECTION (FRONT VIEW)



CONTROL COMPARTMENT REAR PANEL LOWER SECTION (FRONT VIEW)



CONTROL COMPARTMENT BOTTOM PLATE (FRONT VIEW)



DOOR (REAR VIEW)

REVISIONS				
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY APP BY
A	CORRECTED PER CUSTOMER COMMENTS	RLS	1/22/95	
B	CORRECTED PER SCHEMATIC CHANGES	GRM	9/25/95	
C	CORRECTED	RLS	9/18/95	
D	AS BUILT CORRECTIONS	RLS	11/8/95	

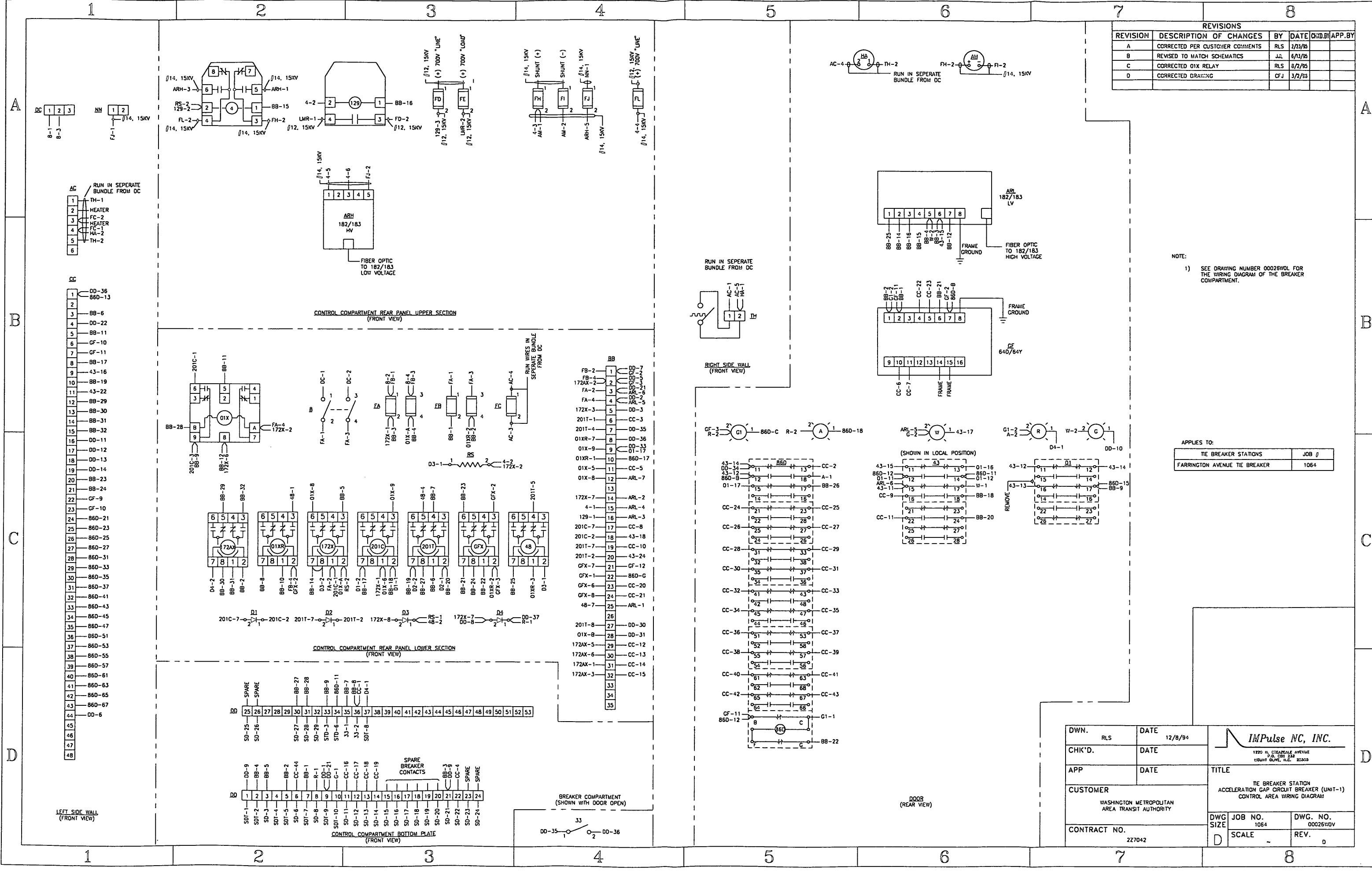
NOTE:
1) SEE DRAWING NUMBER 00026W0N FOR THE WIRING DIAGRAM OF THE BREAKER COMPARTMENT.

APPLIES TO:

SUBSTATIONS	JOB #
GLENMONT YARD SUBSTATION	1072

DWN. RLS	DATE 11/12/94	<p>1320 N. CENTRALE AVENUE P.O. BOX 239 COLUMBIA, N.C. 28033</p>
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER		CATHODE CIRCUIT BREAKER 72-3 CONTROL AREA WIRING
WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		DWG NO. 00026W0U
CONTRACT NO. 227042	DWG SIZE D	SCALE REV.

Jackson Wed Jul 2 11:43:14 1997 - E:\00026\00026M0V



REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY	APP. BY
A	CORRECTED PER CUSTOMER COMMENTS	RLS	2/23/95		
B	REVISED TO MATCH SCHEMATICS	JLL	6/13/95		
C	CORRECTED OIX RELAY	RLS	8/2/95		
D	CORRECTED DRAWING	CFJ	3/2/95		

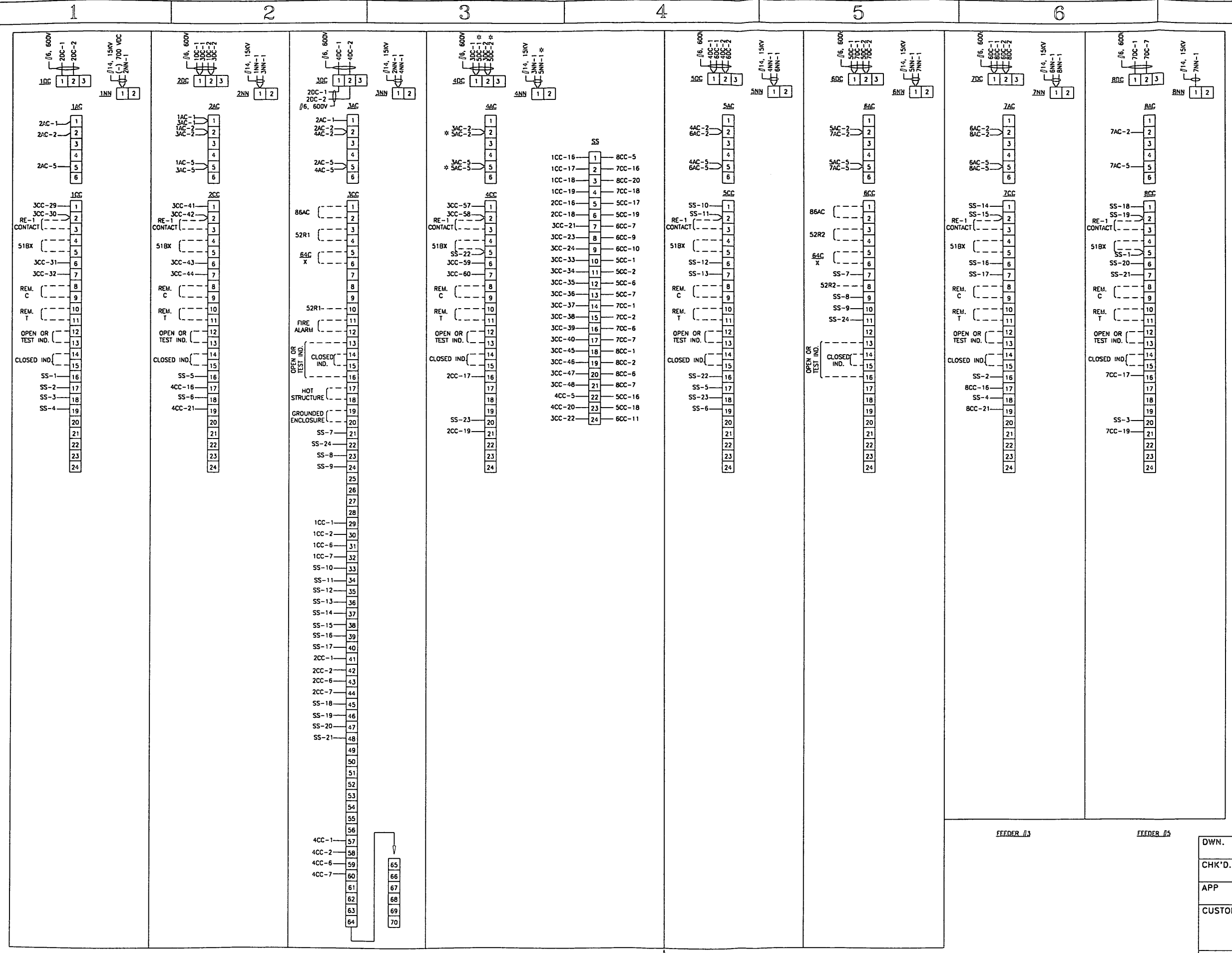
NOTE:
1) SEE DRAWING NUMBER 00025WOL FOR THE WIRING DIAGRAM OF THE BREAKER COMPARTMENT.

APPLIES TO:	
TIE BREAKER STATIONS	JOB #
FARRINGTON AVENUE TIE BREAKER	1064

DWN. RLS	DATE 12/8/94	 1970 N. CLEARLAKE AVENUE P.O. BOX 233 COUNTY GUYLE, N.C. 28355
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER		ACCELERATION CAP CIRCUIT BREAKER (UNIT-1) CONTROL AREA WIRING DIAGRAM
CONTRACT NO. 227042		DWG. NO. 00026M0V
D	SCALE	REV. D

REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D.	APP. BY
A	REVISED PER SCHEMATIC CHANGES	RLS	7/11/95		
B	AS BUILT CORRECTIONS	RLS	11/4/95		

NOTE:
WIRES MARKED WITH (*) WILL BE DISCONNECTED AT THE TERMINAL BLOCK FOR SHIPPING. THEY ARE TO BE RE-CONNECTED BY INSTALLATION CONTRACTOR.

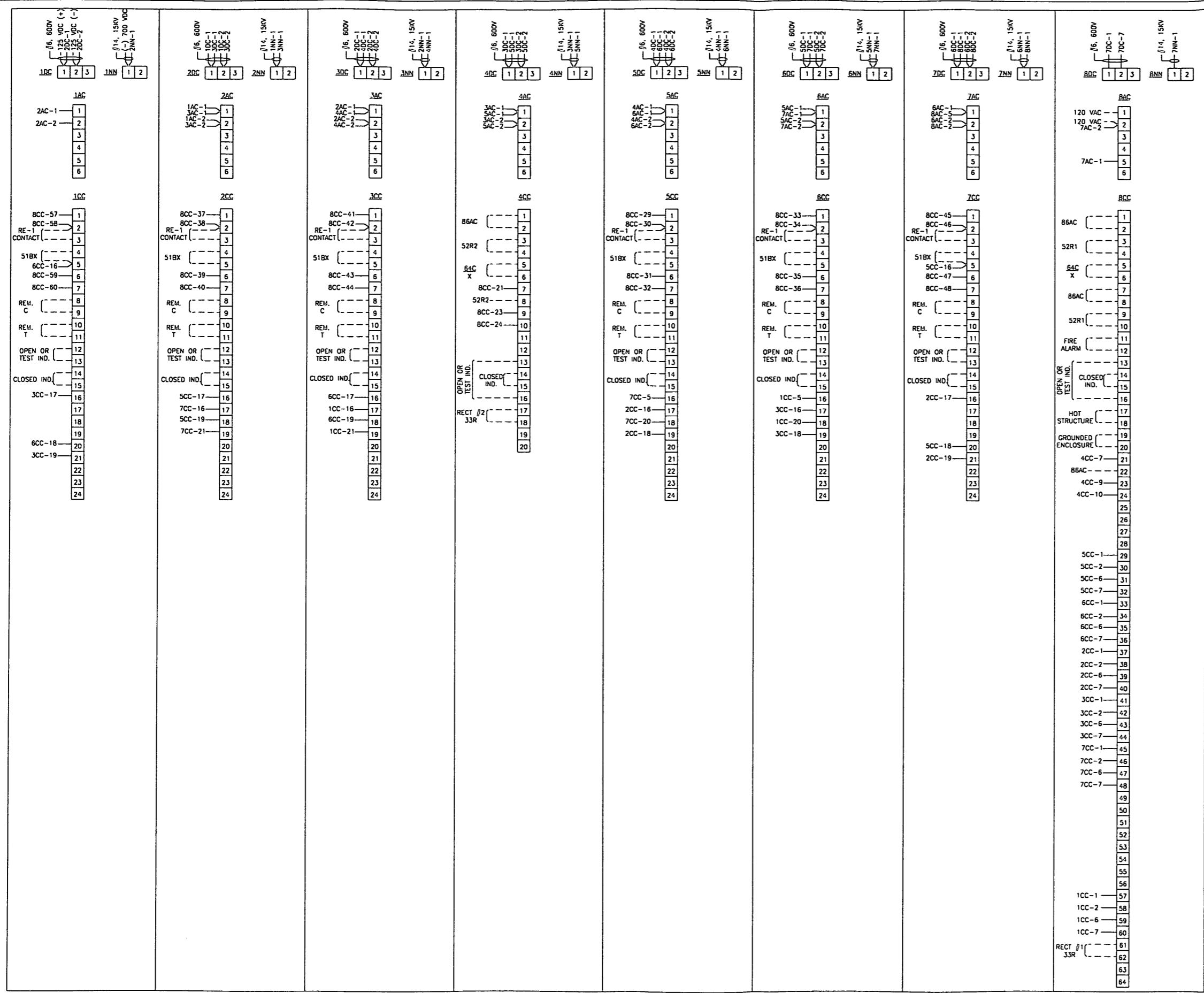


FEEDER #1 FEEDER #4 72-1 FEEDER #6 SHIPPING SPLIT FEEDER #2 72-2 FEEDER #3 FEEDER #5

DWN. RLS	DATE 12/7/94	 1320 N. DODD AVE P.O. BOX 233 LEBANON, TN 37035
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER		HENDERSON AVENUE SUBSTATION DC SWITCHGEAR INNER CONNECTION DIAGRAM
CONTRACT NO. 227042	DWG. NO. 1071	DWG. NO. 00026W0W
	SCALE	REV. B

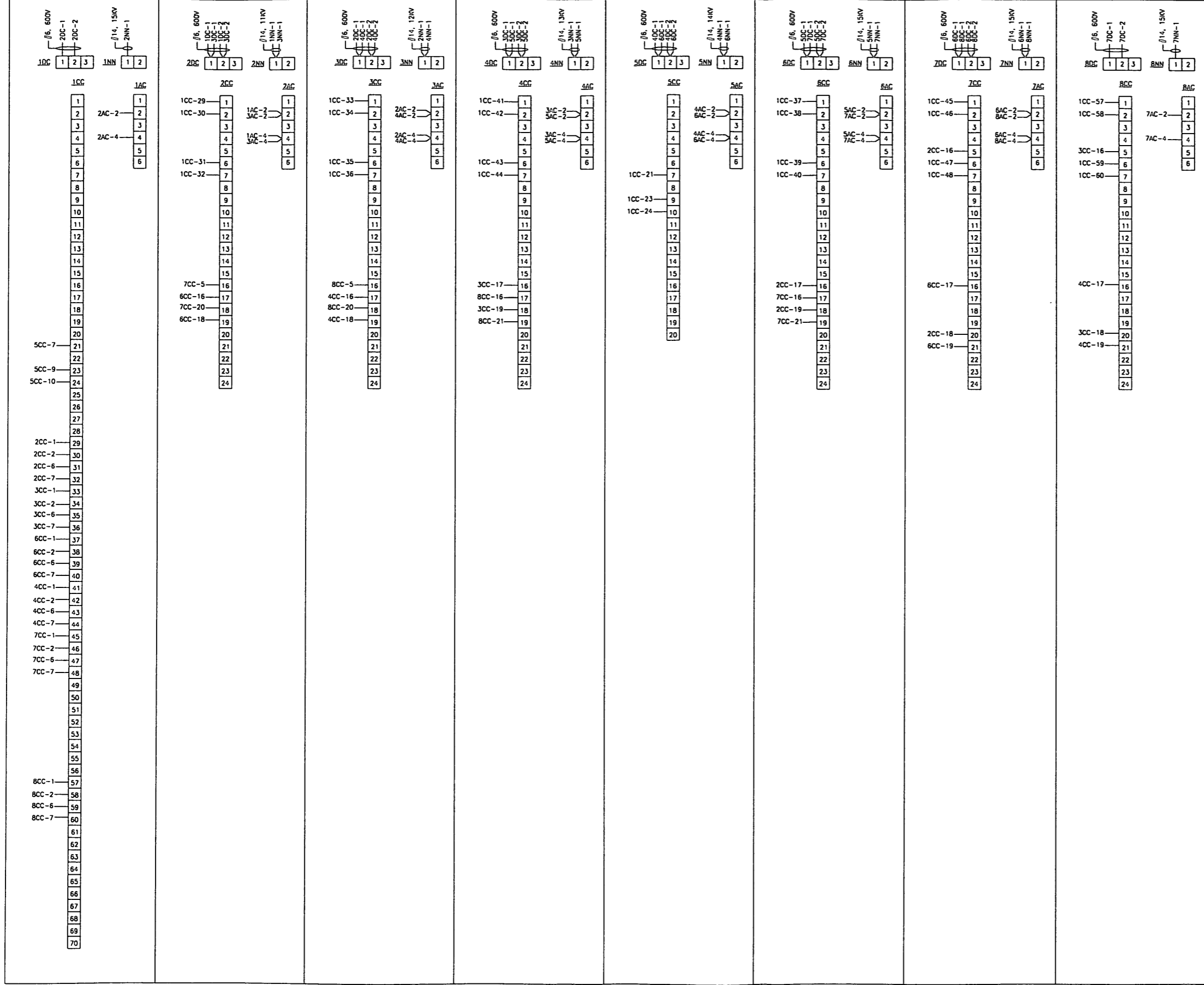
Jackson Wed Jul 2 11:44:12 1997 - E:\00026\00026W0Y

REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D.	APP. BY
A	CORRECTED PER SCHEMATIC CHANGES	RLS	10/27/95		
B	CORRECTED DRAWING	CFJ	3/7/96		



DWN.	RLS	DATE	12/7/94	<p>1220 H. COZZAZALE AVENUE P.O. BOX 232 MOUNTAIN VIEW, N.C. 27055</p>
CHK'D.		DATE		
APP		DATE		TITLE
CUSTOMER				DC SWITCHGEAR INNER CONNECTION DIAGRAM GREENLEAF SUBSTATION
CONTRACT NO.				DWG. NO.
227042				1067
D				SCALE
				REV.
				B

REVISIONS				
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY APP. BY
A	CORRECTED PER SCHEMATIC CHANGES	RLS	9/15/95	
B	CORRECTED DRAWING	CFJ	3/1/95	

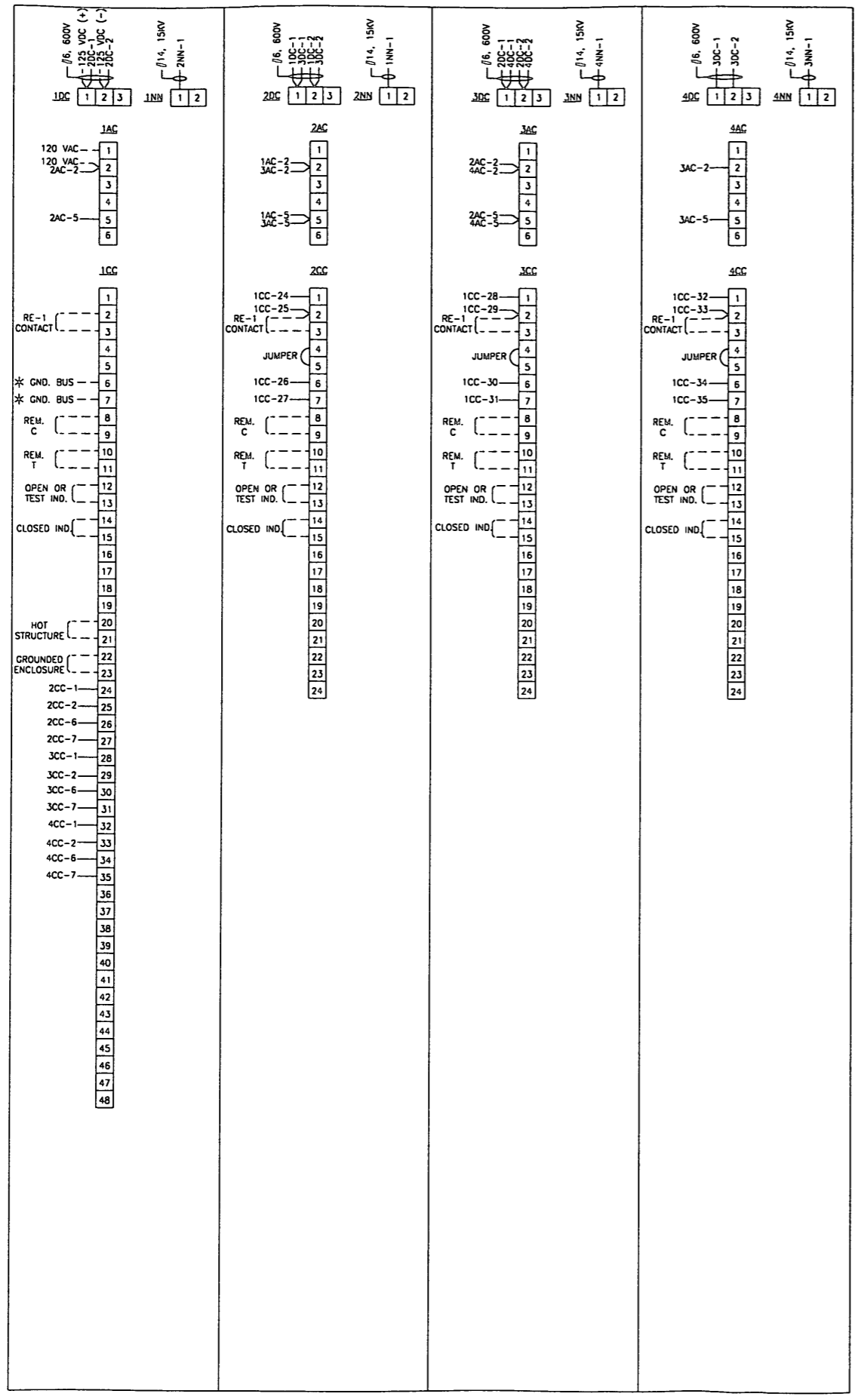


DWN.	RLS	DATE	12/7/96	<p>1220 H. LEAFHARTE AVENUE P.O. BOX 234 DUNN GLEN, N.C. 27024</p>
CHK'D.		DATE		
APP		DATE		
CUSTOMER				TITLE
WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY				DC SWITCHGEAR INNER CONNECTION DIAGRAM TILBURY ROAD SUBSTATION
CONTRACT NO.	227042	DWG. NO.	1066	DWG. NO.
		SCALE	~	REV.
				B

72-1 FEEDER #1 FEEDER #2 FEEDER #4 FEEDER #5 FEEDER #6

Jackson Med Ju1 2 11:44:56 1997 - E:\00026\00026M1A

REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY	APP. BY
A	CORRECTED	RLS	9/25/93		
B	AS BUILT CORRECTIONS	RLS	3/5/97		
C	CORRECTED "ICC" TERMINAL BLOCK	RLS	3/25/97		

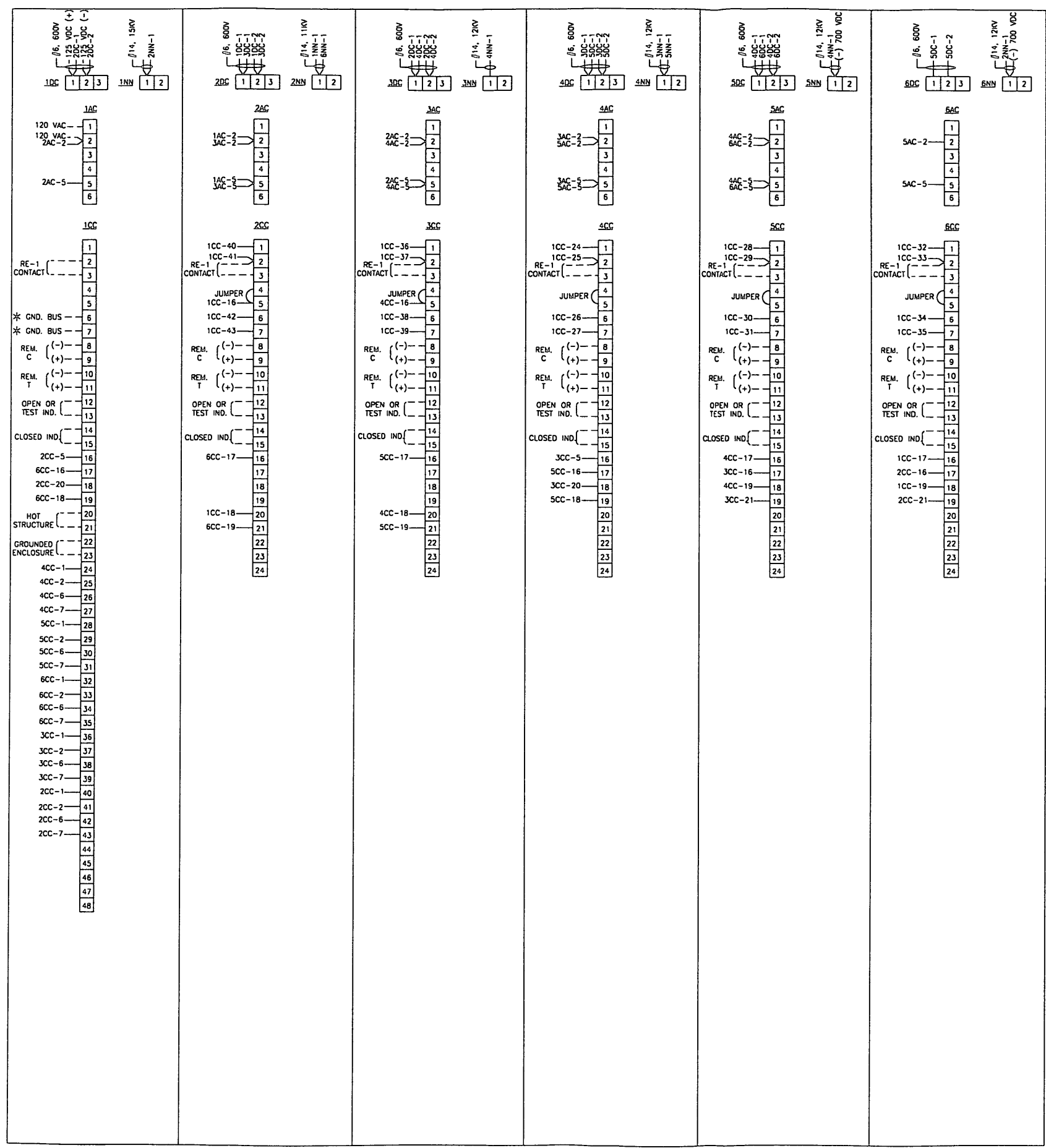


RE-1 EMERGENCY TRIP RELAY
 * MUST BE SEPARATE CONNECTIONS.

DWN. RLS	DATE 12/7/94	 1230 H. CHATELAIN AVENUE P.O. BOX 238 EDMONT, ALAB. 35863
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER		DC SWITCHGEAR INNER CONNECTION DIAGRAM GLENMONT NORTH TIE BREAKER STATION
CONTRACT NO. 227042	DWG. NO. 1069	DWG. NO. 00026M1A
SCALE -	REV. c	

Jackson Wed Jul 2 11:45:17 1997 - E:\00026\00026W1B

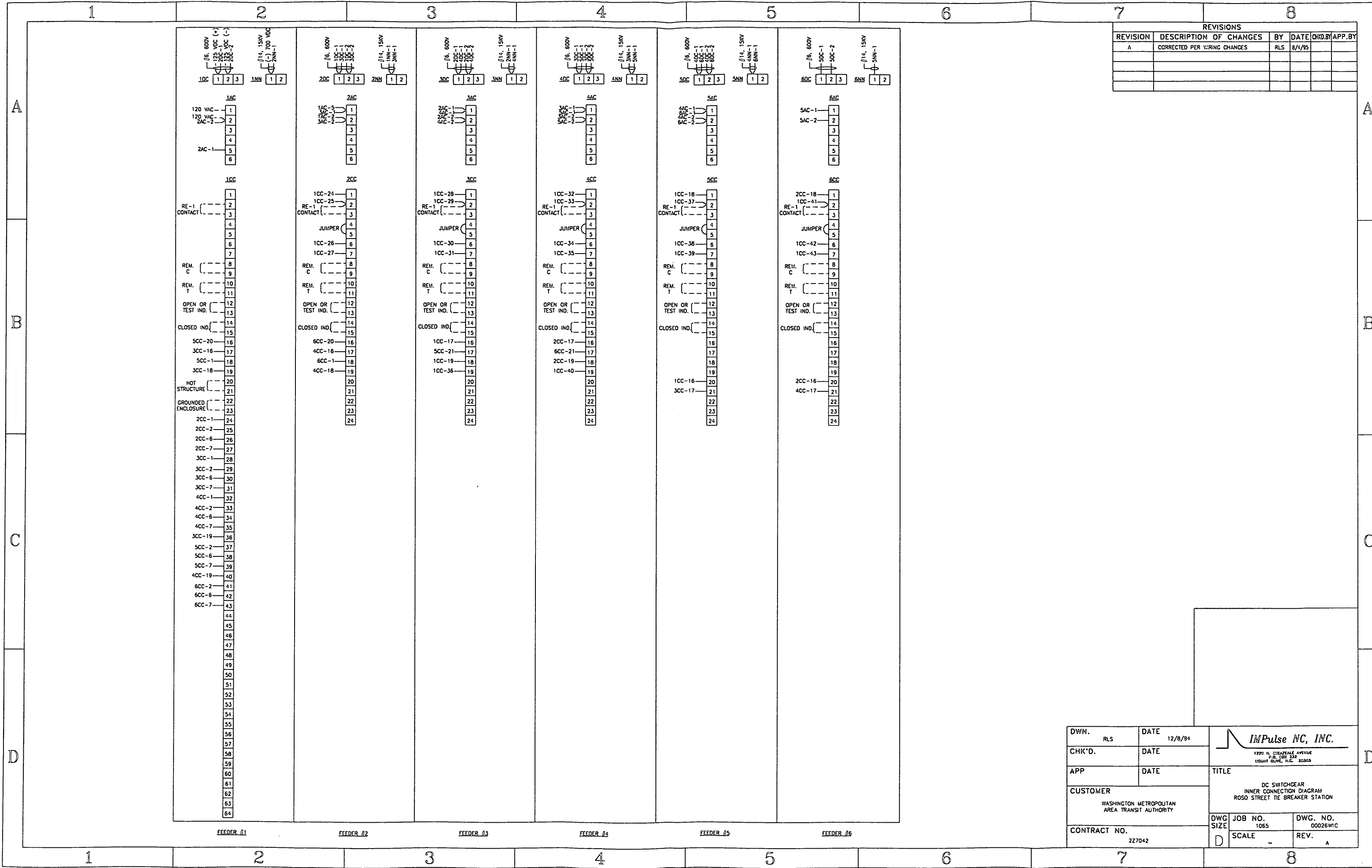
REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D.	APP. BY
A	CORRECTED PER SCHEMATIC CHANGES	RLS	11/23/93		
B	CORRECTED "ICC" TERMINAL BLOCK	RLS	3/25/97		



RE-1 EMERGENCY TRIP RELAY
 * MUST BE SEPARATE CONNECTIONS.

DWN. RLS	DATE 12/7/94	 1220 N. CRENSHAW AVENUE P.O. BOX 233 LIGHT HOUSE, ILL. 60433
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER		DC SWITCHGEAR INNERCONNECTION DIAGRAM GLENMONT SOUTH TIE BREAKER STATION
CONTRACT NO. 227042	DWG. NO. 1070	DWG. NO. 00026W1B
D	SCALE -	REV. B

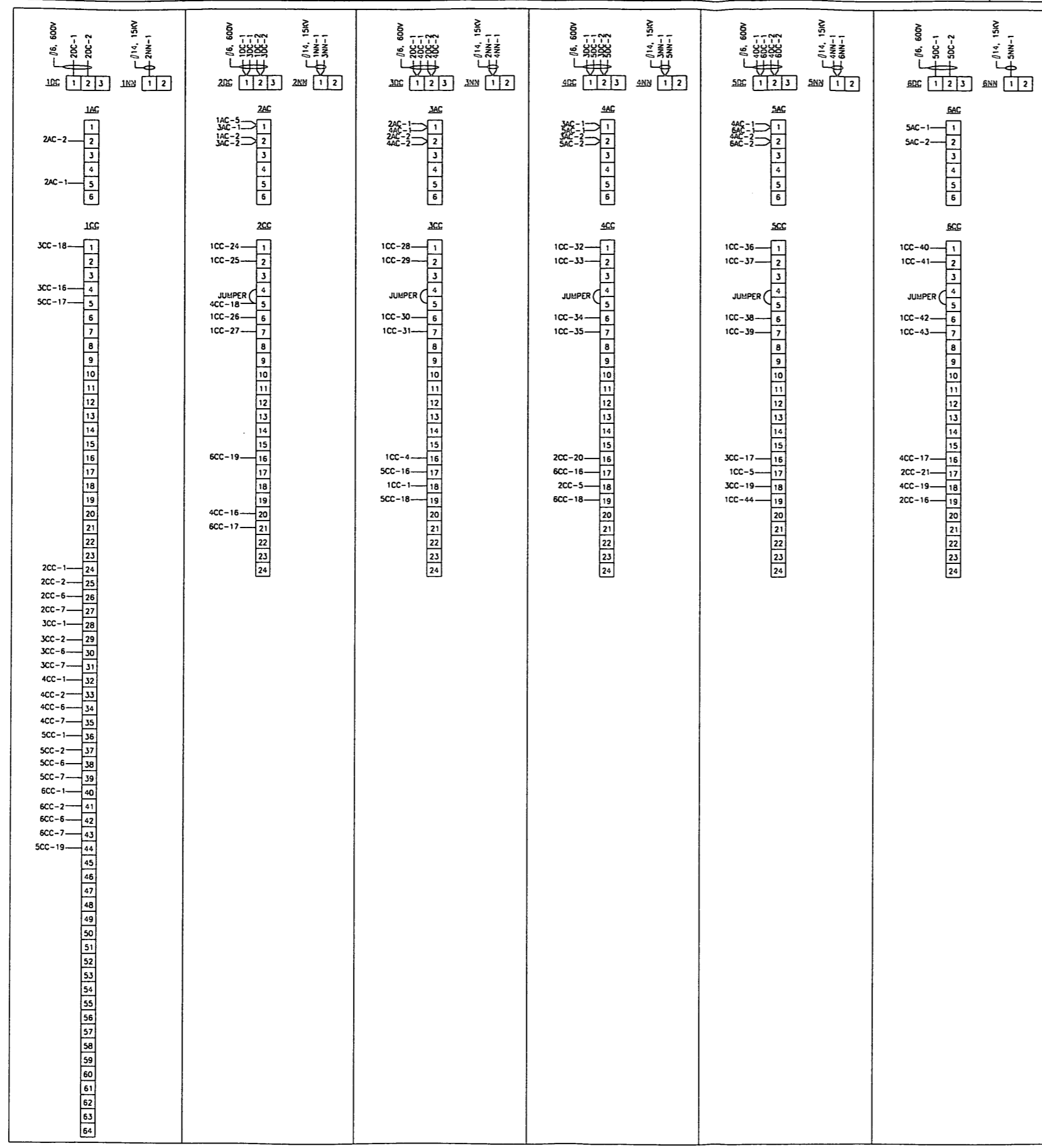
Jackson Wed Jul 2 13:14:17 1997 - E:\00026\00026W1C



REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D.	APP. BY
A	CORRECTED PER WIRING CHANGES	RLS	8/1/95		

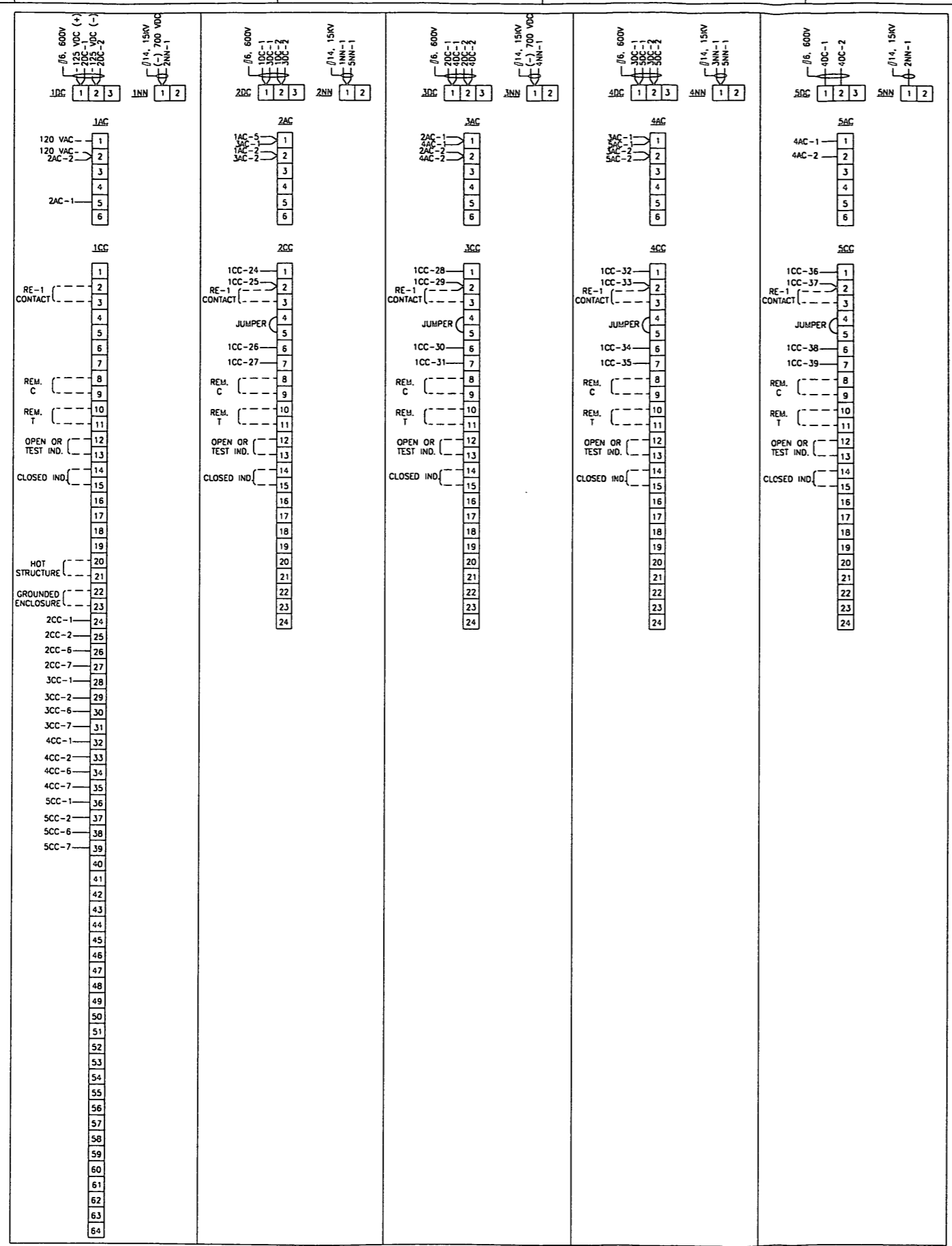
DWN. RLS	DATE 12/8/94	 <small>1220 N. CRENSHAW AVENUE P.O. BOX 224 LISHTON BLVD., D.C. 20305</small>
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		DC SWITCHGEAR INNER CONNECTION DIAGRAM ROSO STREET TIE BREAKER STATION
CONTRACT NO.	DWG SIZE	JOB NO.
227042	D	1065
	SCALE	DWG. NO.
	-	00026W1C
		REV.
		A

REVISIONS				
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY APP. BY
A	CORRECTED PER WIRING CHANGES	RLS	8/3/95	
B	CORRECTED DRAWING	CFJ	3/1/98	



DWN. RLS	DATE 12/8/94	 1270 H. CREECHFIELD AVENUE P.O. BOX 233 LIGHT HOUSE, N.C. 28355
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		DC SWITCHGEAR INNER CONNECTION DIAGRAM FARRINGTON AVENUE TIE BREAKER STATION
CONTRACT NO. 227042	DWG. NO. 1064	DWG. NO. 00026W1D
	SCALE	REV. B

REVISIONS				
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D. BY APP. BY
A	CORRECTED PER WIRING CHANGES	GRM	1/5/93	
B	REVISED PER SCHEMATIC CHANGES	RLS	3/7/93	
C	SPLIT (-) REF.	RLS	6/13/93	
D	FIELD CORRECTIONS	RLS	8/8/93	
E	CORRECTED ERRORS	RLS	9/20/93	

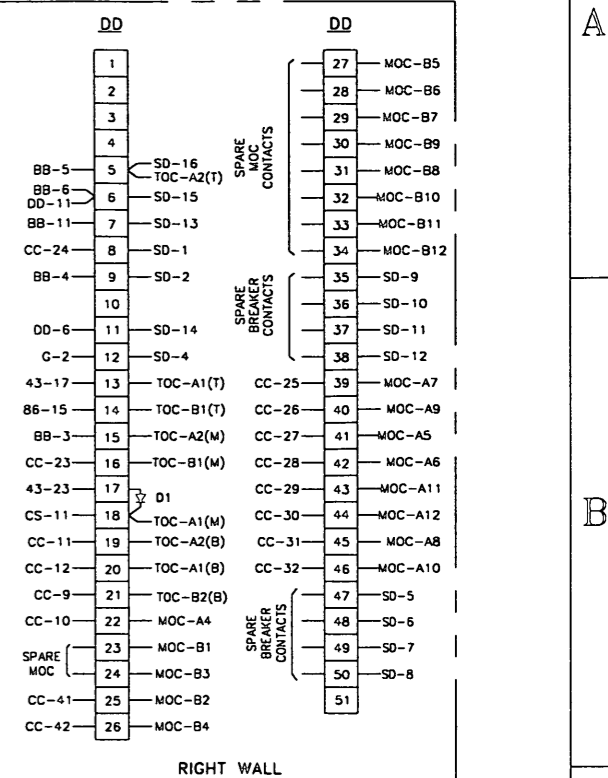
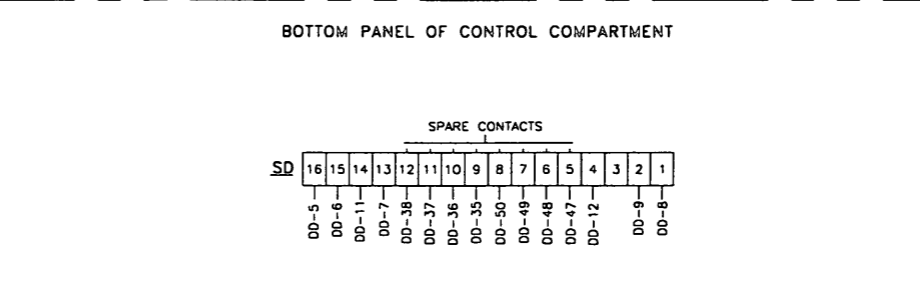
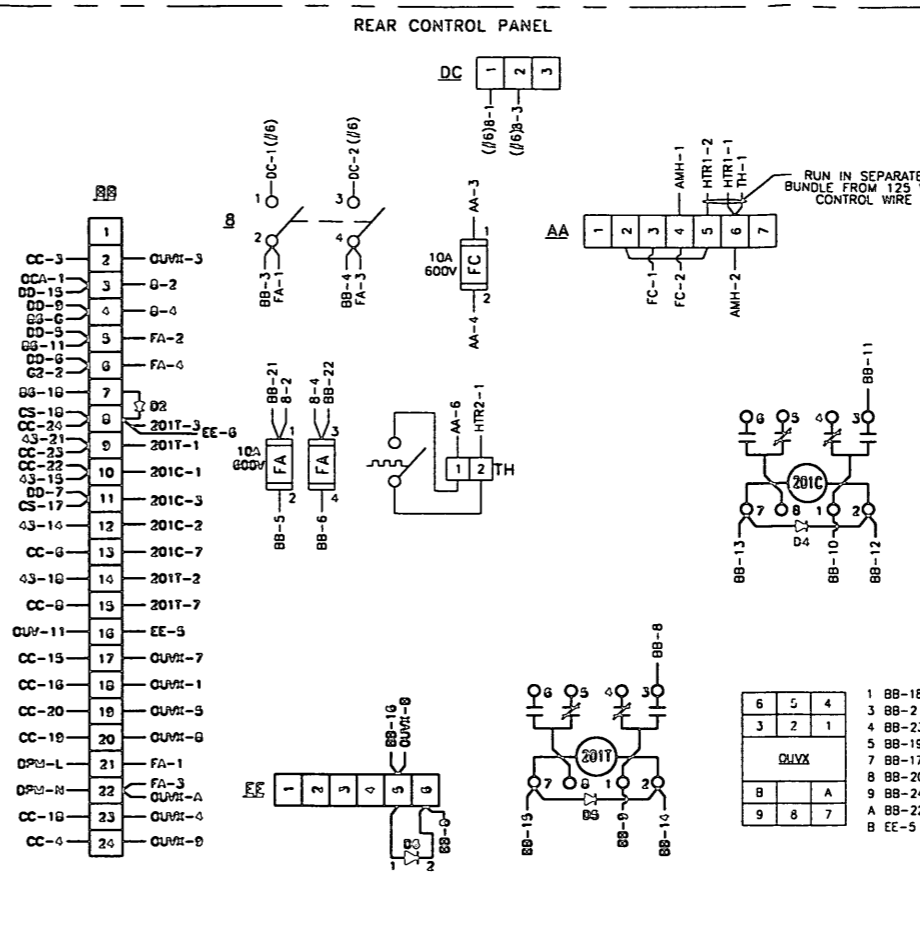
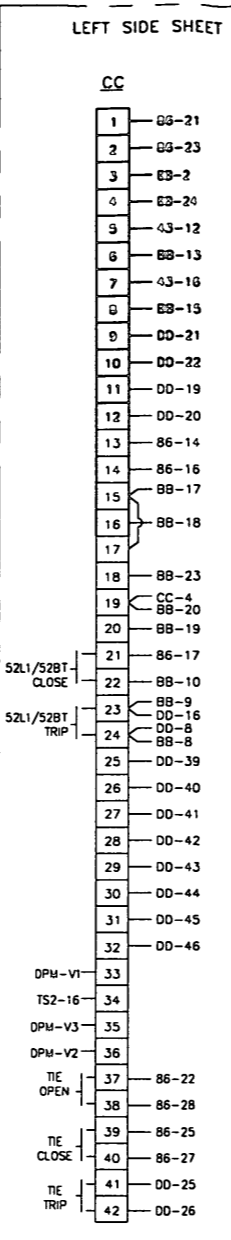
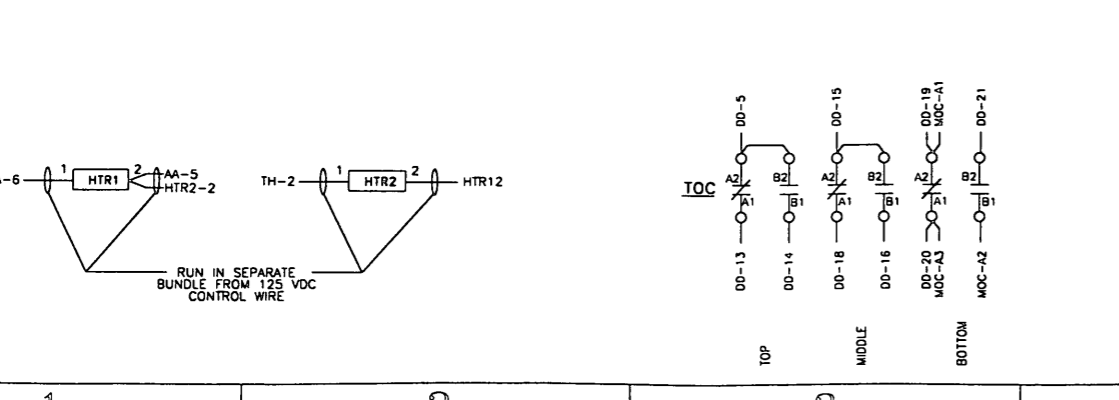
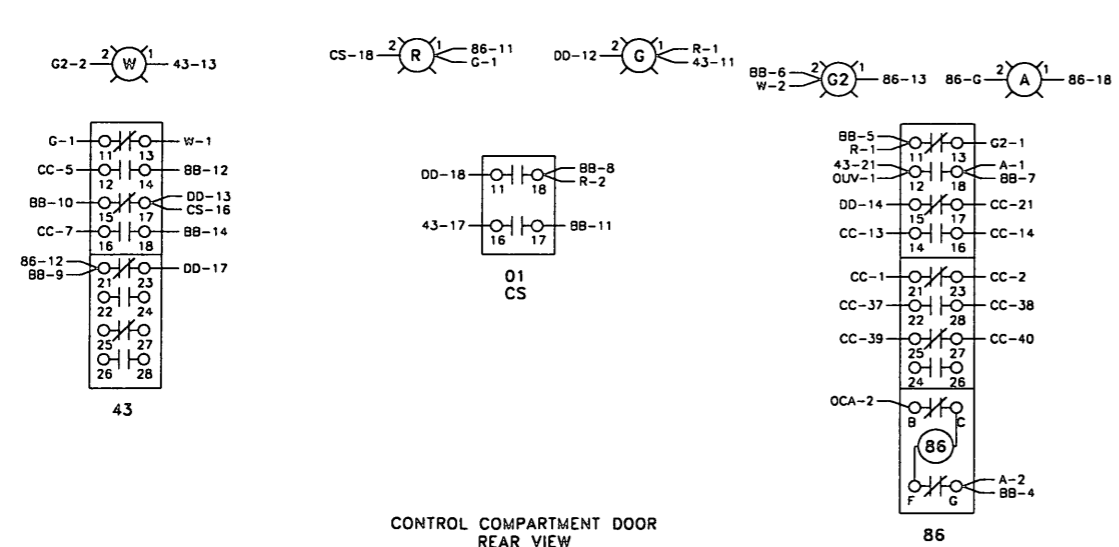
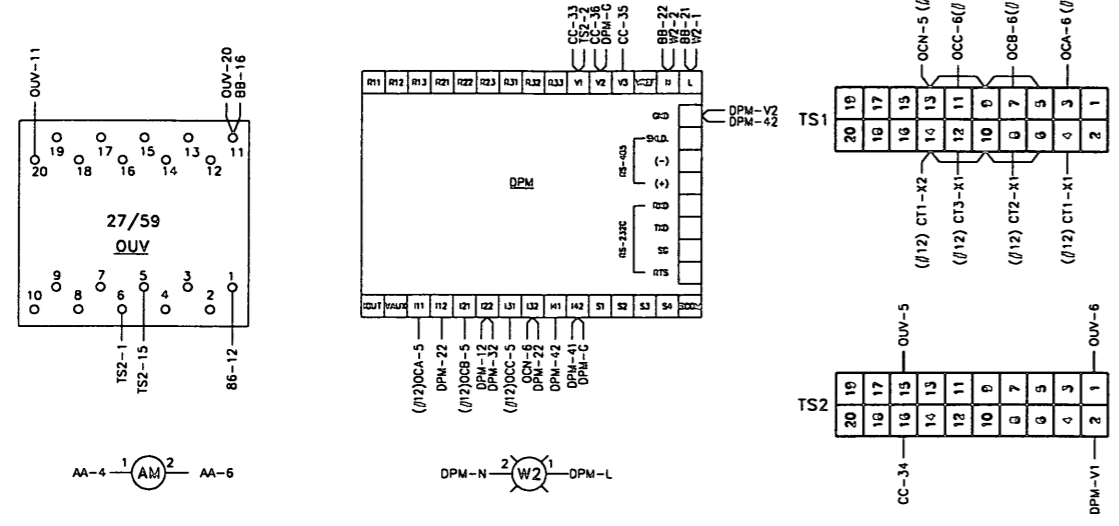
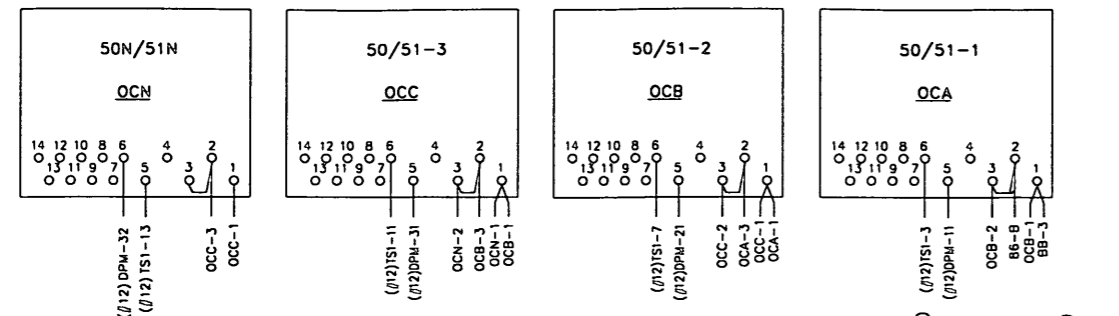


FEEDER #1 FEEDER #3 FEEDER #2 FEEDER #4 FEEDER #5

DWN.	RLS	DATE	12/8/94	<p>1220 W. CRENSHAW AVENUE P.O. BOX 234 ROCKY GLEN, N.C. 27303</p>			
CHK'D.		DATE					
APP		DATE		TITLE			
CUSTOMER WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY				DC SWITCHGEAR INNER CONNECTION DIAGRAM FRANCONIA-SPRINGFIELD TIE BREAKER STATION			
CONTRACT NO.	227042	DWG SIZE	D	JOB NO.	1068	DWG. NO.	00026W1E
		SCALE	-	REV.	E		

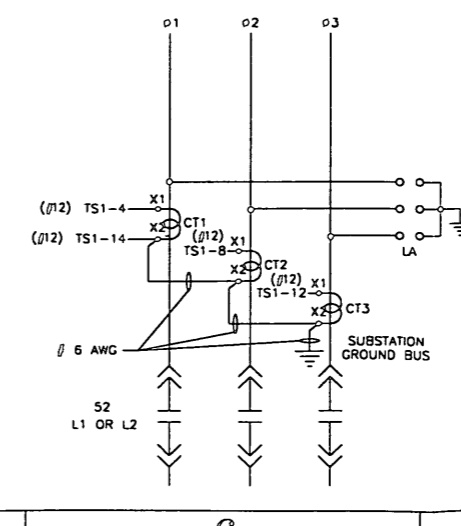
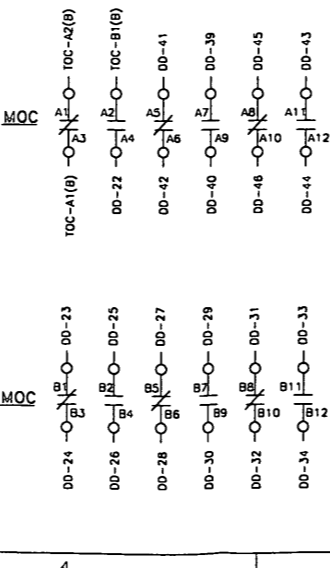
Jackson Wed Jul 2 11:46:43 1997 - E:\00026\00026W1H

REVISIONS				
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY APP. BY
A	CORRECTED PER CUSTOMER COMMENTS	RLS	2/20/95	
B	CORRECTED PER SCHEMATIC CHANGES	JUL	8/14/95	
C	CORRECTED RELAYS	MKM	9/14/95	
D	AS BUILT REVISIONS	RLS	11/3/95	



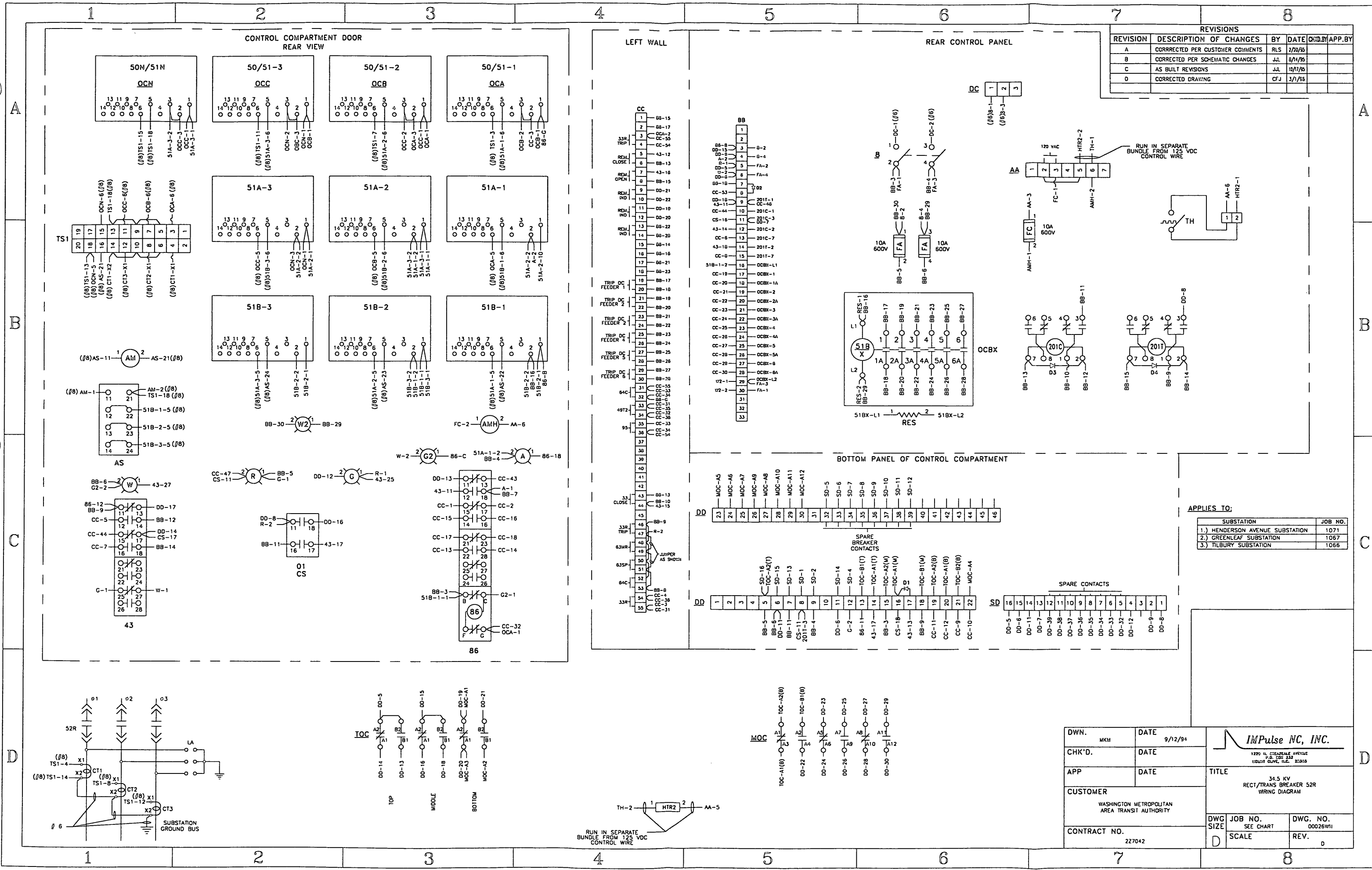
APPLIES TO:

SUBSTATION	JOB NO.
1.) GREENLEAF SUBSTATION	1067
2.) TILBURY SUBSTATION	1066



DWN. MKM	DATE 12/8/94	
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER	WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY	TITLE
CONTRACT NO. 227042		DWG. NO. 00026W1H
		SCALE
		REV. d

Jackson Wed Jul 2 11:47:15 1997 - E:\00026\00026W11

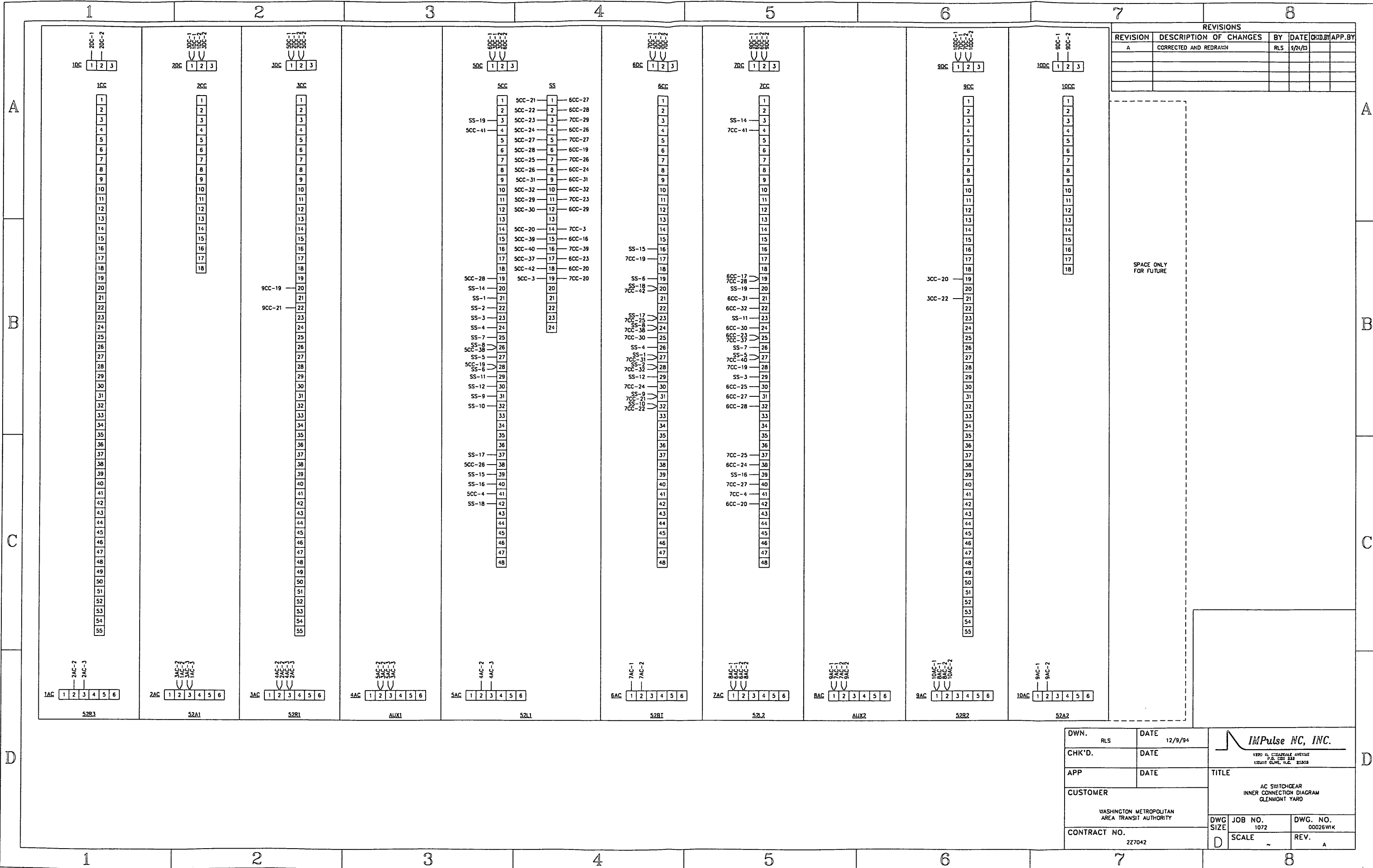


REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY	APP. BY
A	CORRECTED PER CUSTOMER COMMENTS	RLS	7/20/95		
B	CORRECTED PER SCHEMATIC CHANGES	JLL	8/14/95		
C	AS BUILT REVISIONS	JLL	10/17/95		
D	CORRECTED DRAWING	CFJ	3/1/98		

APPLIES TO:

SUBSTATION	JOB NO.
1.) HENDERSON AVENUE SUBSTATION	1071
2.) GREENLEAF SUBSTATION	1067
3.) TILBURY SUBSTATION	1066

DWN. MKM	DATE 9/12/94	<p>1220 IL. CENTRALE AVENUE P.O. BOX 233 LEWISTOWN, N.C. 27058</p>
CHK'D.	DATE	
APP.	DATE	TITLE 34.5 KV RECT/TRANS BREAKER 52R WIRING DIAGRAM
CUSTOMER WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		DWG. NO. 00026W11
CONTRACT NO. 227042		SCALE D
		DWG. NO. 00026W11
		REV. D



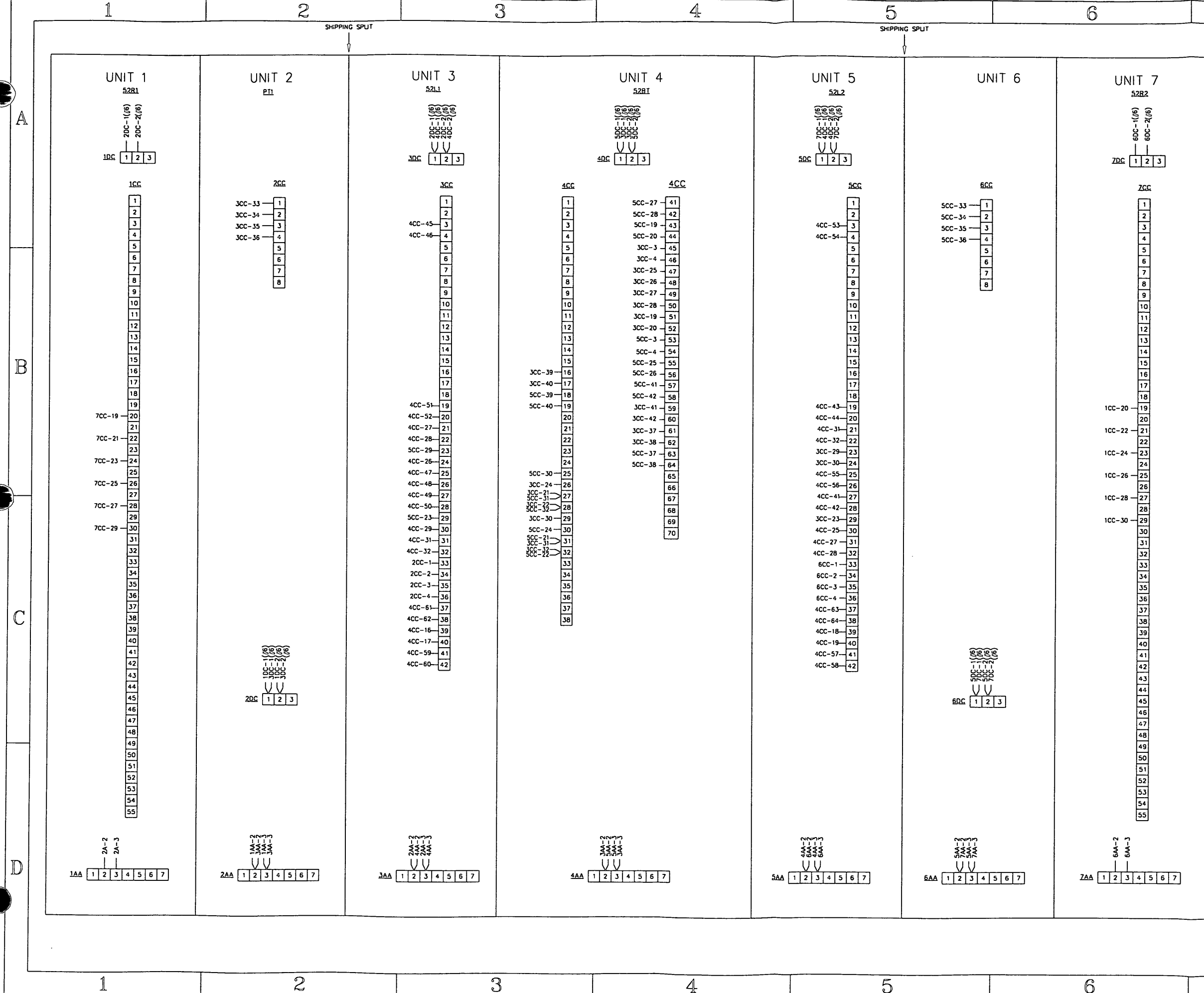
REVISIONS					
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY	APP. BY
A	CORRECTED AND REDRAWN	RLS	9/24/93		

SPACE ONLY FOR FUTURE

DWN. RLS	DATE 12/9/94	<p>1920 H. CHESAPEAKE AVENUE P.O. BOX 232 LEWISTOWN, N.C. 27043</p>
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER		AC SWITCHGEAR INNER CONNECTION DIAGRAM GLENMONT YARD
CONTRACT NO. 227042	DWG. NO. 1072	DWG. NO. 00026W1K
	SCALE	REV. A

Jackson Med Jul 2 11:48:27 1997 - E:\00026\00026W1L

REVISIONS				
REVISION	DESCRIPTION OF CHANGES	BY	DATE	CHK'D BY APP. BY
A	CORRECTED PER SCHEMATIC CHANGES	RLS	11/7/95	
B	AS BUILT	GRM	4/18/95	



DWN. MKM	DATE 12/9/94	 1320 N. BEECHDALE AVENUE P.O. BOX 232 MOUNT GUY, N.C. 28355
CHK'D.	DATE	
APP	DATE	TITLE
CUSTOMER		GREENLEAF SUBSTATION AC SWITCHGEAR INNER CONNECTION DIAGRAM
CONTRACT NO. 227042	DWG. SIZE D	JOB NO. 1067
	SCALE	DWG. NO. 00026W1L
		REV. B