

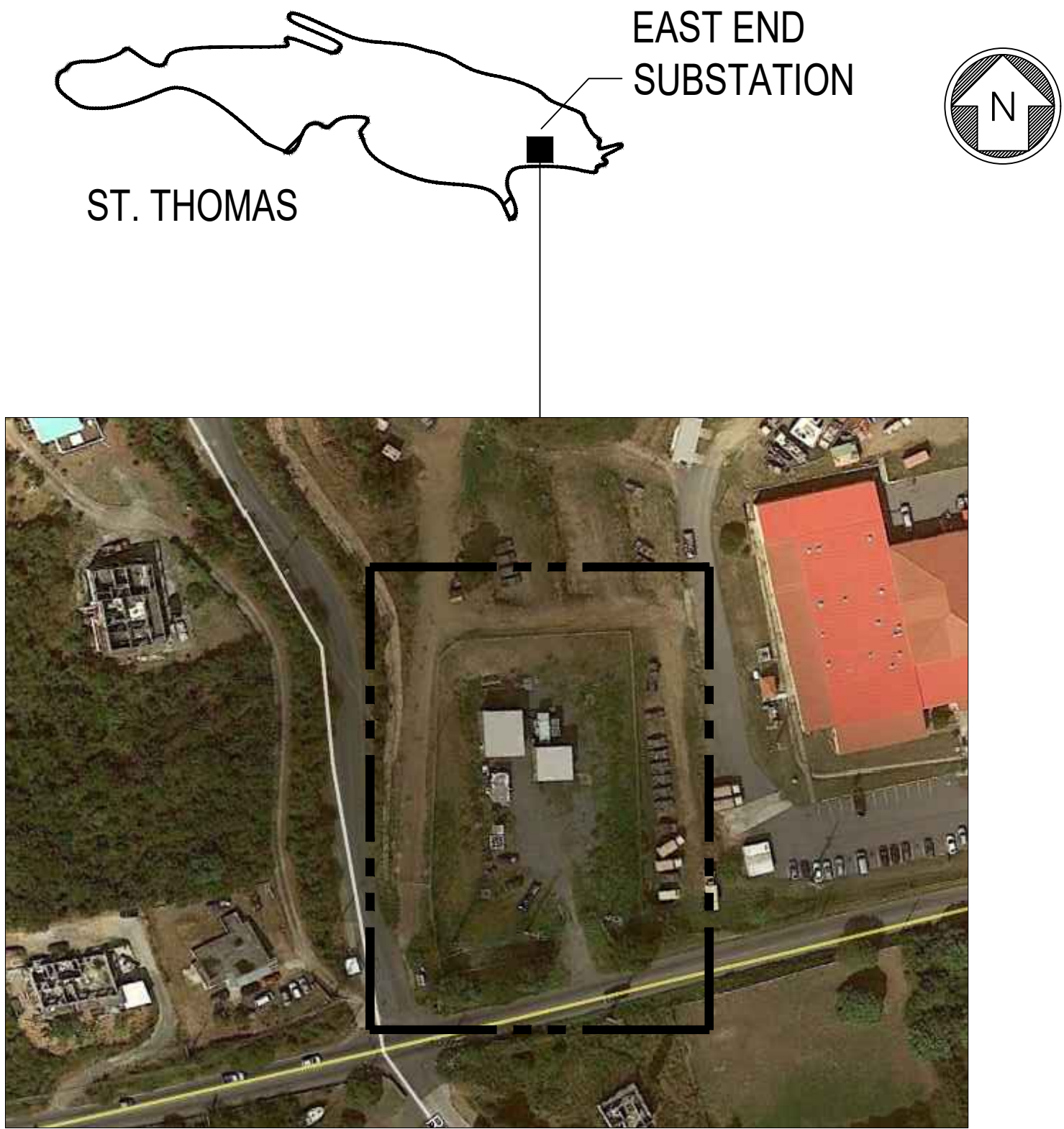
PROJECT

EAST END SUBSTATION  
RESTORATION & EXPANSION PROJECT, PHASE 2  
(13.2kV GIS) ST. THOMAS, USVI

DRAWING INDEX

DRAWINGS INCLUDED IN THIS PACKAGE						
DRAWING _	DRAWING NAME	ISSUE A: 07-25-19	ISSUE 0: 10-17-19	ISSUE 1: 12-03-19		
		PHASE 2 BID REVIEW	PHASE BID	PHASE BID		
STD-18257-E-100	SUBSTATION UNDERGROUND POWER DUCT BANK PLAN	•	•			
STD-18257-E-202	GIS BUILDING ELECTRICAL PLAN, SCHEDULES	•	•	•		
STD-18257-E-600	34.5/13.2KV SUBSTATION ONE LINE DIAGRAM	•	•			
STD-18257-E-603	RELAY PANEL ELEVATIONS RP1 THRU RP11, SCADA / COMMUNICATIONS PANEL		•			
STD-18257-E-605	13.2KV RELAY PANEL ELEVATIONS & BILL OF MATERIALS		•	•		
STD-18257-E-608	COMMUNICATIONS DIAGRAM	•	•			
STD-18257-E-700	AC ELEMENTARY DIAGRAM D-T1 LOW SIDE PROTECTION RELAY 13.2KV RP5	•	•			
STD-18257-E-701	DC ELEMENTARY DIAGRAM D-T1 LOW SIDE PROTECTION RELAY 13.2KV RP5	•	•			
STD-18257-E-702	AC ELEMENTARY DIAGRAM D-FRRID-F9 FEEDER PROTECTION RELAYS 13.2KV RP5	•	•			
STD-18257-E-703	DC ELEMENTARY DIAGRAM D-FRRID-F9 FEEDER PROTECTION RELAYS 13.2KV RP5	•	•			
STD-18257-E-704	AC ELEMENTARY DIAGRAM D-F7/SPARE FEEDER PROTECTION RELAYS 13.2KV RP6	•	•			
STD-18257-E-705	DC ELEMENTARY DIAGRAM D-F7/SPARE FEEDER PROTECTION RELAYS 13.2KV RP6	•	•			
STD-18257-E-706	AC ELEMENTARY DIAGRAM 13.2KV BUS DIFFERENTIAL PROTECTION (87B) 13.2KV RP6	•	•			
STD-18257-E-707	DC ELEMENTARY DIAGRAM 13.2KV BUS DIFFERENTIAL PROTECTION (87B) 13.2KV RP6	•	•			
STD-18257-E-708	DC ELEMENTARY DIAGRAM DPAC-2 RP6	•	•			
STD-18257-E-709	DC ELEMENTARY DIAGRAM DPAC-6 13.2KV GIS CUBICAL D-110	•	•			
STD-18257-E-710	RELAY PANEL 5 WIRING DIAGRAM	•	•			
STD-18257-E-711	RELAY PANEL 6 WIRING DIAGRAM	•	•			

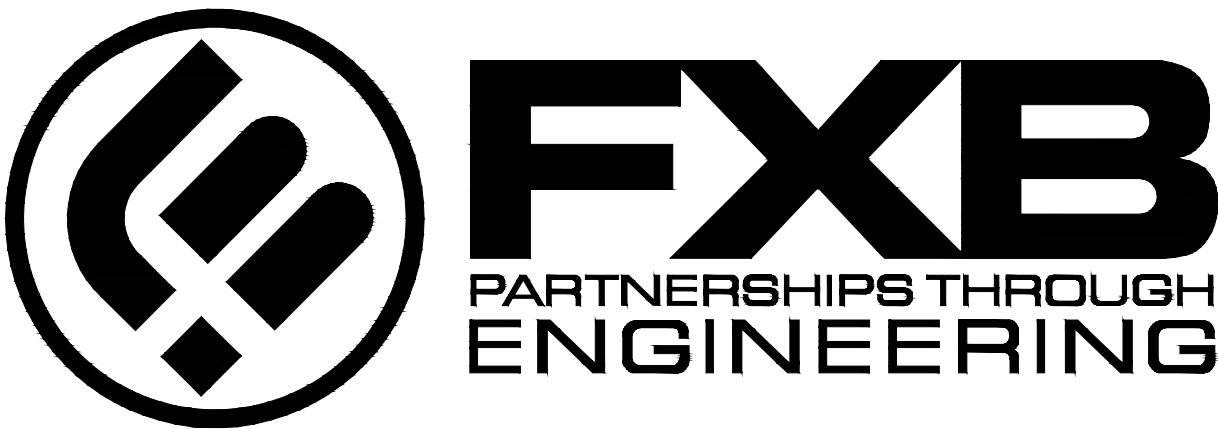
LOCATION MAP



SCOPE OF WORK

- FURNISH & INSTALL A NEW 13.2KV GAS INSULATED SWITCHGEAR (GIS) CONSISTING OF AN INCOMING MAIN AND FOUR FEEDER BREAKERS.
- PROVIDE FACTORY ACCEPTANCE TESTING OF THE NEW 13.2KV GIS
- FURNISH & INSTALL EX-HAUST PLENUM THROUGH THE EXIST GIS BUILDING
- PROVIDE STARTUP, TESTING & COMMISSIONING OF THE NEW 13.2KV GIS
- FURNISH & INSTALL AN ELEVATED PLATFORM FOR THE NEW 13.2KV GIS. THE PLATFORM SHALL BE SIMILAR TO THE 34.5KV GIS PLATFORM THAT IS BEING CONSTRUCTED UNDER PHASE 1. THE PLATFORM SHALL BE A "DELEGATED DESIGN". THE GIS PLATFORM SHALL BE DESIGNED BY A LICENSED PROFESSIONAL STRUCTURAL ENGINEER RETAINED BY THE GIS VENDOR. THE GIS VENDOR SHALL SHALL PROVIDE SIGNED& SEALED SHOP DRAWINGS FOR REVIEW & APPROVAL
- FURNISH & INSTALL 15KV CABLES AS FOLLOWS:
  - 3 SETS EACH OF 3 -1/C #750 KCMIL, 15KV CABLE, IN 3 EX ISTING 6" PVC/RGS CONDUITS FROM EXISTING POWER TRANSFORMER T-D1 TO INCOMING MAIN BREAKER D-110
  - 1 SET OF 3 - 1/C #750 KCMIL, 15KV CABLE, IN 1 - EXISTING 6" PVC CONDUIT FROM FEEDER BREAKER D-RR TO THE EXISTING RIDGE ROAD RISER POLE LOCATED ACROSS THE STREET. CONDUIT RISER ON POLE SHALL BE NEW.
  - 1 SET OF 3 - 1/C #750 KCMIL, 15KV CABLE, IN 1 - EXISTING 6" PVC CONDUIT FROM FEEDER BREAKER D-F9 TO THE EXISTING FEEDER 90 RISER POLE LOCATED INSIDE THE SUBSTATION FENCED AREA. CONDUIT RISER ON POLE SHALL BE NEW.
  - 1 SET OF 3 - 1/C #750 KCMIL, 15KV CABLE, IN 1 - EXISTING 6" PVC CONDUIT FROM FEEDER BREAKER D-F7 TO THE EXISTING FEEDER 70 RISER POLE LOCATED NEAR MANHOLE #4A. CONDUIT RISER ON POLE SHALL BE NEW.
- TEST 15KV CABLES
- FURNISH & INSTALL TWO 13.2KV RELAY PANELS (RPS AND RP6) TO BE LOCATED IN THE EXISTING NEWLY CONSTRUCTED CONTROL BUILDING. BOLT RELAY PANELS TO THE FLOOR SLAB.
- FURNISH & INSTALL RELAYS, METERS, LOCKOUTS, REMOTE BREAKER CONTROL SWITCHES, DPAC, TEST SWITCHES, TEST BL OCKS, FUSES, TERMINAL BLOCKS, ETC.
- FURNISH & INSTALL ALL PROTECTION & SCADA CABLES IN EXISTING RACEWAYS BETWEEN THE EXISTING GIS BUILDING AND THE CONTROL BUILDING AND IN THE EXISTING CABLE TRAY WITHIN THE CONTROL BUILDING
- PROVIDE TESTING & COMMISSIONING OF THE NEW 13.2KV RELAYS & METERS
- FURNISH & INSTALL 120 VOLT AC POWER IN EXISTING RACEWAYS TO THE GIS AND THE TWO RELAY PANELS
- FURNISH & INSTALL LIGHTS UNDER THE 13.2KV GIS PLATFORM

ENGINEER:

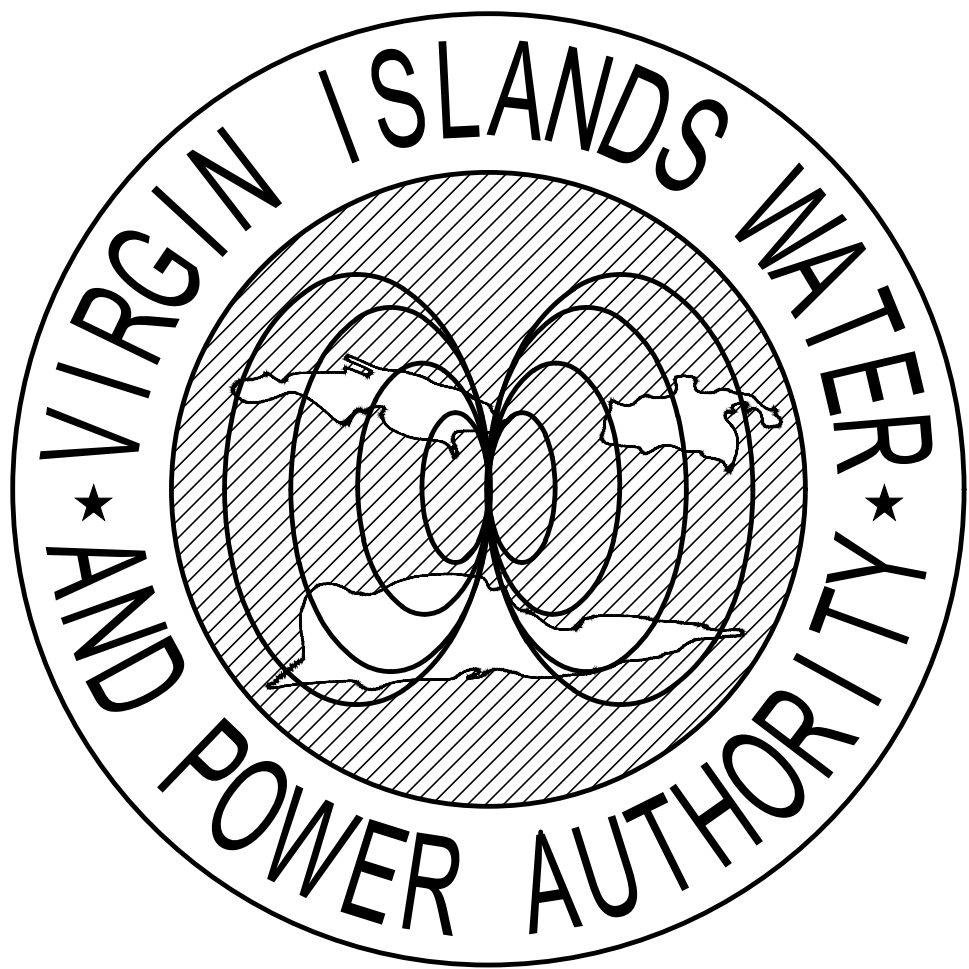


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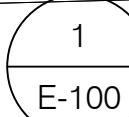
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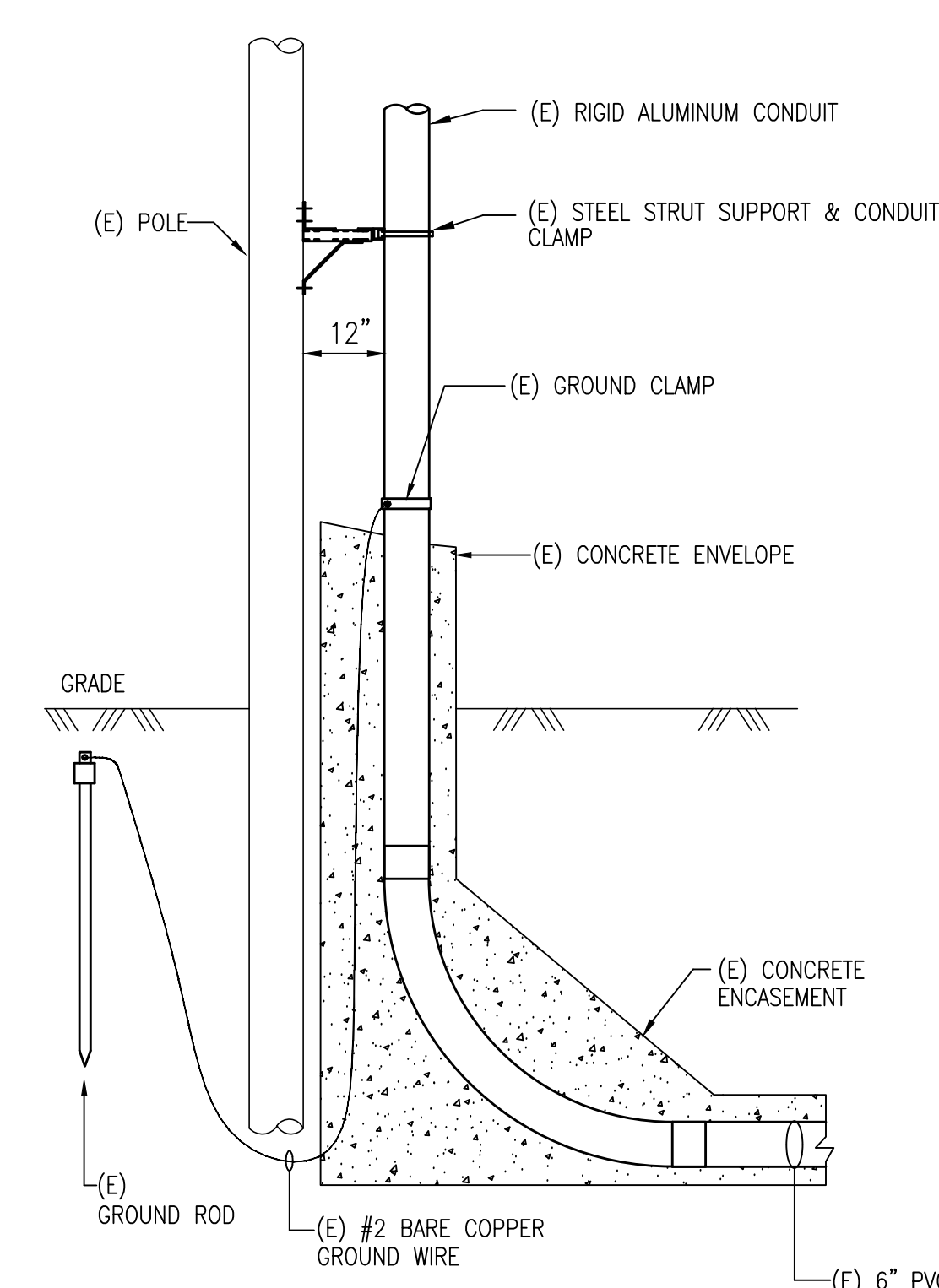






## SUBSTATION UNDERGROUND DUCT BANK PLAN

SCALE: 1" = 10'-0"



FEEDER RR,7D,9D RISER  
POLE BASE DETAIL  
NOT TO SCALE

NOTE: RISER CONDUITS ARE EXISTING. CONTRACTOR SHALL PULL NEW CABLES AND TERMINATE AT RISER POLE IN ACCORDANCE WITH VIWAPA STANDARDS. COORDINATE WITH VIWAPA, "MOP REQUIRED."

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Client



Virgin Islands  
Water and Power  
Authority  
U.S. Virgin Islands

Project Name:

East End Substation  
Restoration &  
Expansion Project  
St. Thomas, USVI  
Phase 2

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Drawn By:	P.
Chkd By:	P.
Date:	10.17.
Scale:	As Noted
Project Number:	VIT 182

Drawing Title:

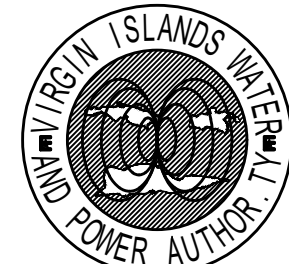
SUBSTATION  
UNDERGROUND  
POWER DUCT BANK  
PLAN

Drawing Number

STD-18257-E-100

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Client:



*Virgin Islands*  
**Water and Power**  
*Authority*  
**U.S. Virgin Islands**

Project Name:

East End Substation  
Restoration &  
Expansion Project  
St. Thomas, USVI  
Phase 2

Issue / Revision:

#	Date	Description
A	07.25.19	Issue for Phase 2 Bid Review
0	10.17.19	Issue for Phase 2 Bid
1	12.03.19	Issue for Phase 2 Bid

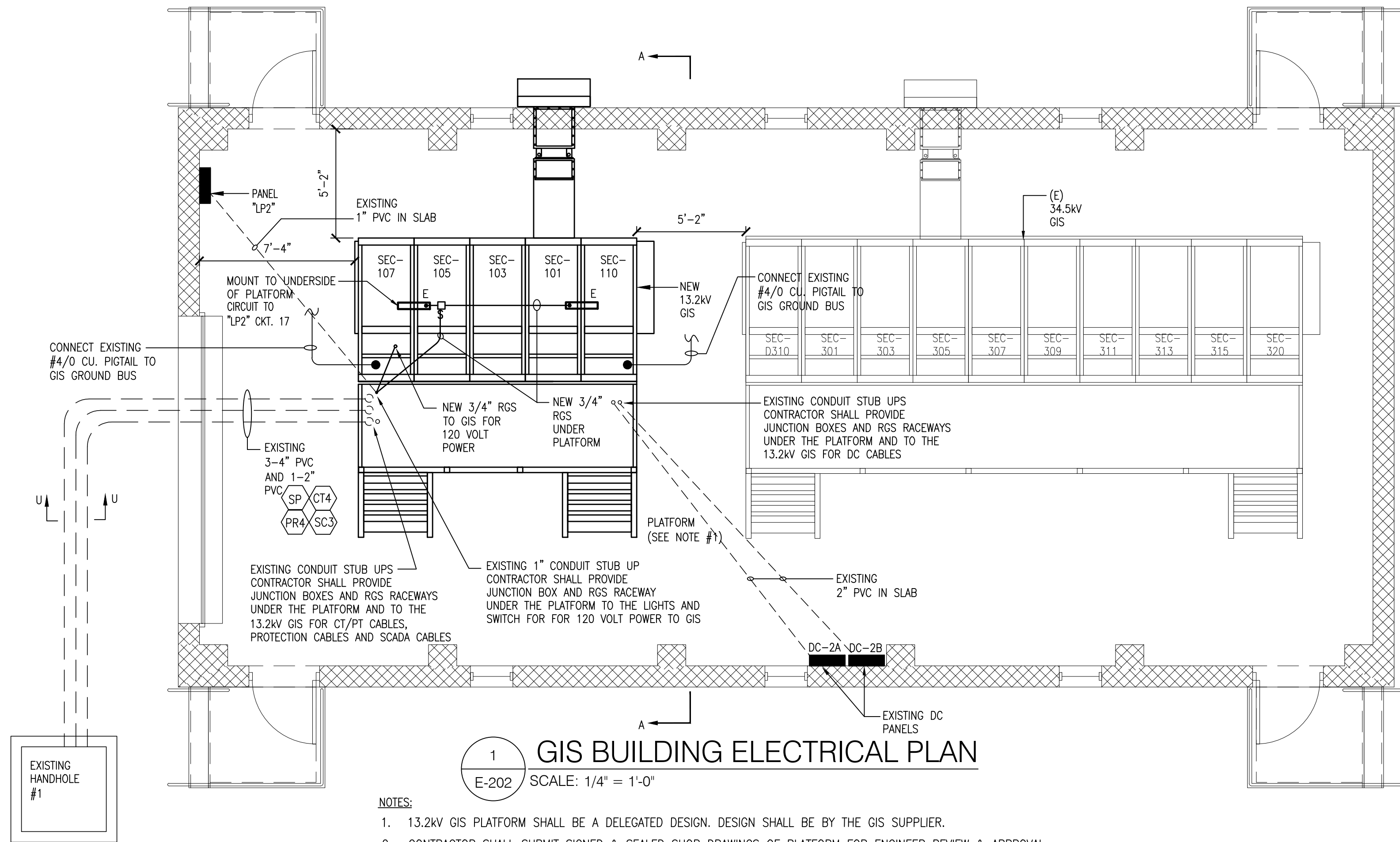
Drawn By: PJB  
Checked By: PJB  
Date: 12.03.19  
Scale: As Noted  
Project Number: VIT 18257  
Drawing Title:

GIS BUILDING ELECTRICAL  
PLAN & SCHEDULES

Drawing Number:

STD-18257-E-202

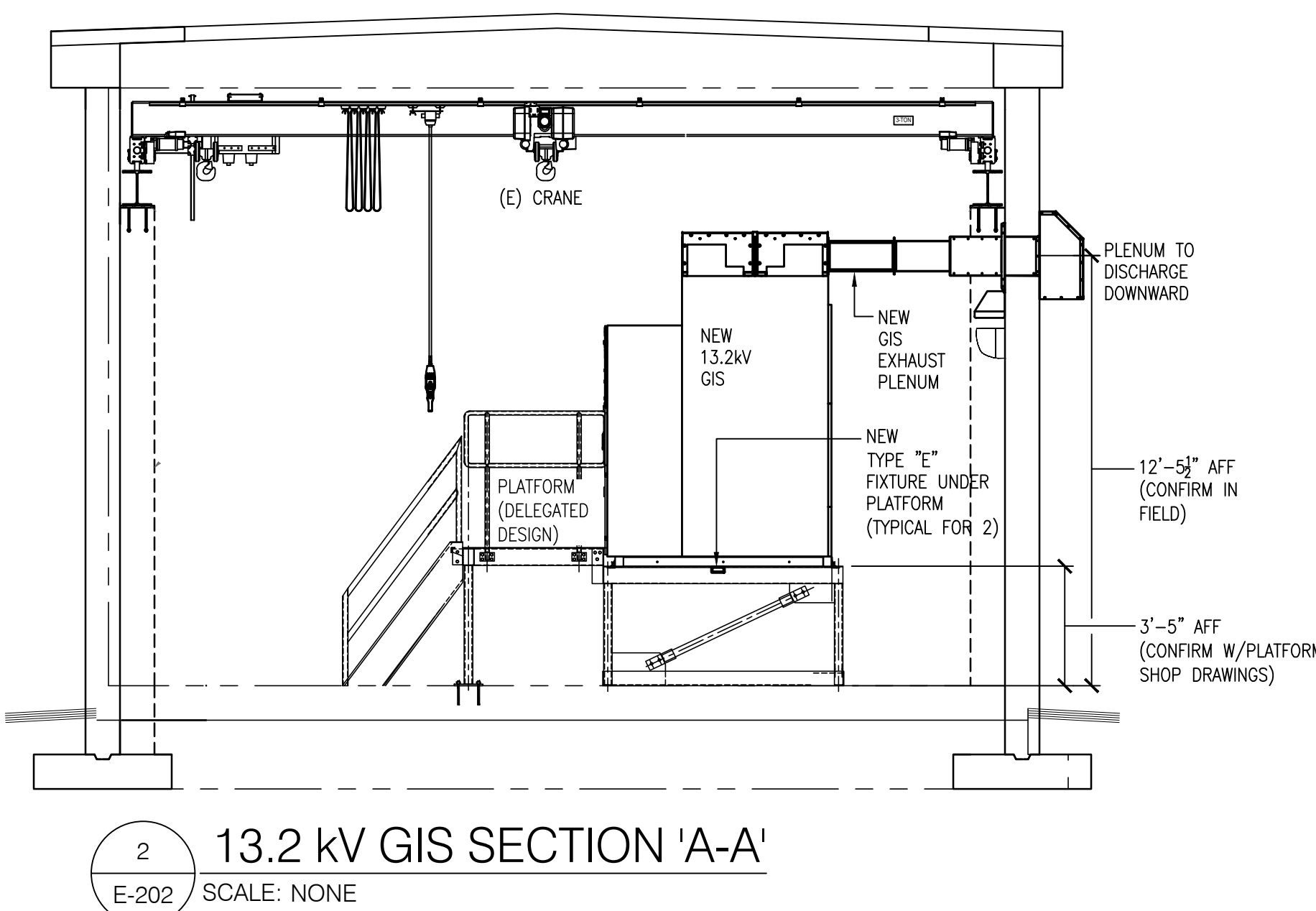
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NOTES:

- 13.2kV GIS PLATFORM SHALL BE A DELEGATED DESIGN. DESIGN SHALL BE BY THE GIS SUPPLIER.
- CONTRACTOR SHALL SUBMIT SIGNED & SEALED SHOP DRAWINGS OF PLATFORM FOR ENGINEER REVIEW & APPROVAL.
- FURNISH & INSTALL ONE (1) SEL 2440 DPAC IN SECTION 110 FOR SCADA WIRING
- FOR EACH BREAKER, MONITOR THE FOLLOWING POINTS VIA THE SEL 2440 DPAC:

TRIP COIL MONITOR 1  
TRIP COIL MONITOR 2  
43 LOCAL/SUPERVISORY SWITCH STATUS  
SF6 GAS ALARM



2 13.2 kV GIS SECTION 'A-A'  
E-202 SCALE: NONE

### MEDIUM VOLTAGE TERMINATION SCHEDULE

ITEM	QUANTITY	DESCRIPTION	DESCRIPTION	INSTALLED BY	FURNISHED BY
①	9	15kV CABLE TERMINATION KIT, CABLE SIZE #750 KCMIL CU., 133% EPR INSULATION, 1/3 CONCENTRIC NEUTRAL CABLE (SEE APPROVED CABLE DATA SHEET), WITH MOUNTING BRACKET	TERMINATION AT POWER TRANSFORMER D-T1 13.2kV AIR TERMINAL CHAMBER	E.C.	E.C.
②	9	15kV CABLE TERMINATION KIT, CABLE SIZE #750 KCMIL CU., 133% EPR INSULATION, 1/3 CONCENTRIC NEUTRAL CABLE (SEE APPROVED CABLE DATA SHEET), WITH MOUNTING BRACKET	TERMINATION AT RISER POLES	E.C.	E.C.
③	21	SEPARABLE CONNECTOR FOR TERMINATION IN 13.2kV GIS	TERMINATIONS @ GIS	E.C.	GIS MANUFACTURER
④	9	CABLE FAULT INDICATOR, SELF POWERED, LOCAL LED INDICATION WITH AUTOMATIC RESET,	FAULT INDICATOR	E.C.	E.C.

NOTE: EQUIPMENT SHALL BE AS SPECIFIED ABOVE OR APPROVED EQUAL.

### MEDIUM VOLTAGE RACEWAY SCHEDULE

MEDIUM VOLTAGE RACEWAY SCHEDULE													
TAG	FROM	TO	CABLES / CONDUCTORS PER CONDUIT						CONDUIT			PURPOSE	
			VOLTAGE	PHASE	NEUTRAL	GROUND	INSULATION	TEMP/ RATING	QUANTITY	SIZE	TYPE		
①	TRANSFORMER D-T1	13.2kV BREAKER D-110	15kV	3-1/C	#750 KCMIL CU.	1/3 CONCENTRIC	N/A	133% EPR	MV105	3	6"	(E) SCHEDULE 40 PVC	13.2kV GIS FEEDER
②	13.2kV BREAKER D-101	13.2kV RISER POLE FOR RIDGE ROAD	15kV	3-1/C	#750 KCMIL CU.	1/3 CONCENTRIC	N/A	133% EPR	MV105	1	6"	(E) SCHEDULE 40 PVC	FEEDER RIDGE ROAD
③	13.2kV BREAKER D-103	13.2kV RISER POLE FOR FEEDER 9D	15kV	3-1/C	#750 KCMIL CU.	1/3 CONCENTRIC	N/A	133% EPR	MV105	1	6"	(E) SCHEDULE 40 PVC	FEEDER 9D
④	13.2kV BREAKER D-105	13.2kV RISER POLE FOR FEEDER 7D	15kV	3-1/C	#750 KCMIL CU.	1/3 CONCENTRIC	N/A	133% EPR	MV105	1	6"	(E) SCHEDULE 40 PVC	FEEDER 7D

NOTE: MEDIUM VOLTAGE CABLE IS SUPPLIED BY VIMPA & RECEIVED, TESTED AND INSTALLED BY CONTRACTOR

### PROTECTION & CONTROL RACEWAY SCHEDULE

TAG	FROM	TO	CONDUCTOR IDENTIFICATION PER CONDUIT	CONDUIT			PURPOSE
				QUANTITY	SIZE	TYPE	
PR4	CONTROL BUILDING EXTERIOR PULL BOX	GIS BUILDING (13.2kV GIS)	SEE CABLE SCHEDULE	1	4"	PVC	PROTECTION
CT4	CONTROL BUILDING EXTERIOR PULL BOX	GIS BUILDING (13.2kV GIS)	SEE CABLE SCHEDULE	1	4"	PVC	PROTECTION CT'S
SC3	CONTROL BUILDING EXTERIOR PULL BOX	GIS BUILDING (13.2kV GIS)	SEE CABLE SCHEDULE	1	2"	PVC	SCADA CABLES TO 13.2kV GIS

NOTE: CONDUITS ARE EXISTING TO REMAIN.

### LIGHTING FIXTURE SCHEDULE

TYPE	LAMPS		MOUNTING	VOLTAGE	DESCRIPTION
	NO.	WATTS			
E	1	19	LED	120	2'-0" LED STRIP LIGHT MOUNTED TO UNDERSIDE OF GIS PLATFORM

(E) PANEL SCHEDULE "DC-1A" VOLTS: RATED @ 250 VDC LOCATION: CONTROL BUILDING SHORT CIRCUIT RATING: 10 KAIC MIN.  
AMPS: 100A MLO MOUNTING: SURFACE

CIR. NO.	DESCRIPTION	WIRE SIZE	FUSE AMPS	POLES	FUSE AMPS	POLES	WIRE SIZE	DESCRIPTION	CIR. NO.
1	87L/L3-OB00 POWER SUPPLY (RELAY PANEL 7)	#12	20	2	20	2	#12	DPAC-1 POWER SUPPLY (RELAY PANEL 1)	2
3	87L/L3-OC00 POWER SUPPLY (RELAY PANEL 7)	#12	20	2	20	2	#12	DPAC-2 POWER SUPPLY (RELAY PANEL 6)	4
5	87L/L3-OD0E1 POWER SUPPLY (RELAY PANEL 8)	#12	20	2	20	2	#12	87B 34.5kV BUS 1/2 POWER SUPPLY (RELAY PANEL 9)	6
7	87L/L3-OD0E2 POWER SUPPLY (RELAY PANEL 8)	#12	20	2	20	2	#12	67 LS/D-T2 & METER POWER SUPPLY (RELAY PANEL 10)	8
9	67 LS / D-T1 & METER D-110 POWER SUPPLY (RELAY PANEL 5)	#12	20	2	20	2	#12	87T/D-T1 & 86T POWER SUPPLY (RELAY PANEL 11)	10
11	67/D-FRR & METER D-101 POWER SUPPLY (RELAY PANEL 5)	#12	20	2	20	2	#12	67/D-F9 & METER D-103 POWER SUPPLY (RELAY PANEL 5)	12
13	67/SPARE & METER D-107 POWER SUPPLY (RELAY PANEL 6)	#12	20	2	20	2	#12	67/D-F7 & METER D-105 POWER SUPPLY (RELAY PANEL 6)	14
15	SCADA EQUIPMENT POWER SUPPLY	#12	20	2	20	2	#12	87B & 86B (13.2KV) POWER SUPPLY (RELAY PANEL 6)	16
17	SPARE		20	2	20	2		SPARE	18
19	SPARE		20	2	20	2		SPARE	20
21	SPARE		20	2	20	2		SPARE	22
23	SPARE		20	2	20	2		SPARE	24
25	SPARE		20	2	20	2		SPARE	26
27	SPARE		20	2	20	2		SPARE	28
29	SPARE		20	2	20	2		SPARE	30

NOTE: PANEL AND ALL CIRCUIT BREAKERS ARE EXISTING TO REMAIN.

(E) PANEL SCHEDULE "DC-2A" VOLTS: RATED @ 250 VDC LOCATION: GIS BUILDING SHORT CIRCUIT RATING: 10 KAIC MIN.  
AMPS: 100A MCB MOUNTING: SURFACE

CIR. NO.	DESCRIPTION	WIRE SIZE	FUSE AMPS	POLES	FUSE AMPS	POLES	WIRE SIZE	DESCRIPTION	CIR. NO.
1	BREAKER D-110 TC1 & CLOSE COIL	#12	20	2	20	2	#12	BREAKER D-310 TC1 & CLOSE COIL	2
3	BREAKER D-101 TC1 & CLOSE COIL	#12	20	2	20	2	#12	BREAKER D-301 TC1 & CLOSE COIL	4
5	BREAKER D-103 TC1 & CLOSE COIL	#12	20	2	20	2	#12	BREAKER D-303 TC1 & CLOSE COIL	6
7	BREAKER D-105 TC1 & CLOSE COIL	#12	20	2	20	2	#12	BREAKER D-305 TC1 & CLOSE COIL	8
9	BREAKER D-107 TC1 & CLOSE COIL	#12	20	2	20	2	#12	BREAKER D-307 TC1 & CLOSE COIL	10
11	DPAC-4 POWER SUPPLY (34.5kV GIS)	#12	20	2	20	2	#12	BREAKER D-309 TC1 & CLOSE COIL	12
13	DPAC-6 POWER SUPPLY (13.5kV GIS)	#12	20	2	20	2	#12	BREAKER D-311 TC1 & CLOSE COIL	14
15	SPARE		20	2	20	2	#12	BREAKER D-313 TC1 & CLOSE COIL	16
17	SPARE		20	2	20	2	#12	BREAKER D-315 TC1 & CLOSE COIL	18
19	MAIN		100	2	20	2	#12	BREAKER D-320 TC1 & CLOSE COIL	20

NOTE: PANEL AND ALL CIRCUIT BREAKERS ARE EXISTING TO REMAIN.

(E) PANEL SCHEDULE "DC-2B" VOLTS: RATED @ 250 VDC LOCATION: GIS BUILDING SHORT CIRCUIT RATING: 10 KAIC MIN.  
AMPS: 100A MCB MOUNTING: SURFACE

CIR. NO.	DESCRIPTION	WIRE SIZE	FUSE AMPS	POLES	FUSE AMPS	POLES	WIRE SIZE	DESCRIPTION	CIR. NO.
1	BREAKER D-110 TC2	#12	20	2	20	2	#12	BREAKER D-310 TC2	2
3	BREAKER D-101 TC2	#12	20	2	20	2	#12	BREAKER D-301 TC2	4
5	BREAKER D-103 TC2	#12	20	2	20	2	#12	BREAKER D-303 TC2	6
7	BREAKER D-105 TC2	#12	20	2	20	2	#12	BREAKER D-305 TC2	8
9	BREAKER D-107 TC2	#12	20	2	20	2	#12	BREAKER D-307 TC2	10
11	DPAC-5 POWER SUPPLY (34.5kV GIS)	#12	20	2	20	2	#12	BREAKER D-309 TC2	12
13	SPARE	#12	20	2	20	2	#12	BREAKER D-311 TC2	14
15	SPARE		20	2	20	2	#12	BREAKER D-313 TC2	16
17	SPARE		20	2	20	2	#12	BREAKER D-315 TC2	18
19	MAIN		100	2	20	2	#12	BREAKER D-320 TC2	20

NOTE: PANEL AND ALL CIRCUIT BREAKERS ARE EXISTING TO REMAIN.



Engineers Seal

Client:



**Virgin Islands  
Water and Power  
Authority  
U.S. Virgin Islands**

Project Name:

**East End Substation  
Restoration &  
Expansion Project  
St. Thomas, USVI  
Phase 1 and 2**

Issue / Revision:

#	Date	Description
A	05.31.19	Issue for VMAPA Review
B	08.08.19	Issue for final review of 13.2kV GIS
C	08.19.19	Revised per 08/19/19 meeting
D	10.17.19	Issue for Phase 2 Bid

Drawn By:

PJB

Checked By:

PJB

Date:

08.19.19

Scale:

As Noted

Project Number:

VIT 18257

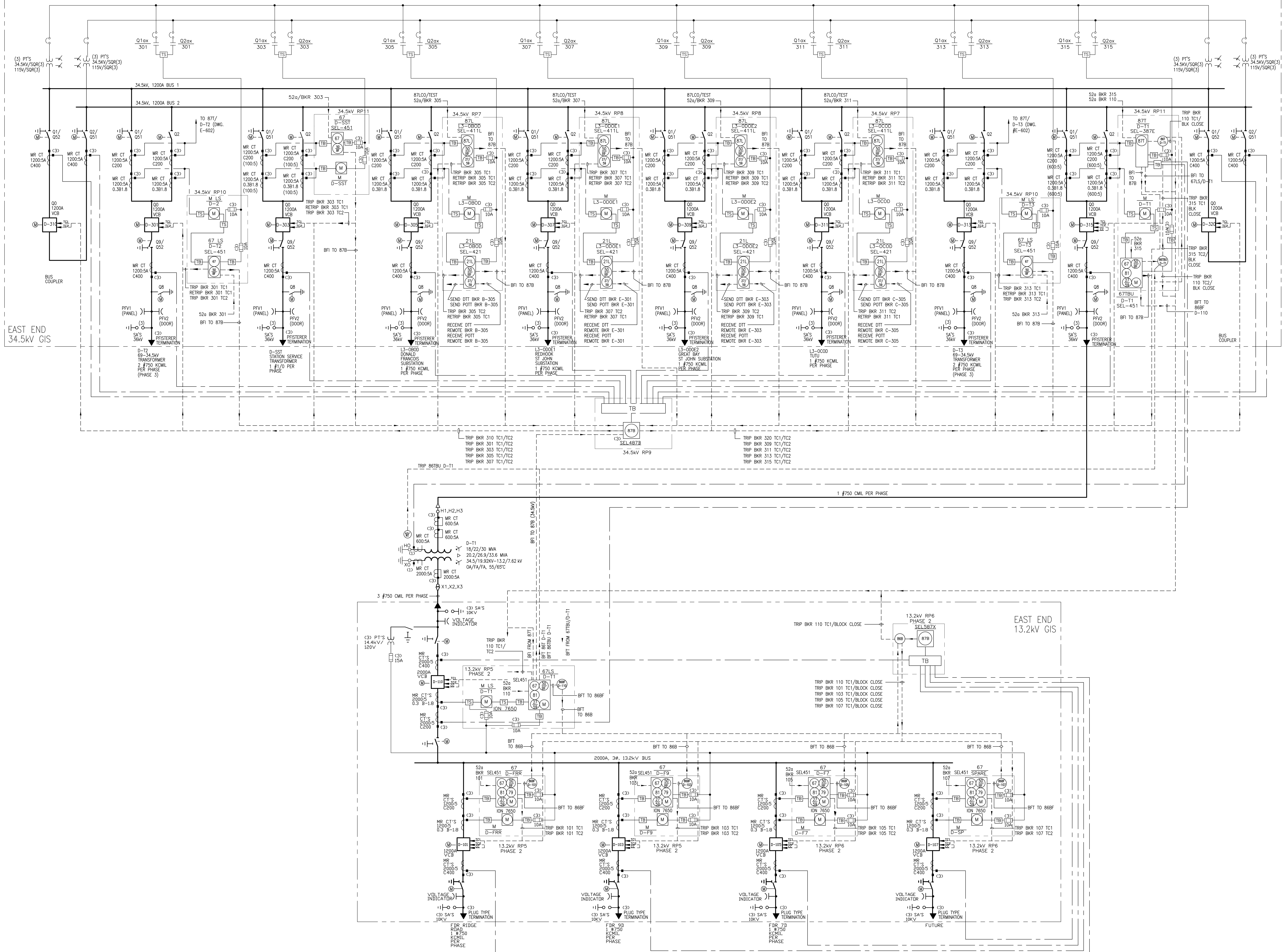
Drawing Title:

**34.5/13.2kV  
SUBSTATION  
ONE LINE DIAGRAM**

Drawing Number:

**STD-18257-E-600**

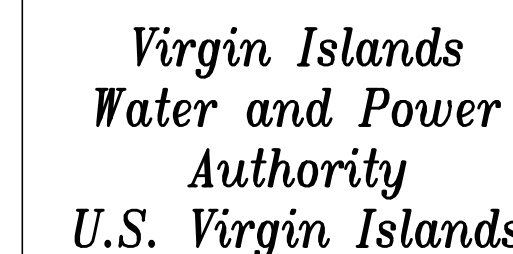
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Project Name

East End Substation  
Restoration &  
Expansion Project  
St. Thomas, USVI  
PHASE 2

Issue / Revisions

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Chkd By:

Date: \_\_\_\_\_

Scale:

Project Number:	As Not
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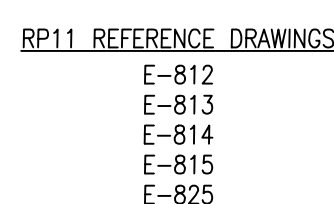
RELAY PANEL  
ELEVATIONS  
RP1 THRU RP11, SCADA /  
COMMUNICATIONS  
PANEL

Drawing Number

STD-18257-E-603

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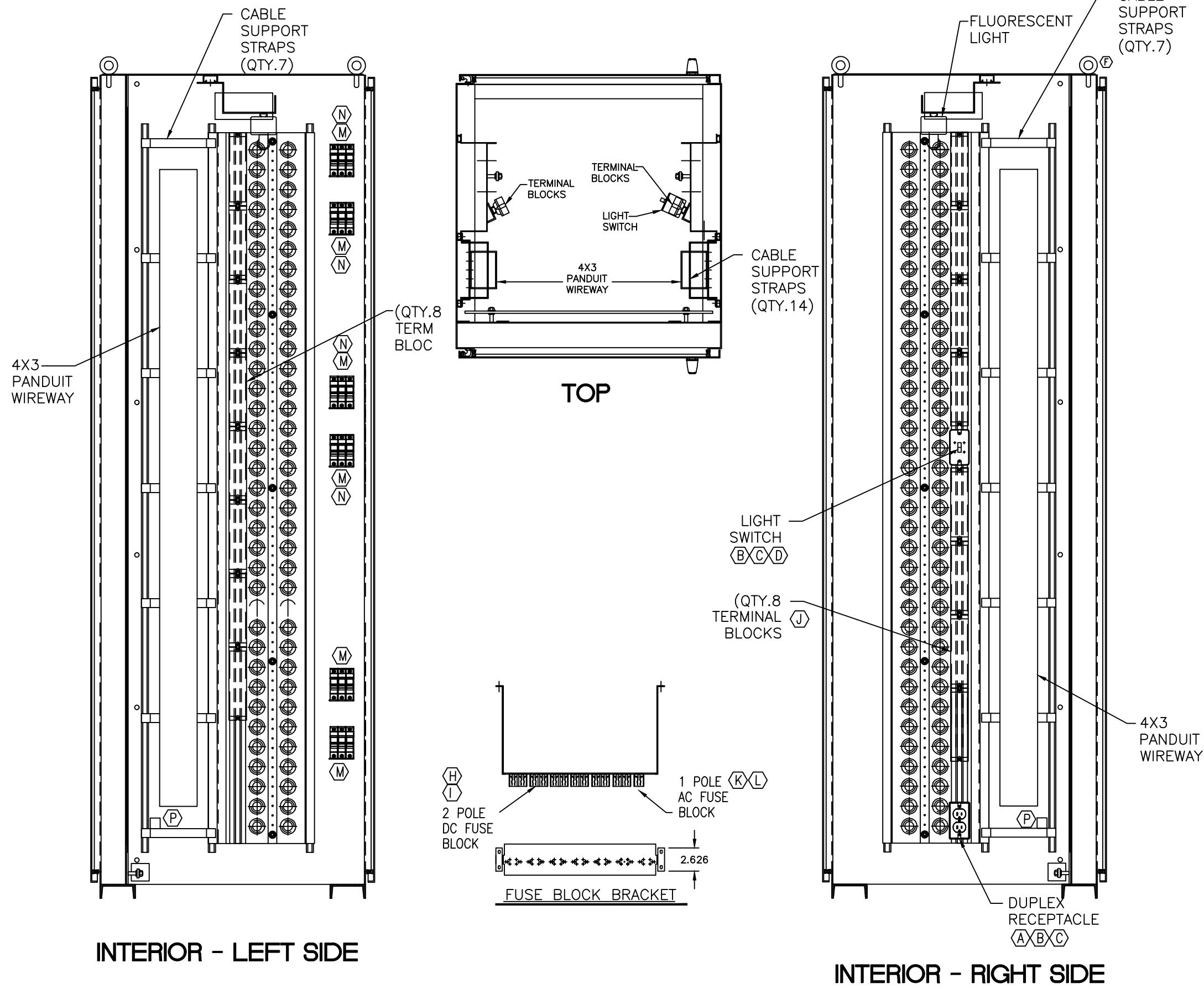
PHASE 2 13.2KV  
SCOPE OF WORK

## RELAY PANEL ELEVATION

## RP-1 THRU RP-11 & COMMUNICATIONS PANEL

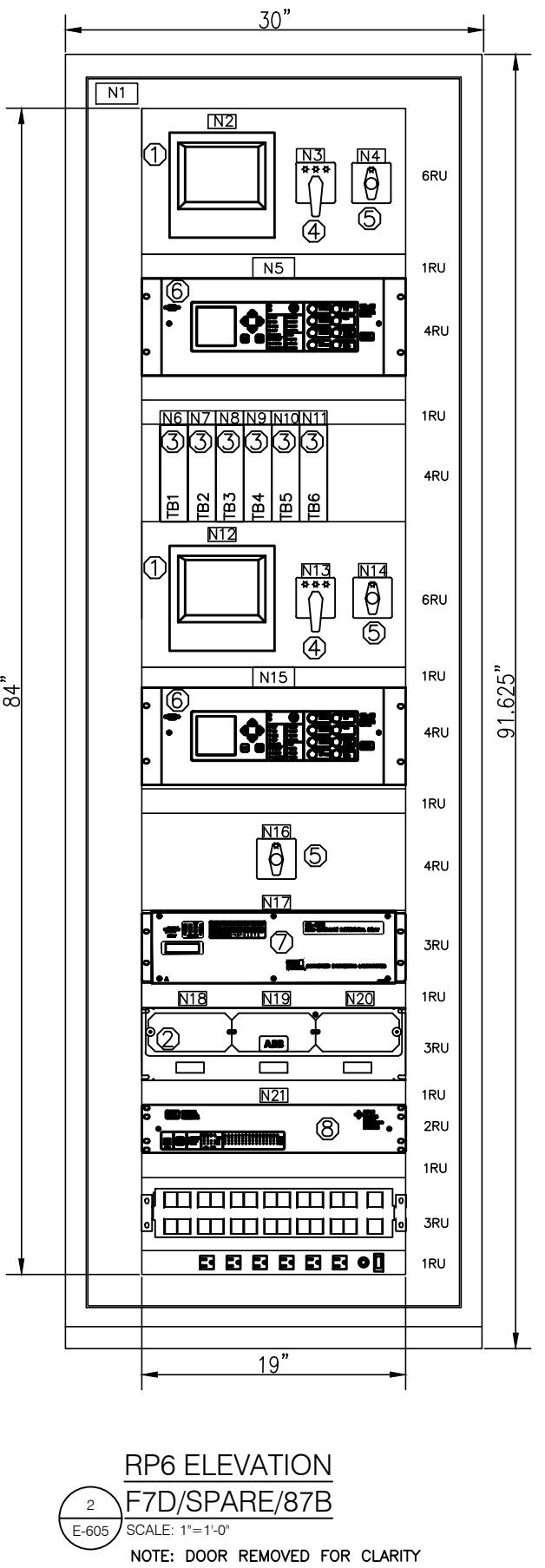
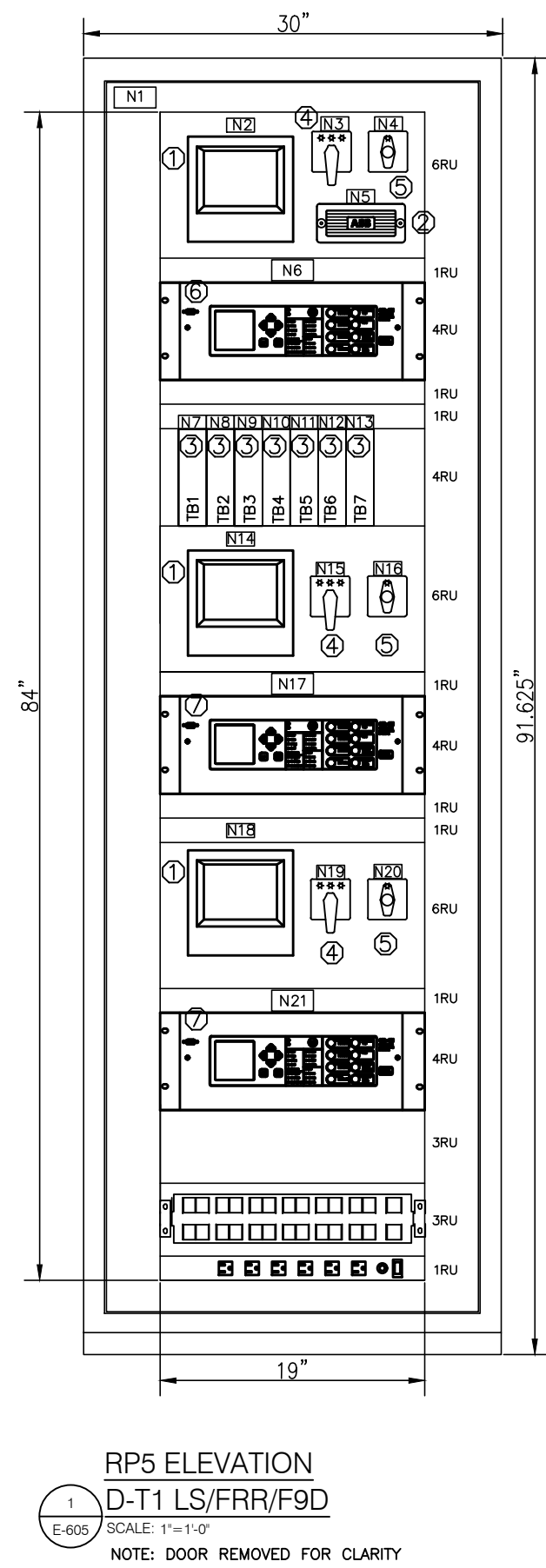
SCALE: 1"=1'-0"

NOTE: DOOR REMOVED FOR CLARITY



BILL OF MATERIALS				
DEVICE	STYLE NUMBER	QTY	MFR	DESCRIPTION
(A)	CR15	1	HUBBELL	DUPLEX RECEPTACLE, 3-WIRE GROUNDING, 15A, 125 VOLT
(B)	QB0001	2	T&B	HANDY BOX, DRAWN, GALVANIZED, 2 X 4, 1-7/8 DEPTH, WITH 1/2" KNOCKOUTS.
(C)		2	HUBBELL	SWITCH OR DUPLEX COVER PLATE
(D)	CS115	1	HUBBELL	SWITCH, SINGLE POLE, 15A, 120/277 VOLTS.
(E)		1		18" FLOURESCENT OR LED LIGHT FIXTURE, WITH LAMP
(F)		4		EYE BOLTS
(G)	BTC3104	2	T&B	MECHANICAL GROUNDING LUG #4-3/0 AWG.
(H)	F30A2S	6	MARATHON	FUSE BLK, 2-POLE, 30 AMP, 250 VOLT, CLASS H
(I)	NON10	12	BUSSMAN	FUSE, TYPE NON, ONE-TIME, CLASS H, 10A.
(J)	EB25B12	16	G.E.	TERMINAL BLOCK, TYPE EB-25, 1-PIECE, 12-CIRCUIT, 600-V, 30-A, WITH WASHER-HEAD SCREWS AND WHITE MARKING STRIP.
(K)	F30A1S	1	MARATHON	FUSE BLK, 1-POLE, 30AMP, 250 VOLT, CLASS H
(L)	NON10	1	BUSSMAN	FUSE, TYPE NON, ONE-TIME, CLASS H, 10A
(M)	CHM3D	6	BUSSMAN	AC FUSE HOLDER
(N)	NON05	18	BUSSMAN	FUSES, 5 AMP
(P)	DRS-1215	1	TRIPPLITE	RACKMOUNT ECONOMY SURGE SUPPRESSOR 14 OUTLET (6 FRONT/8 BACK)

- NOTES:**
- ALL DIMENSIONS ARE IN INCHES.
  - PANELS SHALL BE FABRICATED FROM 11 GA CRS.
  - PANELS TO BE BRACED AS REQUIRED TO INSURE A SMOOTH AND LEVEL SURFACE. ALL EXPOSED WELDS TO BE GROUND SMOOTH.
  - INTERIOR FINISH TO BE - HIGH GLOSS WHITE  
EXTERIOR FINISH TO BE - ANSI 61 GLOSS GRAY
  - BILL OF MATERIAL LIST IS TYPICAL FOR 2 13.2KV RELAY PANELS



## BILL OF MATERIALS

ITEM	DESCRIPTION	QTY	MANUFACT.	CATALOG No.
①	POWER METER	3	ION (SCHNEIDER)	M7650 AOC0B6F1A0A
②	TEST SWITCH (FT-1)	2	ABB	F 129A528G01 (CODE 26)
③	TEST BLOCK	7	AREVA	MMLG01
④	CB CONTROL SWITCH, 6 DECKS, TRIP/CLOSE & PULL TO LOCK, WITH TRIP COIL MONITOR	3	ELECTROSWITCH	24PD58D
⑤	LOCKOUT RELAY (MANUAL RESET), 4 DECKS, W/TRIP COIL MONITOR & FAULT INDICATOR	3	ELECTROSWITCH	78P B GXR X 04 D
⑥	TRANSFORMER FEEDER PROTECTION RELAY	1	SEL	04515625XC0X4H224XX2X W/ HARNESS WA04510BC2A
⑦	FEEDER PROTECTION RELAY	2	SEL	04515625XC0X4H224XX2X W/ HARNESS WA04510BC2A

2 ELECTROSWITCH

## NAMEPLATE SCHEDULE

NO.	FIRST LINE	SECOND LINE	SIZE	TEXT
N1	RP5 13.2KV		3" X 1-1 1/2"	5/16"
N2	M-D-110		2" X 1"	3/16"
N3	CB-D-110		2" X 1"	3/16"
N4	86BF D-110		2" X 1"	3/16"
N5	TS1 M-D-110		2" X 1"	3/16"
N6	67LS	D-T1	3" X 1-1 1/2"	3/16"
N7	TB1-67 DT1		2" X 1"	3/16"
N8	TB2-67 DT1		2" X 1"	3/16"
N9	TB3-67 DT1		2" X 1"	3/16"
N10	TB4-67 FRR		2" X 1"	3/16"
N11	TB5-67 FRR		2" X 1"	3/16"
N12	TB6-67 F9D		2" X 1"	3/16"
N13	TB7-67 F9D		2" X 1"	3/16"
N14	M-D-101		2" X 1"	3/16"
N15	CB-D-101		2" X 1"	3/16"
N16	86BF D-101		2" X 1"	3/16"
N17	67	D-FRR	3" X 1-1 1/2"	3/16"
N18	M-D-103		2" X 1"	3/16"
N19	CB-D-103		2" X 1"	3/16"
N20	86BF D-103		2" X 1"	3/16"
N21	67	D-F9	3" X 1-1 1/2"	3/16"

## BILL OF MATERIALS

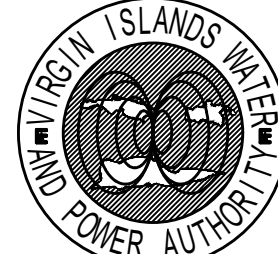
ITEM	DESCRIPTION	QTY	MANUFACT.	CATALOG No.
①	POWER METER	2	ION (SCHNEIDER)	M7650 AOC0B6F1A0A
②	TEST SWITCH (FT-19) NO. OF POLES 10+10+10 ARRANGEMENT POSITION A: P C-C P C-C P C-C P POSITION B: P C-C P C-C P C-C P POSITION C: P C-C P C-C P C-C P COVER: FULL CLEAR TERMINALS: SCREW TERMINALS	1	ABB	TBD
③	TEST BLOCK	6	AREVA	MMLG01
④	CB CONTROL SWITCH, 6 DECKS, TRIP/CLOSE & PULL TO LOCK, WITH TRIP COIL MONITOR	2	ELECTROSWITCH	24PD58D
⑤	LOCKOUT RELAY (MANUAL RESET), 4 DECKS, W/TRIP COIL MONITOR & FAULT INDICATOR	3	ELECTROSWITCH	78P B GXR X 04 D
⑥	FEEDER PROTECTION RELAY	2	SEL	04515625XC0X4H224XX2X W/ HARNESS WA04510BC2A
⑦	THREE PHASE BUS DIFFERENTIAL RELAY	1	SEL	0587Z0X625H2ZXX
⑧	DPAC CONTROLLER	1	SEL	24402H12A1A11631

## NAMEPLATE SCHEDULE

NO.	FIRST LINE	SECOND LINE	SIZE	TEXT
N1	RP6 13.2KV		3" X 1-1 1/2"	5/16"
N2	M-D-105		2" X 1"	3/16"
N3	CB-D-105		2" X 1"	3/16"
N4	86BF D-105		2" X 1"	3/16"
N5	67	D-F7	3" X 1-1 1/2"	3/16"
N6	TB1-67 D-F7		2" X 1"	3/16"
N7	TB2-67 D-F7		2" X 1"	3/16"
N8	TB3-67 SPARE		2" X 1"	3/16"
N9	TB4-67 SPARE		2" X 1"	3/16"
N10	TB5-86B			
N11	TB6-86B		2" X 1"	3/16"
N12	M-D-107		2" X 1"	3/16"
N13	CB-D-107		2" X 1"	3/16"
N14	86BF D-107		2" X 1"	3/16"
N15	67	SPARE	3" X 1-1 1/2"	3/16"
N16	86B	13.2KV BUS	3" X 1-1 1/2"	3/16"
N17	87B	13.2KV BUS	3" X 1-1 1/2"	3/16"
N18	TS1-87B		2" X 1"	3/16"
N19	TS2-87B		2" X 1"	3/16"
N20	TS3-SPARE		2" X 1"	3/16"
N21	DPAC-2		2" X 1"	3/16"

Seal:

Client:



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Water and Power  
Authority  
U.S. Virgin Islands*

Project Name:

East End Substation  
Restoration &  
Expansion Project  
St. Thomas, USVI  
PHASE 2

Issue / Revisions:

#	Date	Description
0	10/17/19	Issue for Phase 2 Bid
1	12/03/19	Issue for Phase 2 Bid

Drawn By: PJB  
Checked By: PJB  
Date: 12.03.19  
Scale: As Noted  
Project Number: VIT 18257  
Drawing Title:

13.2KV RELAY PANEL  
ELEVATIONS  
&  
BILL OF MATERIALS

Drawing Number:

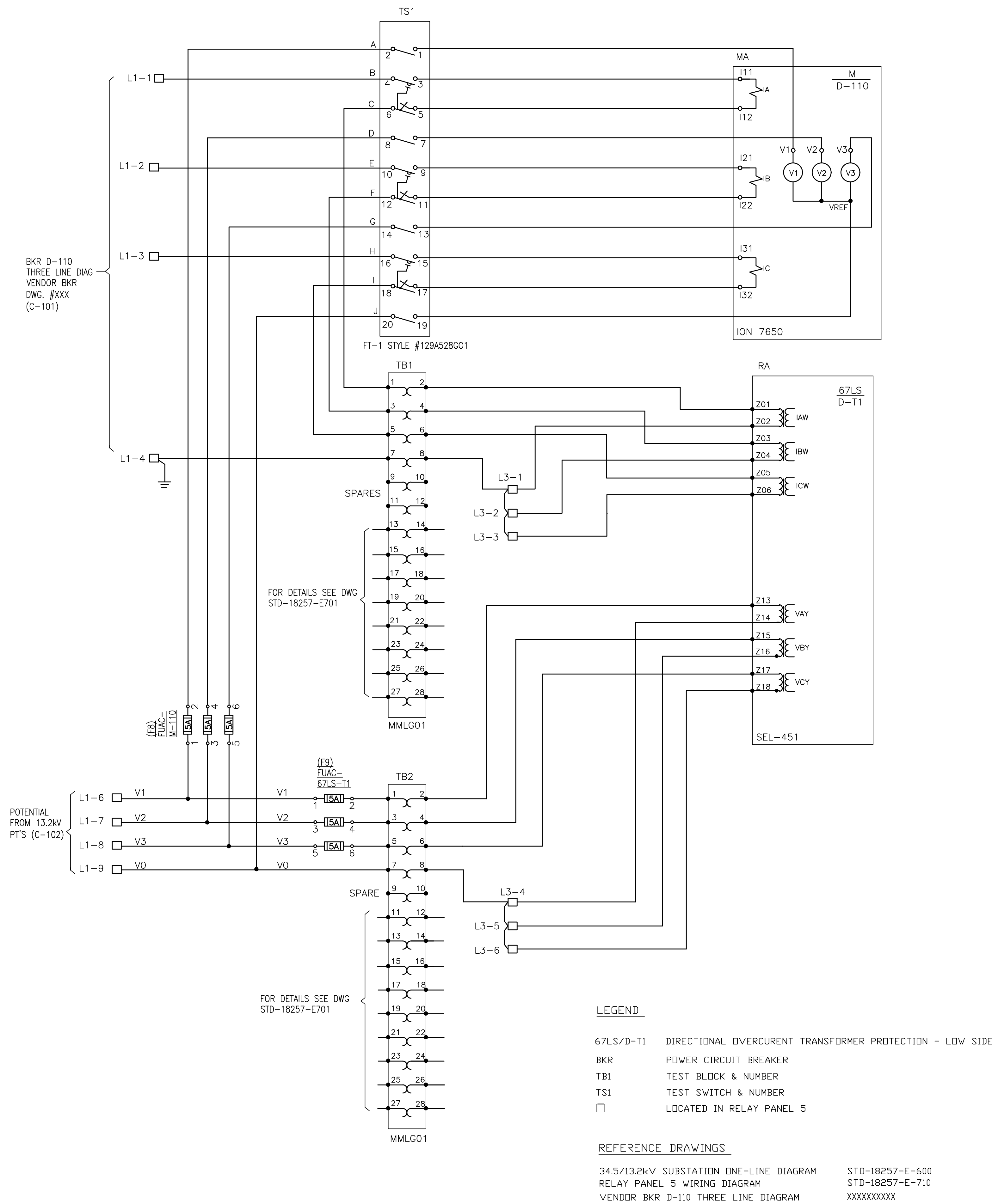
STD-18257-E-605

Sheet Number of

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U.S. Virgin Islands*

Project Name:

East End Substation  
Restoration &  
Expansion Project  
St. Thomas, USVI  
Phase 2 (13.2kV GIS)

Issue / Revisions:

#	Date	Description
A	07.25.19	Issue for Phase 2 Bid Review
O	10.17.19	Issue for Phase 2 Bid

Drawn By: PJB  
Checked By: PJB  
Date: 10.17.19  
Scale: As Noted  
Project Number: VIT 18257

Drawing Title:  
**AC ELEMENTARY  
DIAGRAM  
D-T1 LOW SIDE  
PROTECTION RELAY  
13.2kV RP5**

Drawing Number:

**STD-18257-E-700**

Sheet Number 1 of 1  
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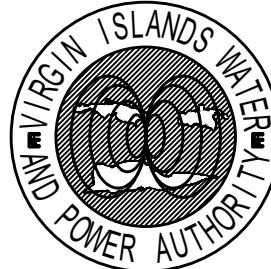


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U.S. Virgin Islands

Project Name:

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Restoration &  
Expansion Project  
St. Thomas, USVI  
Phase 2 (13.2kV GIS)

Issue / Revisions:

#	Date	Description
A	07.25.19	Issue for Phase 2 Bid Review
O	10.17.19	Issue for Phase 2 Bid

Drawn By: PJB

Checked By: PJB

Date: 10.17.19

Scale: As Noted

Project Number: VIT 18257

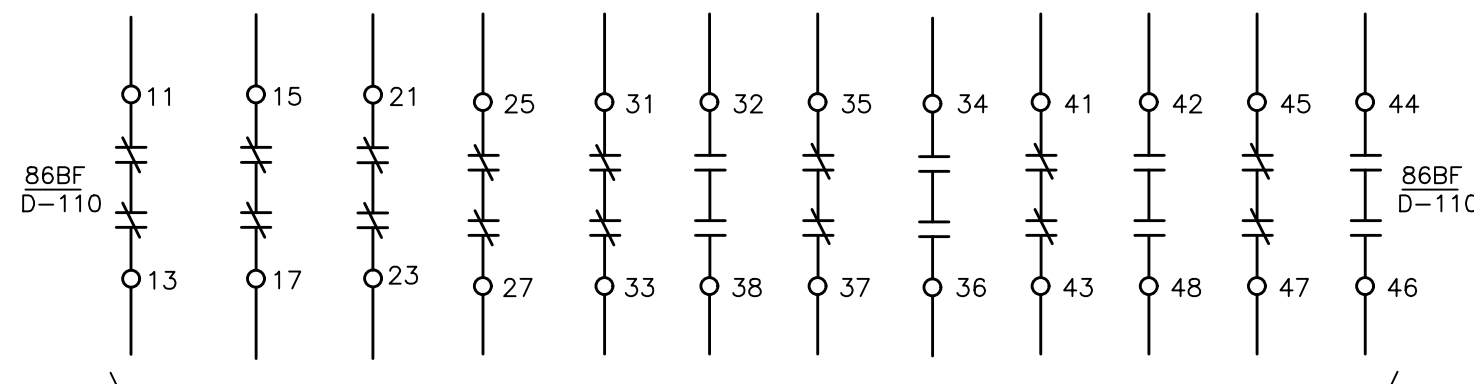
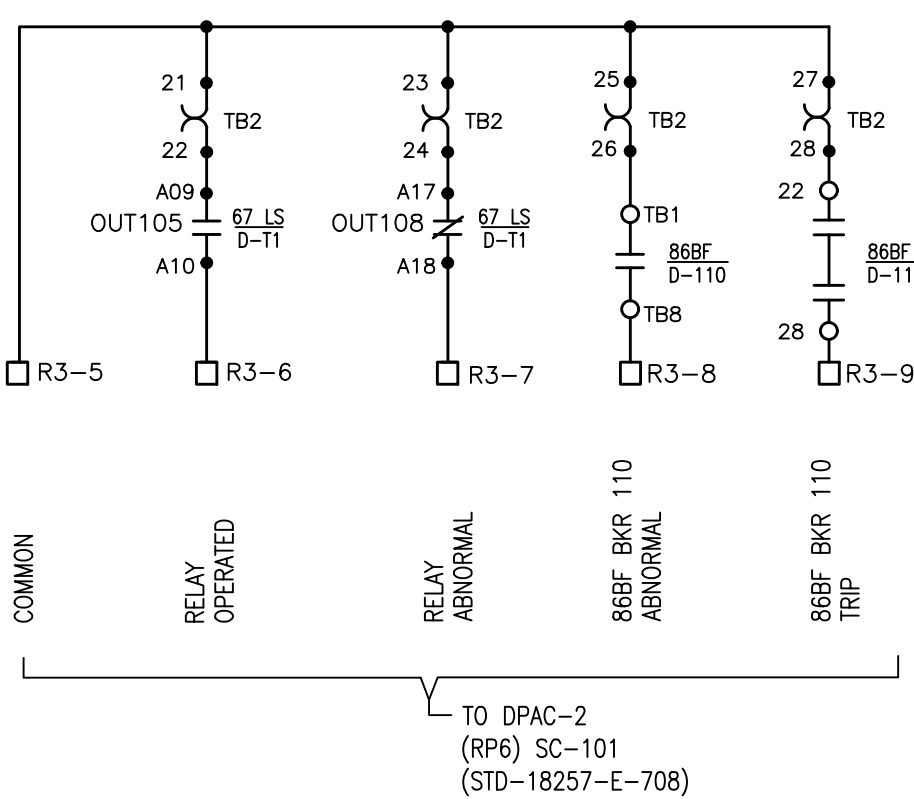
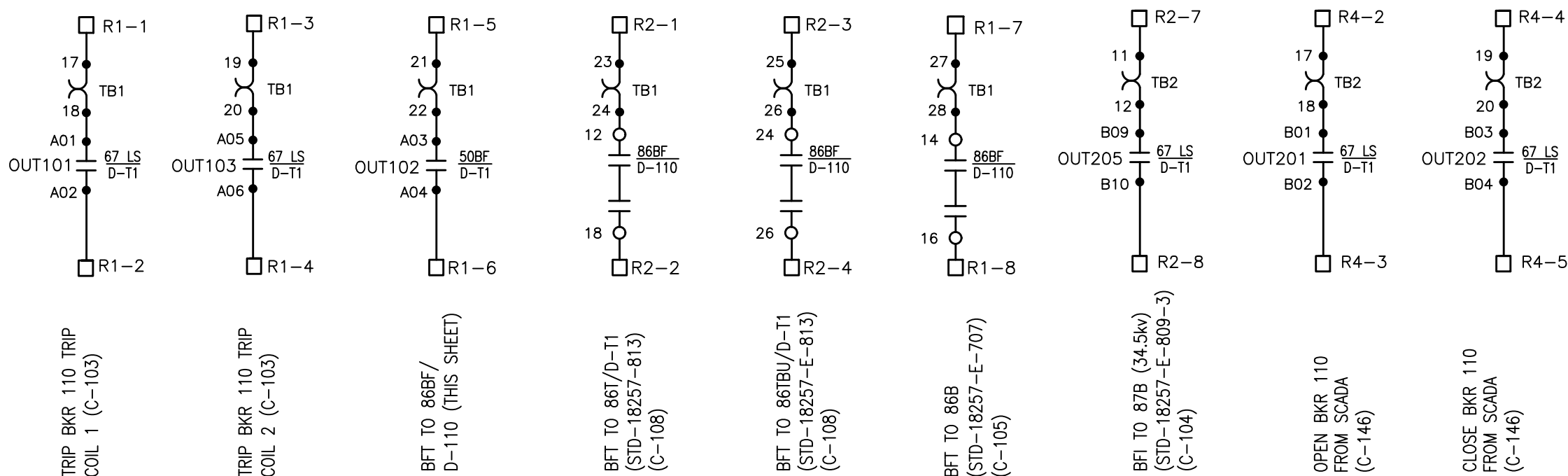
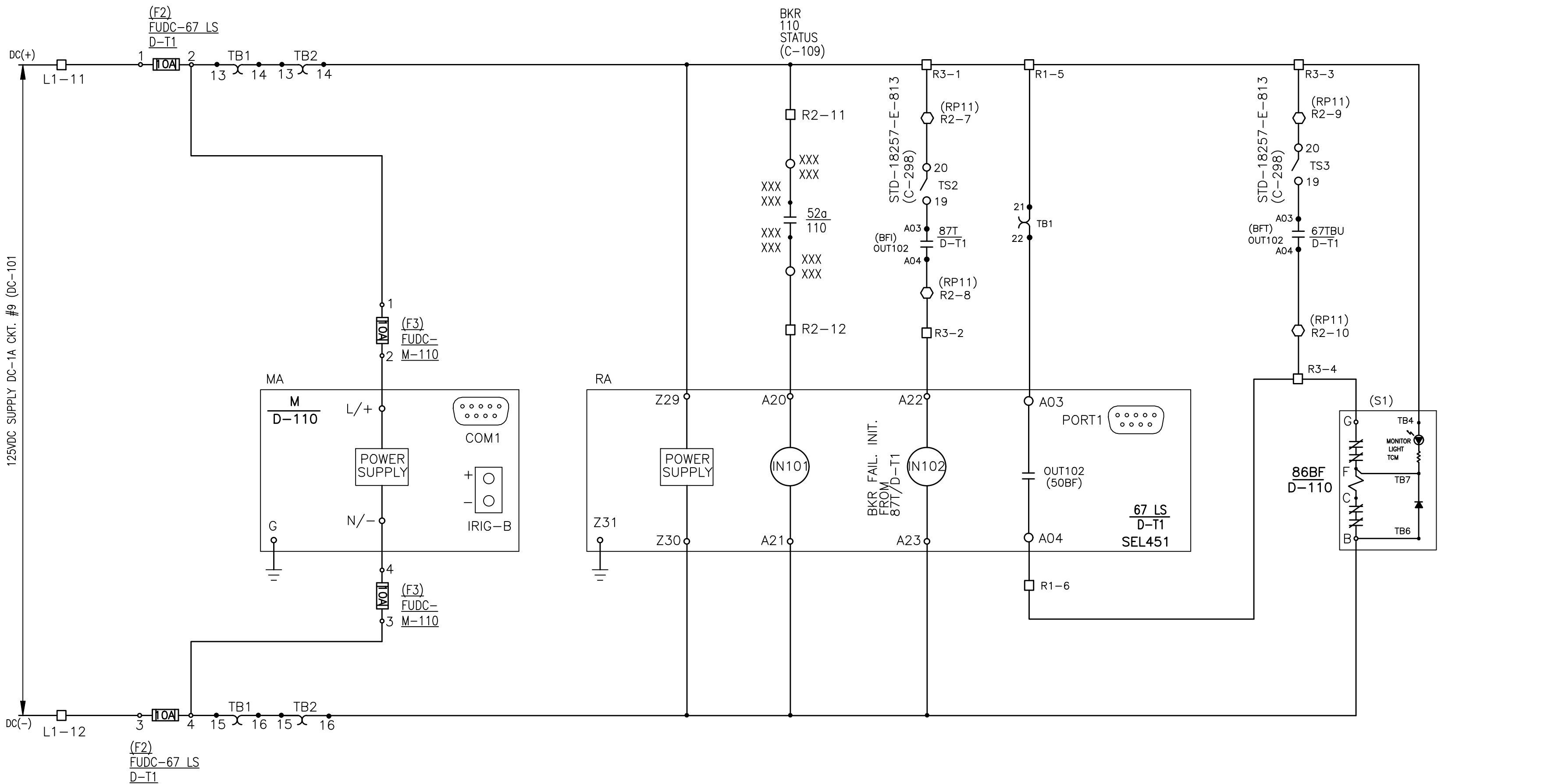
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DC ELEMENTARY  
DIAGRAM  
D-T1 LOW SIDE  
PROTECTION RELAY  
13.2kV RP5

Drawing Number:

STD-18257-E-701

Sheet Number 1 of 1  
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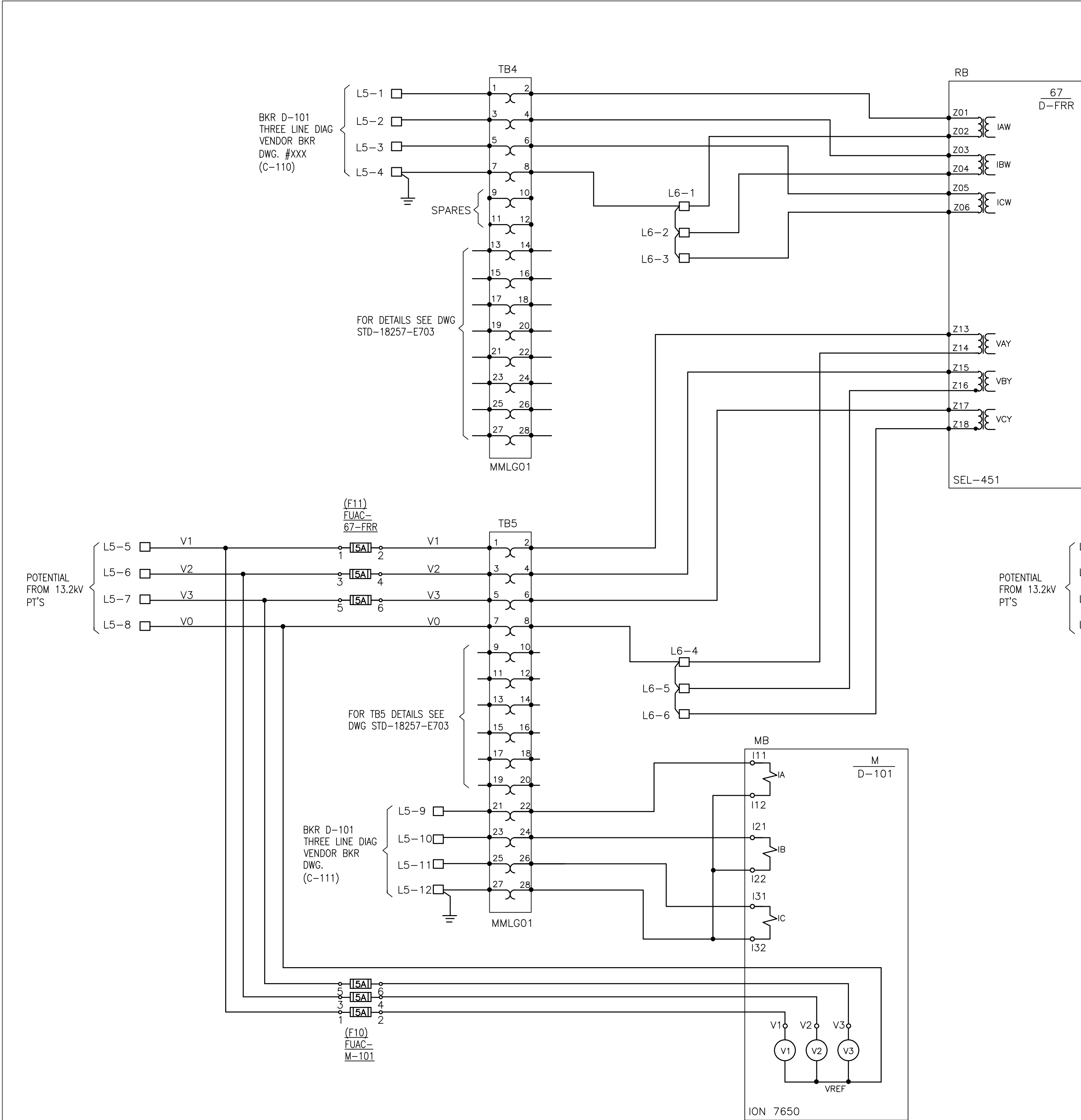
DC ELEMENTARY DIAGRAM  
D-T1

LEGEND

- 67LS DIRECTIONAL OVERCURRENT TRANSFORMER LOW SIDE
- TB1 TEST BLOCK & NUMBER
- TS1 TEST SWITCH & NUMBER
- BKR POWER CIRCUIT BREAKER
- LOCATED IN RELAY PANEL 5
- LOCATED AT 13.2KV GIS

REFERENCE DRAWINGS

- 34.5/13.2kV SUBSTATION ONE-LINE DIAGRAM
- RELAY PANEL 5 WIRING DIAGRAM
- DC ELEMENTARY DIAGRAM 13.2kV BUS DIFFERENTIAL PROTECTION
- DC ELEMENTARY DIAGRAM DPAC-2
- DC ELEMENTARY DIAGRAM BUS 1-2 DIFFERENTIAL RELAY 34.5kV
- DC ELEMENTARY DIAGRAM D-T1 PRIMARY/SECONDARY RELAY
- VENDOR BKR D-110 DC ELEMENTARY DIAGRAMS
- STD-18257-E-600
- STD-18257-E-710
- STD-18257-E-707
- STD-18257-E-708
- STD-18257-E-809-3
- STD-18257-E-813
- XXXXXXXXXX



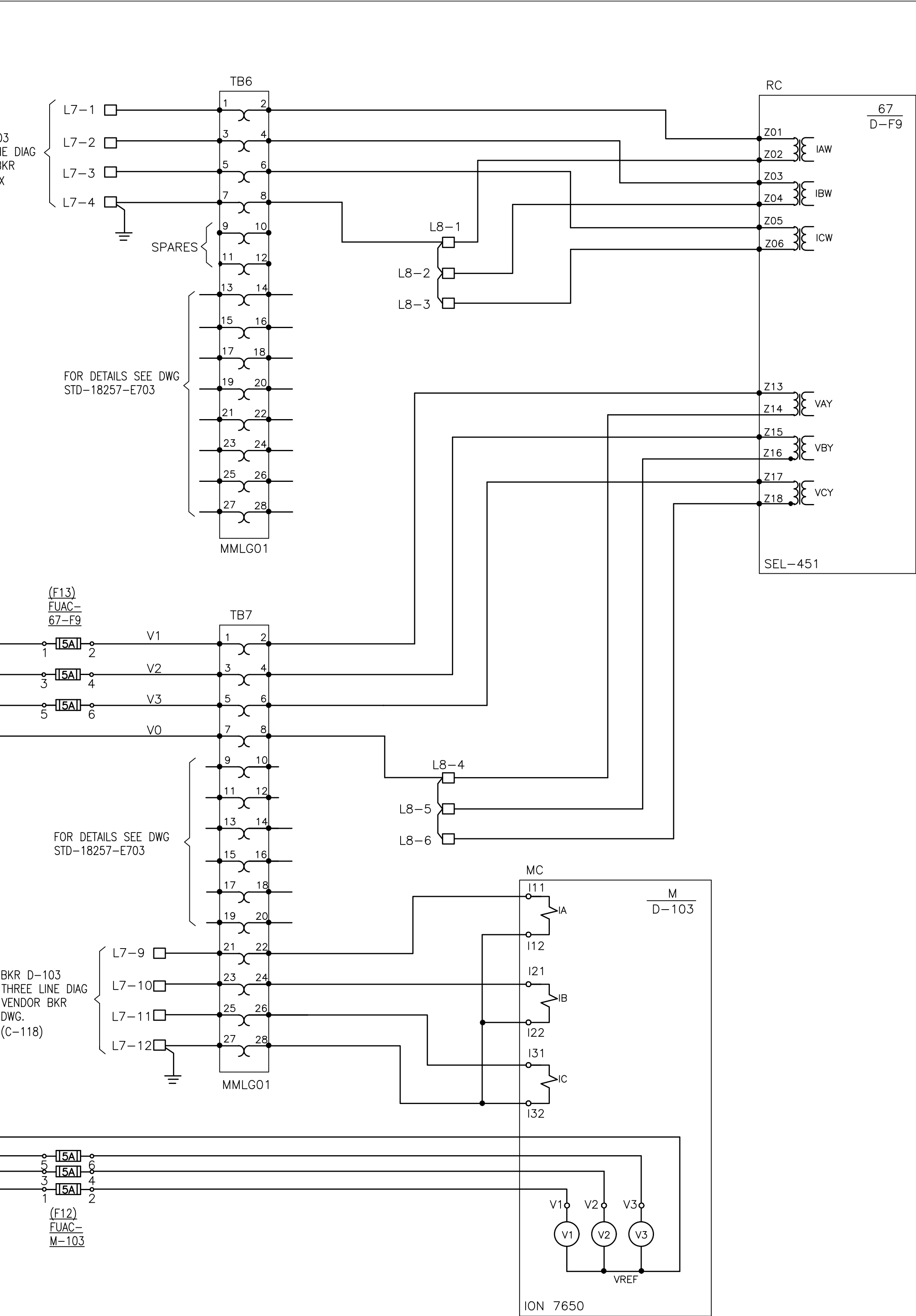
AC ELEMENTARY DIAGRAM  
D-FRR

LEGEND

- 67 DIRECTIONAL OVERCURRENT RELAY
- BKR POWER CIRCUIT BREAKER
- TB1 TEST BLOCK & NUMBER
- TS1 TEST SWITCH & NUMBER
- LOCATED IN RELAY PANEL 5

REFERENCE DRAWINGS

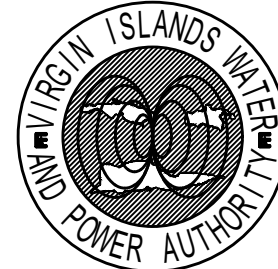
- SUBSTATION ONE-LINE DIAGRAM
- RELAY PANEL 5 WIRING DIAGRAM
- VENDOR BKR D-101 THREE LINE DIAGRAM
- VENDOR BKR D-103 THREE LINE DIAGRAM



AC ELEMENTARY DIAGRAM  
D-F9

Seal:

Client:



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Authority  
U.S. Virgin Islands

Project Name:

East End Substation  
Restoration &  
Expansion Project  
St. Thomas, USVI  
Phase 2 (13.2kV GIS)

Issue / Revisions:

#	Date	Description
A	07.25.19	Issue for Phase 2 Bid Review
O	10.17.19	Issue for Phase 2 Bid

Drawn By:	PJB
Checked By:	PJB
Date:	10.17.19
Scale:	As Noted
Project Number:	VIT 18257

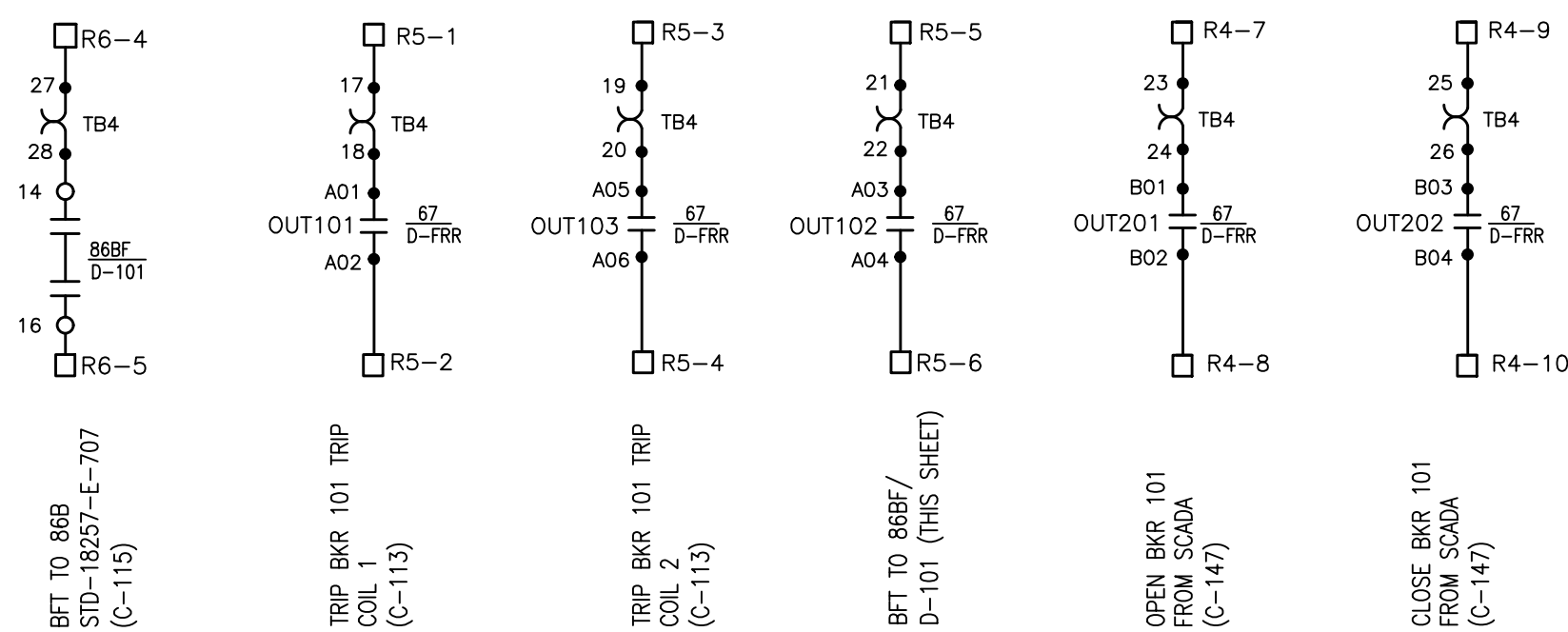
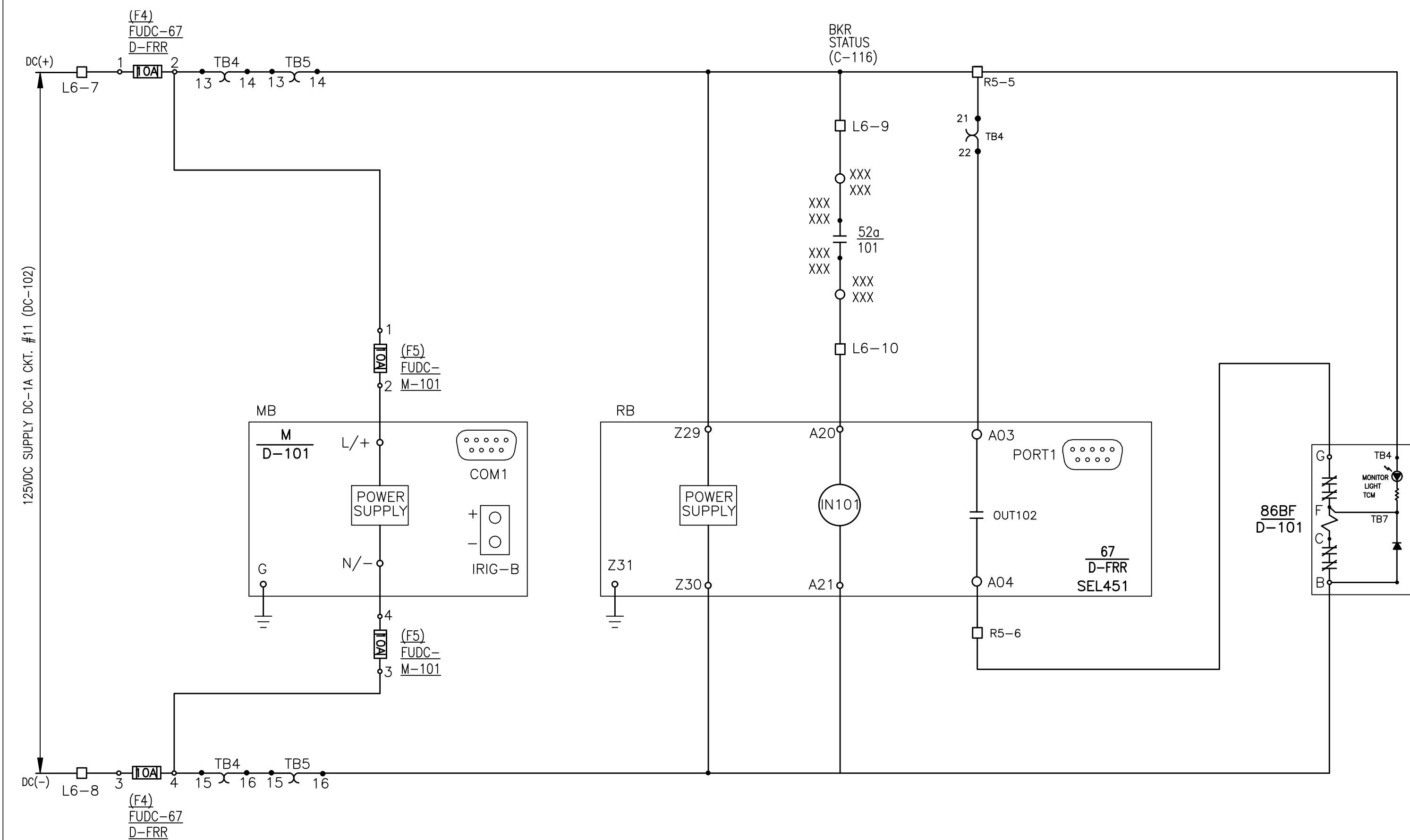
Drawing Title:  
**AC ELEMENTARY  
DIAGRAM D-FRR/D-F9  
FEEDER PROTECTION  
RELAYS  
13.2kV RP5**

Drawing Number:

**STD-18257-E-702**

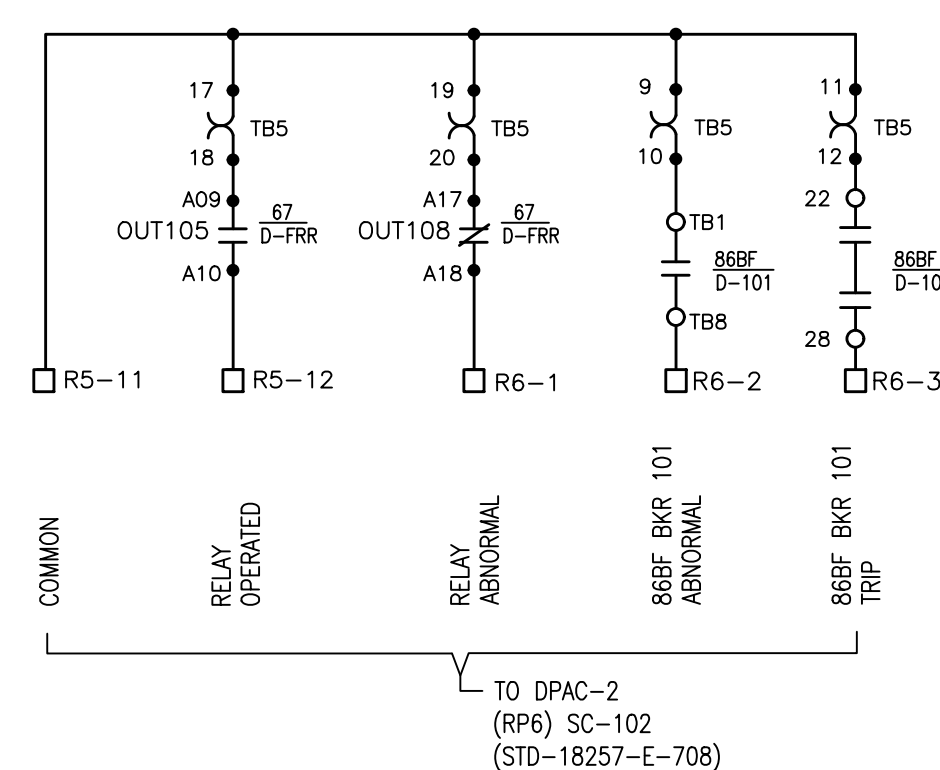
Sheet Number 1 of 1  
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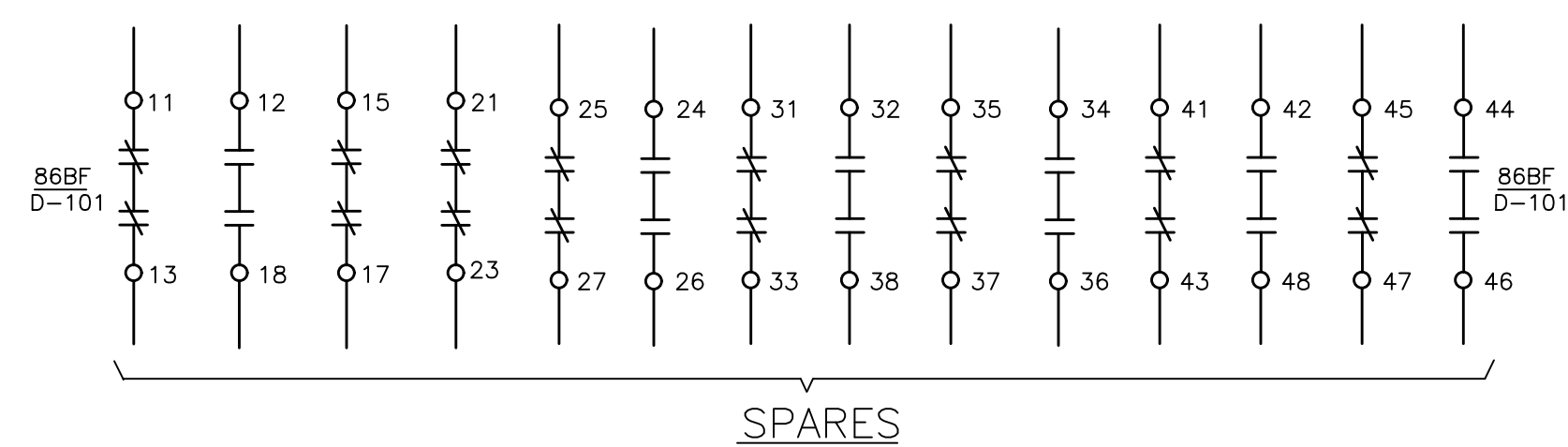


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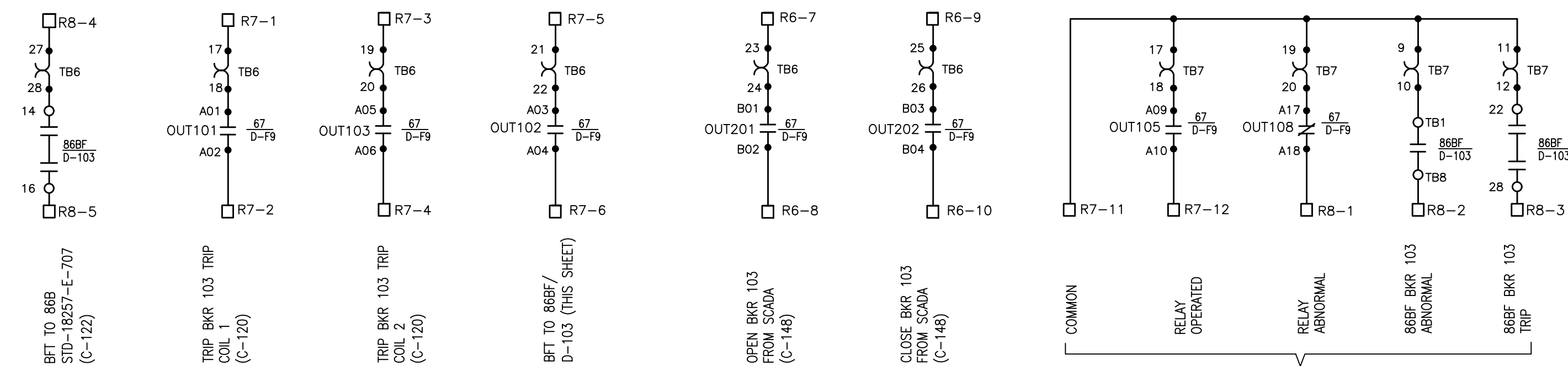
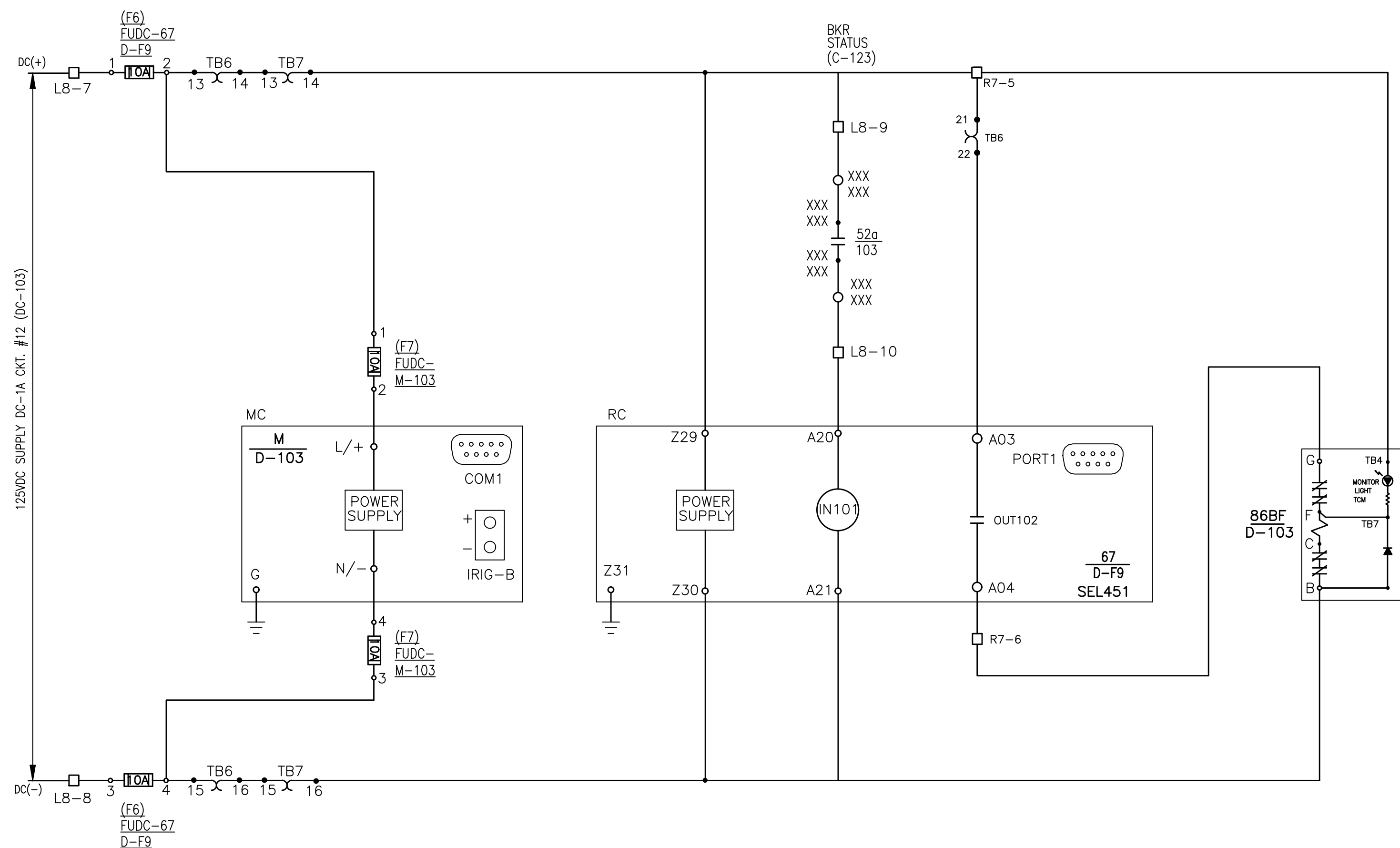
## SCADA CONTROL



## SCADA ALARMS

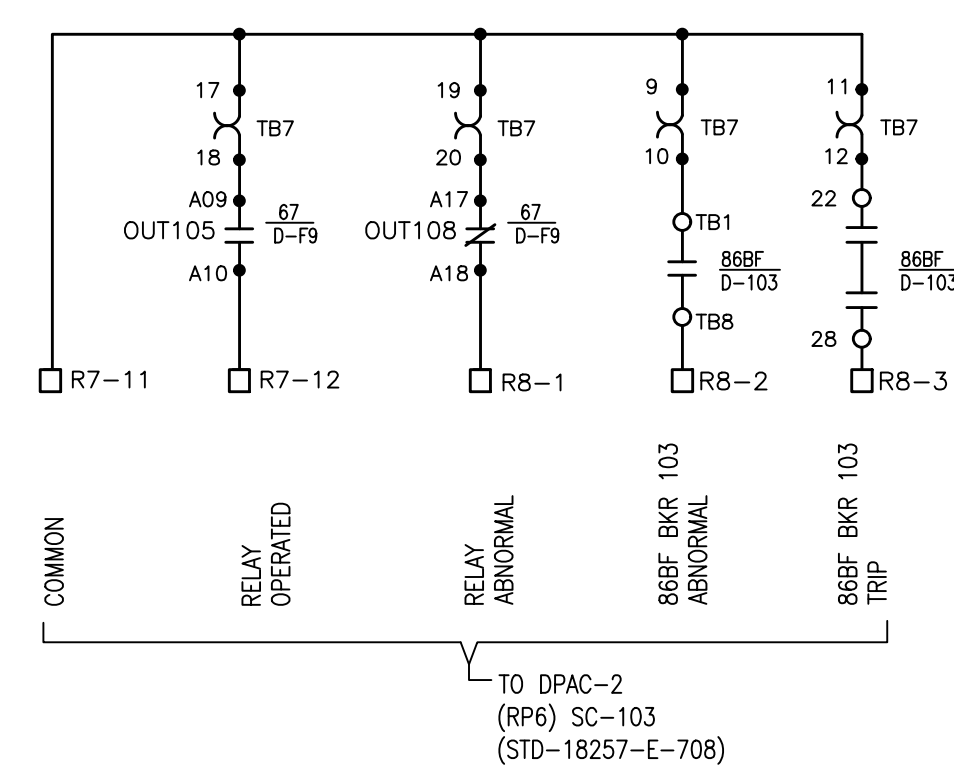
SPARES

DC ELEMENTARY DIAGRAM  
D-FRR

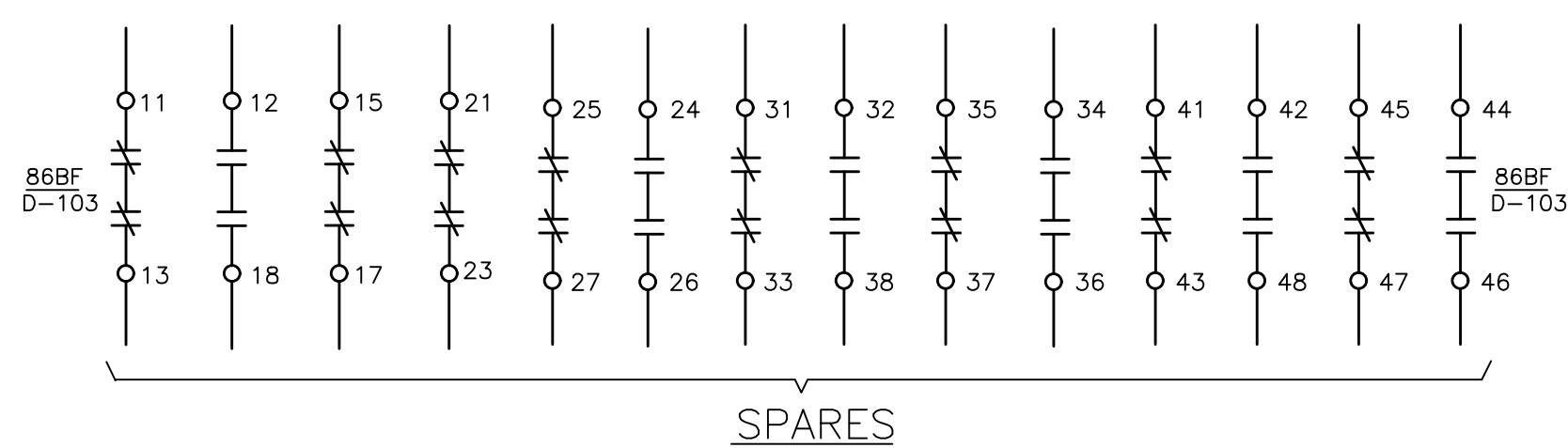


## OUTPUTS

## SCADA CONTROL



## SCADA ALARMS

SPARES

DC ELEMENTARY DIAGRAM  
D-F9

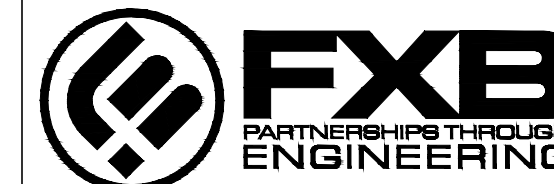
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67	DIRECTIONAL OVERCURRENT RELAY
TB1	TEST BLOCK & NUMBER
BKR	POWER CIRCUIT BREAKER
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<input type="radio"/>	LOCATED AT 13.2KV GIS

## REFERENCE DRAWINGS

34.5/13.2kV SUBSTATION ONE-LINE DIAGRAM  
RELAY PANEL 5 WIRING DIAGRAM  
DC ELEMENTARY DIAGRAM 13.2kV BUS DIFFERENTIAL PROTECTION  
DC ELEMENTARY DIAGRAM DPAC-2  
VENDOR BKR D-101 THREE LINE DIAGRAM  
VENDOR BKR D-103 THREE LINE DIAGRAM

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STD-18257-E-710  
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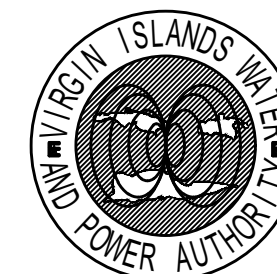


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Project Name

East End Substation  
Restoration &  
Expansion Project  
St. Thomas, USVI  
Phase 2 (13.2kV GIS)

[illegible]

Drawn By: P 10

Chk'd By: \_\_\_\_\_

Date: 10.17.15

Scale:	10.17.15
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Project Number:	AS Notes
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VII 1825

Drawing Title:

DC ELEMENTARY  
DIAGRAM D-FRR/D-F9  
FEEDER PROTECTION  
RELAYS  
13.2kV RP5

Drawing Number

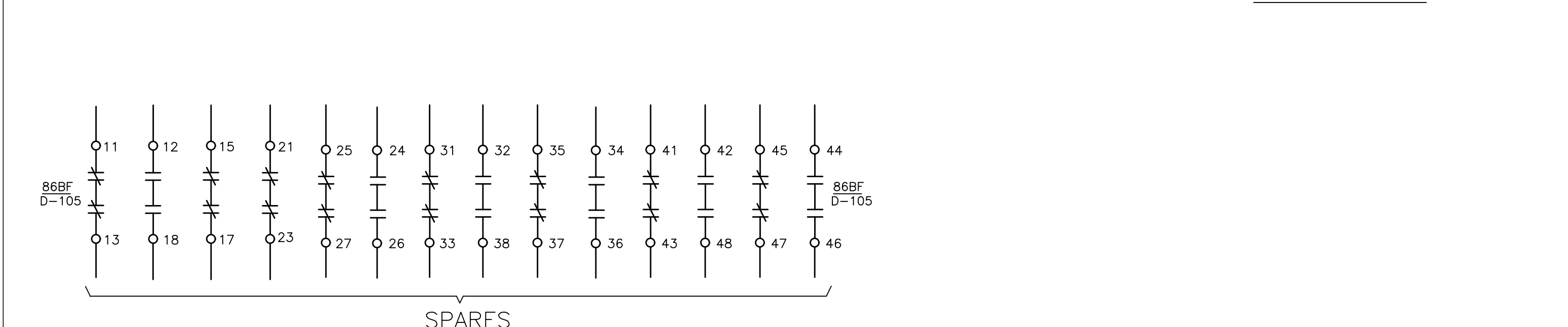
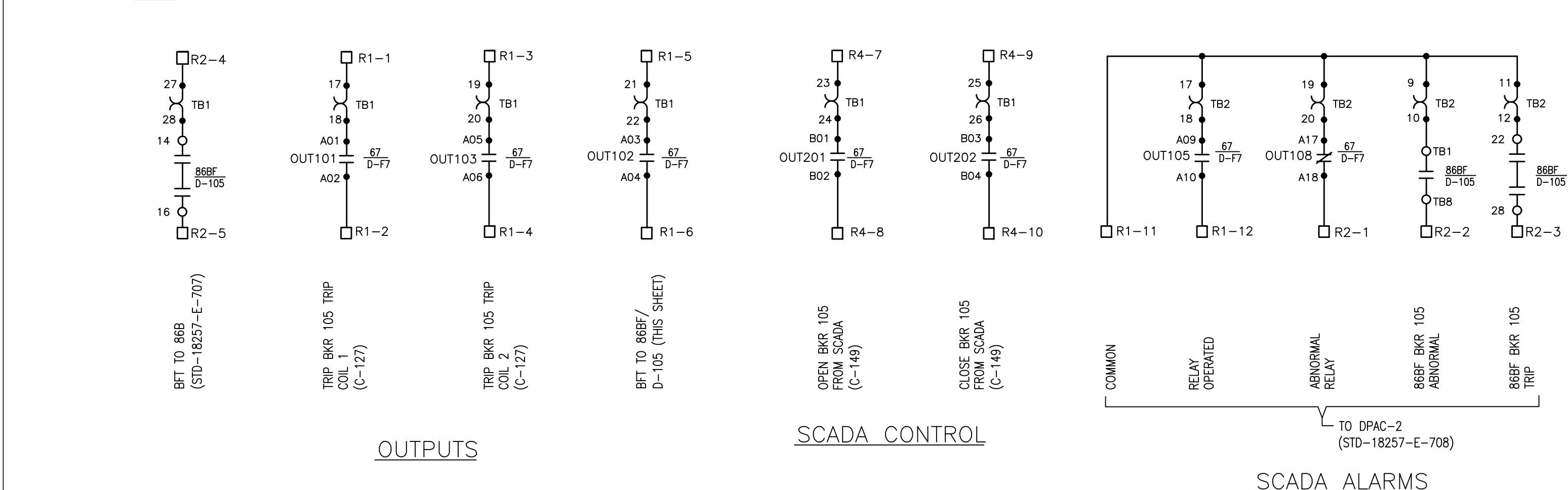
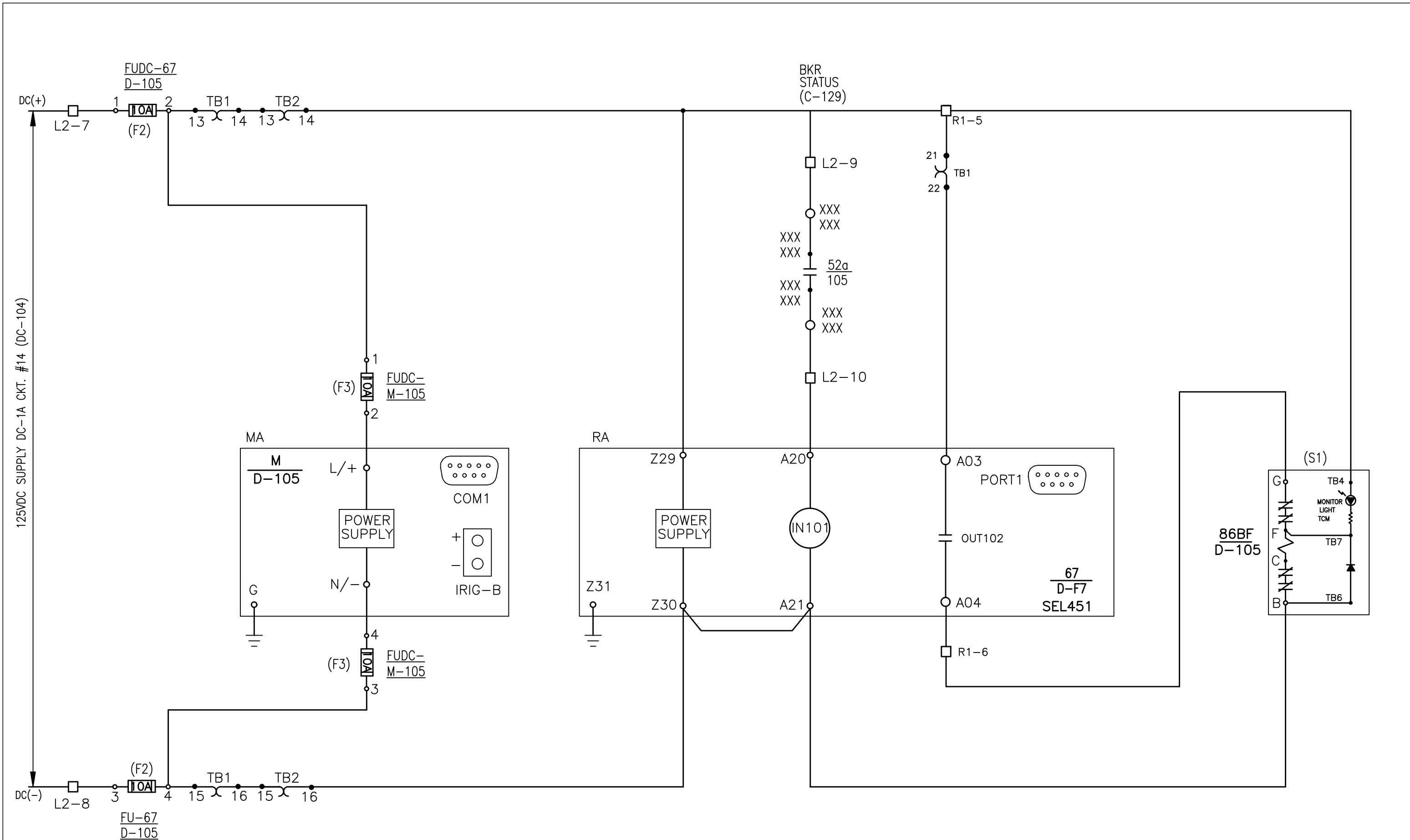
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Sheet Number 1 of 1

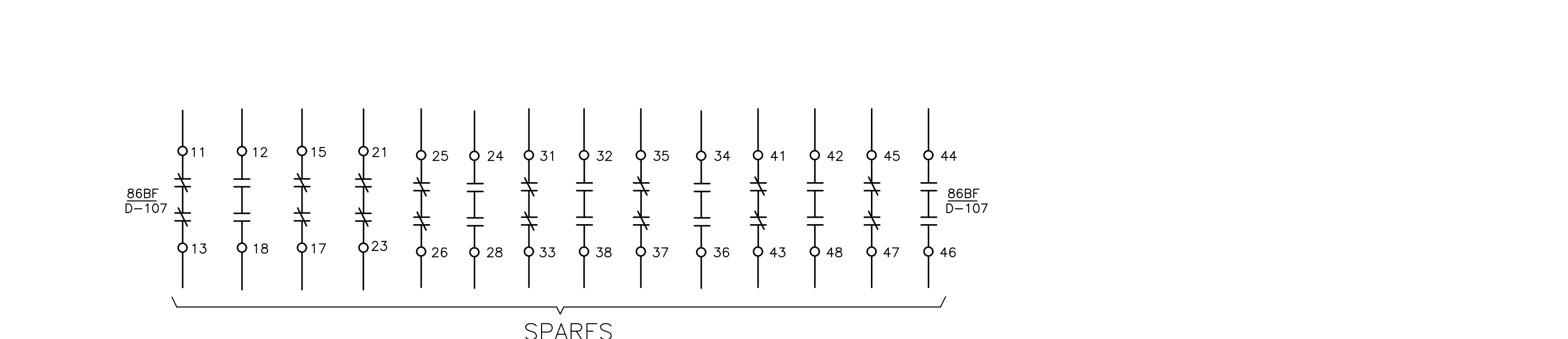
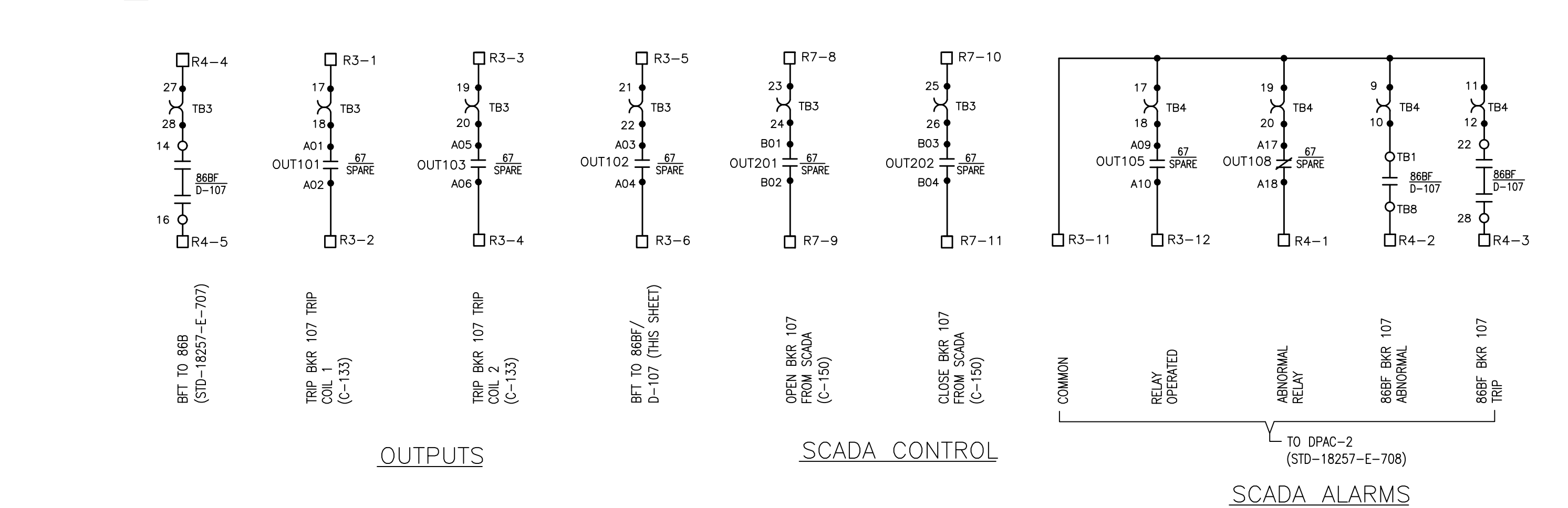
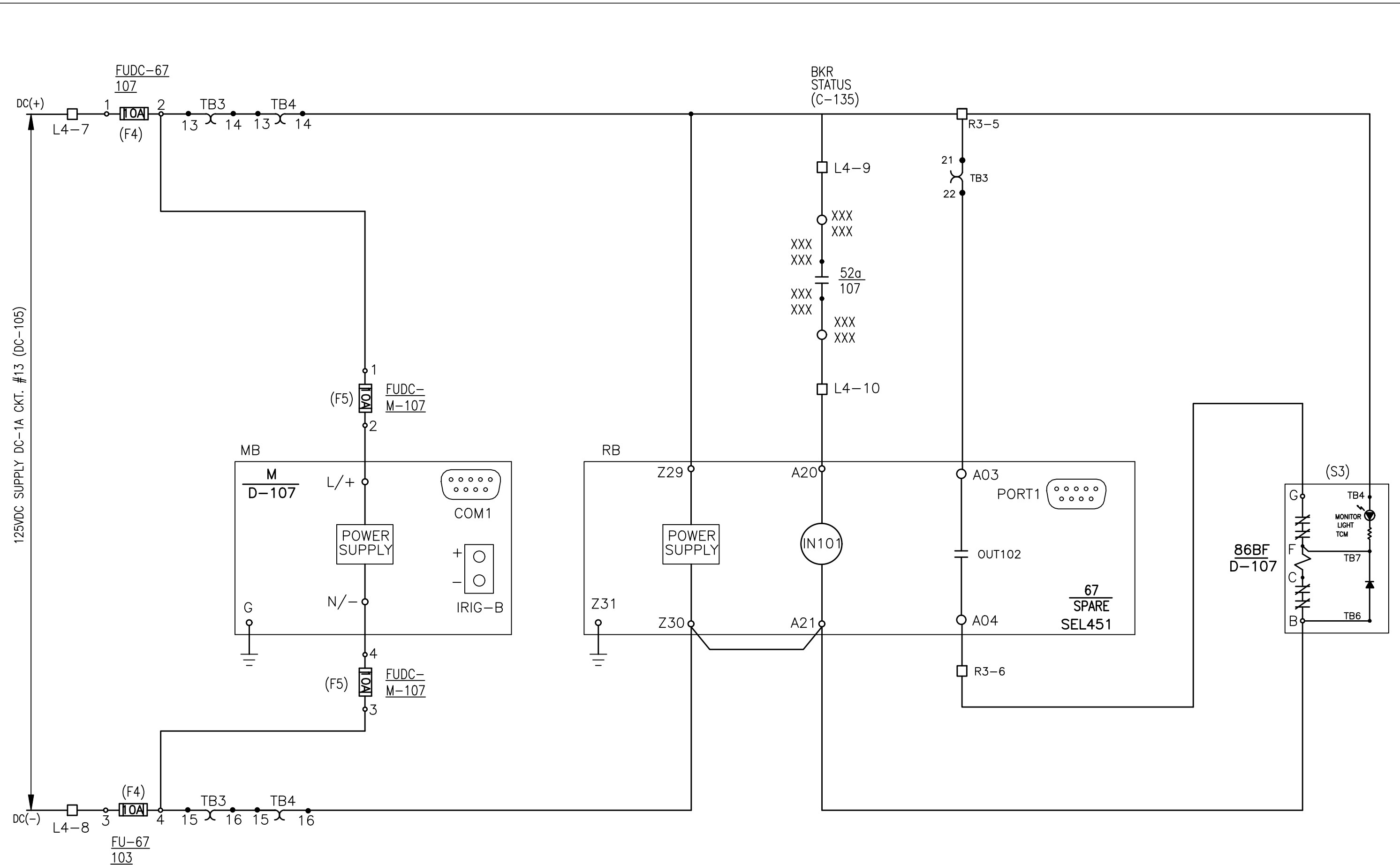
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DC ELEMENTARY DIAGRAM  
D-F7



DC ELEMENTARY DIAGRAM  
SPARE

LEGEND

- 67 DIRECTIONAL OVERCURRENT RELAY
- TB1 TEST BLOCK & NUMBER
- BKR POWER CIRCUIT BREAKER
- LOCATED IN RELAY PANEL 6
- LOCATED AT 13.2KV GIS

REFERENCE DRAWINGS

- 34.5/13.2kV SUBSTATION ONE-LINE DIAGRAM
- RELAY PANEL 6 WIRING DIAGRAM
- DC ELEMENTARY DIAGRAM 13.2kV BUS DIFFERENTIAL PROTECTION
- DC ELEMENTARY DIAGRAM DPAC-2
- VENDOR BKR D-105 THREE LINE DIAGRAM
- VENDOR BKR D-107 THREE LINE DIAGRAM

- STD-18257-E-600
- STD-18257-E-711
- STD-18257-E-707
- STD-18257-E-708
- XXXXXXXXXXXX
- XXXXXXXXXXXX

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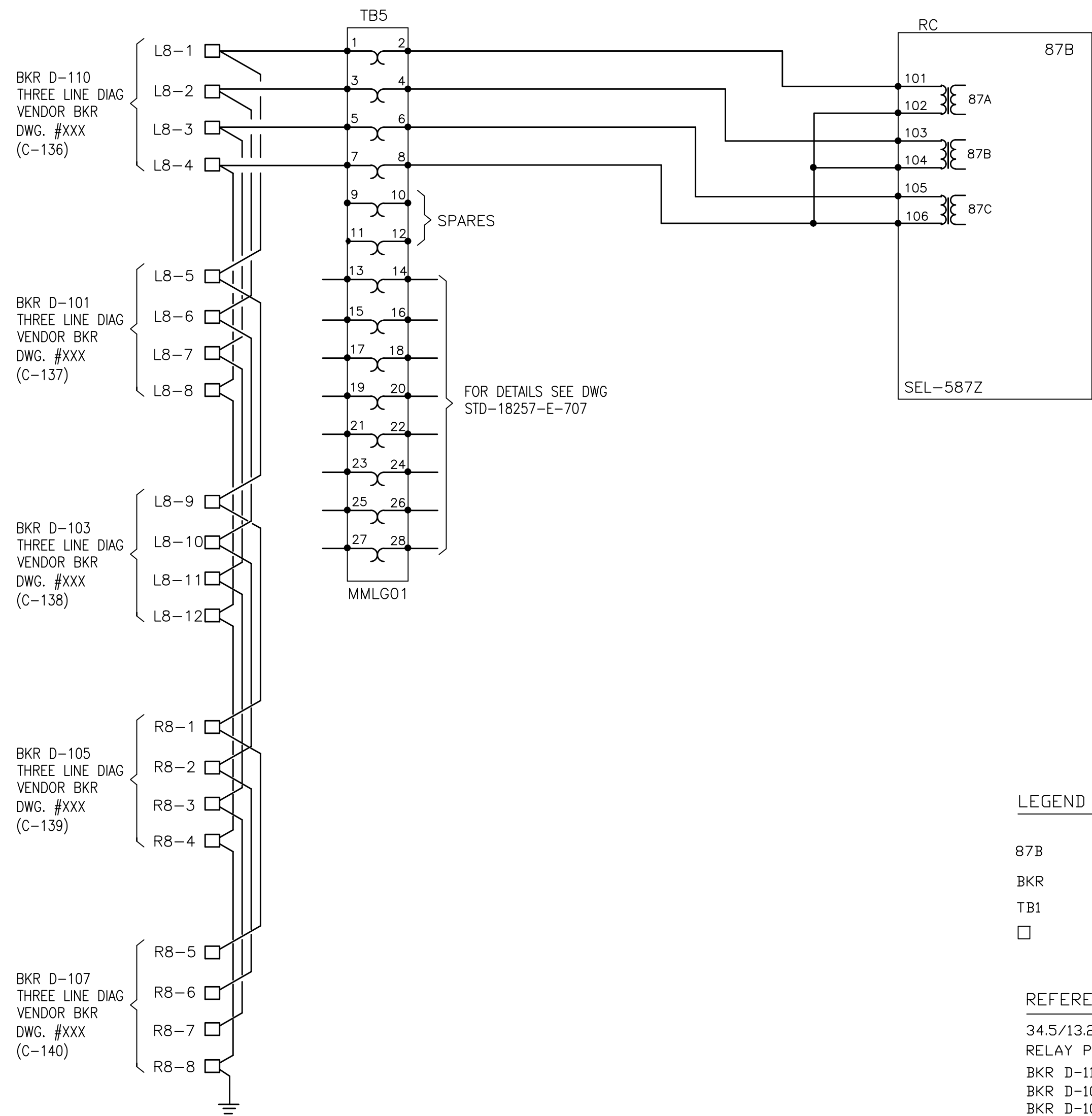
Project Name:

East End Substation  
Restoration &  
Expansion Project  
St. Thomas, USVI  
Phase 2 (13.2kV GIS)

Issue / Revisions:

#	Date	Description
A	07.25.19	Issue for Phase 2 Bid Review
O	10.17.19	Issue for Phase 2 Bid

Drawn By: PJB  
Checked By: PJB  
Date: 10.17.19  
Scale: As Noted  
Project Number: VIT 18257  
Drawing Title:  
DC ELEMENTARY  
DIAGRAM D-F7/SPARE  
FEEDER PROTECTION  
RELAYS  
13.2kV RP6  
Drawing Number:  
STD-18257-E-705  
Sheet Number 1 of 1  
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LEGEND

- 87B HIGH IMPEDEENCE BUS DIFFERENTIAL RELAY  
BKR POWER CIRCUIT BREAKER  
TB1 TEST BLOCK & NUMBER  
□ LOCATED IN RELAY PANEL 6

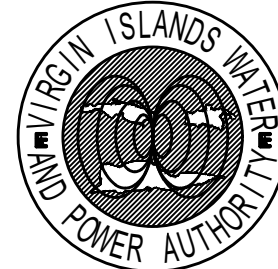
REFERENCE DRAWINGS

- 34.5/13.2KV SUBSTATION ONE-LINE DIAGRAM STD-18257-E-600  
RELAY PANEL 6 WIRING DIAGRAM STD-18257-E-711  
BKR D-110 THREE LINE DIAGRAM XXXXXXXXXXXX  
BKR D-101 THREE LINE DIAGRAM XXXXXXXXXXXX  
BKR D-103 THREE LINE DIAGRAM XXXXXXXXXXXX  
BKR D-105 THREE LINE DIAGRAM XXXXXXXXXXXX  
BKR D-107 THREE LINE DIAGRAM XXXXXXXXXXXX

AC ELEMENTARY DIAGRAM  
87B

Seal:

Client:



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Project Name:

East End Substation  
Restoration &  
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St. Thomas, USVI  
Phase 2 (13.2kV GIS)

Issue / Revisions:

#	Date	Description
A	07.25.19	Issue for Phase 2 Bid Review
O	10.17.19	Issue for Phase 2 Bid

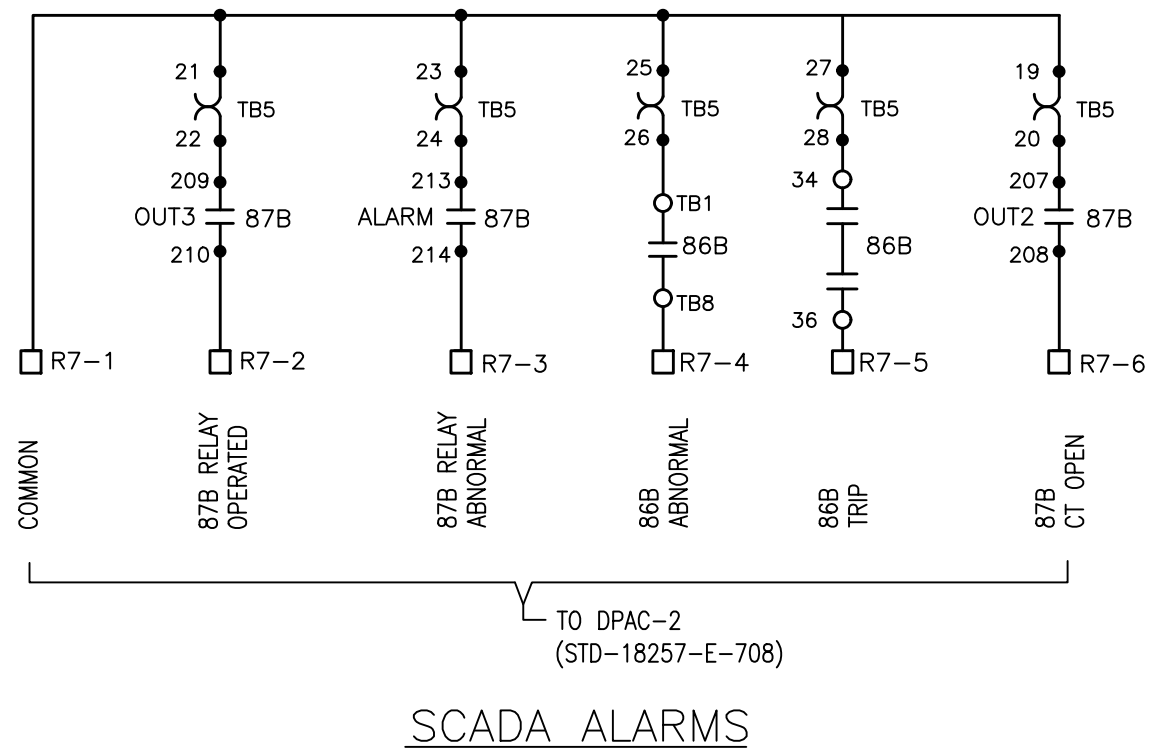
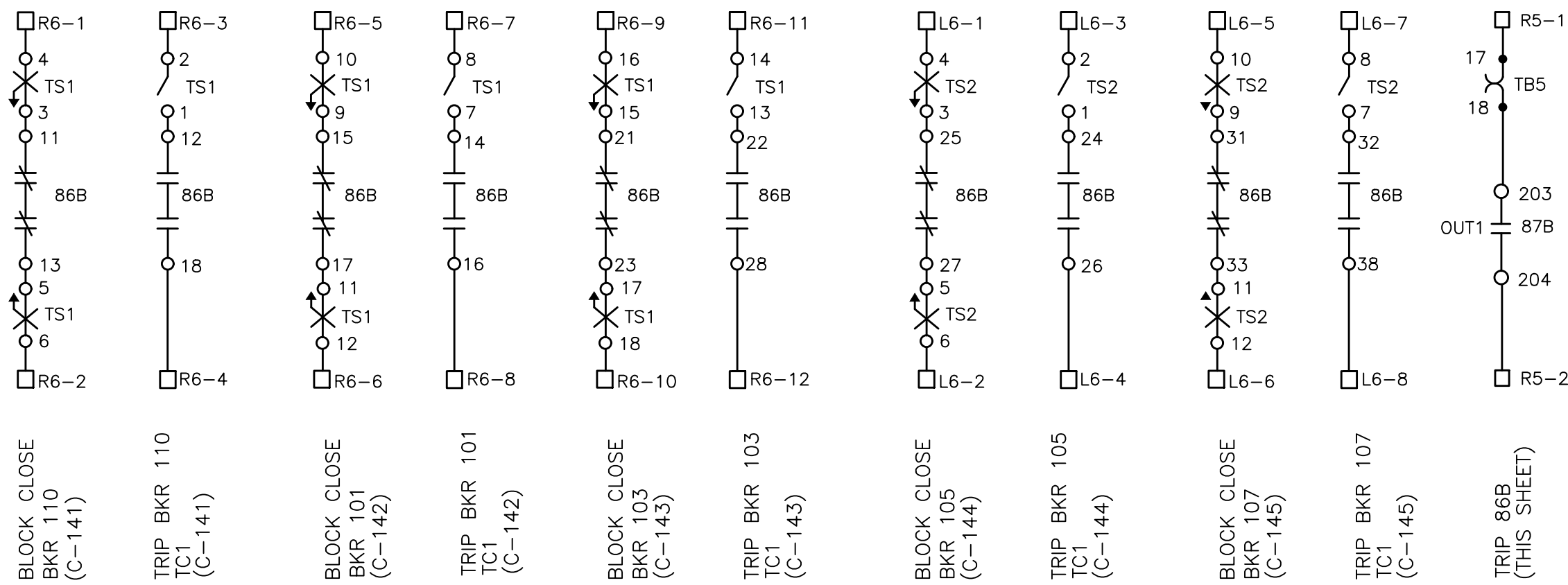
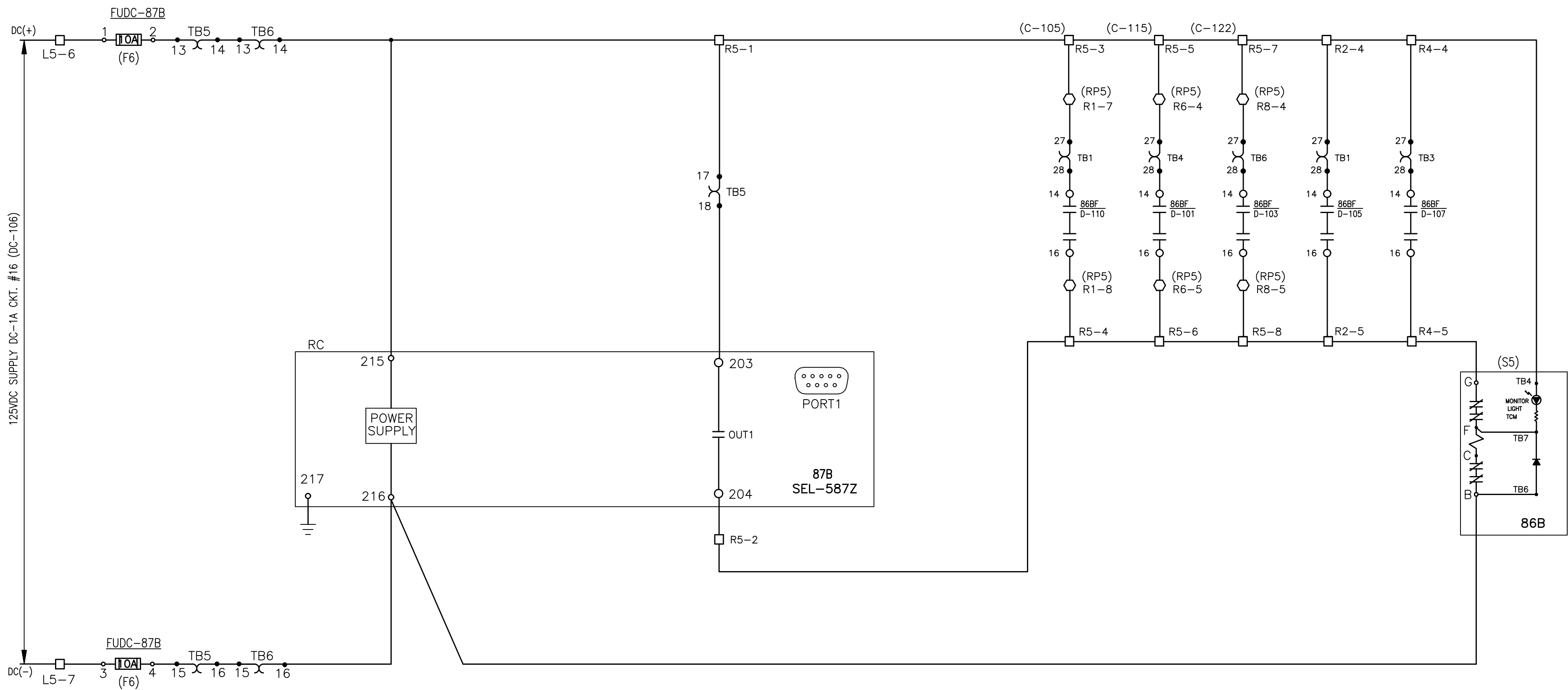
Drawn By: PJB  
Checked By: PJB  
Date: 10.17.19  
Scale: As Noted  
Project Number: VIT 18257

Drawing Title:  
**AC ELEMENTARY  
DIAGRAM 13.2KV BUS  
DIFFERENTIAL  
PROTECTION  
(87B) 13.2 KV RP6**

Drawing Number:

**STD-18257-E-706**





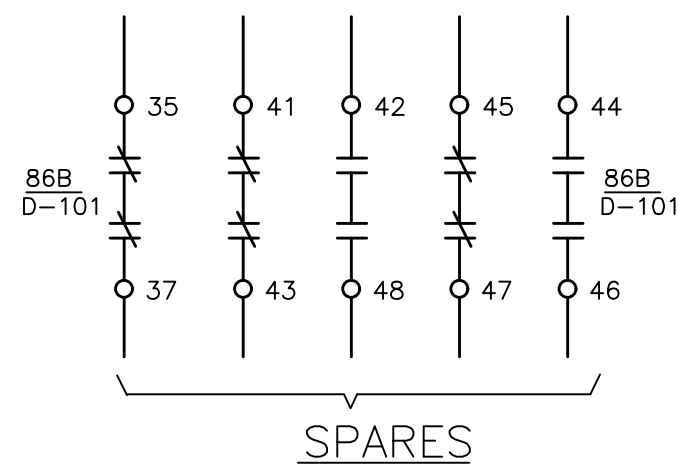
LEGEND

- 87B HIGH IMPEDANCE BUS DIFFERENTIAL RELAY  
86B BUS DIFFERENTIAL LOCKOUT  
TB1 TEST BLOCK & NUMBER  
TS1 TEST SWITCH & NUMBER  
BKR POWER CIRCUIT BREAKER  
□ LOCATED IN RELAY PANEL 6  
○ LOCATED IN RELAY PANE 5

REFERENCE DRAWINGS

- 34.5/13.2kV SUBSTATION ONE-LINE DIAGRAM  
RELAY PANEL 6 WIRING DIAGRAM  
DC ELEMENTARY DIAGRAM D-T1 LOW SIDE PROTECTION  
DC ELEMENTARY DIAGRAM D-FRR/D-F9 FEEDER PROTECTION  
DC ELEMENTARY DIAGRAM D-F7/SPARE FEEDER PROTECTION  
DC ELEMENTARY DIAGRAM DPAC-2  
DC ELEMENTARY DIAGRAM BKR D-110  
DC ELEMENTARY DIAGRAM BKR D-101  
DC ELEMENTARY DIAGRAM BKR D-103  
DC ELEMENTARY DIAGRAM BKR D-105  
DC ELEMENTARY DIAGRAM BKR D-107

- STD-18257-E-600  
STD-18257-E-711  
STD-18257-E-701  
STD-18257-E-703  
STD-18257-E-705  
STD-18257-E-708  
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XXX  
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XXX



DC ELEMENTARY DIAGRAM  
87B

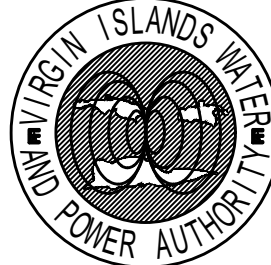


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Project Name:

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St. Thomas, USVI  
Phase 2 (13.2kV GIS)

Issue / Revisions:

#	Date	Description
A	07.25.19	Issue for Phase 2 Bid Review
O	10.17.19	Issue for Phase 2 Bid

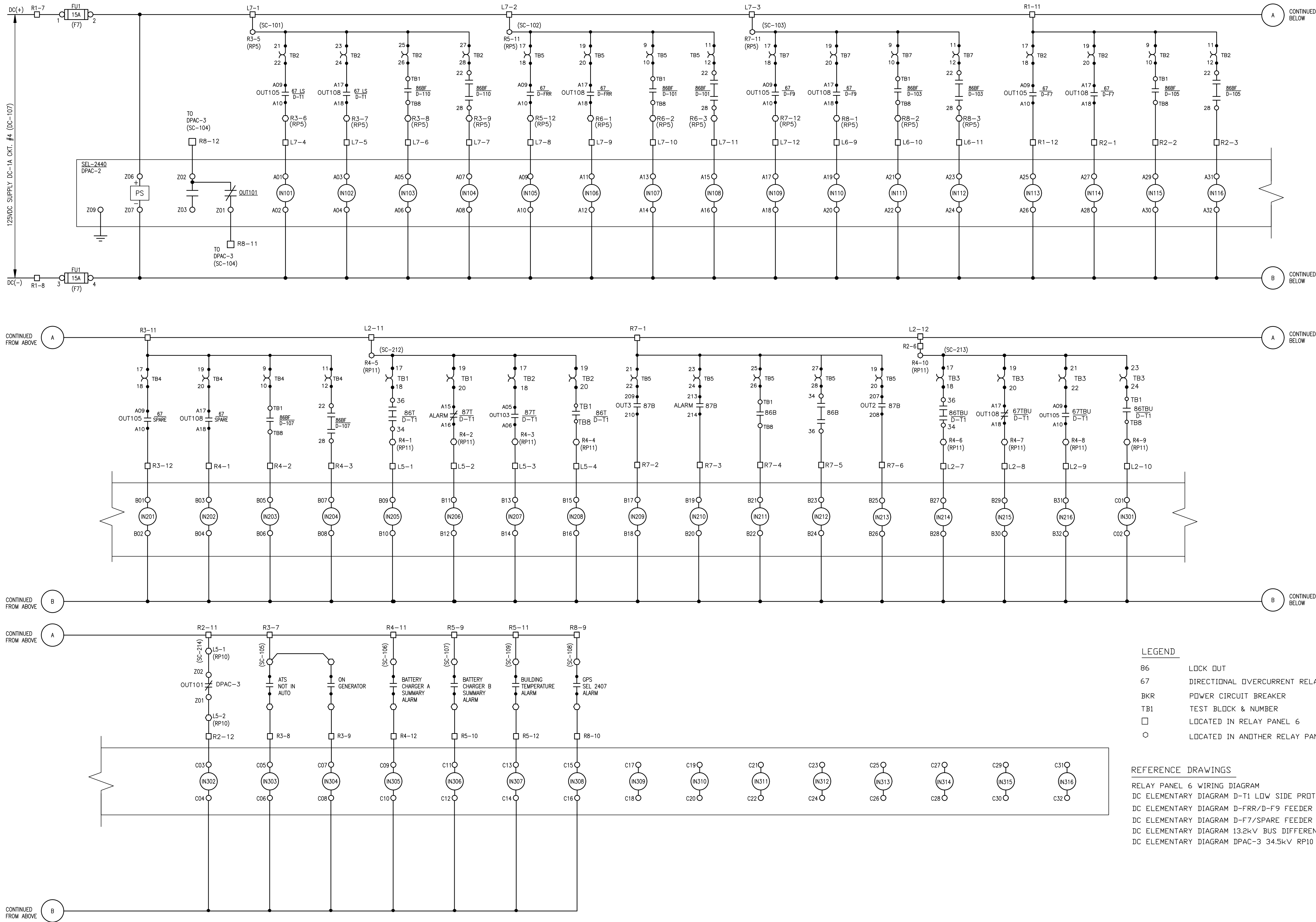
Drawn By:	PJB
Checked By:	PJB
Date:	10.17.19
Scale:	As Noted
Project Number:	VIT 18257

Drawing Title:  
**DC ELEMENTARY  
DIAGRAM  
13.2KV BUS DIFFERENTIAL  
PROTECTION  
(87B) 13.2KV RP6**

Drawing Number:

STD-18257-E-707

Sheet Number 1 of 1  
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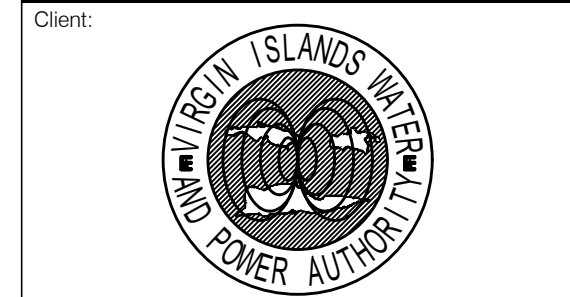


DC ELEMENTARY DIAGRAM  
DPAC-2



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Project Name:

East End Substation  
Restoration &  
Expansion Project  
St. Thomas, USVI  
Phase 2 (13.2kV GIS)

Issue / Revisions:		
#	Date	Description
A	07.25.19	Issue for Phase 2 Bid Review
O	10.17.19	Issue for Phase 2 Bid

Drawn By:	PJB
Checked By:	PJB
Date:	10.17.19
Scale:	As Noted
Project Number:	VIT 18257
Drawing Title:	

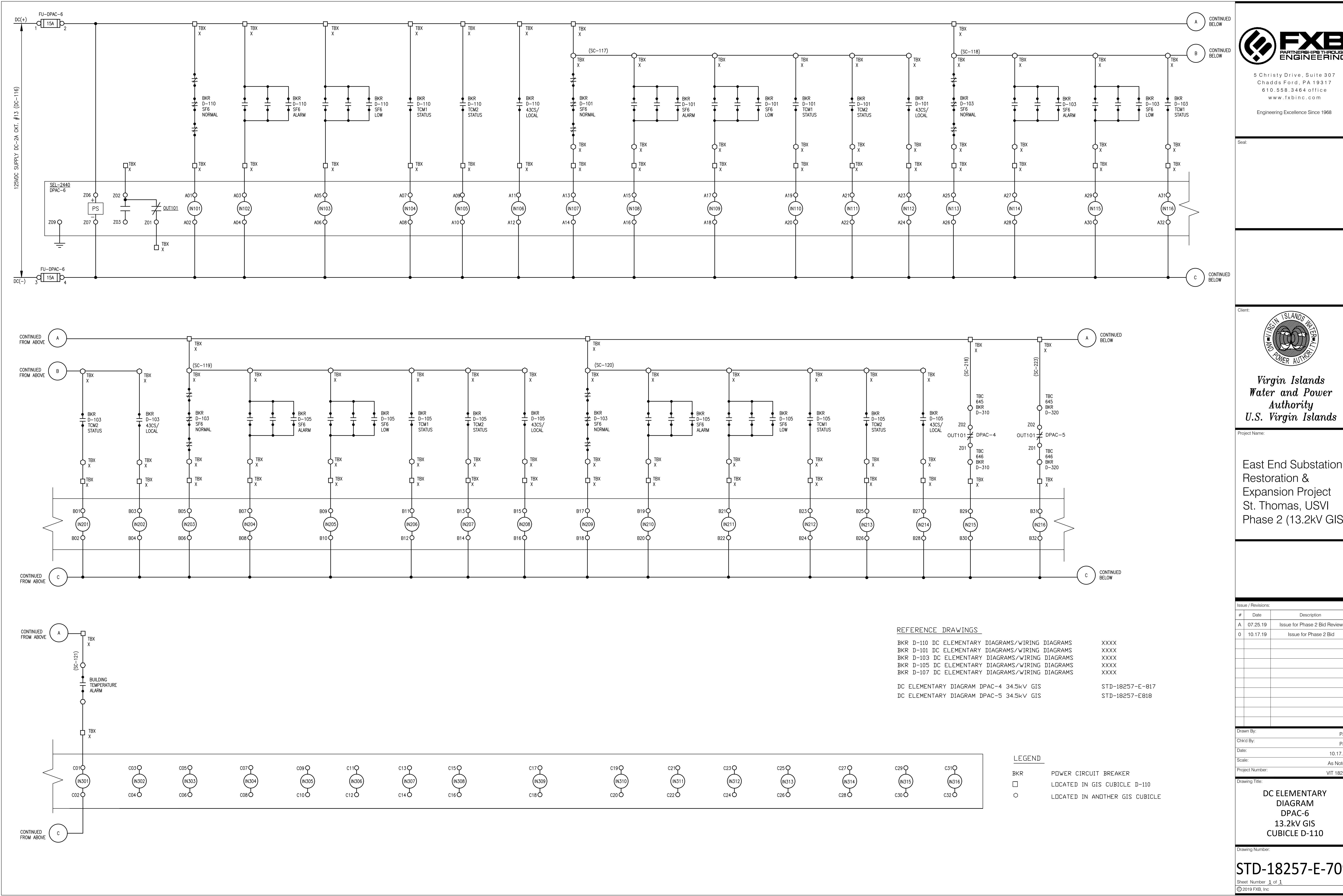
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DIAGRAM  
DPAC-2  
13.2kV RP6

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Seal:

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DC ELEMENTARY  
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DPAC-6  
13.2kV GIS  
CUBICLE D-110





E-711

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