

# SOUTHEAST BOOSTER PUMP STATION VFD UPGRADE

C.O.W. PROJECT NO. 448-2026-010537  
O.R.G. NO. 54258125 W5044

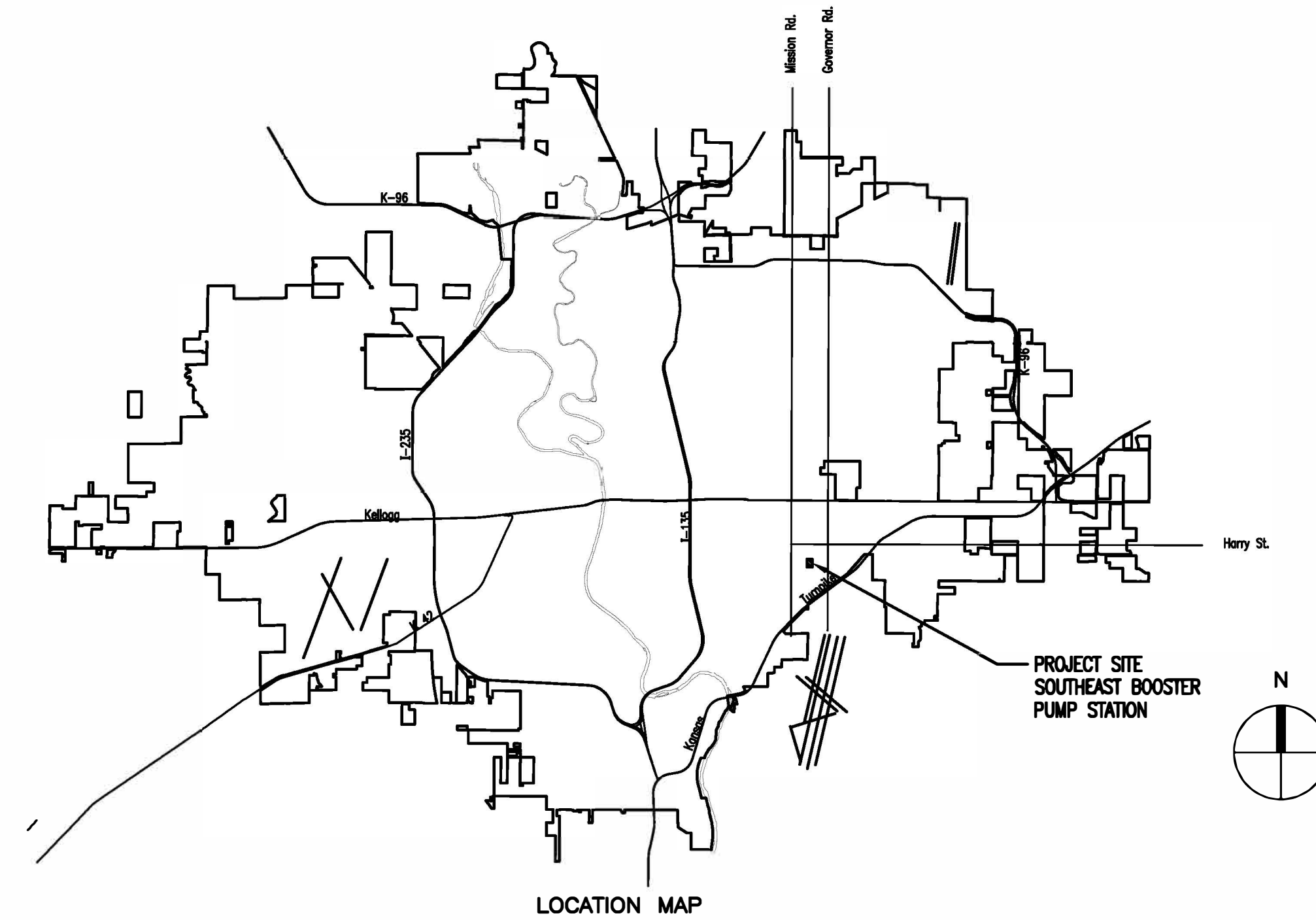
## CITY OF WICHITA, KANSAS

PAUL GUNZELMAN, P.E. - CITY ENGINEER

PROJECT ADDRESS: 6919 E OSIE CIRCLE, WICHITA, KS 67207

### SHEET INDEX

SHEET NO.	DESCRIPTION
G-001	COVER SHEET
D-101	PUMP STATION IMPROVEMENT PLAN
E-001	ELECTRICAL LEAD SHEET
E-101	ELECTRICAL DEMOLITION PLAN
E-301	ELECTRICAL POWER PLAN
E-501	ELECTRICAL VFD WIRING DIAGRAM
E-502	ELECTRICAL MPR WIRING DIAGRAM
E-601	ELECTRICAL DEMOLITION ONE-LINE DIAGRAM
E-602	ELECTRICAL PROPOSED ONE-LINE DIAGRAM
E-603	ELECTRICAL SCHEDULES
E-604	ELECTRICAL CONTROL SYSTEM ARCHITECTURE



**APRIL 2024**  
PLANS PREPARED BY  
**PROFESSIONAL ENGINEERING CONSULTANTS, P.A.**  
ENGINEERS  
WICHITA, KANSAS



SE BOOSTER PUMP  
STATION VFD UPGRADE

CITY OF WICHITA, KANSAS

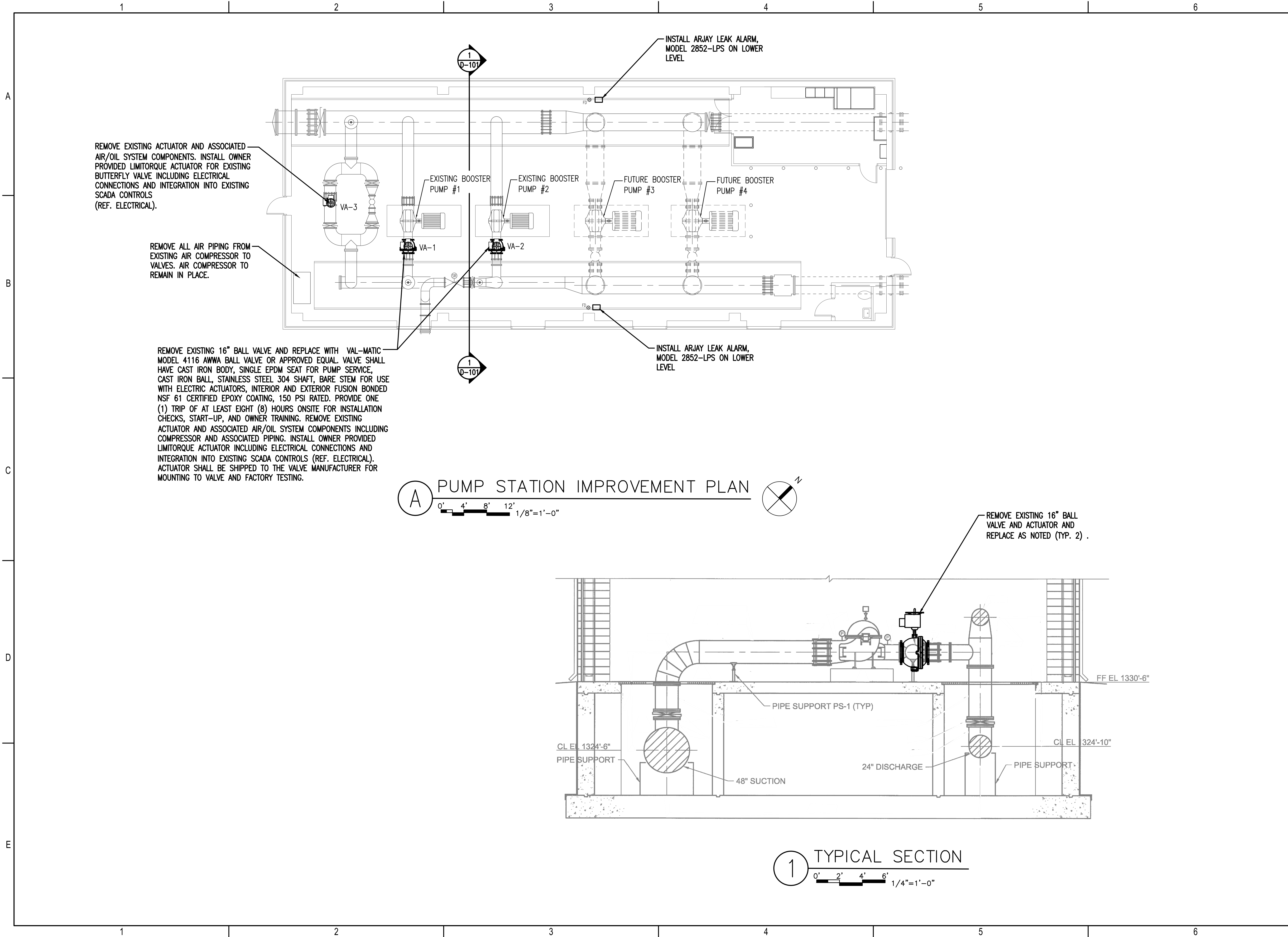
ISSUE:	DATE:	BY:

JOB NO.	237043-004
DATE	APRIL 2024
PM	RWW
DESIGNED BY	DCG
DRAWN BY	JAB
CHECKED BY	RWW

COVER SHEET

G-001

SAVED 3/1/2024 11:59:33 AM BY CHRIS.EPP  
 PLOTTED 4/9/2024 1:41:09 PM BY CHRIS.EPP  
 U:\WICHITA-CIVIL\2023\237043\04\MUNIDRAWINGS\ID-101 BOOSTER PUMP STATION IMPROVEMENT PLAN.DWG



**SE BOOSTER PUMP  
 STATION VFD UPGRADE**

**CITY OF WICHITA, KANSAS**

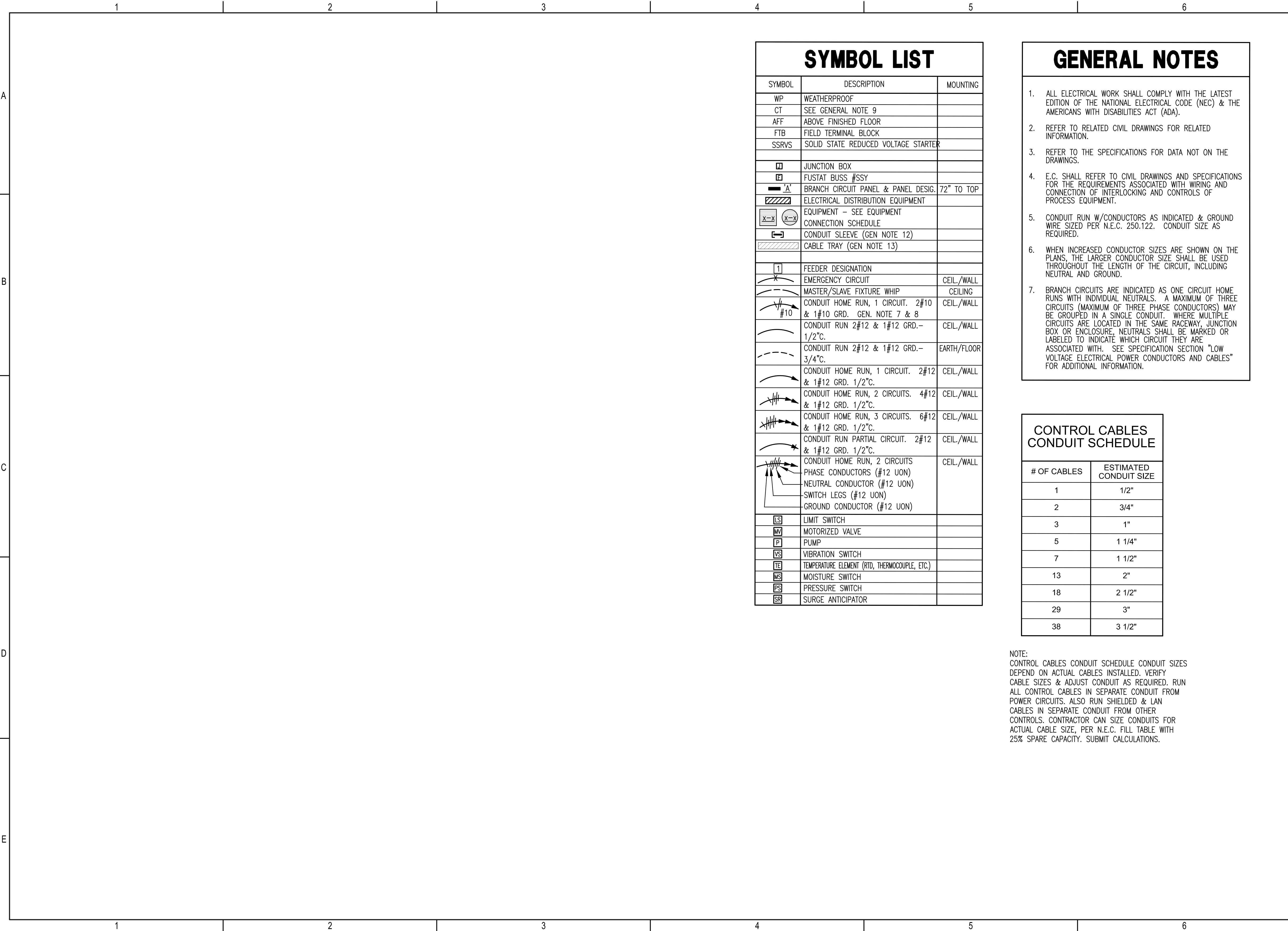
Issue:	

JOB NO.	237043-004
DATE	APRIL 2024
PM	RWW
DESIGNED BY	SCU
DRAWN BY	CAE
CHECKED BY	NDF

PUMP STATION IMPROVEMENT PLAN

D-101

SAVED 1/30/2024 1:21:14 PM BY JACOB.BURNS  
 PLOTTED 4/16/2024 2:00:32 PM BY JACOB.BURNS  
 U:\WICHITA-CIVIL\2023\237043004\ELECTRICAL DRAWINGS\E-001 ELECTRICAL LEAD SHEET.DWG



### SYMBOL LIST

SYMBOL	DESCRIPTION	MOUNTING
WP	WEATHERPROOF	
CT	SEE GENERAL NOTE 9	
AFF	ABOVE FINISHED FLOOR	
FTB	FIELD TERMINAL BLOCK	
SSRVS	SOLID STATE REDUCED VOLTAGE STARTER	
	JUNCTION BOX	
	FUSTAT BUSS #SSY	
	BRANCH CIRCUIT PANEL & PANEL DESIG.	72" TO TOP
	ELECTRICAL DISTRIBUTION EQUIPMENT	
	EQUIPMENT - SEE EQUIPMENT CONNECTION SCHEDULE	
	CONDUIT SLEEVE (GEN NOTE 12)	
	CABLE TRAY (GEN NOTE 13)	
	FEEDER DESIGNATION	
	EMERGENCY CIRCUIT	CEIL./WALL
	MASTER/SLAVE FIXTURE WHIP	CEILING
	CONDUIT HOME RUN, 1 CIRCUIT. 2#10 & 1#10 GRD. GEN. NOTE 7 & 8	CEIL./WALL
	CONDUIT RUN 2#12 & 1#12 GRD.- 1/2"C.	CEIL./WALL
	CONDUIT RUN 2#12 & 1#12 GRD.- 3/4"C.	EARTH/FLOOR
	CONDUIT HOME RUN, 1 CIRCUIT. 2#12 & 1#12 GRD. 1/2"C.	CEIL./WALL
	CONDUIT HOME RUN, 2 CIRCUITS. 4#12 & 1#12 GRD. 1/2"C.	CEIL./WALL
	CONDUIT HOME RUN, 3 CIRCUITS. 6#12 & 1#12 GRD. 1/2"C.	CEIL./WALL
	CONDUIT RUN PARTIAL CIRCUIT. 2#12 & 1#12 GRD. 1/2"C.	CEIL./WALL
	CONDUIT HOME RUN, 2 CIRCUITS PHASE CONDUCTORS (#12 UON) NEUTRAL CONDUCTOR (#12 UON) SWITCH LEGS (#12 UON) GROUND CONDUCTOR (#12 UON)	CEIL./WALL
	LIMIT SWITCH	
	MOTORIZED VALVE	
	PUMP	
	VIBRATION SWITCH	
	TEMPERATURE ELEMENT (RTD, THERMOCOUPLE, ETC.)	
	MOISTURE SWITCH	
	PRESSURE SWITCH	
	SURGE ANTICIPATOR	

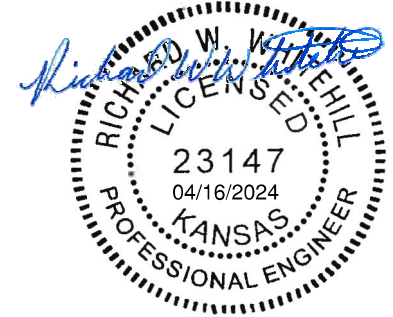
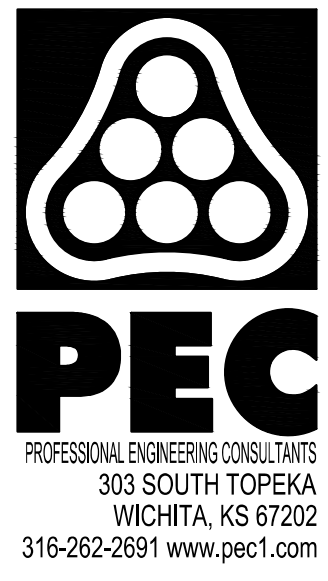
### GENERAL NOTES

- ALL ELECTRICAL WORK SHALL COMPLY WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NEC) & THE AMERICANS WITH DISABILITIES ACT (ADA).
- REFER TO RELATED CIVIL DRAWINGS FOR RELATED INFORMATION.
- REFER TO THE SPECIFICATIONS FOR DATA NOT ON THE DRAWINGS.
- E.C. SHALL REFER TO CIVIL DRAWINGS AND SPECIFICATIONS FOR THE REQUIREMENTS ASSOCIATED WITH WIRING AND CONNECTION OF INTERLOCKING AND CONTROLS OF PROCESS EQUIPMENT.
- CONDUIT RUN W/CONDUCTORS AS INDICATED & GROUND WIRE SIZED PER N.E.C. 250.122. CONDUIT SIZE AS REQUIRED.
- WHEN INCREASED CONDUCTOR SIZES ARE SHOWN ON THE PLANS, THE LARGER CONDUCTOR SIZE SHALL BE USED THROUGHOUT THE LENGTH OF THE CIRCUIT, INCLUDING NEUTRAL AND GROUND.
- BRANCH CIRCUITS ARE INDICATED AS ONE CIRCUIT HOME RUNS WITH INDIVIDUAL NEUTRALS. A MAXIMUM OF THREE CIRCUITS (MAXIMUM OF THREE PHASE CONDUCTORS) MAY BE GROUPED IN A SINGLE CONDUIT. WHERE MULTIPLE CIRCUITS ARE LOCATED IN THE SAME RACEWAY, JUNCTION BOX OR ENCLOSURE, NEUTRALS SHALL BE MARKED OR LABELED TO INDICATE WHICH CIRCUIT THEY ARE ASSOCIATED WITH. SEE SPECIFICATION SECTION "LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES" FOR ADDITIONAL INFORMATION.

### CONTROL CABLES CONDUIT SCHEDULE

# OF CABLES	ESTIMATED CONDUIT SIZE
1	1/2"
2	3/4"
3	1"
5	1 1/4"
7	1 1/2"
13	2"
18	2 1/2"
29	3"
38	3 1/2"

NOTE:  
 CONTROL CABLES CONDUIT SCHEDULE CONDUIT SIZES DEPEND ON ACTUAL CABLES INSTALLED. VERIFY CABLE SIZES & ADJUST CONDUIT AS REQUIRED. RUN ALL CONTROL CABLES IN SEPARATE CONDUIT FROM POWER CIRCUITS. ALSO RUN SHIELDED & LAN CABLES IN SEPARATE CONDUIT FROM OTHER CONTROLS. CONTRACTOR CAN SIZE CONDUITS FOR ACTUAL CABLE SIZE, PER N.E.C. FILL TABLE WITH 25% SPARE CAPACITY. SUBMIT CALCULATIONS.



SE BOOSTER PUMP  
 STATION VFD UPGRADE  
 CITY OF WICHITA, KANSAS

Issue:	

JOB NO.	237043-004
DATE	APRIL 2024
PM	RWW
DESIGNED BY	DCG
DRAWN BY	JAB
CHECKED BY	RWW

ELECTRICAL LEAD SHEET

E-001

SAVED 4/16/2024 1:25:32 PM BY JACOB.BURNS  
 PLOTTED 4/16/2024 2:00:35 PM BY JACOB.BURNS  
 U:\WICHITA-CIVIL\2023\237043004\ELECTRICAL\DRAWINGS\E-101 ELECTRICAL DEMOLITION PLAN.DWG

1 2 3 4 5 6

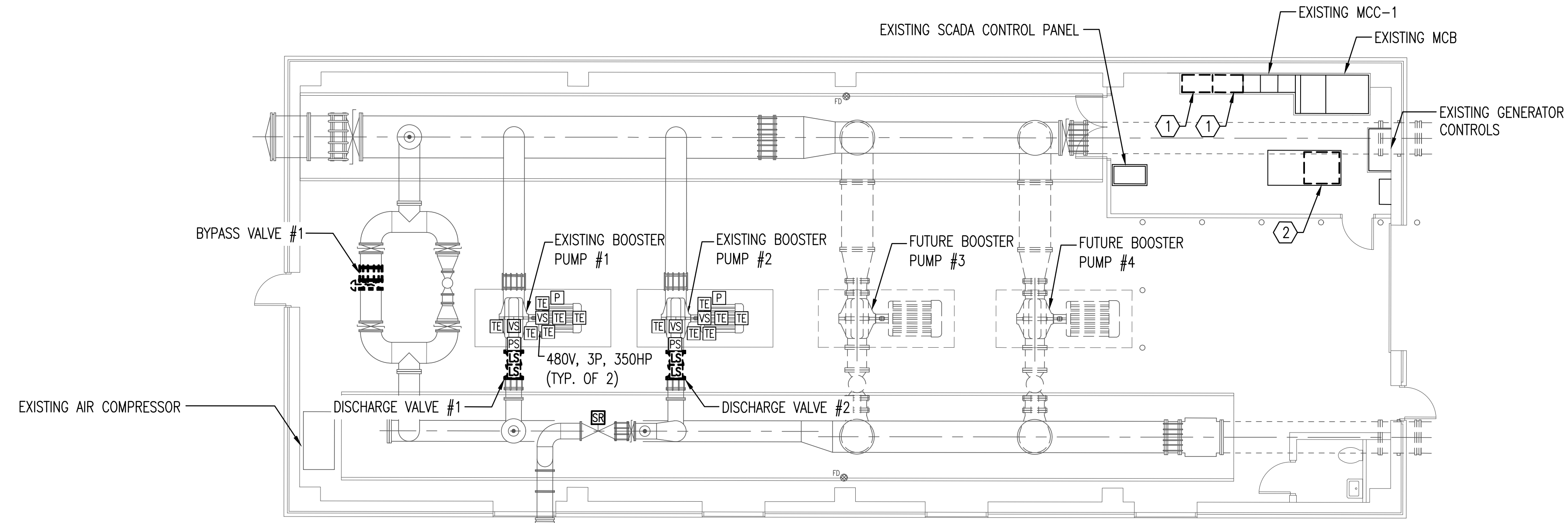
A

B

C

D

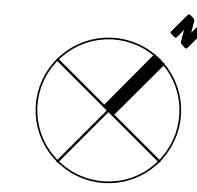
E



EXISTING DISCHARGE VALVE #1 AND DISCHARGE VALVE #2 TO BE DEMOLISHED.  
 EXISTING OIL/AIR ACTUATOR FOR BYPASS VALVE #1 TO BE DEMOLISHED.

**A** PUMP STATION DEMOLITION PLAN

0' 4' 8' 12' 1/8"=1'-0"

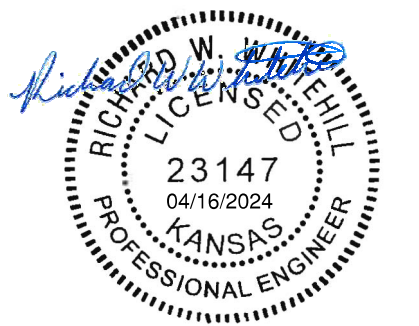


**DEMOLITION NOTES:**

- DEMOLITION PLANS SHOW THE GENERAL EXTENT OF THE ELECTRICAL DEMOLITION WORK. THE ELECTRICAL CONTRACTOR SHALL DISCONNECT ELECTRICAL SERVICES TO ALL EQUIPMENT BEING REMOVED. SEE MECHANICAL PLANS. OWNER SHALL HAVE THE OPTION TO RETAIN REUSABLE ITEMS, SUCH AS COVERPLATES, RECEPTACLES, LIGHTS, PANELS, ETC. NOT BEING USED IN THE FINISHED WORK. COORDINATE WITH OWNER PRIOR TO STARTING DEMOLITION. PROPERLY AND LEGALLY DISPOSE OF ALL EQUIPMENT AND MATERIALS BEING REMOVED.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PATCHING ALL OPENINGS IN EXISTING CONSTRUCTION AFTER REMOVAL OF EQUIPMENT, RACEWAY SYSTEMS, OUTLET BOXES, ETC.
- WHERE EQUIPMENT AND OTHER DEVICES ARE BEING REMOVED, THE CIRCUITING SHALL BE REMOVED, IF POSSIBLE, BACK TO POINT OF SUPPLY. WHERE REQUIRED, CIRCUITING SHALL BE EXTENDED TO MAINTAIN CONTINUITY OF THE CIRCUIT OR OPERATION OF THE SYSTEM.
- ALL DEVICES SHOWN IN A LIGHT LONG DASHED LINE ARE FUTURE UNDER THIS CONTRACT.
- ALL DEVICES SHOWN IN A DARK DASHED LINE ARE TO BE REMOVED UNDER THIS CONTRACT.
- ALL DEVICES SHOWN IN A LIGHT SHORT DASHED LINE ARE UNDERGROUND UNDER THIS CONTRACT.
- FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS PRIOR TO BEGINNING WORK.
- COORDINATE ALL SHUTDOWNS WITH OWNER.

**KEY NOTES:**

- ① REMOVE (2) EXISTING MCC SECTIONS WITH SSRVS ASSOCIATED WITH EXISTING BOOSTER PUMP 1 AND 2.
- ② REMOVE EXISTING AUTOMATIC CAPACITOR BANK.



**SE BOOSTER PUMP  
 STATION VFD UPGRADE**  
 CITY OF WICHITA, KANSAS

Issue:	

JOB NO.	237043-004
DATE	APRIL 2024
PM	RWW
DESIGNED BY	DCG
DRAWN BY	JAB
CHECKED BY	RWW

ELECTRICAL DEMOLITION  
 PLAN

E-101

1 2 3 4 5 6

1 2 3 4 5 6

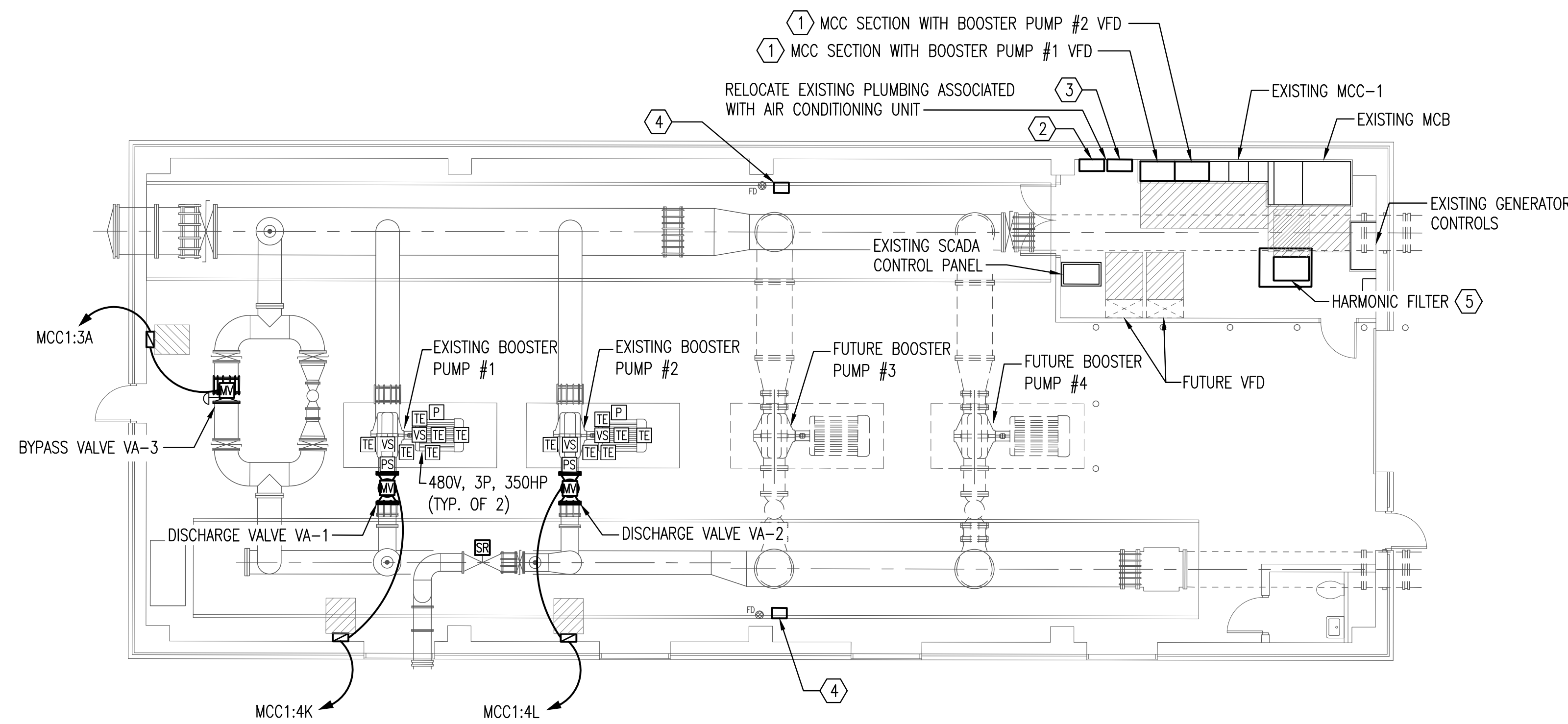
A

B

C

D

E



**PLAN NOTES:**

1. BRANCH CIRCUITS ARE INDICATED AS ONE CIRCUIT HOME RUNS WITH INDIVIDUAL NEUTRALS. A MAXIMUM OF THREE CIRCUITS (MAXIMUM OF THREE PHASE CONDUCTORS) MAY BE GROUPED IN A SINGLE CONDUIT. WHERE MULTIPLE CIRCUITS ARE LOCATED IN THE SAME RACEWAY, JUNCTION BOX OR ENCLOSURE, NEUTRALS SHALL BE MARKED OR LABELED TO INDICATE WHICH CIRCUIT THEY ARE ASSOCIATED WITH. SEE SPECIFICATION SECTION "LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES" FOR ADDITIONAL INFORMATION.
2. A GROUND CONDUCTOR SIZED PER N.E.C. ARTICLE 250 IS REQUIRED IN ALL CONDUITS.
3. REFER TO EXISTING SCADA CONTROL PANEL SCHEDULE, VFD-1 PLC AND VFD-2 PLC CONTROL SCHEDULES ON SHEET E-603 FOR WIRING REQUIREMENTS ASSOCIATED WITH CONTROLS.
4. REFER TO EQUIPMENT CONNECTION SCHEDULE ON SHEET E-603 FOR CONNECTION REQUIREMENTS ASSOCIATED WITH EQUIPMENT.

**KEY NOTES:**

- ① PROVIDE NEW VFD IN MCC SECTION TO REPLACE EXISTING PUMP SSRVS. CONTRACTOR TO MEGGER EXISTING CONDUCTORS AND PROVIDE RESULTS TO ENGINEER AND OWNER. DETERMINATION TO REUSE OR REPLACE CONDUCTORS WILL BE MADE BY OWNER BASED ON TEST RESULTS. PROVIDE COSTS TO REPLACE FEEDER AS ADD ALTERNATE #1.
- ② PUMP #1 VFD CONTROL PANEL. PROVIDE 20A, 120V BREAKER IN PANEL LP1, LOCATED IN MCC1, FOR CONNECTION.
- ③ PUMP #2 VFD CONTROL PANEL. PROVIDE 20A, 120V BREAKER IN PANEL LP1, LOCATED IN MCC1, FOR CONNECTION.
- ④ ARJAY LEAK ALARM INSTALLED IN LOWER LEVEL. PROVIDE 20A, 120V BREAKER IN PANEL LP1, LOCATED IN MCC1, FOR CONNECTION.
- ⑤ EXTEND EXISTING CONDUIT AS REQUIRED FOR TOP ENTRY INTO HARMONIC FILTER. REWORK EXISTING CONCRETE PAD AS REQUIRED.



**SE BOOSTER PUMP  
STATION VFD UPGRADE**  
  
**CITY OF WICHITA, KANSAS**

**A PUMP STATION POWER PLAN**  
 0' 4' 8' 12' 1/8"=1'-0"

SAVED 4/16/2024 1:56:54 PM BY JACOB.BURNS  
 PLOTTED 4/16/2024 2:00:40 PM BY JACOB.BURNS  
 U:\WICHITA-CIVIL\2023\237043004\ELECTRICAL DRAWINGS\E-301 ELECTRICAL POWER PLAN.DWG

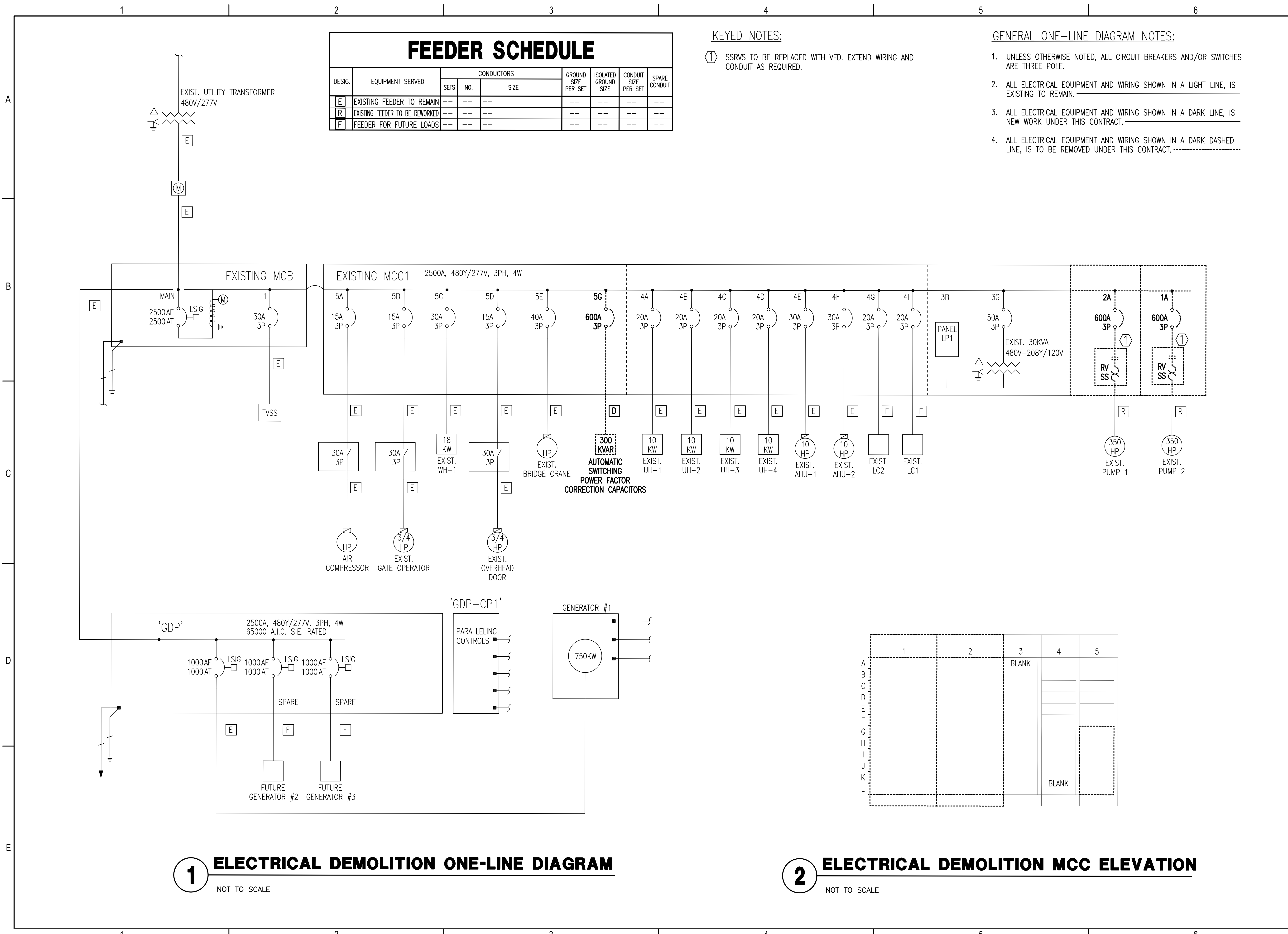
Issue:	
JOB NO.	237043-004
DATE	APRIL 2024
PM	RWW
DESIGNED BY	DCG
DRAWN BY	JAB
CHECKED BY	RWW
ELECTRICAL POWER PLAN	

1 2 3 4 5 6





4/15/2024 4:14:51 PM BY JACOB.BURNS  
 PLOTTED 4/16/2024 2:00:55 PM BY JACOB.BURNS  
 U:\WICHITA-CIVIL\2023\3237043004\ELECTRICAL\DRAWINGS\E-601 ELECTRICAL DEMOLITION ONE-LINE DIAGRAM.DWG



### FEEDER SCHEDULE

DESIG.	EQUIPMENT SERVED	CONDUCTORS			GROUND SIZE PER SET	ISOLATED GROUND SIZE	CONDUIT SIZE PER SET	SPARE CONDUIT
		SETS	NO.	SIZE				
E	EXISTING FEEDER TO REMAIN	--	--	--	--	--	--	--
R	EXISTING FEEDER TO BE REWORKED	--	--	--	--	--	--	--
F	FEEDER FOR FUTURE LOADS	--	--	--	--	--	--	--

**KEYED NOTES:**

① SSRVS TO BE REPLACED WITH VFD. EXTEND WIRING AND CONDUIT AS REQUIRED.

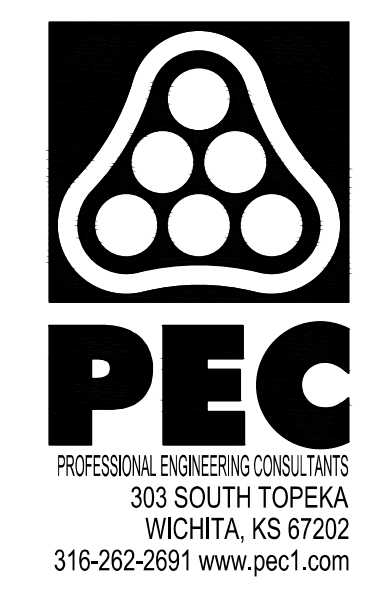
**GENERAL ONE-LINE DIAGRAM NOTES:**

- UNLESS OTHERWISE NOTED, ALL CIRCUIT BREAKERS AND/OR SWITCHES ARE THREE POLE.
- ALL ELECTRICAL EQUIPMENT AND WIRING SHOWN IN A LIGHT LINE, IS EXISTING TO REMAIN.
- ALL ELECTRICAL EQUIPMENT AND WIRING SHOWN IN A DARK LINE, IS NEW WORK UNDER THIS CONTRACT.
- ALL ELECTRICAL EQUIPMENT AND WIRING SHOWN IN A DARK DASHED LINE, IS TO BE REMOVED UNDER THIS CONTRACT.

**1 ELECTRICAL DEMOLITION ONE-LINE DIAGRAM**  
NOT TO SCALE

**2 ELECTRICAL DEMOLITION MCC ELEVATION**  
NOT TO SCALE

	1	2	3	4	5
A			BLANK		
B					
C					
D					
E					
F					
G					
H					
I					
J					
K					
L				BLANK	



**SE BOOSTER PUMP  
STATION VFD UPGRADE**  
  
 CITY OF WICHITA, KANSAS

Issue:	
JOB NO.	237043-004
DATE	APRIL 2024
PM	RWW
DESIGNED BY	DCG
DRAWN BY	JAB
CHECKED BY	RWW
ELECTRICAL DEMOLITION ONE-LINE DIAGRAM	
E-601	



## EXISTING SCADA CONTROL PANEL SCHEDULE

LOCATION:  
BOOSTER PUMP STATION

CIRCUIT NO.	EQUIPMENT SERVED/ MARK	CONNECT			DESCRIPTION/FUNCTION	CONDUCTORS IN CABLE	DISCRETE	ANALOG	DIGITAL	INPUT	OUTPUT	REMARKS
		DEVICE	CTL. PNL	STARTER								
1				X	VFD-1 START/STOP CMD	ENET	X	X	X			
2				X	VFD-1 RUN STATUS	ENET	X	X	X			
3				X	VFD-1 FAULT INDICATION	ENET	X	X	X			
4				X	VFD-1 SPEED INDICATION	ENET	X	X	X			
5				X	VFD-1 SPEED CONTROL	ENET	X	X	X			
6				X	VFD-1 OUTPUT POWER	ENET	X	X	X			
7				X	VFD-1 HAND INDICATION	ENET	X	X	X			
8				X	VFD-1 OFF INDICATION	ENET	X	X	X			
9				X	VFD-1 AUTO INDICATION	ENET	X	X	X			
10				X	P-1 MOTOR OVERLOAD/FAILURE	ENET	X	X	X			
11				X	P-1 VIBRATION WARNING	ENET	X	X	X			
12				X	P-1 VIBRATION ALARM	ENET	X	X	X			
13				X	P-1 MOTOR VIBRATION WARNING	ENET	X	X	X			
14				X	P-1 MOTOR VIBRATION ALARM	ENET	X	X	X			
15				X	P-1 WINDING TEMPERATURE ALARM	ENET	X	X	X			
16				X	P-1 INNER BEARING TEMPERATURE	ENET	X	X	X			
17				X	P-1 OUTER BEARING TEMPERATURE	ENET	X	X	X			
18				X	P-1 MOTOR INNER BEARING TEMPERATURE	ENET	X	X	X			
19				X	P-1 MOTOR OUTER BEARING TEMPERATURE	ENET	X	X	X			
20				X	MPR-1 WINDING A TEMPERATURE DETECTOR NO. 1	ENET	X	X	X			
21				X	MPR-1 WINDING A TEMPERATURE DETECTOR NO. 2	ENET	X	X	X			
22				X	MPR-1 WINDING B TEMPERATURE DETECTOR NO. 1	ENET	X	X	X			
23				X	MPR-1 WINDING B TEMPERATURE DETECTOR NO. 2	ENET	X	X	X			
24				X	MPR-1 WINDING C TEMPERATURE DETECTOR NO. 1	ENET	X	X	X			
25				X	MPR-1 WINDING C TEMPERATURE DETECTOR NO. 2	ENET	X	X	X			
26				X	P-1 DISCHARGE PRESSURE SWITCH	ENET	X	X	X			
27				X	DISCHARGE VALVE #1 FAILURE	ENET	X	X	X			
28				X	DISCHARGE VALVE #1 OPEN STATUS	ENET	X	X	X			
29				X	DISCHARGE VALVE #1 CLOSED STATUS	ENET	X	X	X			
30				X	DISCHARGE VALVE #1 10% OPEN STATUS	ENET	X	X	X			
31				X	VFD-2 START/STOP CMD	ENET	X	X	X			
32				X	VFD-2 RUN STATUS	ENET	X	X	X			
33				X	VFD-2 FAULT INDICATION	ENET	X	X	X			
34				X	VFD-2 SPEED INDICATION	ENET	X	X	X			
35				X	VFD-2 SPEED CONTROL	ENET	X	X	X			
36				X	VFD-2 OUTPUT POWER	ENET	X	X	X			
37				X	VFD-2 HAND INDICATION	ENET	X	X	X			
38				X	VFD-2 OFF INDICATION	ENET	X	X	X			
39				X	VFD-2 AUTO INDICATION	ENET	X	X	X			
40				X	P-2 MOTOR OVERLOAD/FAILURE	ENET	X	X	X			
41				X	P-2 VIBRATION WARNING	ENET	X	X	X			
42				X	P-2 VIBRATION ALARM	ENET	X	X	X			
43				X	P-2 MOTOR VIBRATION WARNING	ENET	X	X	X			
44				X	P-2 MOTOR VIBRATION ALARM	ENET	X	X	X			
45				X	P-2 WINDING TEMPERATURE ALARM	ENET	X	X	X			
46				X	P-2 INNER BEARING TEMPERATURE	ENET	X	X	X			
47				X	P-2 OUTER BEARING TEMPERATURE	ENET	X	X	X			
48				X	P-2 MOTOR INNER BEARING TEMPERATURE	ENET	X	X	X			
49				X	P-2 MOTOR OUTER BEARING TEMPERATURE	ENET	X	X	X			
50				X	MPR-2 WINDING A TEMPERATURE DETECTOR NO. 1	ENET	X	X	X			
51				X	MPR-2 WINDING A TEMPERATURE DETECTOR NO. 2	ENET	X	X	X			
52				X	MPR-2 WINDING B TEMPERATURE DETECTOR NO. 1	ENET	X	X	X			
53				X	MPR-2 WINDING B TEMPERATURE DETECTOR NO. 2	ENET	X	X	X			
54				X	MPR-2 WINDING C TEMPERATURE DETECTOR NO. 1	ENET	X	X	X			
55				X	MPR-2 WINDING C TEMPERATURE DETECTOR NO. 2	ENET	X	X	X			
56				X	P-2 DISCHARGE PRESSURE SWITCH	ENET	X	X	X			
57				X	DISCHARGE VALVE #2 FAILURE	ENET	X	X	X			
58				X	DISCHARGE VALVE #2 OPEN STATUS	ENET	X	X	X			
59				X	DISCHARGE VALVE #2 CLOSED STATUS	ENET	X	X	X			
60				X	DISCHARGE VALVE #2 10% OPEN STATUS	ENET	X	X	X			
61				X	DISCHARGE VALVE #3 OPEN STATUS	2 #14	X	X	X			
62				X	DISCHARGE VALVE #3 CLOSED STATUS	2 #14	X	X	X			
63				X	DISCHARGE VALVE #3 10% OPEN STATUS	2 #14	X	X	X			
61				X	DISCHARGE VALVE #3 OPEN CMD	2 #14	X	X	X			
62				X	DISCHARGE VALVE #3 CLOSE CMD	2 #14	X	X	X			
63				X	DISCHARGE VALVE #3 FAILURE	2 #14	X	X	X			
64				X	NORTH LEAK ALARM	2 #14	X	X	X			PROVIDE 120V POWER
65				X	SOUTH LEAK ALARM	2 #14	X	X	X			PROVIDE 120V POWER

ALL I/O SHOWN IN SCADA CONTROL PANEL SCHEDULE IS NEW TO SCADA. REMOVE ALL EXISTING I/O IN SCADA CONTROL PANEL THAT PERTAINS TO EXISTING SOFT STARTS.

### PLAN NOTES:

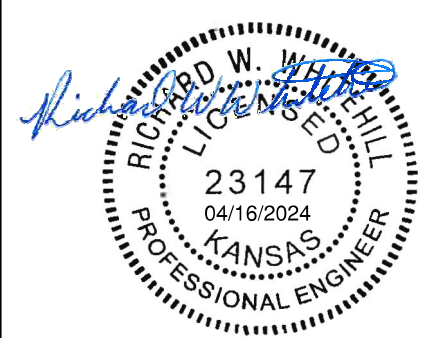
1. CONTROL JUNCTION BOXES SHALL BE SIZED PER THE N.E.C. AS A MINIMUM.
2. RUN ALL CONTROL CABLES IN SEPARATE CONDUITS FROM POWER CIRCUITS. RUN SHIELDED CABLES (ANALOG) AND LAN CABLES IN SEPARATE CONDUIT FROM OTHER CONTROL CABLES (DISCRETE).
3. SEE CONTROL CABLES CONDUIT SCHEDULE FOR CONTROL CABLE CONDUIT SIZING REQUIREMENTS.
4. FURNISH AND INSTALL ALL CONDUIT AND WIRING AS REQUIRED FOR COMPLETE FUNCTIONALITY OF EQUIPMENT AS SPECIFIED AND AS IDENTIFIED BY THE MANUFACTURER. COORDINATE FIELD WIRING REQUIREMENTS WITH EQUIPMENT MANUFACTURER.
5. REFER TO CIVIL DRAWINGS AND SECTIONS FOR EXACT EQUIPMENT LOCATIONS.
6. LOCATE CONTROLS CONDUIT AND JUNCTION BOXES SO AS NOT TO INTERFERE WITH EQUIPMENT OPERATION, MAINTENANCE, OR REPLACEMENT.
7. A CONDUIT FOR ANALOG CABLE SHALL TERMINATE IN EQUIPMENT ENCLOSURE AS CLOSE AS POSSIBLE TO THE TERMINALS. CABLES SHALL NOT PASS NEAR TO CABLES OR EQUIPMENT OPERATING ABOVE 24V.
8. INTERNAL AND EXTERNAL I/O SHALL BE LANDED ON TERMINAL STRIPS.
9. I/O IDENTIFIED ON CONTROL DIAGRAM SHEETS ARE FOR INPUTS & OUTPUTS EXTERNAL TO THE EQUIPMENT CONTROL PANEL. I/O NECESSARY FOR THE COMPLETE FUNCTIONALITY OF THE EQUIPMENT (INTERNAL I/O) SHALL BE PROVIDED BY THE EQUIPMENT MANUFACTURER. THE CONTRACTOR SHALL FURNISH & INSTALL CONDUIT AND WIRE REQUIRED FOR COMPLETE FUNCTIONALITY OF EQUIPMENT AS SPECIFIED AND AS IDENTIFIED BY THE MANUFACTURER. THE CONTRACTOR SHALL COORDINATE WITH EQUIPMENT MANUFACTURER TO DETERMINE FIELD WIRING REQUIREMENTS.

VFD-1 PLC												LOCATION: BOOSTER PUMP STATION NEMA-1
CIRCUIT NO.	EQUIPMENT SERVED/ MARK	CONNECT			DESCRIPTION/FUNCTION	CONDUCTORS IN CABLE	DISCRETE	ANALOG	DIGITAL	INPUT	OUTPUT	REMARKS
		DEVICE	CTL. PNL	STARTER								
1		X			PUMP DISCHARGE PRESSURE SWITCH	2 #14	X			X		
2	PUMP #1	X			PUMP VIBRATION SWITCH	2 #14	X			X		
3		X			MOTOR VIBRATION SWITCH	2 #14	X			X		
4		X			DISCHARGE VALVE OPEN CMD	2 #14	X				X	
5		X			DISCHARGE VALVE CLOSED CMD	2 #14	X				X	
6	VALVE #1	X			DISCHARGE VALVE OPEN STATUS	2 #14	X			X		
7		X			DISCHARGE VALVE CLOSED STATUS	2 #14	X			X		
8		X			DISCHARGE VALVE 10% OPEN STATUS	2 #14	X			X		
9	SACP	X			SURGE ANTIPICTOR ENABLE	2 #14	X				X	

VFD-2 PLC												LOCATION: BOOSTER PUMP STATION NEMA-1
CIRCUIT NO.	EQUIPMENT SERVED/ MARK	CONNECT			DESCRIPTION/FUNCTION	CONDUCTORS IN CABLE	DISCRETE	ANALOG	DIGITAL	INPUT	OUTPUT	REMARKS
		DEVICE	CTL. PNL	STARTER								
1		X			PUMP DISCHARGE PRESSURE SWITCH	2 #14	X			X		
2	PUMP #2	X			PUMP VIBRATION SWITCH	2 #14	X			X		
3		X			MOTOR VIBRATION SWITCH	2 #14	X			X		
4		X			DISCHARGE VALVE OPEN CMD	2 #14	X				X	
5		X			DISCHARGE VALVE CLOSED CMD	2 #14	X				X	
6	VALVE #2	X			DISCHARGE VALVE OPEN STATUS	2 #14	X			X		
7		X			DISCHARGE VALVE CLOSED STATUS	2 #14	X			X		
8		X			DISCHARGE VALVE 10% OPEN STATUS	2 #14	X			X		
9	SACP	X			SURGE ANTIPICTOR ENABLE	2 #14	X				X	

EQUIPMENT CONNECTION SCHEDULE																
UNIT DESIG.	UNIT VOLTAGE	LOAD			PANEL DEVICE				DEVICE AT UNIT				S.E.T.S.	FEEDER DESCRIPTION OR SEE THE FEEDER SCHEDULE	REMARKS OR SEE THE INDICATED NOTES BELOW	
		H.P.	FLA	KVA	CIRCUIT NUMBER	BKR/SW/FUSE	NEMA START. SIZE	BKR/SW/FUSE	NEMA START. SIZE	OTHER						
P	BOOSTER PUMP															
1	480/3	350	414.0	344.2	MCC-1:1A	600		3	VFD					2	3 #350 KCMIL THWN; #1 AWG GRD; 3-1/2" C.	
2	480/3	350	414.0	344.2	MCC-1:2A	600		3	VFD					2	3 #350 KCMIL THWN; #1 AWG GRD; 3-1/2" C.	
VA	VALVE ACTUATOR															
1	480/3	0.25	1.0	0.831	MCC-1:4K	20		3				30	1.6	3	1	3 #12 AWG THWN; #12 AWG GRD; 1" C.
2	480/3	0.25	1.0	0.831	MCC-1:4L	20		3				30	1.6	3	1	3 #12 AWG THWN; #12 AWG GRD; 1" C.
3	480/3	0.25	1.0	0.831	MCC-1:3A	20		3				30	1.6	3	1	3 #12 AWG THWN; #12 AWG GRD; 1" C.

① REPLACE MCC SECTION WITH NEW VFD. CONTRACTOR TO MEGGER EXISTING CONDUCTORS AND PROVIDE RESULTS TO ENGINEER AND OWNER. DETERMINATION TO REUSE OR REPLACE CONDUCTORS WILL BE MADE BY OWNER BASED ON TEST RESULTS.



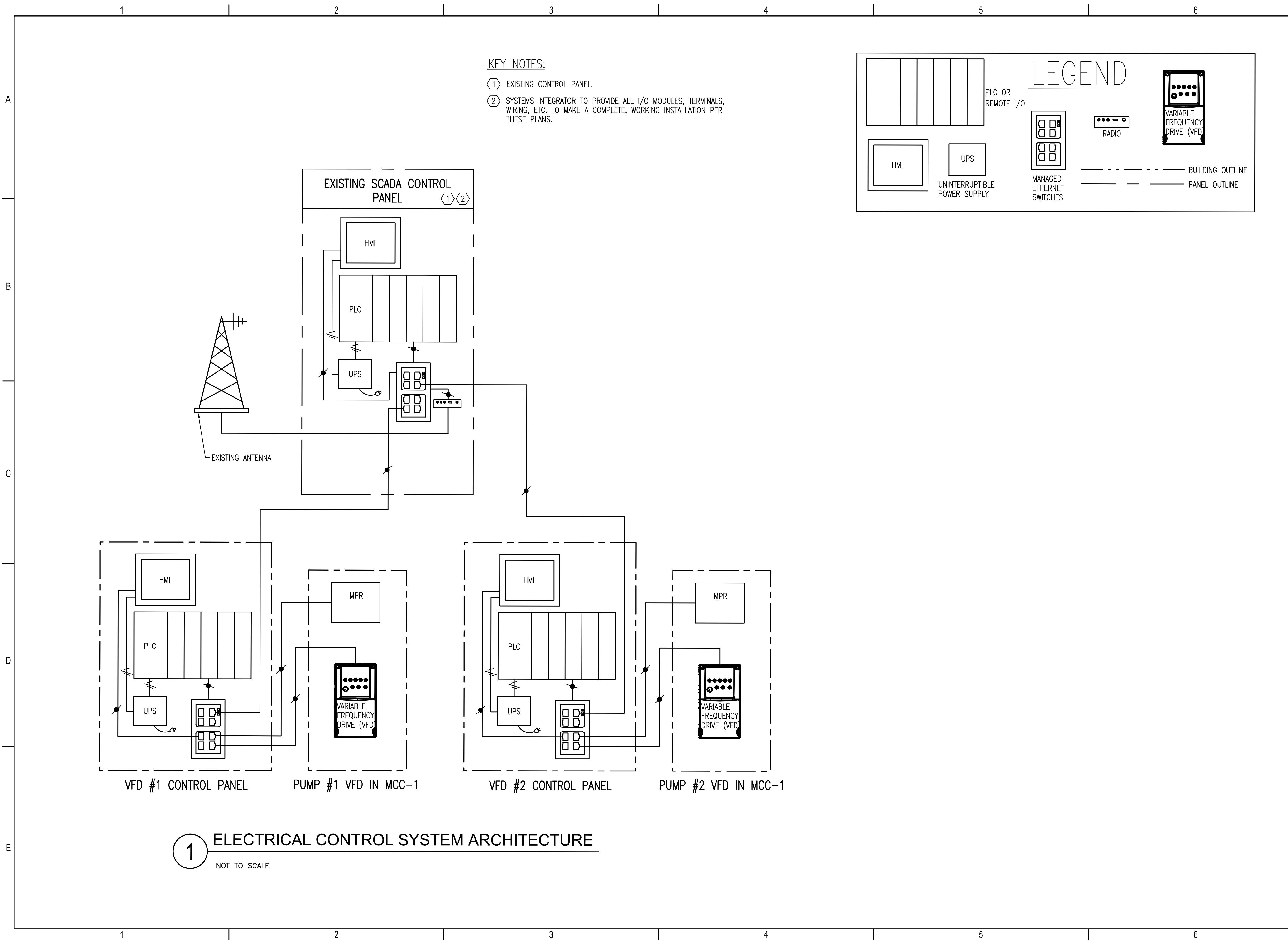
SE BOOSTER PUMP STATION VFD UPGRADE  
CITY OF WICHITA, KANSAS

Issue:	

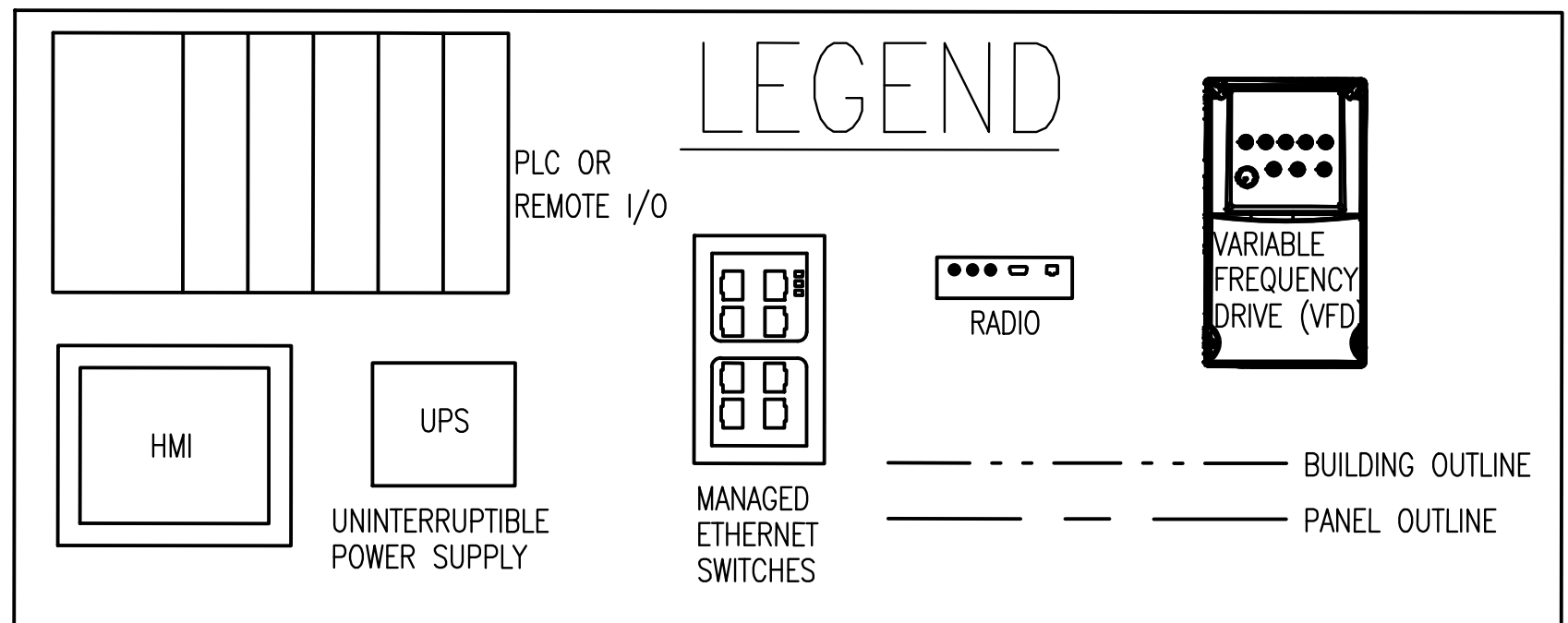
JOB NO.	237043-004
DATE	APRIL 2024
PM	RWW
DESIGNED BY	DCG
DRAWN BY	JAB
CHECKED BY	RWW

ELECTRICAL SCHEDULES

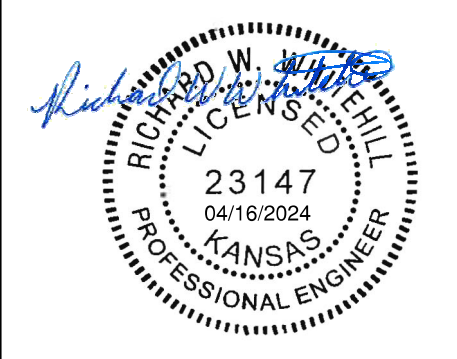
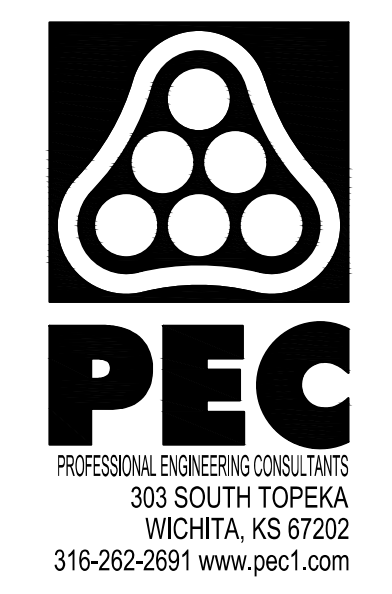
SAVED 4/16/2024 1:56:47 PM BY JACOB.BURNS  
 PLOTTED 4/16/2024 2:01:10 PM BY JACOB.BURNS  
 U:\WICHITA-CIVIL\2023\237043004\ELECTRICAL\DRAWINGS\E-604 ELECTRICAL CONTROL SYSTEM ARCHITECTURE.DWG



**KEY NOTES:**  
 ① EXISTING CONTROL PANEL.  
 ② SYSTEMS INTEGRATOR TO PROVIDE ALL I/O MODULES, TERMINALS, WIRING, ETC. TO MAKE A COMPLETE, WORKING INSTALLATION PER THESE PLANS.



**1 ELECTRICAL CONTROL SYSTEM ARCHITECTURE**  
 NOT TO SCALE



**SE BOOSTER PUMP  
 STATION VFD UPGRADE**  
 CITY OF WICHITA, KANSAS

Issue:	
JOB NO.	237043-004
DATE	APRIL 2024
PM	RWW
DESIGNED BY	DCG
DRAWN BY	JAB
CHECKED BY	RWW
ELECTRICAL CONTROL SYSTEM ARCHITECTURE	

E-604