

**DUPLEX PUMP STATION W/ GENERATOR  
ELECTRICAL DRAWING INDEX**

STANDARD DRAWINGS

- E-1 ELECTRICAL DRAWING INDEX
- E-2 ELECTRICAL SYMBOLS LEGEND & ABBREVIATIONS

DUPLEX PUMP STATION GENERATOR SITES

- E-3 STANDARD 240V-1Ø (0-10HP) DUPLEX PUMP STATION W/ GENERATOR POWER, INSTRUMENTATION AND CONTROL PLAN
- E-4 STANDARD 240V-1Ø (0-10HP) DUPLEX PUMP STATION W/ GENERATOR LIGHTNING PROTECTION, BONDING & GROUNDING PLAN
- E-5 STANDARD 240V-1Ø (0-10HP) DUPLEX PUMP STATION W/ GENERATOR ELECTRICAL EQUIPMENT RACK ELEVATION
- E-6 STANDARD 240V-1Ø (0-10HP) DUPLEX PUMP STATION W/ GENERATOR ELECTRICAL RISER DIAGRAM AND PANEL SCHEDULE
- E-7 STANDARD 240V-1Ø (0-10HP) DUPLEX PUMP STATION W/ GENERATOR CONTROL PANEL ELEVATION
- E-8 STANDARD 240V-1Ø (0-10HP) DUPLEX PUMP STATION W/ GENERATOR CONTROL PANEL ELEMENTARY DRAWING
- E-9 STANDARD 240V-1Ø (0-10HP) DUPLEX PUMP STATION W/ GENERATOR CONTROL PANEL ELEMENTARY DRAWING
- E-10 STANDARD 240V-1Ø (0-10HP) DUPLEX PUMP STATION W/ GENERATOR CONTROL PANEL ELEMENTARY DRAWING
- E-11 STANDARD 240V-1Ø (0-10HP) DUPLEX PUMP STATION W/ GENERATOR CONTROL PANEL ELEMENTARY DRAWING
- E-12 STANDARD 240V-1Ø (0-10HP) DUPLEX PUMP STATION W/ GENERATOR CONTROL PANEL ELEMENTARY DRAWING
- E-13 DATA COLLECTOR INSTALLATION DETAIL
- E-14 GENERATOR LAYOUT & DETAILS

STANDARD DETAIL DRAWINGS

- ES-1 JUNCTION BOX AND TERMINAL STRIP INSTALLATION AT CONTROL PANEL LOCATION
- ES-2 GROUNDING DETAILS
- ES-3 STREAMER RETARDING FIXTURE AIR TERMINAL FIXTURE POLE MOUNTED
- ES-4 LEVEL TRANSMITTER DETAIL
- ES-5 TERMINATION OF SHIELDED INSTRUMENT CONTROL CABINET DETAIL
- ES-6 INSTRUMENT GROUNDING & SURGE PROTECTION DETAIL
- ES-7 UNDERGROUND CONDUIT INSTALLATION
- ES-8 GROUND ROD INSTALLATION DETAIL

**GENERAL NOTES:**

- 1.) SITE SPECIFIC CONDITIONS DETERMINE THE CLASSIFICATION OF PUMP STATION IN ACCORDANCE WITH FDEP STANDARDS AND MUST BE DETERMINED BY THE DESIGN ENGINEER FOR EACH SPECIFIC PROJECT.
- 2.) A PUMP STATION THAT RECEIVES FLOW FROM MORE THAN 1 LOCATION WILL BE CLASSIFIED AS EITHER A REPUMP STATION OR A MASTER PUMP STATION. THE DETERMINATION OF PUMP STATION CLASSIFICATION IS VERY SITE SPECIFIC. ENGINEER, DEVELOPER AND/OR CONTRACTOR MUST COORDINATE WITH LEE COUNTY UTILITIES TO CORRECTLY CATEGORIZE THE STATION. PUMP STATION CLASSIFICATION DETERMINES WHICH STANDARD TO REFERENCE. REPUMP STATIONS CAN BE UP TO 77HP, 2 OR 3 PUMPS AND WILL BE EQUIPPED WITH ACROSS THE LINE STARTERS CONTROLLED BY SCADA-PAK. REFERENCE LCU STANDARD DUPLEX 3-PHASE PUMP STATION WITH GENERATOR OR LCU STANDARD TRIPLEX 3-PHASE PUMP STATION WITH GENERATOR FOR GENERAL CONSTRUCTION STANDARDS. SIZE ELECTRICAL SERVICE AND EQUIPMENT SITE SPECIFIC TO REPUMP STATION HORSEPOWER. MASTER PUMP STATIONS WILL BE 35HP AND GREATER, MOST LIKELY 3 PUMPS. THEY WILL BE EQUIPPED WITH VFDS WHICH ARE LEVEL CONTROLLED THROUGH A PLC. REFERENCE LCU MASTER PUMP STATION STANDARD DRAWINGS. SIZE ELECTRICAL SERVICE AND EQUIPMENT SITE SPECIFIC TO MASTER PUMP STATION HORSEPOWER.

**STAND-BY GENERATOR REQUIREMENT:**

FDEP REQUIRES AN IN PLACE EMERGENCY GENERATOR TO PROVIDE UNINTERRUPTED PUMPING CAPABILITY FOR PUMP STATIONS RECEIVING FLOW FROM ONE OR MORE PUMP STATIONS THROUGH A FORCE MAIN OR PUMP STATIONS DISCHARGING THROUGH PIPES 12 INCHES OR LARGER. REFERENCE FDEP FORM 62-604.300(8)(a) EMERGENCY OPERATION OF PUMP STATIONS PARAGRAPH 71. IN ADDITION TO FDEP REQUIREMENTS, GENERATORS ARE REQUIRED BY LCU AT PUMP STATIONS BASED ON SITE SPECIFIC FLOWS. COORDINATE WITH LCU TO DETERMINE IF SITE SPECIFIC FLOWS AT PUMP STATION REQUIRE AN IN PLACE EMERGENCY GENERATOR.

**SUBMITTAL REQUIREMENT:**


LEE COUNTY UTILITIES REQUIRES PUMP STATION SUBMITTALS BE PROVIDED FOR THEIR REVIEW TO ENSURE COMPLIANCE WITH THE LCU PUMP STATION STANDARDS.

ELECTRICAL DRAWING  
INDEX

E-1

NOTE:

THIS DRAWING IS A LEE COUNTY STANDARD DETAIL AND THEREFORE DOES NOT NEED TO BE SIGNED AND SEALED

	LEE COUNTY SOUTHWEST FLORIDA 1500 MONROE STREET	LEE COUNTY UTILITIES ENGINEERING FORT MYERS, FLORIDA 33901
	SHEET TITLE: <b>DUPLEX PUMP STATION DRAWING INDEX</b>	
TITLE: <b>STANDARD 240V 1PH DUPLEX PUMP STATION w-GEN</b>		
PROJECT: <b>WASTE WATER DUPLEX, TRIPLEX PUMP STA. MASTER PUMP STATION DESIGN STANDARD</b>		
PROJECT NO: 240V 1PH DPS w-GEN	FILE NAME: Duplex 240 1PH w-GEN	SHEET NUMBER: 1 OF 13

**CONTROL/ELEMENTARY SYMBOLS**

	NORMALLY OPEN CONTACT
	NORMALLY CLOSED CONTACT
	LIMIT SWITCH, NORMALLY OPEN
	LIMIT SWITCH, NORMALLY CLOSED
	PRESSURE SWITCH, NORMALLY OPEN
	PRESSURE SWITCH, NORMALLY CLOSED
	FLOAT SWITCH, NORMALLY OPEN
	FLOAT SWITCH, NORMALLY CLOSED
	FLOW SWITCH, NORMALLY OPEN
	FLOW SWITCH, NORMALLY CLOSED
	TEMPERATURE SWITCH, NORMALLY OPEN
	TEMPERATURE SWITCH, NORMALLY CLOSED
	NORMALLY OPEN, TIMED TO CLOSE CONTACT
	NORMALLY CLOSED, TIMED TO OPEN CONTACT
	NORMALLY CLOSED, TIMED TO CLOSE CONTACT
	NORMALLY OPEN, TIMED TO OPEN CONTACT
	ANALYZER INDICATOR TRANSMITTER
	ALARM RELAY
	ALARM TIMER
	CONTROL RELAY
	FLOW INDICATOR TRANSMITTER (TOTALIZER)
	FLOW SWITCH HIGH/LOW
	LIQUID LEVEL SWITCH
	LEVEL INDICATOR TRANSMITTER
	LIMIT SWITCH OR LEVEL SWITCH
	MOTOR SWITCH MANUAL
	MOTOR STARTER
	PRESSURE GAUGE
	PROCESS FLOW TIMER
	PRESSURE SWITCH
	TEMPERATURE SWITCH
	TIMING RELAY
	SURGE SUPPRESSION DEVICE
	SOLENOID VALVE
	VIBRATION SWITCH
	TORQUE SWITCH
	ZERO SPEED SWITCH
	ALARM INDICATING LIGHT
	RUN INDICATING LIGHT
	MOMENTARY CONTACT PUSHBUTTON
	MOMENTARY BREAK PUSHBUTTON OR RESET
	KEYED SWITCH
	MAINTAINED CONTACT ON-OFF SWITCH
	START/STOP (S/S) CONTROL SWITCH
	MAINTAINED CONTACT
	FUSE
	MOLDED CASE CIRCUIT BREAKER
	CONTROL POWER TRANSFORMER
	REMOTE TERMINAL BLOCK POINT
	COPPERWELD GRD. ROD
	HAND OFF REMOTE CONTROL STATION
	HAND OFF AUTO CONTROL STATION
	MOTOR STRIP HEATER

**ELECTRICAL PLAN SYMBOLS**

	WALL OUTLET BOX AND 20 AMP SINGLE POLE SWITCH ('a' INDICATES SWITCHES) 48" TO CENTERLINE
	WALL OUTLET BOX AND 20 AMP 3-WAY SWITCH ('a' INDICATES SWITCHES) 48" TO CTR LINE.
	MANUAL MOTOR STARTING SWITCH WITH OVERLOADS AND PILOT LIGHT. NEMA 4X TYPICAL
	WALL OUTLET BOX AND 20 AMP SWITCH WITH WEATHERPROOF COVER OR ENCLOSURE.
	WALL OUTLET BOX AND 20 AMP DUPLEX RECEPTACLE 18" TO CENTERLINE
	WALL OUTLET BOX AND 20 AMP DUPLEX RECEPT MOUNTED 48" AFF OR AS NOTED.
	WALL OUTLET BOX AND 20 AMP GFCI DUPLEX RECEPTACLE AT 18" TO CENTERLINE. WP INDICATES WEATHERPROOF COVER PLATE.
	WALL OUTLET BOX AND 20 AMP GFCI RECEPTACLE MOUNTED 48" AFF OR AS NOTED.
	WALL OUTLET BOX AND DOUBLE 20 AMP DUPLEX RECEPTACLES 18" TO CENTERLINE
	FLUSH MOUNTED JUNCTION BOX ( SURFACE IN MECH/ELEC SPACES OR ABOVE CEILINGS).
	BRANCH CIRCUIT CONDUIT AND WIRE GENERALLY SURFACE MOUNTED, CONCEALED ABOVE CEILINGS SLASH MARKS INDICATE NUMBER OF CONDUCTORS; (MARKS SHOWN TO AID CONTRACTOR IN BIDDING, THE CONTRACTOR SHALL PROVIDE THE REQUIRED CONDUCTORS UNDER THE CONTRACT SUM WHETHER OR NOT SHOWN). SHORT SLASHES INDICATE PHASE CONDUCTOR OR SWITCH LEG. LONG INDICATE NEUTRAL CONDUCTOR. GREEN GROUND CONDUCTOR NOT SHOWN; ALL CONDUITS REQUIRE COPPER GROUND CONDUCTOR. TWO CONDUCTORS PLUS GROUND REQUIRED, MINIMUM.
	CONDUIT AND WIRE CONCEALED IN FLOOR SLAB OR UNDERGROUND.
	BRANCH CIRCUIT PANELBOARD AS NOTED; SEE PANEL SCHEDULES
	DISCONNECT SWITCH SIZE PER EQUIPMENT NAME PLATE OR AS NOTED; FOR DISCONNECTS SERVING MOTOR LOADS OF 10HP OR GREATER AND FOR ALL MOTOR LOADS SERVED THROUGH VARIABLE FREQUENCY DRIVES; PROVIDE SURGE SUPPRESSION DEVICE EQUAL TO SQ.-D. SP3650 OR EQUAL AT DISCONNECT.
	MOTOR CONNECTION
	MANUAL TRANSFER SWITCH OR REVERSING SWITCH

**LIGHTING FIXTURES SYMBOLS**

	LED FIXTURE POLE MOUNTED SEE DETAIL
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**SYSTEM SYMBOL LEGEND**

	SYSTEMS CABINET AS NOTED OR MARKED. (WHITE PAINTED S.S. PUMP CONTROL PANEL)
	LIGHTNING PROTECTION AIR TERMINAL STREAMER RETARDING TYPE.
	STREAMER RETARDING AIR TERMINAL MOUNTED TO LIGHT POLE.

**SINGLE LINE DIAGRAM SYMBOLS**

	VOLTMETER
	POWER FACTOR METER
	KILOWATT METER
	AMMETER
	THREE PHASE VOLT SWITCH
	THREE PHASE AMP SWITCH
	CURRENT TRANSMITTER
	KILOWATT TRANSMITTER
	POWER FACTOR TRANSMITTER
	LOCAL CONTROL PANEL
	GROUND FAULT INTERRUPTER
	WATT HOUR METER
	FUSE
	CAPACITOR
	DRAW-OUT CIRCUIT BREAKER
	MOLDED CASE CIRCUIT BREAKER
	TYPICAL STARTER CONTROL. SEE SWITCHGEAR CONTROL DIAGRAMS FOR EXACT TYPE.
	ELECTRIC A.C. MOTOR, NO. INDICATES HORSEPOWER.
	ELECTRIC D.C. MOTOR, NO. INDICATES HORSEPOWER.
	SERVICE OR EQUIPMENT GROUND.
	NON-FUSIBLE DISCONNECT SWITCH, 30A,3P UNLESS OTHERWISE INDICATED.
	NON-FUSIBLE DISCONNECT SWITCH, 30A,3P UNLESS OTHERWISE INDICATED, WITH REMOTE CONTROL STATION AS REQUIRED BY ELEMENTARY DIAGRAMS OR SPECS.
	LIGHTING PANELBOARD
	POWER PANELBOARD
	KIRK KEY INTERLOCK
	CURRENT TRANSFORMERS
	POTENTIAL TRANSFORMERS
	MANUAL OR AUTOMATIC TRANSFER SWITCH

**ABBREVIATIONS LIST**

A	AMPS
AF	AMP FRAME
AIC	AMPS INTERRUPTING CURRENT
ALUM	ALUMINUM
AT	AMP TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AVAIL	AVAILABLE
AWG	AMERICAN WIRE GAUGE
C	CONDUIT
CAB	CABINET
CAT	CATEGORY
CONV	CONVERSION
CRCC	CELLULAR ROUTER COMMUNICATION CABINET
CU	COPPER
D	DEPTH
DIA	DIAMETER
DRGS	DRAWINGS
ENET	ETHERNET
EXT	EXTERNAL
FOCC	FIBER OPTIC CONVERSION CABINET
FPL	FLORIDA POWER AND LIGHT
GND OR GRD. OR G.	GROUND
H	HEIGHT
HZ	HERTZ
I&C	INSTRUMENTATION AND CONTROLS
I/O	INPUT/OUTPUT
INST	INSTRUMENT
INT	INTERNAL
KVA	KILOVOLT-AMPERES (1VA*10^-3)
LCU	LEE COUNTY UTILITIES
LT	LIGHT
MA	MILLIAMPS (1A*10^-3)
MCB	MAGNETIC CIRCUIT BREAKER
MIN	MINIMUM
NA	NOT APPLICABLE
NEC	NATIONAL ELECTRIC CODE
NEMA	NATIONAL ELECTRIC MANUFACTURERS ASSOCIATION
NTS	NOT TO SCALE
P	POLE
PH	PHASE
P&ID	PROPORTIONAL INTEGRAL DERIVATIVE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PW	PRODUCTION WELL
MPZ	MINI POWER ZONE
SCH	SCHEDULE
SE	SERVICE ENTRANCE
SPD	SURGE PROTECTION DEVICE
SS	STAINLESS STEEL
TEMP	TEMPERATURE OR TEMPORARY
TSP	TWISTED SHIELDED PAIR
TYP	TYPICAL
U.G.	UNDERGROUND
UPS	UNINTERRUPTIBLE POWER SOURCE
V	VOLTS
VA	VOLT-AMPERES (APPARENT POWER)
VAC	VOLTS ALTERNATING CURRENT
VDC	VOLTS DIRECT CURRENT
VFD	VARIABLE FREQUENCY DRIVE
W	WATTS (REAL POWER)
PCP	PUMP CONTROL PANEL
W/	WITH
XEMR	TRANSFORMER
"	INCHES
'	FEET
# OR NO.	NUMBER
E# OR 1#	11"X17" SHEET
ES-#	8.5"X11" SHEET
FDEP	FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

E-2

**ELECTRICAL SYMBOLS LEGEND & ABBREVIATIONS**

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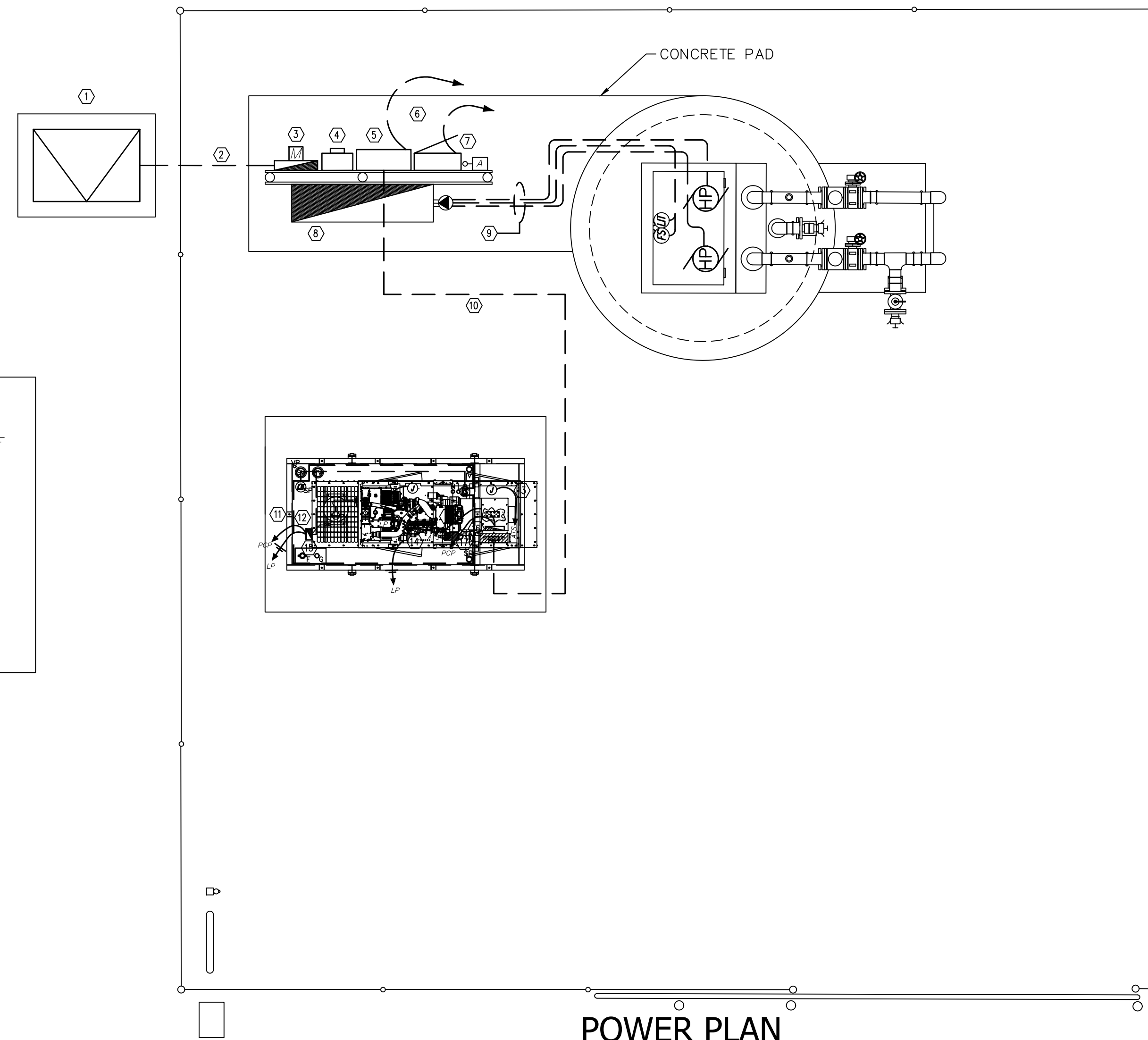
<p>LEE COUNTY SOUTHWEST FLORIDA</p>	<p>LEE COUNTY UTILITIES ENGINEERING</p> <p>1500 MONROE STREET FORT MYERS, FLORIDA 33901</p>
	<p>SHEET TITLE: <b>DUPLEX PUMP STATION NOTES &amp; ABBREVIATIONS</b></p>
<p>TITLE: <b>STANDARD 240V 1PH DUPLEX PUMP STATION w-GEN</b></p>	<p>PROJECT: <b>WASTE WATER DUPLEX, TRIPLEX PUMP STA. MASTER PUMP STATION DESIGN STANDARD</b></p>
<p>PROJECT NO: <b>240V 1PH DPS w-GEN</b></p>	<p>FILE NAME: <b>Duplex 240 1PH w-GEN</b></p>
<p>SHEET NUMBER: <b>2</b></p>	<p>OF <b>13</b></p>

MINIMUM EQUIPMENT RACK LAYOUT BASED ON THE FOLLOWING:  
 ADJUST EQUIPMENT RATINGS AND DIMENSIONS FOR SPECIFIC PUMP STATION  
 HORSEPOWER AND SERVICE SIZE (MINIMUM 100A SERVICE SIZE). IN NO CASE  
 SHALL DIMENSIONS BE PERMITTED TO BE REDUCED IN SIZE.

EQUIPMENT	SIZE	H(IN)	W(IN)	D(IN)	EQUIPMENT	SIZE	H(IN)	W(IN)	D(IN)	EQUIPMENT	SIZE	H(IN)	W(IN)	D(IN)
UTILITY MAIN BREAKER (0-1.5HP)	100A	33	10	8	PUMP STATION CONTROL PANEL (2HP-7.5HP)	250AF 200AT	48	60	16	PANELBOARD (0-30HP)	60A	38	20	7
UTILITY MAIN BREAKER (2HP-7.5HP)	200A	33	10	8	PUMP STATION CONTROL PANEL (10HP)	250AF 225AT	48	60	16					
UTILITY MAIN BREAKER (10HP)	300A	33	10	8	AUTOMATIC TRANSFER SWITCH (0-3HP)	125A	46	32	16					
PUMP STATION CONTROL PANEL (0HP-1.5HP)	125AF 100AT	48	60	16	AUTOMATIC TRANSFER SWITCH (5HP-10HP)	225A	46	32	16					

### GENERAL NOTES

- ALL EQUIPMENT SHALL BE HUNG ON EQUIPMENT RACK. OPEN WINDOW CUTTING OF ENCLOSURE BOTTOMS IS NOT PERMITTED.
- ALL EQUIPMENT ENCLOSURES ARE REQUIRED TO BE NEMA 4X STAINLESS STEEL POWDER COATED WHITE WITH 3-POINT LATCH.
- PROVIDE NEOPRENE PADS BETWEEN CONCRETE EQUIPMENT PADS AND ALL FREE STANDING EQUIPMENT AND GENERATOR FUEL TANK SUPPORTS.
- REFERENCE SINGLE LINE DRAWING FOR CONDUIT AND WIRE SIZE.



### POWER PLAN

STANDARD 240V-1Ø (0-10HP) DUPLEX PUMP STATION W/  
 GENERATOR POWER, INSTRUMENTATION AND CONTROL PLAN

### KEYNOTES

- UTILITY PADMOUNT TRANSFORMER OR AERIAL TRANSFORMER BANK. COORDINATE SERVICE CHARACTERISTICS, EXACT LOCATION AND PRIMARY FEEDER DETAILS WITH UTILITY. PROVIDE GROUNDING, TRANSFORMER PAD AND CONDUIT ENTRY PER UTILITY REQUIREMENTS.
- UNDERGROUND SERVICE LATERAL.
- ALUMINUM DIRECT READING UTILITY METER.
- NEMA 4XSS SE RATED ENCLOSED CIRCUIT BREAKER.
- NEMA 4XSS AUTOMATIC TRANSFER SWITCH.
- DEDICATED 2 WIRE UTP CABLE FOR REMOTE GEN-START COMMAND IN 1" C.
- NEMA 4X, SS 120/208V 3PH-4WIRE PANELBOARD LP.
- DEP COMPLIANT PUMP CONTROL PANEL (PCP). (WHITE PAINTED S.S. PUMP CONTROL PANEL)
- (3) MINIMUM 2" CONDUITS INTO WETWELL. (2) FOR SUBMERSIBLE PUMP CABLES, (1) FOR FLOATS AND LIT CABLES. CORE DRILL NEW PENETRATIONS THROUGH WETWELL. PATCH ALL WITH HYDROCEMENT.
- STAND-BY POWER UNDERGROUND SERVICE LATERAL.
- GENSET WITH SUBBASE FUEL TANK.
- (2) PAIR #16 TSP INSTRUMENTATION CABLE IN 1" C. AND (9) CONDUCTOR #14 CONTROL CABLE IN 1.25" C.
- (2)#8 AND #10G IN 1" C. TO BATTERY CHARGER. FIELD COORDINATE EXACT LOCATION OF BATTERY.
- GENSET STRIP HEATER AND JACKET WATER HEATER. MINIMUM (3)#10 IN 0.75" C. COORDINATE EXACT LOCATION OF HEATERS.
- GENERATOR FUEL FILL PANEL WITH FUEL LEVEL TRANSMITTER & TANK LEAK ALARM PANEL MOUNTED WITHIN NEMA4X SS POWDER COATED WHITE ENCLOSURE.
- GENERATOR CONTROL PANEL; (GCP). COORDINATE EXACT LOCATION PRIOR TO ROUGH-IN. PROGRAM TO PROVIDE MONITORING CONTACTS FOR: GENERATOR FAULT, GENERATOR RUNNING
- (2)1.25" C. (1) SPARE, (1) WITH (13) CONDUCTOR #14 CONTROL CABLE.

E-3

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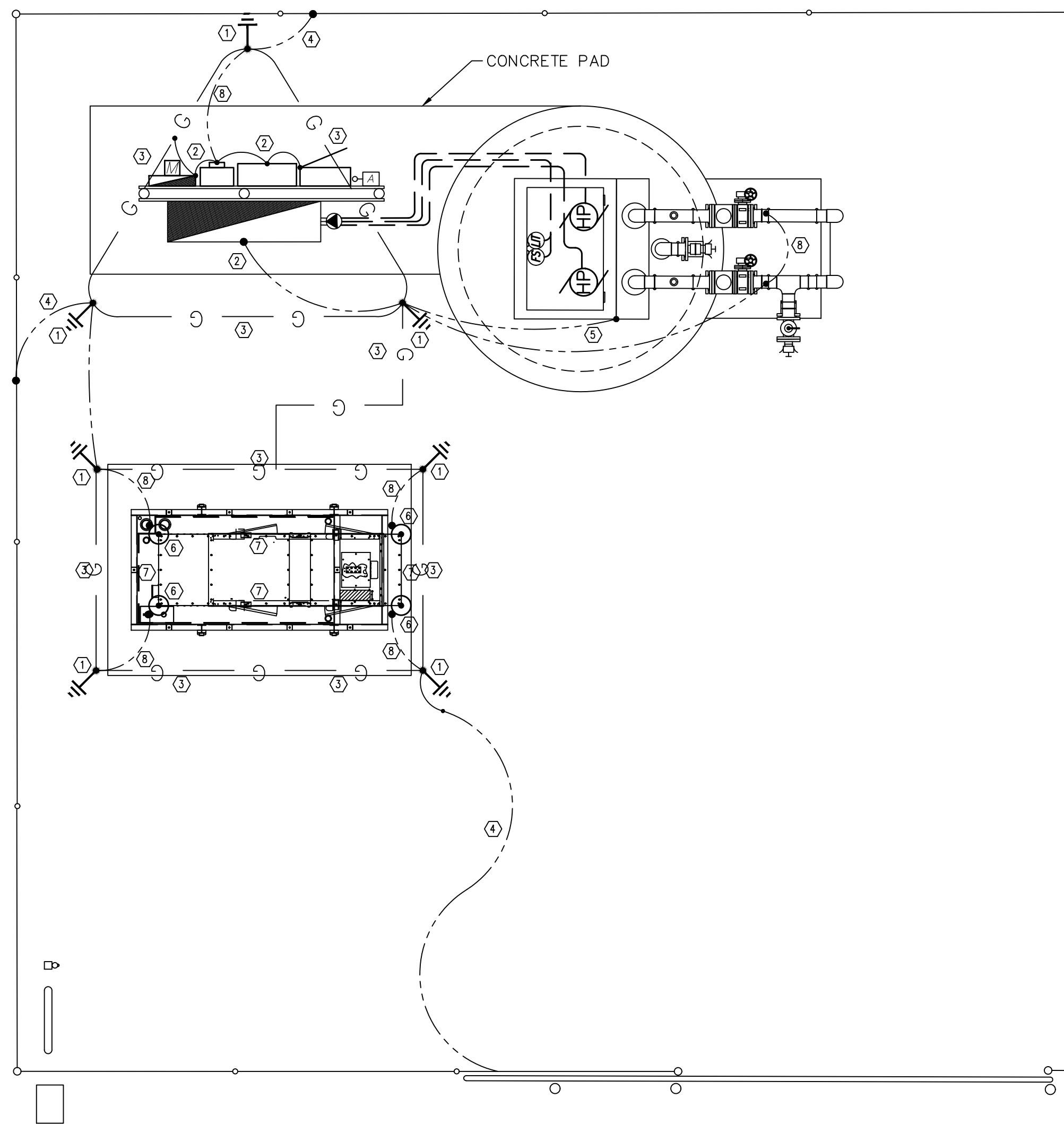
	LEE COUNTY SOUTHWEST FLORIDA 1500 MONROE STREET	LEE COUNTY UTILITIES ENGINEERING FORT MYERS, FLORIDA 33901
	SHEET TITLE: DUPLEX PUMP STATION POWER DISTRIBUTION & CONTROL PLAN	
TITLE: STANDARD 240V 1PH DUPLEX PUMP STATION w-GEN		
PROJECT: WASTE WATER DUPLEX, TRIPLEX PUMP STA. MASTER PUMP STATION DESIGN STANDARD		
PROJECT NO: 240V 1PH DPS w-GEN	FILE NAME: Duplex 240 1PH w-GEN	SHEET NUMBER: 3 OF 13

**GENERAL NOTES**

- 1.) ALL U.G. CONNECTIONS TO BE VIA EXOTHERMIC WELD (CADWELD) UNLESS INDICATED OTHERWISE.
- 2.) ALL REQUIRED BONDS MAY NOT BE SHOWN; PROVIDE ADDITIONAL BONDS TO ALL DEVICES, INSTRUMENTS, CABINETS, CONTROL VALVES, ETC. AS REQUIRED TO COMPLY WITH UL AND NEC.

**KEYNOTES**

- 1.) 20" DRIVEN GROUND ROD WITH INSPECTION TEST WELL (SEE DETAIL). TYPICAL.
- 2.) #2 TINNED SOLID COPPER BOND. TYPICAL.
- 3.) #2/0 TINNED STRANDED COPPER COUNTERPOISE LOOP GROUND. TYPICAL.
- 4.) #2/0 TINNED SOLID BARE BOND TO GROUND GRID.
- 5.) BOND TO HINGE CORNER OF HATCH FRAME. DRILL TAP AS REQUIRED.
- 6.) STREAMER RETARDING ROOF MOUNTED AIR TERMINAL. TYPICAL.
- 7.) MAIN ROOF CONDUCTOR. TYPICAL.
- 8.) ROOF DOWN CONDUCTOR TO GROUND GRID.




**LIGHTNING PROTECTION LEGEND:**

- LP — MAIN ROOF/DOWN CONDUCTOR TYPICAL
- G — #2/0 TINNED BARE COPPER COUNTERPOISE LOOP GROUND.
- #2 TINNED SOLID COPPER BOND TO EQUIPMENT/CABINETS ETC.

STANDARD 240V-1Ø (0-10HP) DUPLEX PUMP STATION W/  
GENERATOR LIGHTNING PROTECTION, BONDING & GROUNDING PLAN

E-4

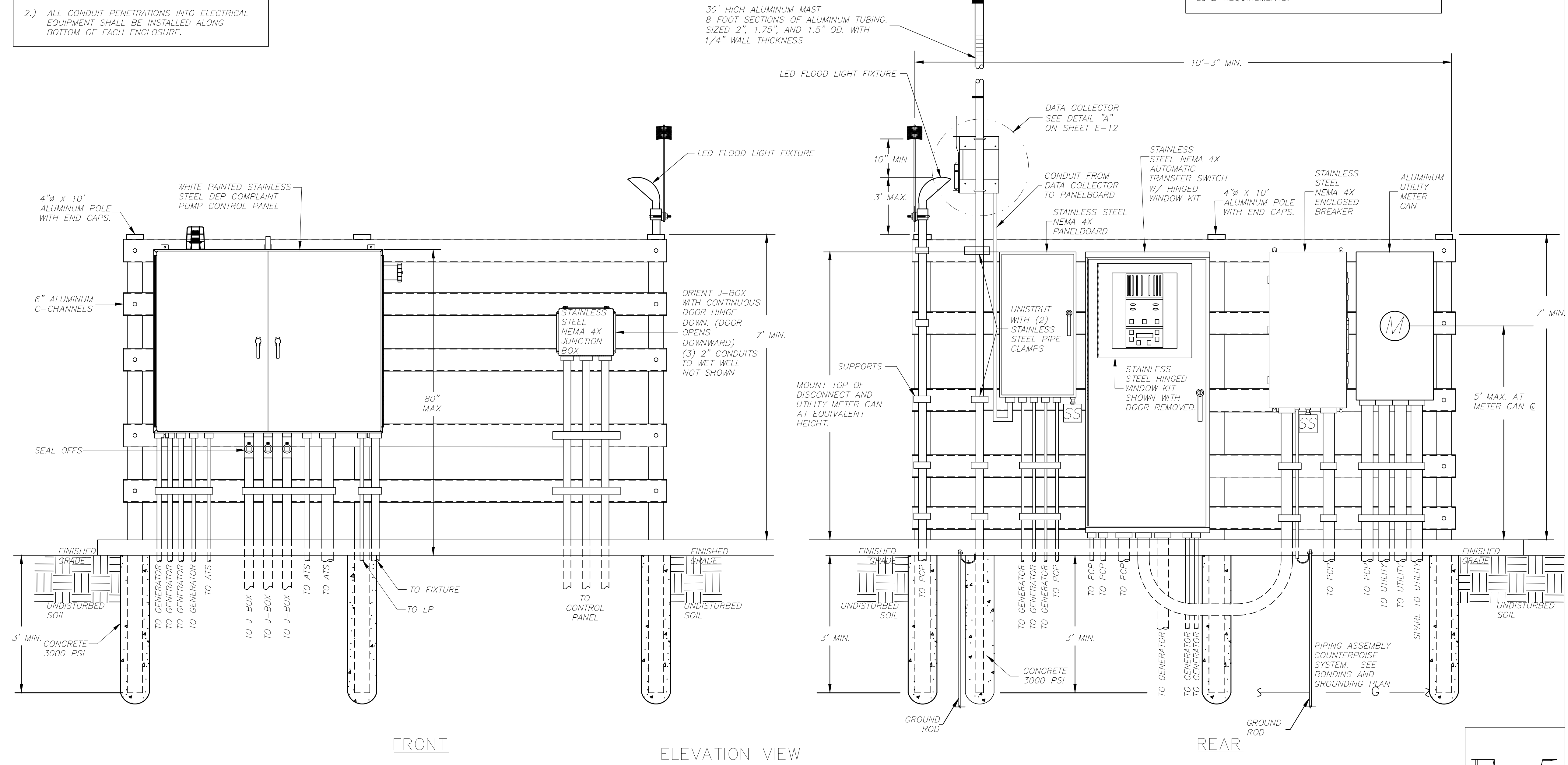
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	LEE COUNTY SOUTHWEST FLORIDA 1500 MONROE STREET	LEE COUNTY UTILITIES ENGINEERING FORT MYERS, FLORIDA 33901
	SHEET TITLE: <b>DUPLEX PUMP STATION LIGHTNING PROTECTION PLAN</b>	
TITLE: <b>STANDARD 240V 1PH DUPLEX PUMP STATION w-GEN</b>		
PROJECT: <b>WASTE WATER DUPLEX, TRIPLEX PUMP STA. MASTER PUMP STATION DESIGN STANDARD</b>		
PROJECT NO: 240V 1PH DPS w-GEN	FILE NAME: Duplex 240 1PH w-GEN	SHEET NUMBER: 4 OF 13

**GENERAL NOTES**

- 1.) ALL CONDUIT PENETRATIONS INTO THE TOP OR SIDES OF THE ENCLOSURE ARE REQUIRED TO BE MADE USING MYERS HUBS.
- 2.) ALL CONDUIT PENETRATIONS INTO ELECTRICAL EQUIPMENT SHALL BE INSTALLED ALONG BOTTOM OF EACH ENCLOSURE.


PROVIDE SHOP DRAWINGS FROM A FLORIDA REGISTERED PROFESSIONAL ENGINEER CERTIFYING THAT THE ALUMINUM POST FOUNDATION AND RACK MEET CURRENT FLORIDA BUILDING CODE AND WIND LOAD REQUIREMENTS.



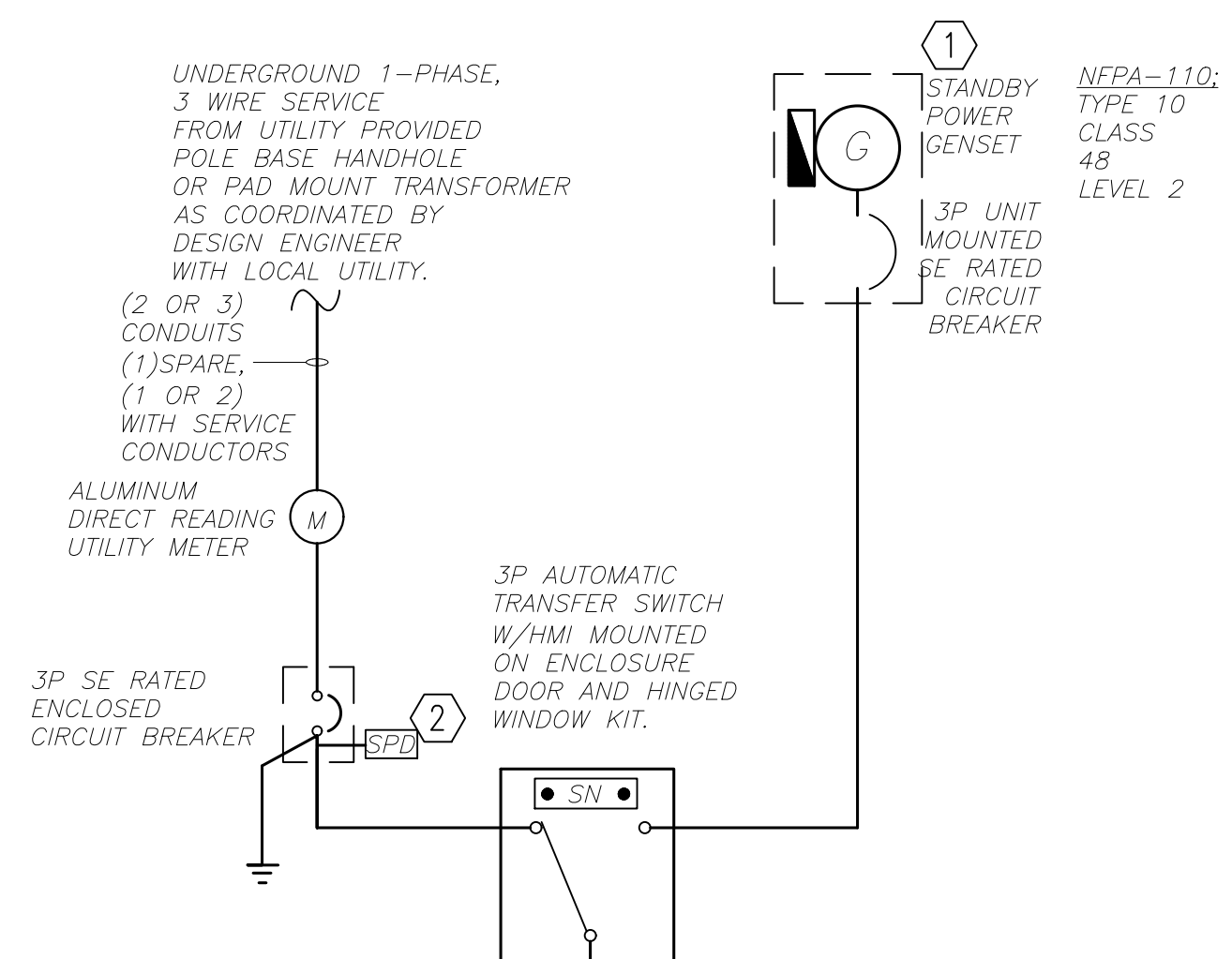
STANDARD 240V-1Ø (0-10HP) DUPLEX PUMP STATION W/  
GENERATOR ELECTRICAL EQUIPMENT RACK ELEVATION

E-5

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 LEE COUNTY SOUTHWEST FLORIDA 1500 MONROE STREET	LEE COUNTY UTILITIES ENGINEERING
	FORT MYERS, FLORIDA 33901
SHEET TITLE:	DUPLEX PUMP STATION ELECTRICAL EQUIPMENT RACK ELEVATION
TITLE:	STANDARD 240V 1PH DUPLEX PUMP STATION w-GEN
PROJECT:	WASTE WATER DUPLEX, TRIPLEX PUMP STA. MASTER PUMP STATION DESIGN STANDARD
PROJECT NO:	240V 1PH DPS w-GEN
FILE NAME:	Duplex 240 1PH w-GEN
SHEET NUMBER:	5 OF 13



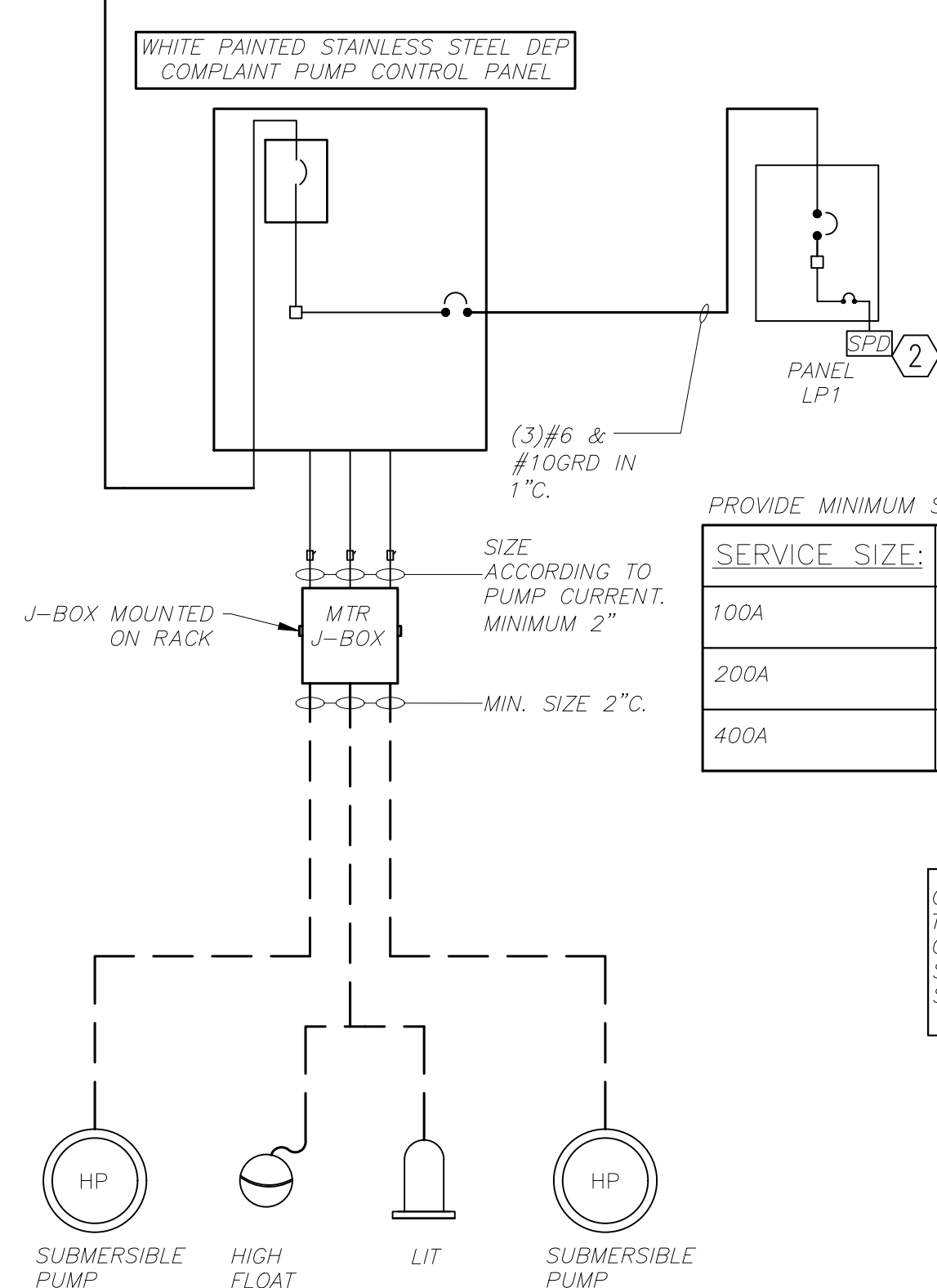


**GENERAL NOTES:**

- MINIMUM EQUIPMENT AIC RATINGS:  
240V SERVICE 35,000AIC  
480V SERVICE 65,000AIC  
EQUIPMENT AIC RATINGS SHOWN TO ESTABLISH MINIMUM ACCEPTABLE RATING. DESIGNER TO COORDINATE REQUIRED AIC RATINGS WITH SITE SPECIFIC ELECTRICAL SERVICE CHARACTERISTICS AND IN NO CASE LOWER THEN ESTABLISHED MINIMUMS.
- THIS PLAN DOES NOT INDICATE ALL CONDUIT & WIRE REQUIRED; SEE ADDITIONAL REQUIREMENTS ON ELEMENTARY & PLAN DRAWINGS.

**KEYNOTES**

- DO NOT GROUND GENERATOR NEUTRAL AT GENSET. PROVIDE NEUTRAL CONDUCTOR FROM GENSET TO MAIN SERVICE ENTRANCE DISCONNECT NEUTRAL BUS.
- CUTLER HAMMER CVX100-240S 100KA SURGE SUPPRESSOR OR EQUAL. MOUNT WITH INDICATOR LIGHTS VISIBLE TO OPERATOR WHILE FACING BREAKER.



PROVIDE MINIMUM SERVICES UTILITY SIZES AS FOLLOWS:

SERVICE SIZE:	CONDUIT SIZE:	CONDUCTOR SIZE:	GROUND SIZE:
100A	(1)2"	(4)#3	(1)#8
200A	(1)2.5"	(4)#3/0	(1)#3
400A	(1)3"	(4)350KCMIL	(1)#1/0

GENERIC SINGLE LINE DRAWING-- REVISE ACCORDINGLY TO PROVIDE SITE SPECIFIC DETAILS INCLUDING UTILITY COORDINATION, SERVICE SIZE AND GENERATOR SIZE. SIZE SERVICE, GENERATOR, CONDUIT AND WIRE PER SITE SPECIFIC WELL HORSEPOWER.

PANEL: LP		BUS: 100A, 60A MCB		VOLTAGE: 120/240V, 1P, 3W	
MOUNTING: WALL MOUNT		POLES: 18		35,000AIC MIN	
LOCATION: EQUIPMENT RACK		NEMA 4X SS ENCLOSURE			
CIR. NO.	DESCRIPTION	TRIP	POLES	REMARKS	
1	GENERATOR BATTERY CHARGER	20	1		
2	GENERATOR STRIP HEATER	20	1		
3	GENERATOR WATER HEATER	20	1		
4	DATA COLLECTOR HUB	20	1		
5	SPARE	20	1		
6	SPARE	20	1		
7	SPARE	20	1		
8	SPARE	20	1		
9-17	SPACE	20	1		
10-12	SPACE	20	1		
14,16,18	SURGE SUPPRESSION	30	1		

PROVIDE PANEL WITH 35KAIC RATING.  
PROVIDE PANEL WITH EXTERNAL CUTLER HAMMER CVX100 SERIES SPD

**PANEL SCHEDULE**

N.T.S.

**ELECTRICAL RISER DIAGRAM (240V 1-PHASE)**

N.T.S.

STANDARD 240V-1Ø (0-10HP) DUPLEX PUMP STATION W/ GENERATOR ELECTRICAL RISER DIAGRAM & PANEL SCHEDULE

E-6

**NOTE:**  
THIS DRAWING IS A LEE COUNTY STANDARD DETAIL AND THEREFORE DOES NOT NEED TO BE SIGNED AND SEALED

LEE COUNTY SOUTHWEST FLORIDA 1500 MONROE STREET FORT MYERS, FLORIDA 33901

LEE COUNTY UTILITIES ENGINEERING

SHEET TITLE: DUPLEX PUMP STATION ELECTRICAL RISER DIAGRAM & PANEL SCHEDULE

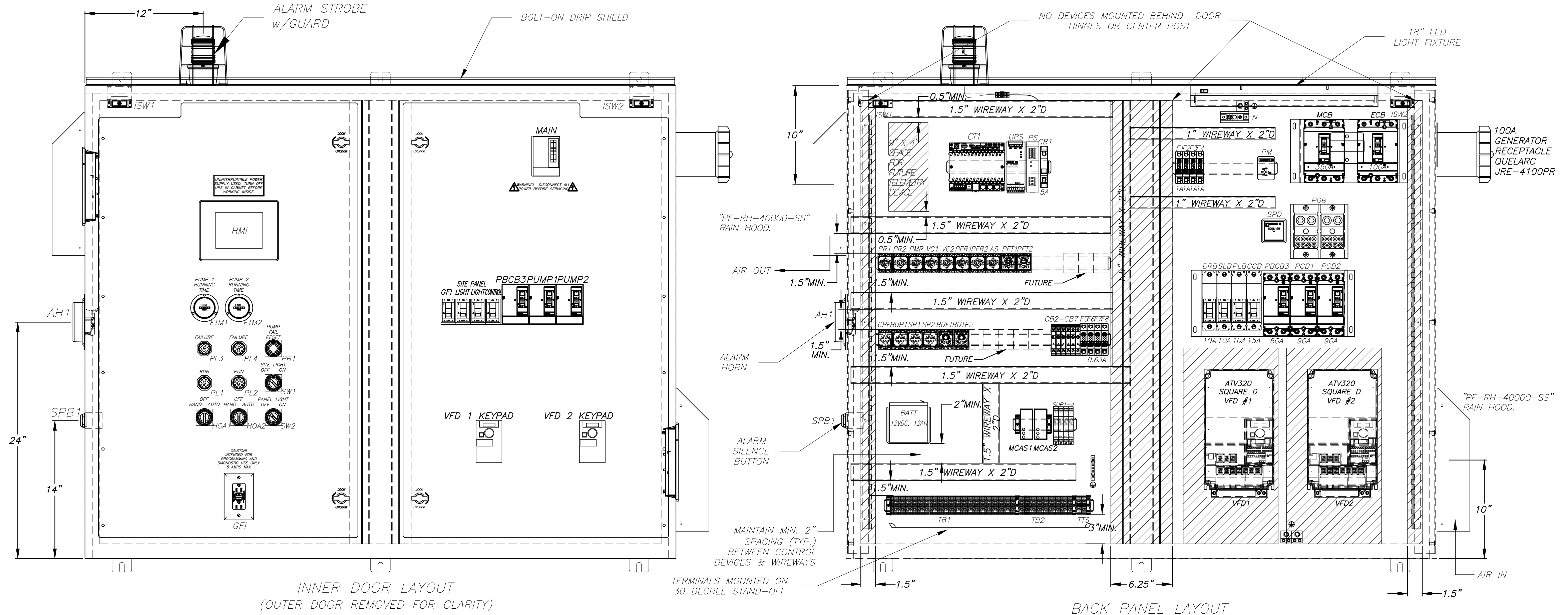
TITLE: STANDARD 240V 1PH DUPLEX PUMP STATION w-GEN

PROJECT: WASTE WATER DUPLEX, TRIPLEX PUMP STA. MASTER PUMP STATION DESIGN STANDARD

PROJECT NO: 240V 1PH DPS w-GEN FILE NAME: Duplex 240 1PH w-GEN SHEET NUMBER: 6 OF 13

CONTROL WIRE COLOR CODE:

FUNCTION DESCRIPTION	WIRE COLOR	FUNCTION DESCRIPTION	WIRE COLOR	FUNCTION DESCRIPTION	WIRE COLOR	FUNCTION DESCRIPTION	WIRE COLOR	FUNCTION DESCRIPTION	WIRE COLOR
120VAC FEED	BLACK	H-O-A 1 SCADA	BROWN	PUMP 2 RUN SCADA	ORANGE/BLACK	PUMP 3 FAIL SCADA	BLUE/RED	START PUMP 3	BLACK/BLUE
120VAC LOAD	RED	H-O-A 1 COMMON SCADA	BROWN	PUMP 2 RUN COMMON SCADA	ORANGE/BLACK	PUMP 3 FAIL COMMON SCADA	BLUE/RED	START PUMP 3 COMMON	BLACK/BLUE
120VAC NEUTRAL	WHITE	H-O-A 2 SCADA	RED/BLACK	PUMP 3 RUN SCADA	YELLOW/BLACK	CONTROL POWER FAIL SCADA	YELLOW/RED	ALARM RESET	RED/BLUE
PHASE MONITOR FAIL	BLUE	H-O-A 2 COMMON SCADA	RED/BLACK	PUMP 3 RUN COMMON SCADA	YELLOW/BLACK	CONTROL POWER FAIL SCADA COMMON	YELLOW/RED	ALARM RESET COMMON	RED/BLUE
PHASE MONITOR COMMON	BLUE	H-O-A 3 SCADA	YELLOW	PUMP 1 FAIL SCADA	BROWN/BLACK	START PUMP 1	ORANGE/RED	ALARM LIGHT HORN	ORANGE/BLUE
24VDC POSITIVE (+)	BLUE	H-O-A 3 COMMON SCADA	YELLOW	PUMP 1 FAIL COMMON SCADA	BROWN/BLACK	START PUMP 1 COMMON	ORANGE/RED	ALARM LIGHT HORN COMMON	ORANGE/BLUE
24VDC NEGATIVE (-)	WHITE/BLUE	PUMP 1 RUN SCADA	BLUE/BLACK	PUMP 2 FAIL SCADA	BLACK/RED	START PUMP 2	BROWN/RED	SCADA HIGH LEVEL FLOAT	YELLOW/BLUE
GROUND	GREEN	PUMP 1 RUN COMMON SCADA	BLUE/BLACK	PUMP 2 FAIL COMMON SCADA	BLACK/RED	START PUMP 2 COMMON	BROWN/RED	SCADA HIGH LEVEL FLOAT COMMON	YELLOW/BLUE

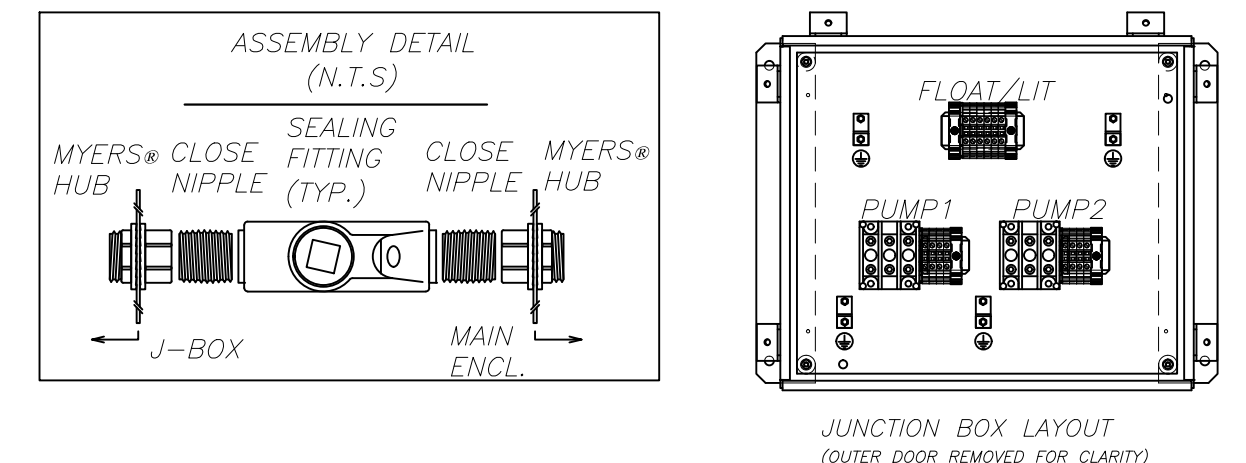


**ENCLOSURE:**  
MIN. SPN4DSS-486016 (48"H x 60"W x 16"D) NEMA 4X RATED, WITH BOLT-ON DRIP SHIELD AND REMOVABLE CENTER POST, FABRICATED FROM TYPE 304 STAINLESS STEEL, WITH WHITE PAINTED FINISH. OUTER DOORS HAVE 3-POINT PAD-LOCKABLE HANDLES, AND 90° STOPS.

**BACK PANEL:**  
SPPD-6048 (45"H x 57"W) FABRICATED FROM 12ga. CARBON STEEL PAINTED WHITE.

**INNER DOOR:**  
(2) HD-4830 FABRICATED FROM .125 BLACK ENGRAVED ALUMINUM.

- NOTES:**
1. TERMINAL ON CONTROL CIRCUIT TERMINAL STRIP
  2. TERMINAL ON POWER DISTRIBUTION BLOCK
  3. NEUTRAL AND GROUND LUGS
  4. FIELD WIRING (EXTERNAL TO CONTROL PANEL)
  5. PANEL WIRING
  6. SEAL ALL CONDUITS ENTERING CONTROL PANEL
  7. CONTROL PANEL IS UL508A LABELED
  8. INSTALL IN ACCORDANCE WITH ARTICLE 504 OF THE N.E.C.
  9. MINIMUM #14 AWG WIRE AT 600V
  10. MAINTAIN MIN. 2" SPACE BETWEEN CONTROL DEVICES & WIREWAYS
  11. MAINTAIN MAX. 6" EXTRA LENGTH ON CONTROL WIRES
  12. ALL BREAKERS MUST BE ACCESSIBLE FROM DEAD-FRONT



**JUNCTION BOX ENCLOSURE:**  
SPJH4SS-1412B (14"H x 12"W x 8"D) NEMA 4X RATED, JIC TYPE, FABRICATED FROM TYPE 304 STAINLESS STEEL, POLISHED FINISH. OUTER DOOR HAS JIC CLAMPS.

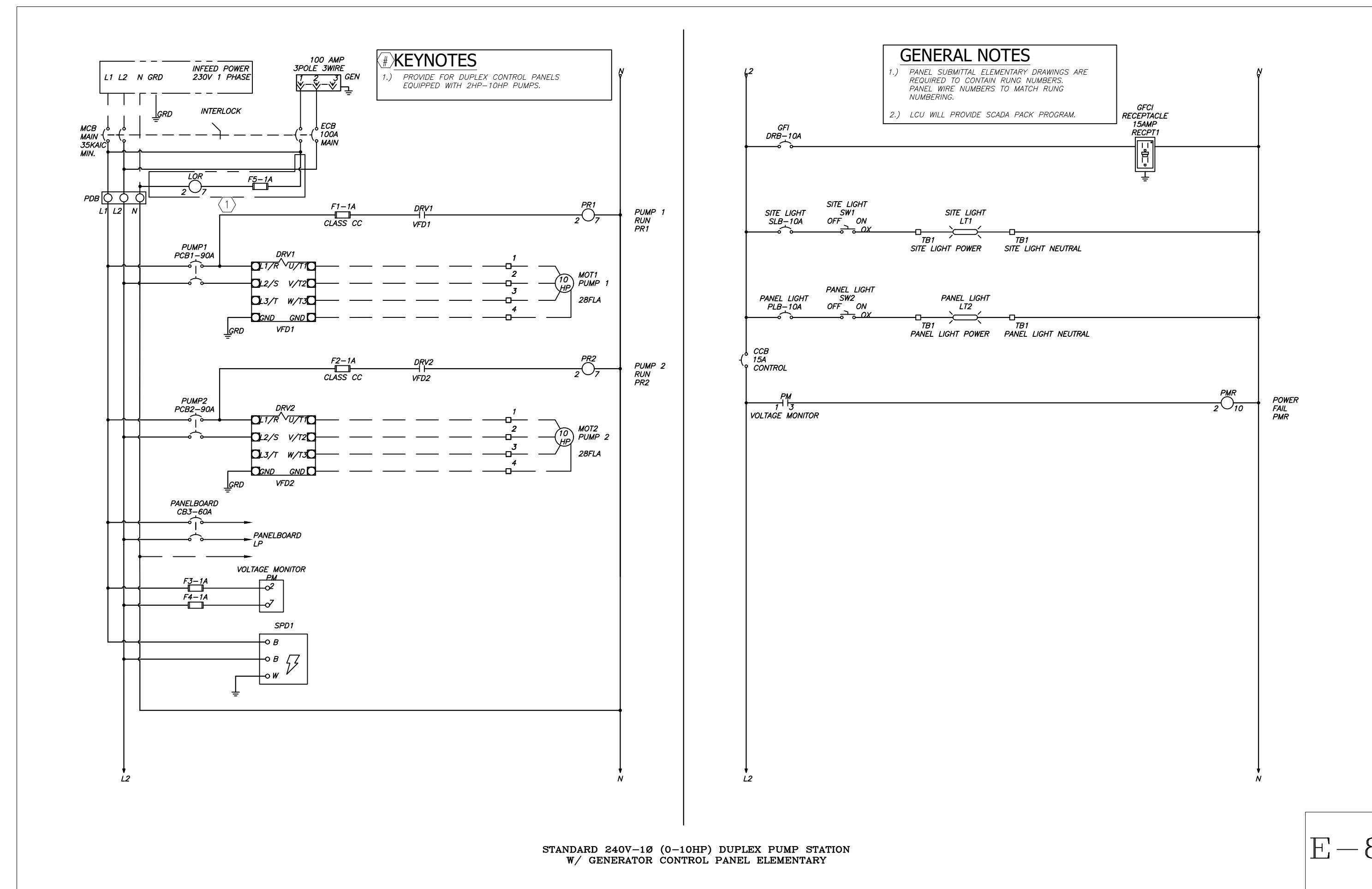
**BACK PANEL:**  
SPPJ-1412 (12.88"H x 10.88"W) FABRICATED FROM 12ga. CARBON STEEL PAINTED WHITE.

STANDARD 240V-1Ø (0-10HP) DUPLEX PUMP STATION W/ GENERATOR CONTROL PANEL ELEVATION

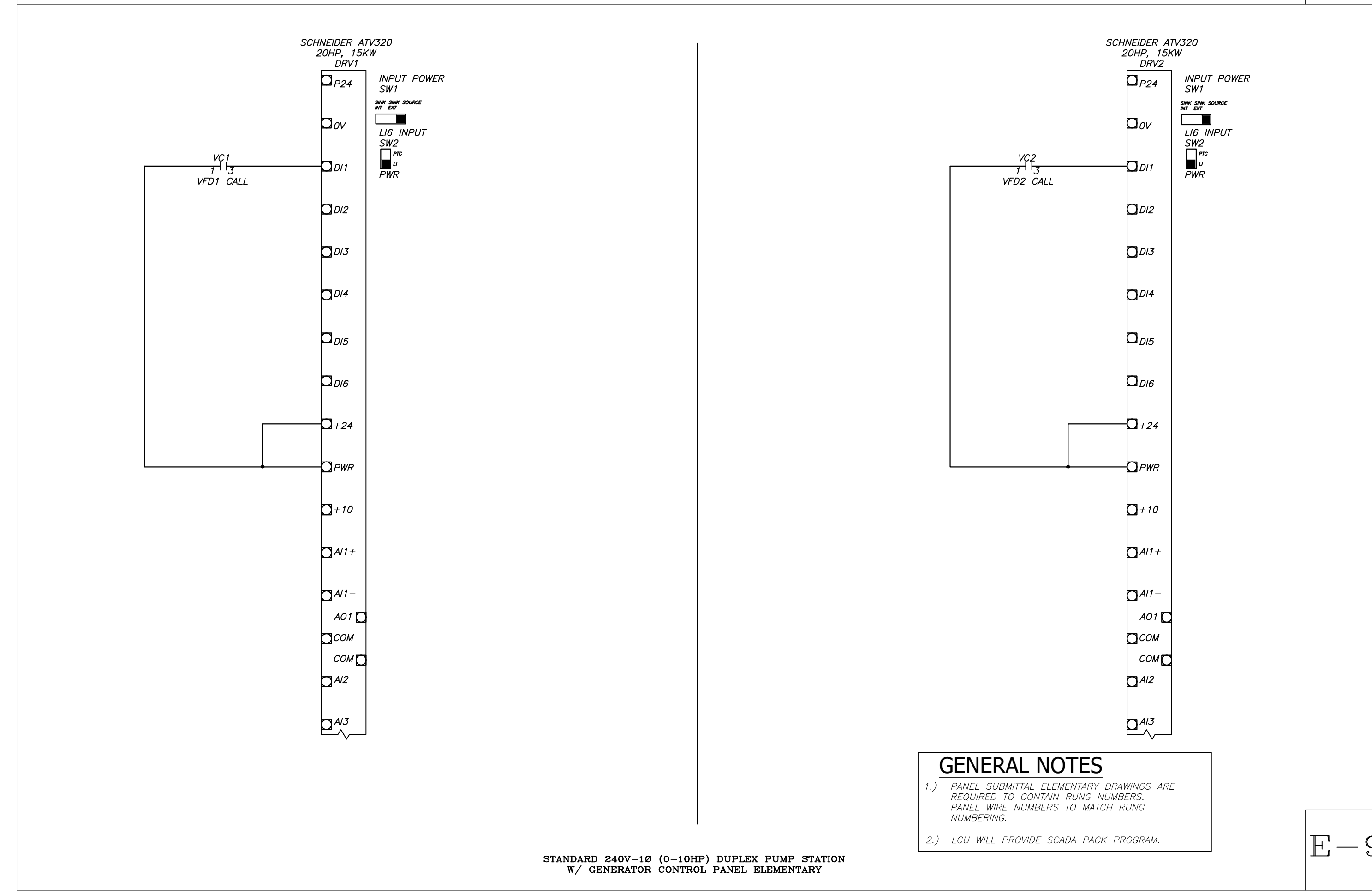
E-7

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<p>LEE COUNTY SOUTHWEST FLORIDA</p>	<p>LEE COUNTY UTILITIES ENGINEERING</p>
	<p>1500 MONROE STREET FORT MYERS, FLORIDA 33901</p>
<p>SHEET TITLE: <b>DUPLEX PUMP STATION CONTROL PANEL ELEVATION</b></p>	
<p>TITLE: <b>STANDARD 240V 1PH DUPLEX PUMP STATION w-GEN</b></p>	
<p>PROJECT: <b>WASTE WATER DUPLEX, TRIPLEX PUMP STA. MASTER PUMP STATION DESIGN STANDARD</b></p>	
<p>PROJECT NO: 240V 1PH DPS w-GEN</p>	<p>FILE NAME: Duplex 240 1PH w-GEN</p>
<p>SHEET NUMBER: 7 OF 13</p>	



E-8

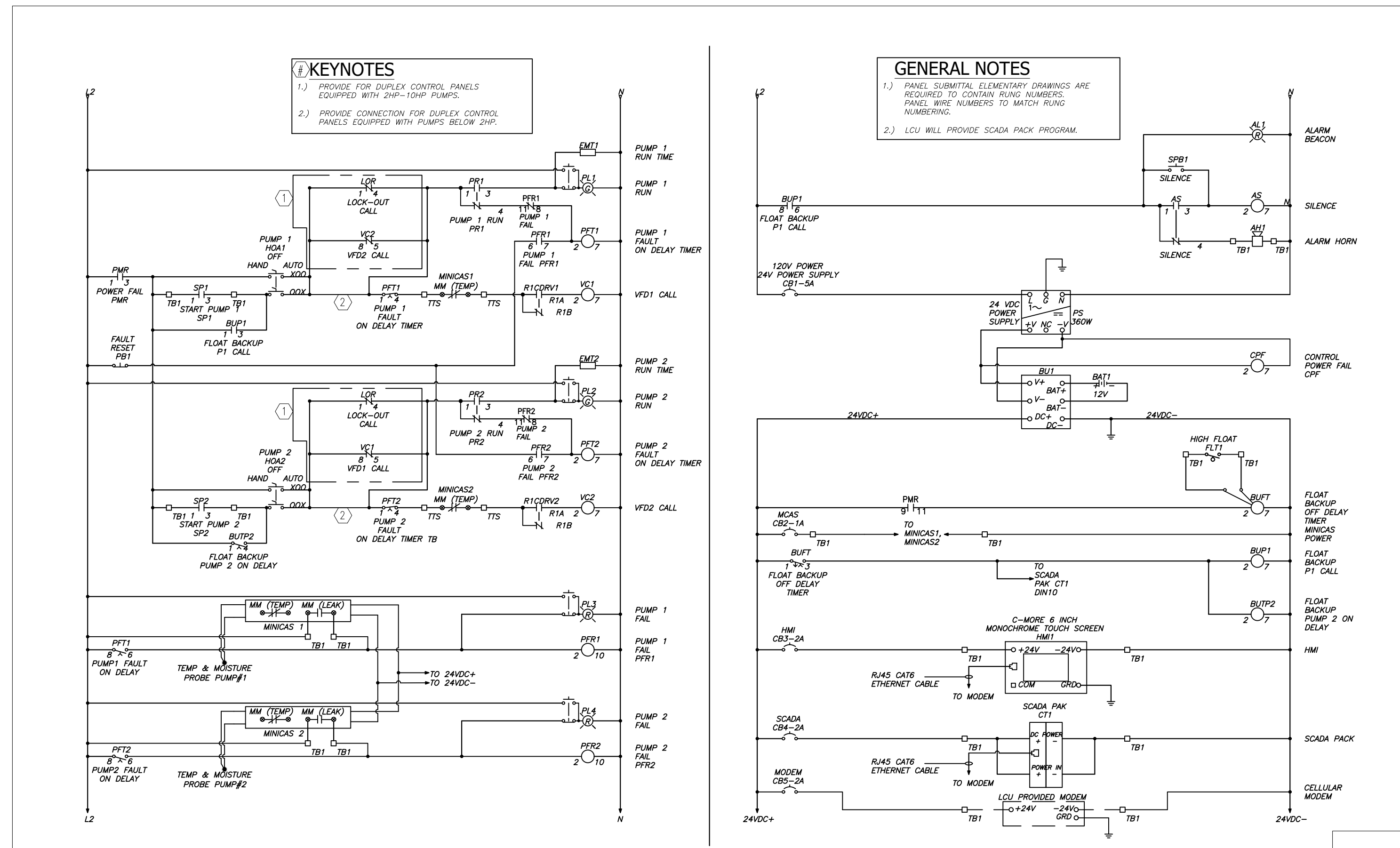


E-9

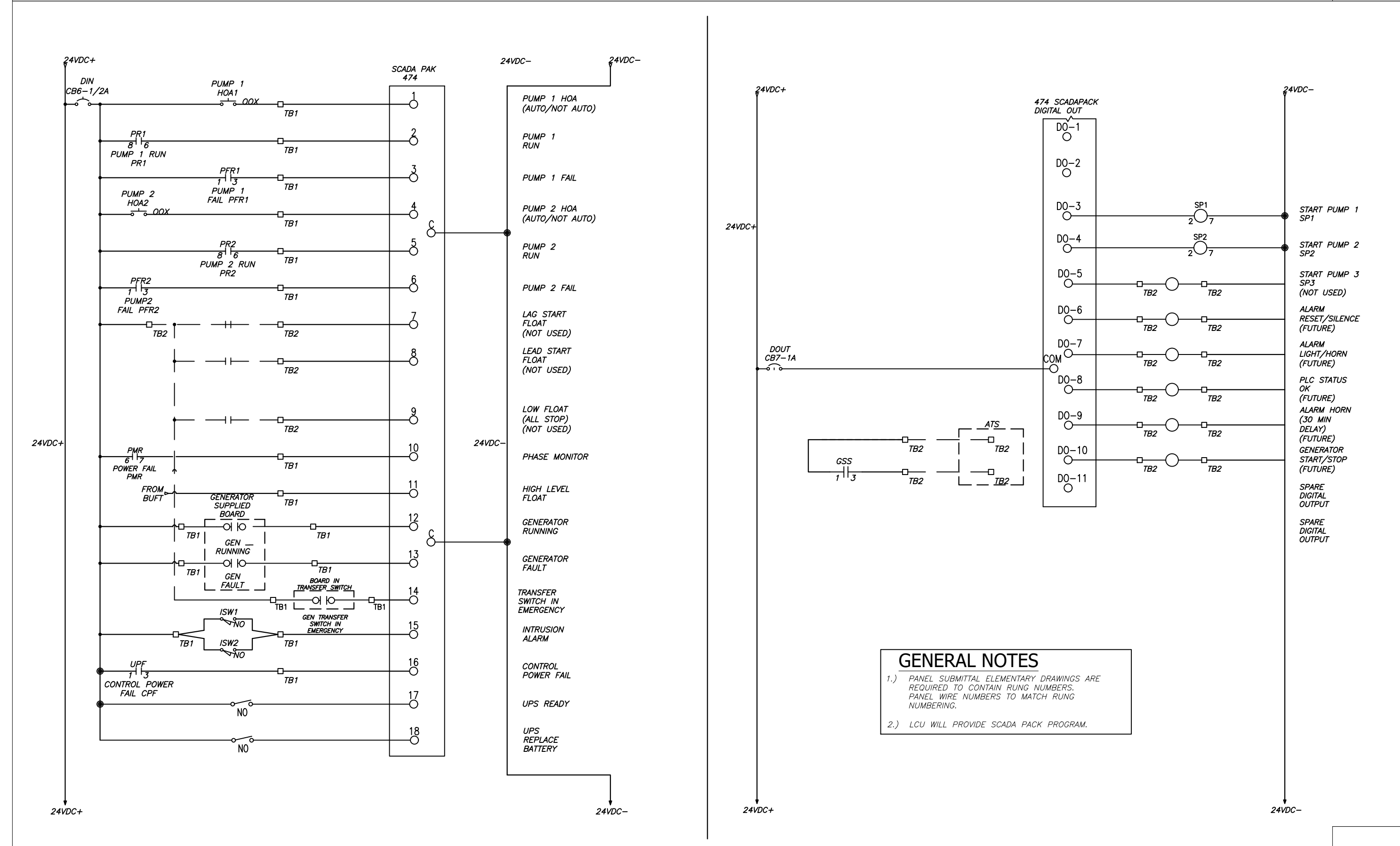
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	<b>LEE COUNTY SOUTHWEST FLORIDA</b> 1500 MONROE STREET	<b>LEE COUNTY UTILITIES ENGINEERING</b> FORT MYERS, FLORIDA 33901
	SHEET TITLE: <b>DUPLEX PUMP STATION ELECTRICAL DIAGRAMS</b>	
TITLE: <b>STANDARD 240V 1PH DUPLEX PUMP STATION w-GEN</b>		
PROJECT: <b>WASTE WATER DUPLEX, TRIPLEX PUMP STA. MASTER PUMP STATION DESIGN STANDARD</b>		
PROJECT NO: 240V 1PH DPS w-GEN	FILE NAME: Duplex 240 1PH w-GEN	SHEET NUMBER: 8 OF 13





E-10

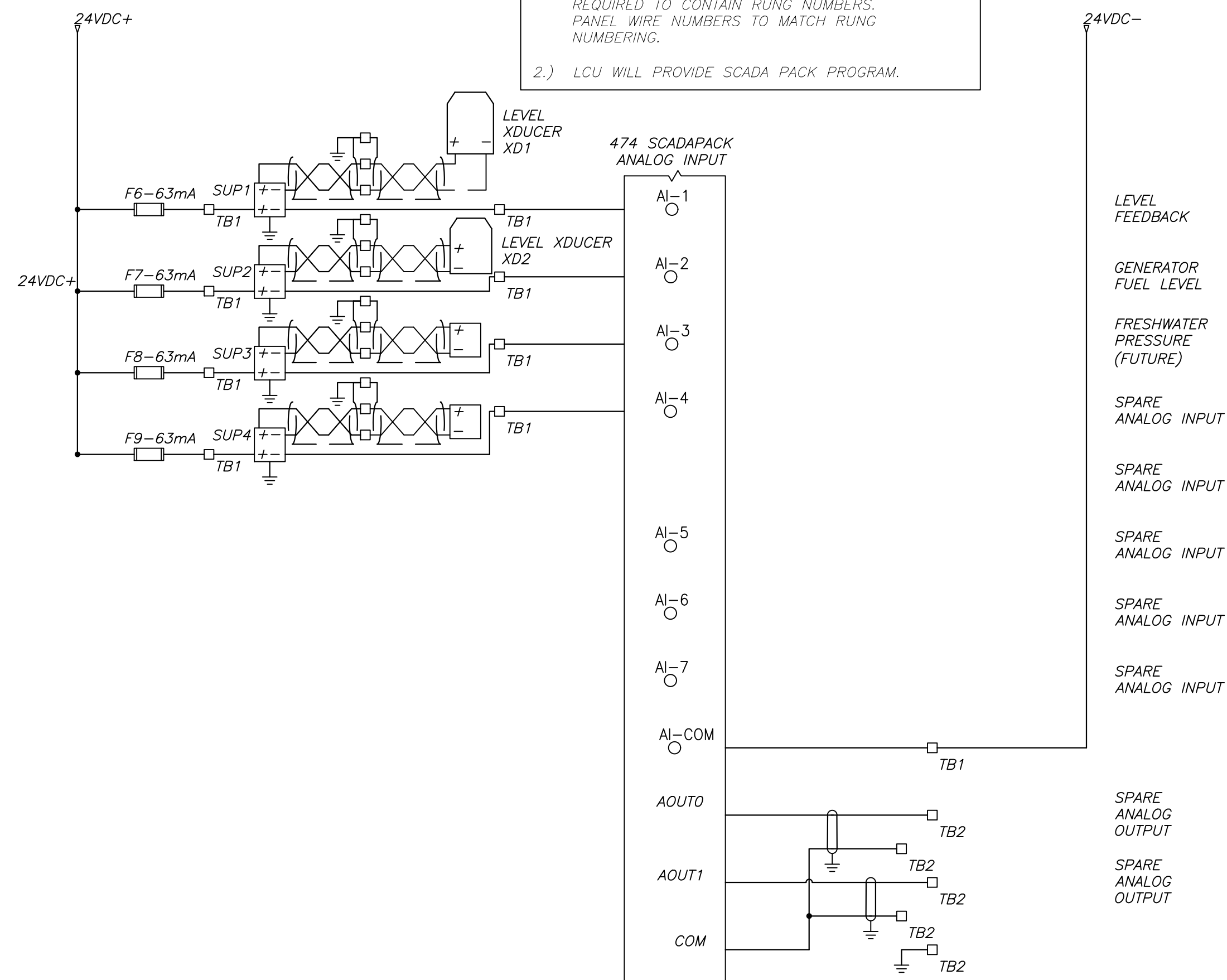


E-11

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	<b>LEE COUNTY SOUTHWEST FLORIDA</b> 1500 MONROE STREET FORT MYERS, FLORIDA 33901	<b>LEE COUNTY UTILITIES ENGINEERING</b>
	SHEET TITLE: <b>DUPLEX PUMP STATION ELECTRICAL DIAGRAMS</b>	
TITLE: <b>STANDARD 240V 1PH DUPLEX PUMP STATION w-GEN</b>		
PROJECT: <b>WASTE WATER DUPLEX, TRIPLEX PUMP STA. MASTER PUMP STATION DESIGN STANDARD</b>		
PROJECT NO: 240V 1PH DPS w-GEN	FILE NAME: Duplex 240 1PH w-GEN	SHEET NUMBER: 9 OF 13

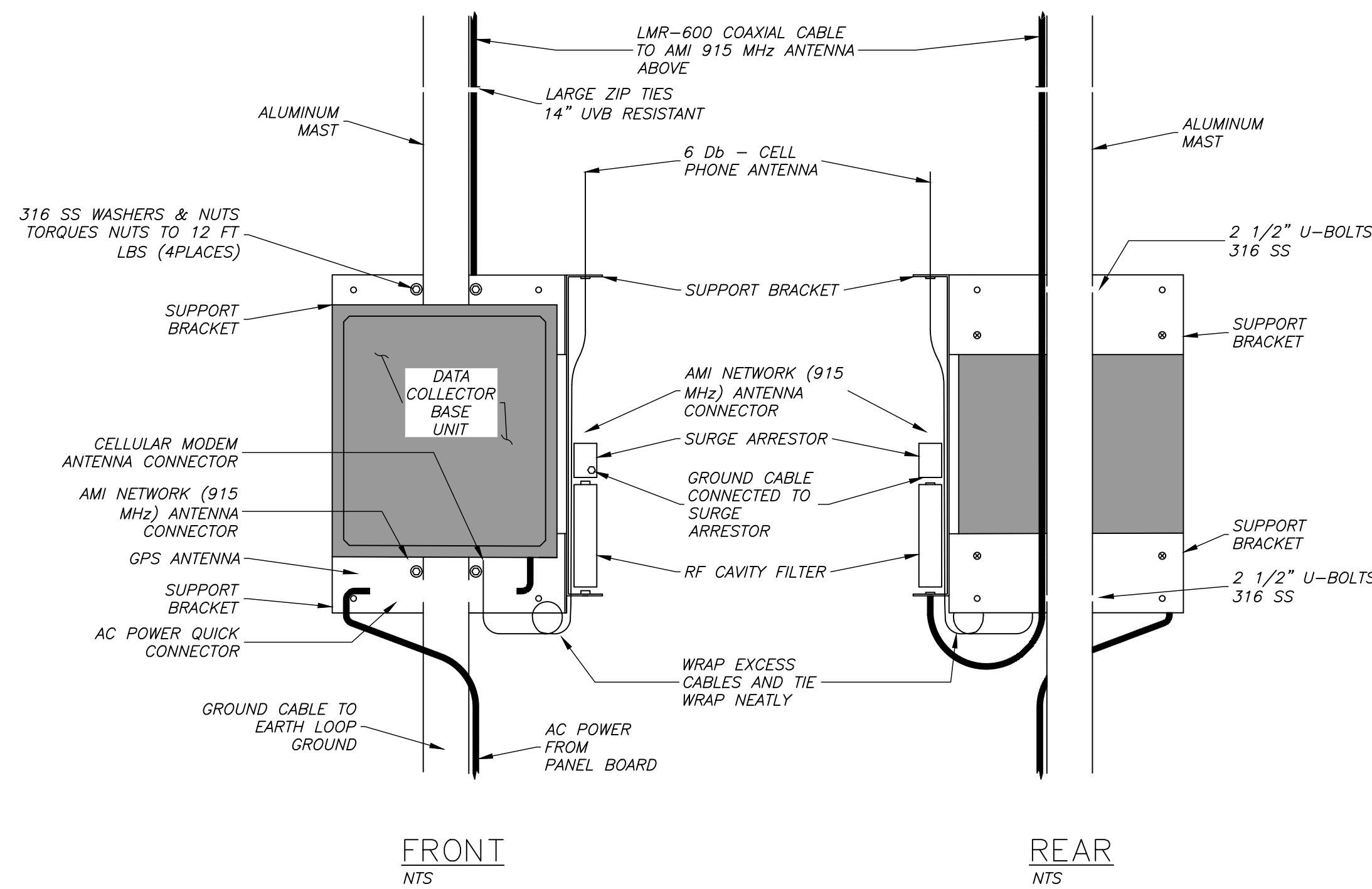
**GENERAL NOTES**  
 1.) PANEL SUBMITTAL ELEMENTARY DRAWINGS ARE REQUIRED TO CONTAIN RUNG NUMBERS. PANEL WIRE NUMBERS TO MATCH RUNG NUMBERING.  
 2.) LCU WILL PROVIDE SCADA PACK PROGRAM.



STANDARD 240V-1Ø (0-10HP) DUPLEX PUMP STATION  
 W/ GENERATOR CONTROL PANEL ELEMENTARY

E-12


**GENERAL NOTES**  
 1.) ALL CONNECTORS TO BE WRAPPED WITH MASTIC AND TAPE.

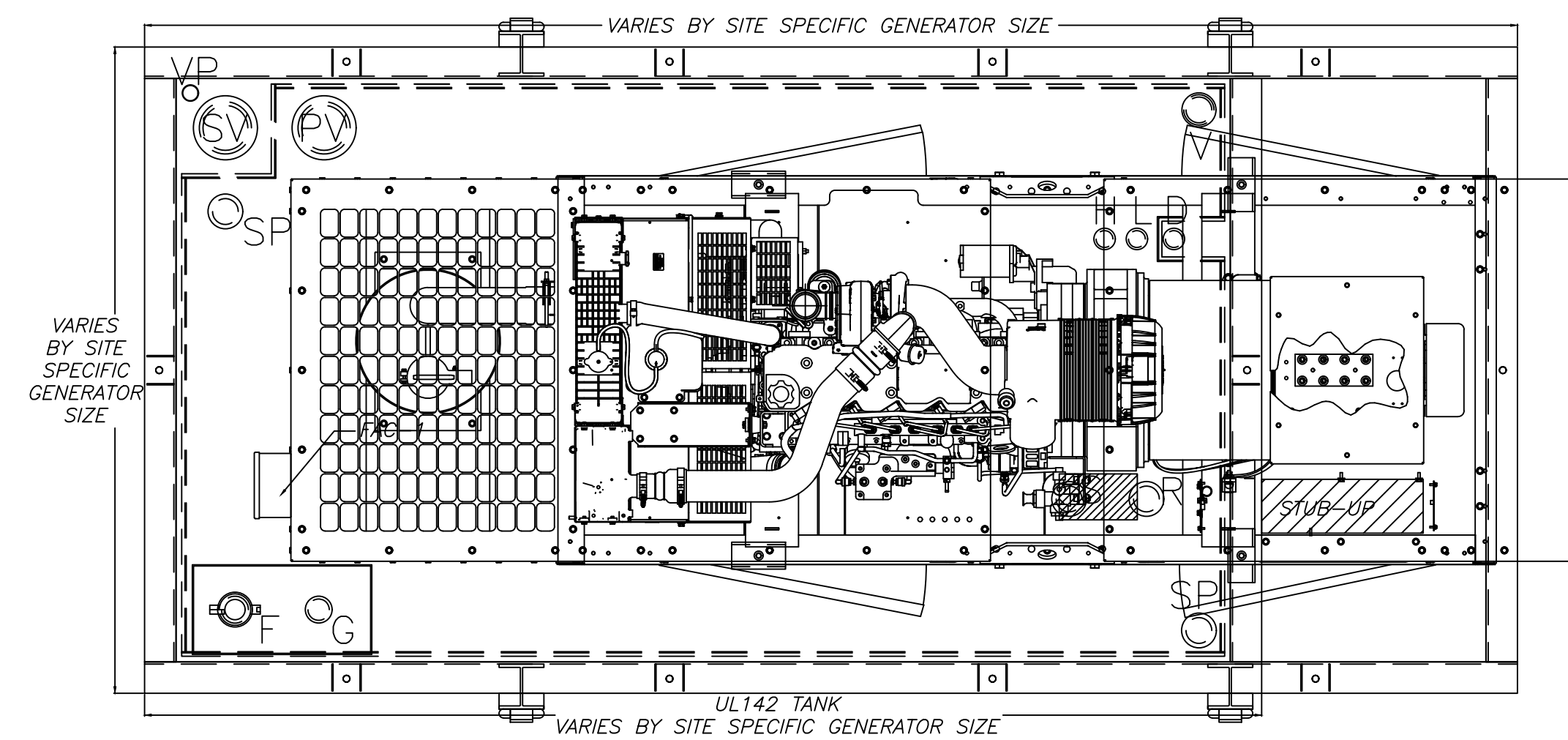


STANDARD 240V-1Ø (0-10HP) DUPLEX PUMP STATION  
 DATA COLLECTOR INSTALLATION DETAIL "A"

E-13

**NOTE:**  
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	LEE COUNTY SOUTHWEST FLORIDA 1500 MONROE STREET	LEE COUNTY UTILITIES ENGINEERING FORT MYERS, FLORIDA 33901
	SHEET TITLE: <b>DUPLEX PUMP STATION ELECTRICAL DIAGRAM &amp; DATA COLLECTOR</b>	
TITLE: <b>STANDARD 240V 1PH DUPLEX PUMP STATION w-GEN</b>		
PROJECT: <b>WASTE WATER DUPLEX, TRIPLEX PUMP STA. MASTER PUMP STATION DESIGN STANDARD</b>		
PROJECT NO: 240V 1PH DPS w-GEN	FILE NAME: Duplex 240 1PH w-GEN	SHEET NUMBER: 10 OF 13

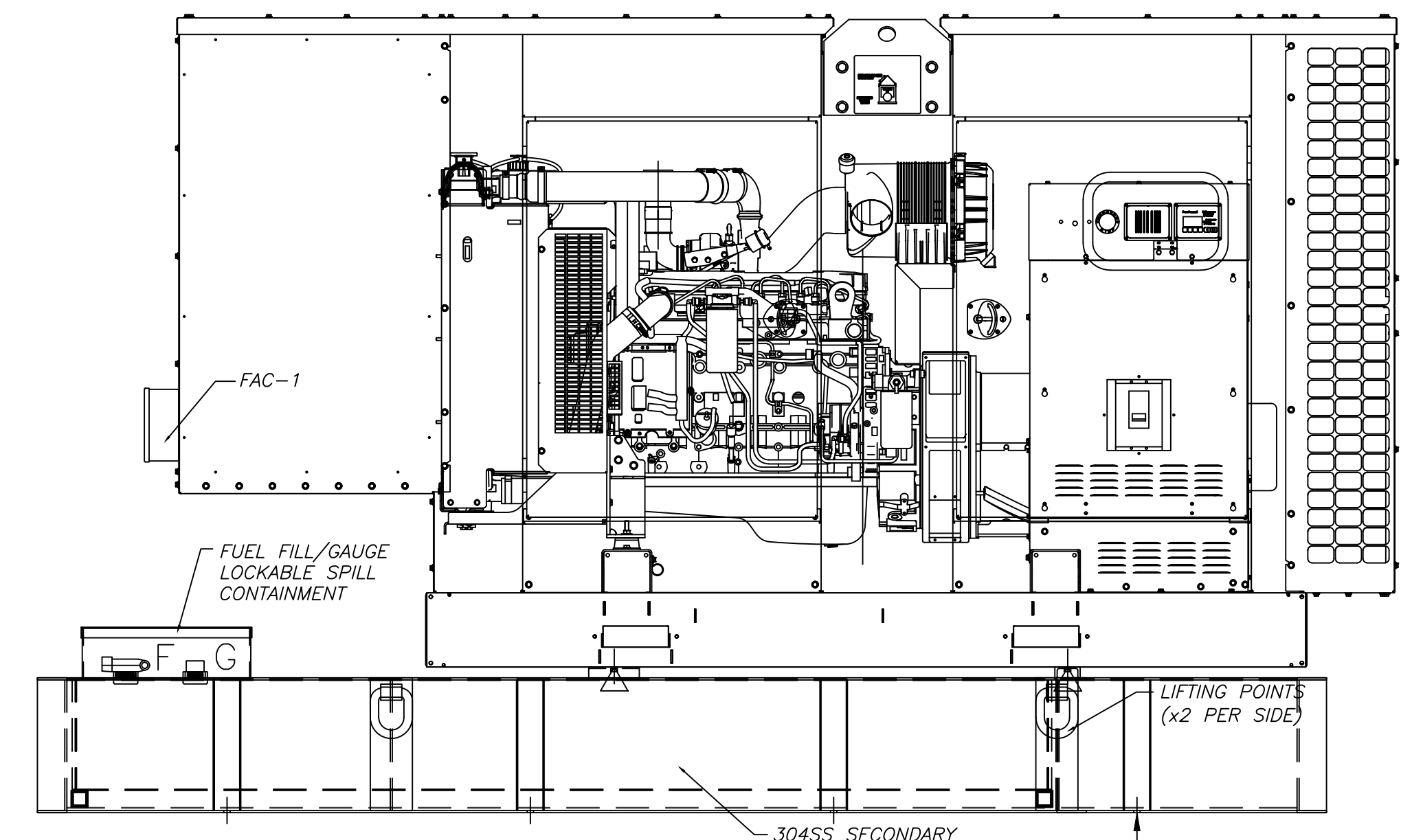


**TANK FITTING LEGEND**

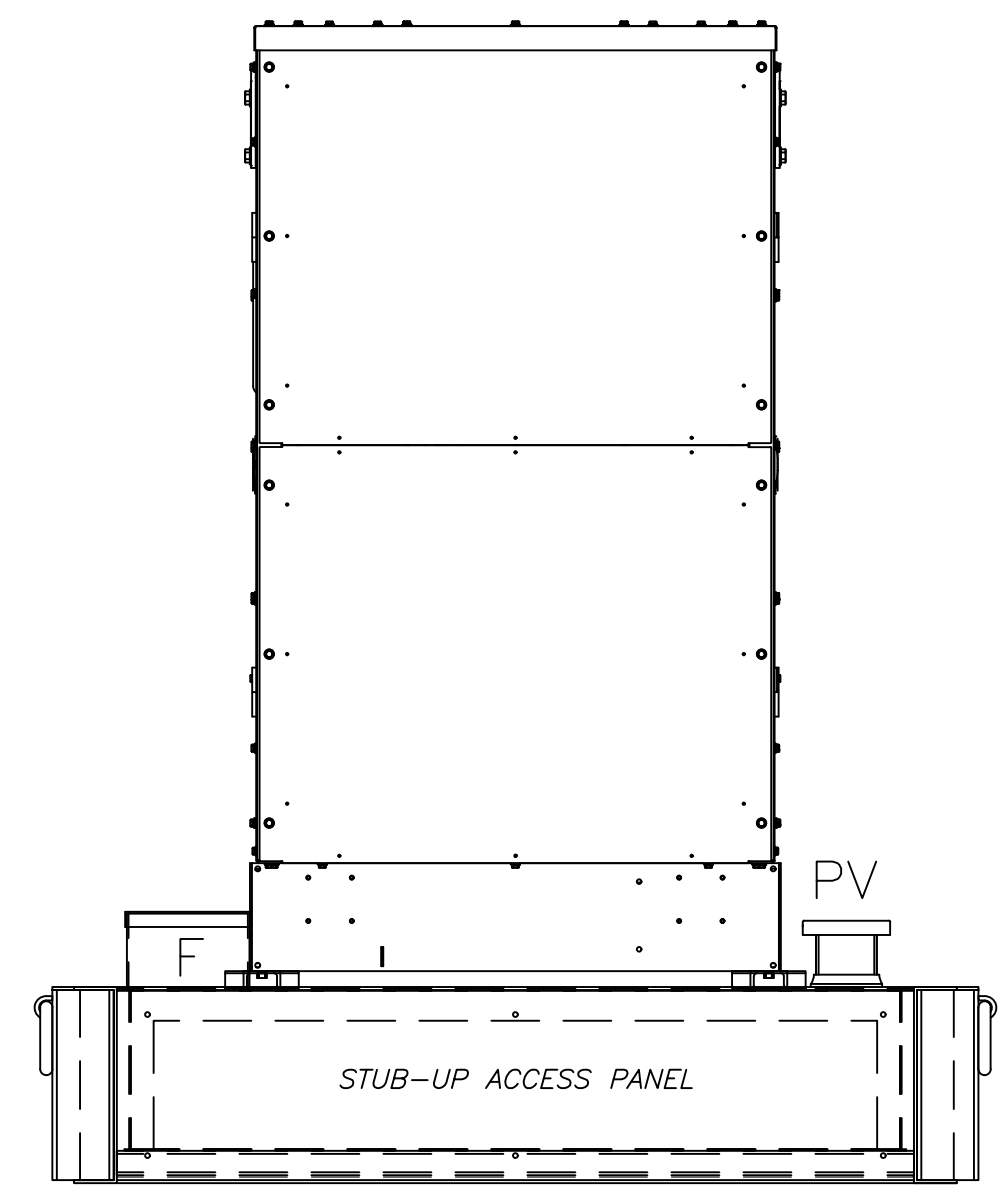
- F - FUEL FILL
- FP - FUEL FILL PANEL
- G - MECH. FUEL GAUGE
- D - LEAK DETECTOR
- S - FUEL SUPPLY
- R - FUEL RETURN
- V - MAIN VENT
- SV - SECONDARY EMERGENCY VENT
- PV - PRIMARY EMERGENCY VENT
- H - HIGH FUEL LEVEL SENSOR
- L - LOW FUEL LEVEL SENSOR
- SP - SPARE
- VP - SECONDARY VACUUM PORT
- SS - 4-20ma ULTRASONIC SENSOR

**GENERAL SHEET NOTES**

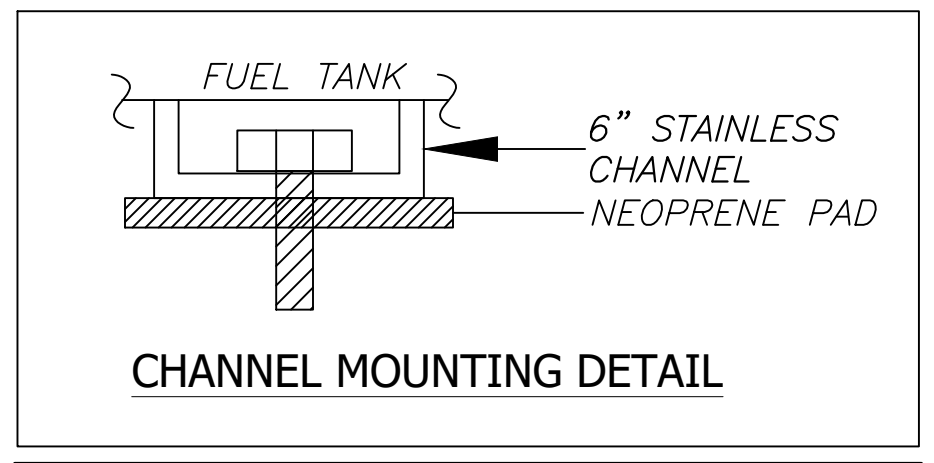
- 1.) ALL FITTINGS TO BE S.S. THREADED PIPE. (UNLESS OTHERWISE NOTED)
- 2.) EXTERIOR FINISH: COMM. WHITE METAL SANDBLAST, 12 TO 15 MIL INTERMEDIATE GLASS FLAKE EPOXY COAT & 2 TO 3 MIL POLYURETHANE TOP COAT
- 3.) TANK SHALL BE PROVIDED WITH 6" WIDE X 3/8" THICK; FULL LENGTH NEOPRENE PADS FOR EACH TANK SUPPORT FOOT.
- 4.) APPROXIMATE TANK VOLUME: SIZE FOR 48 HOUR FULLY LOADED RUN TIME.
- 5.) TANK CONSTRUCTION: STAINLESS STEEL OUTER SHELL; RATED UL-142 DOUBLE CONTAINMENT
- 6.) ENCLOSURE SOUND ATTENUATION LEVEL: MINIMUM -35DBA



GENERATOR SIDE VIEW



GENERATOR INTAKE END VIEW



ACOUSTIC RATING: THE ENCLOSURE TO BE LINED WITH ACOUSTIC SOUND FOAM TO ACHIEVE 55 dbA @ 21 FT.

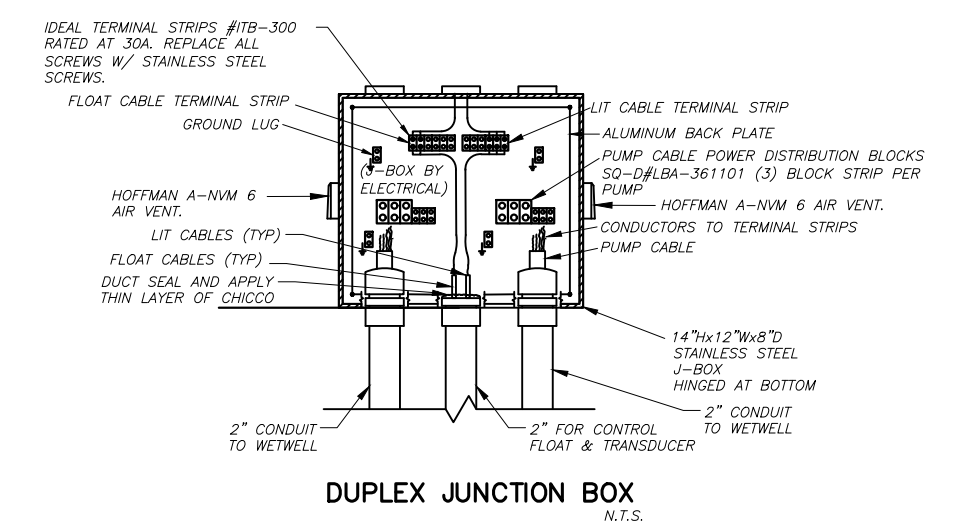
NOTE: WALK-IN ENCLOSURE MAY BE REQUIRED DEPENDING ON THE UNITS PROXIMITY TO PROPERTY LINE AND RESIDENCIES.

GENERATOR LAYOUT & DETAILS

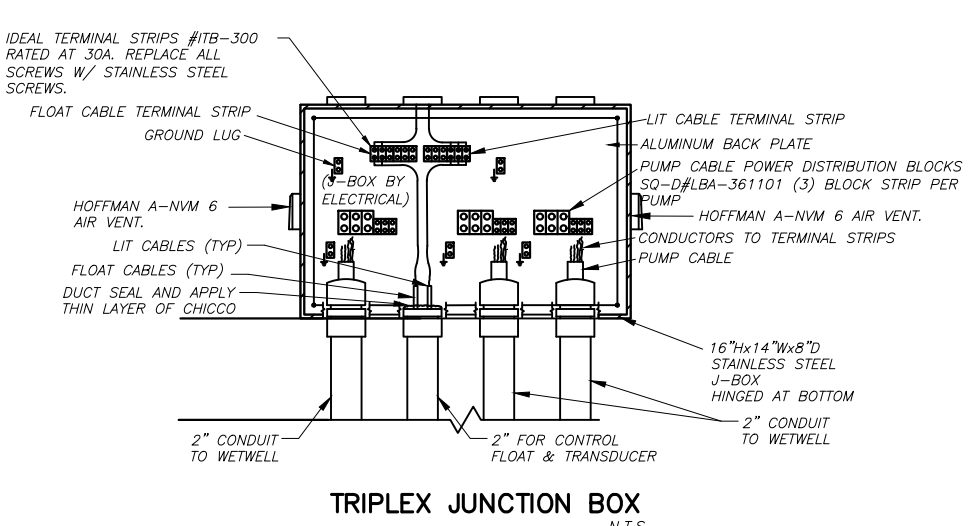
E-14

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	LEE COUNTY SOUTHWEST FLORIDA 1500 MONROE STREET	LEE COUNTY UTILITIES ENGINEERING FORT MYERS, FLORIDA 33901
	SHEET TITLE: <b>DUPLEX PUMP STATION GENERATOR LAYOUT &amp; DETAILS</b>	
TITLE: <b>STANDARD 240V 1PH DUPLEX PUMP STATION w-GEN</b>		
PROJECT: <b>WASTE WATER DUPLEX, TRIPLEX PUMP STA. MASTER PUMP STATION DESIGN STANDARD</b>		
PROJECT NO: 240V 1PH DPS w-GEN	FILE NAME: Duplex 240 1PH w-GEN	SHEET NUMBER: 11 OF 13

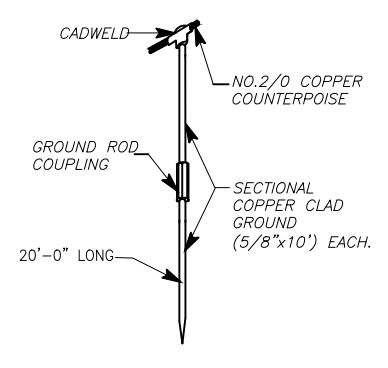


DUPLEX JUNCTION BOX  
N.T.S.

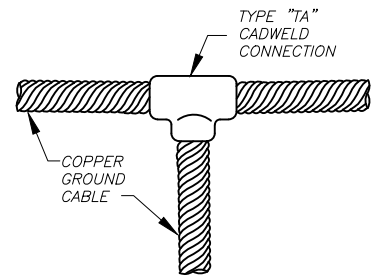


TRIPLEX JUNCTION BOX  
N.T.S.

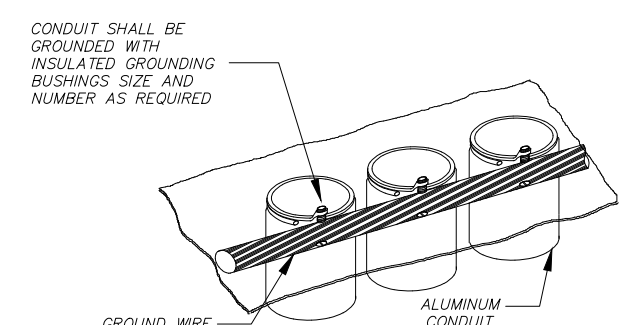
JUNCTION BOX & TERMINAL STRIP INSTALLATION AT CONTROL PANEL LOCATION



TYPICAL GROUND ROD CONNECTION DETAIL  
N.T.S.

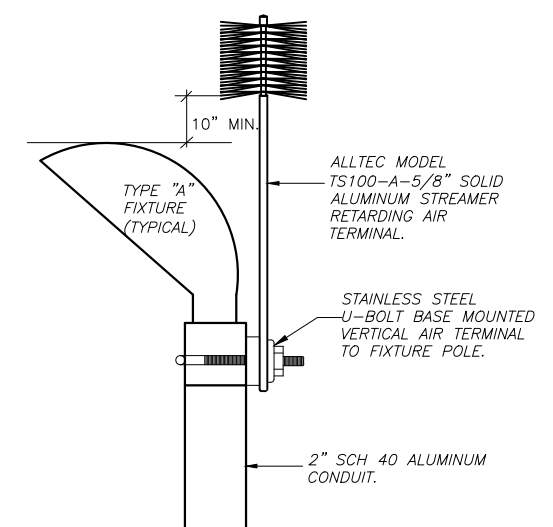


GROUND CABLE CONNECTION  
N.T.S.



PANEL CONDUIT GROUNDING DETAIL  
N.T.S.

GROUNDING DETAILS

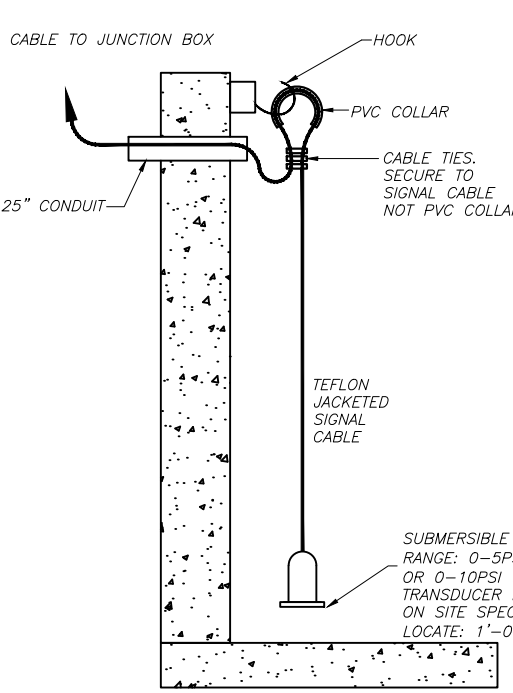


STREAMER RETARDING AIR TERMINAL FIXTURE POLE MOUNTED

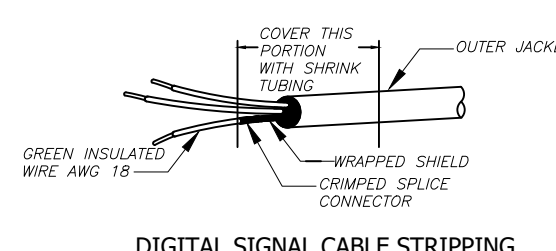
ES-1

ES-2

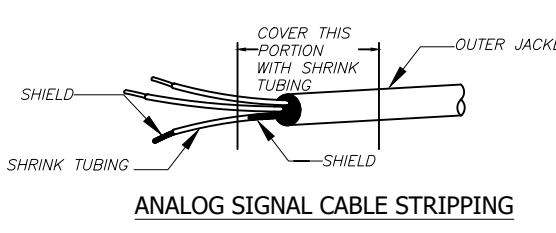
ES-3



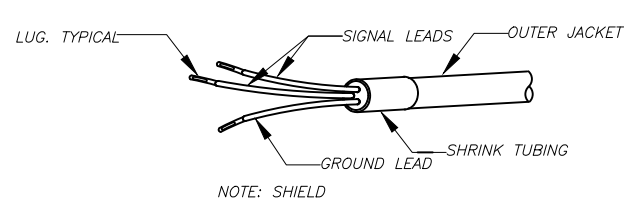
LEVEL TRANSMITTER DETAIL



DIGITAL SIGNAL CABLE STRIPPING



ANALOG SIGNAL CABLE STRIPPING

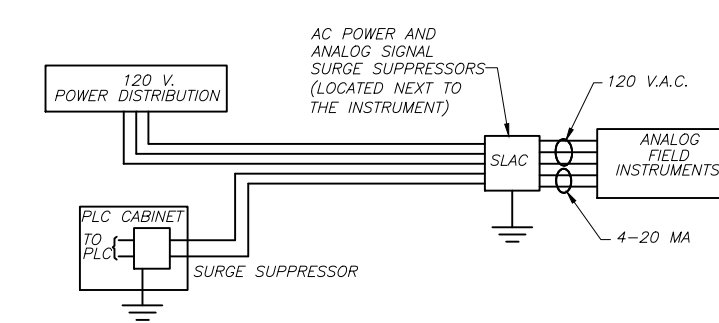


SIGNAL CABLE SHRINK TUBING

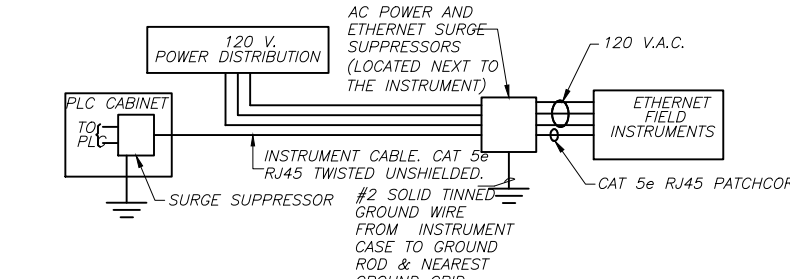
TERMINATION OF SHIELDING INSTRUMENT CONTROL CABLE DETAIL

ES-4

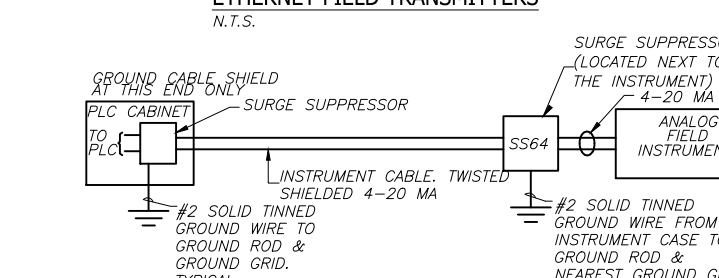
ES-5



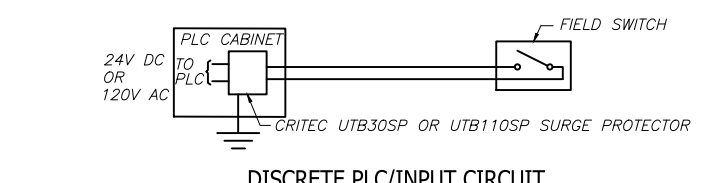
4-WIRE FIELD TRANSMITTERS  
N.T.S.



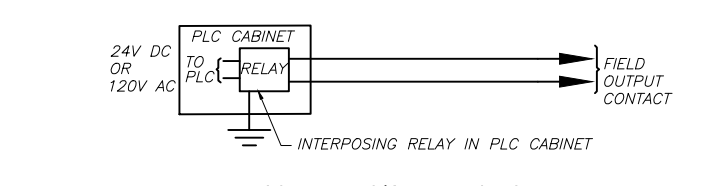
ETHERNET FIELD TRANSMITTERS  
N.T.S.



2-WIRE FIELD TRANSMITTERS  
N.T.S.



DISCRETE PLC/OUTPUT CIRCUIT  
N.T.S.



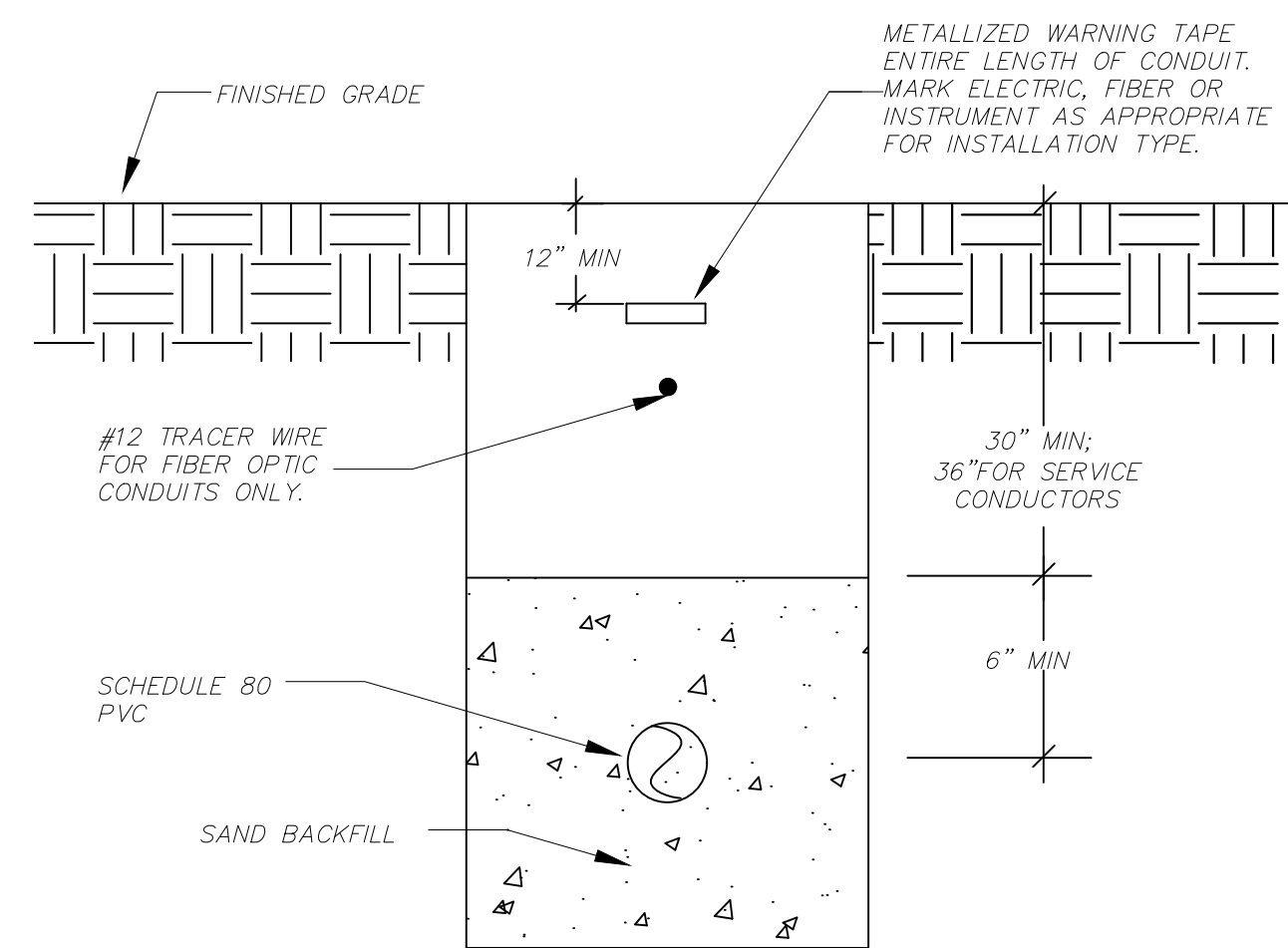
DISCRETE PLC/OUTPUT CIRCUIT  
N.T.S.

INSTRUMENTATION GROUNDING & SURGE PROTECTION DETAIL

ES-6

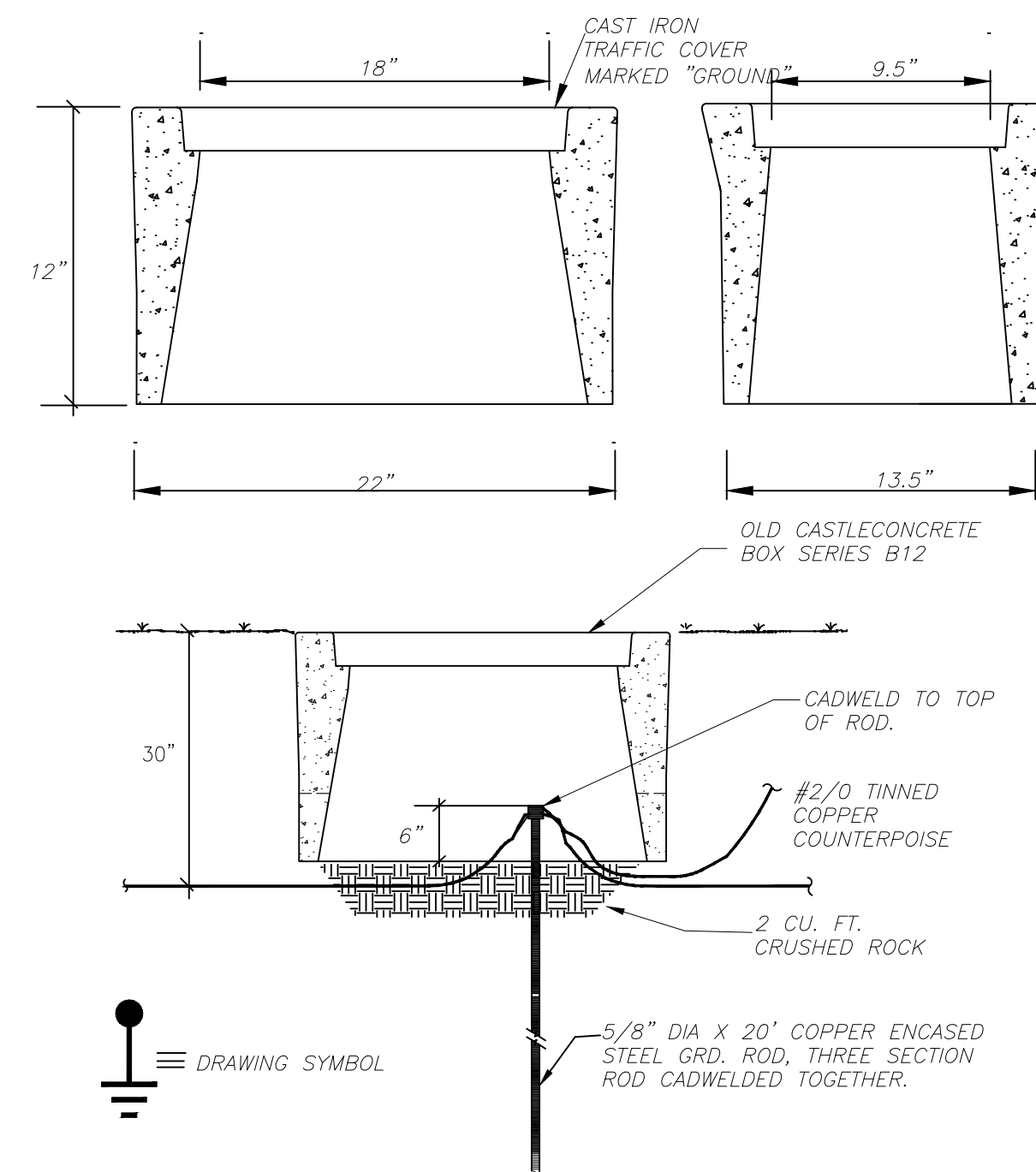
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	<b>LEE COUNTY SOUTHWEST FLORIDA</b> 1500 MONROE STREET FORT MYERS, FLORIDA 33901	<b>LEE COUNTY UTILITIES ENGINEERING</b> FORT MYERS, FLORIDA 33901
	<b>SHEET TITLE: DUPLEX PUMP STATION TYPICAL DETAILS</b>	
<b>TITLE: STANDARD 240V 1PH DUPLEX PUMP STATION w-GEN</b>		
<b>PROJECT: WASTE WATER DUPLEX, TRIPLEX PUMP STA. MASTER PUMP STATION DESIGN STANDARD</b>		
<b>PROJECT NO: 240V 1PH DPS w-GEN</b>	<b>FILE NAME: Duplex 240 1PH w-GEN</b>	<b>SHEET NUMBER: 12 OF 13</b>



UNDERGROUND CONDUIT INSTALLATION DETAIL


ES-7



GROUND ROD INSTALLATION DETAIL

ES-8

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	SHEET TITLE: <b>DUPLEX PUMP STATION TYPICAL DETAILS</b>	
TITLE: <b>STANDARD 240V 1PH DUPLEX PUMP STATION w-GEN</b>		
PROJECT: <b>WASTE WATER DUPLEX, TRIPLEX PUMP STA. MASTER PUMP STATION DESIGN STANDARD</b>		
PROJECT NO: 240V 1PH DPS w-GEN	FILE NAME: Duplex 240 1PH w-GEN	SHEET NUMBER: 13 OF 13