

DUPLEX PUMP STATION W/ GENERATOR ELECTRICAL DRAWING INDEX

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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

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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:	DUPLEX PUMP STATION DRAWING INDEX	
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: 1 OF 13

CONTROL/ELEMENTARY SYMBOLS	ELECTRICAL PLAN SYMBOLS	SYSTEM SYMBOL LEGEND	ABBREVIATIONS LIST
<p> 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 </p>	<p> 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 </p>	<p> SYSTEMS CABINET AS NOTED OR MARKED. LIGHTNING PROTECTION AIR TERMINAL STREAMER RETARDING TYPE. STREAMER RETARDING AIR TERMINAL MOUNTED TO LIGHT POLE. </p> <p style="text-align: center;">SINGLE LINE DIAGRAM SYMBOLS</p> <p> 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 MOULDED 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 </p>	<p>ABBREVIATIONS LIST</p> <p> 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 MILLIAMPS (1A*10⁻³) MCB MAGNETIC CIRCUIT BREAKER MIN MINIMUM NA NOT APPLICABLE NEC NATIONAL ELECTRIC CODE NEMA NATIONAL ELECTRIC MANUFACTURERS ASSOCIATION 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 XFMR TRANSFORMER " INCHES ' OR FT FEET # OR NO. NUMBER E# OR I# 11"X17" SHEET ES-# 8.5"X11" SHEET FDEP FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION </p>
LIGHTING FIXTURES SYMBOLS			
<p> LED FIXTURE POLE MOUNTED SEE DETAIL </p>			

E-2

ELECTRICAL SYMBOLS LEGEND & ABBREVIATIONS

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

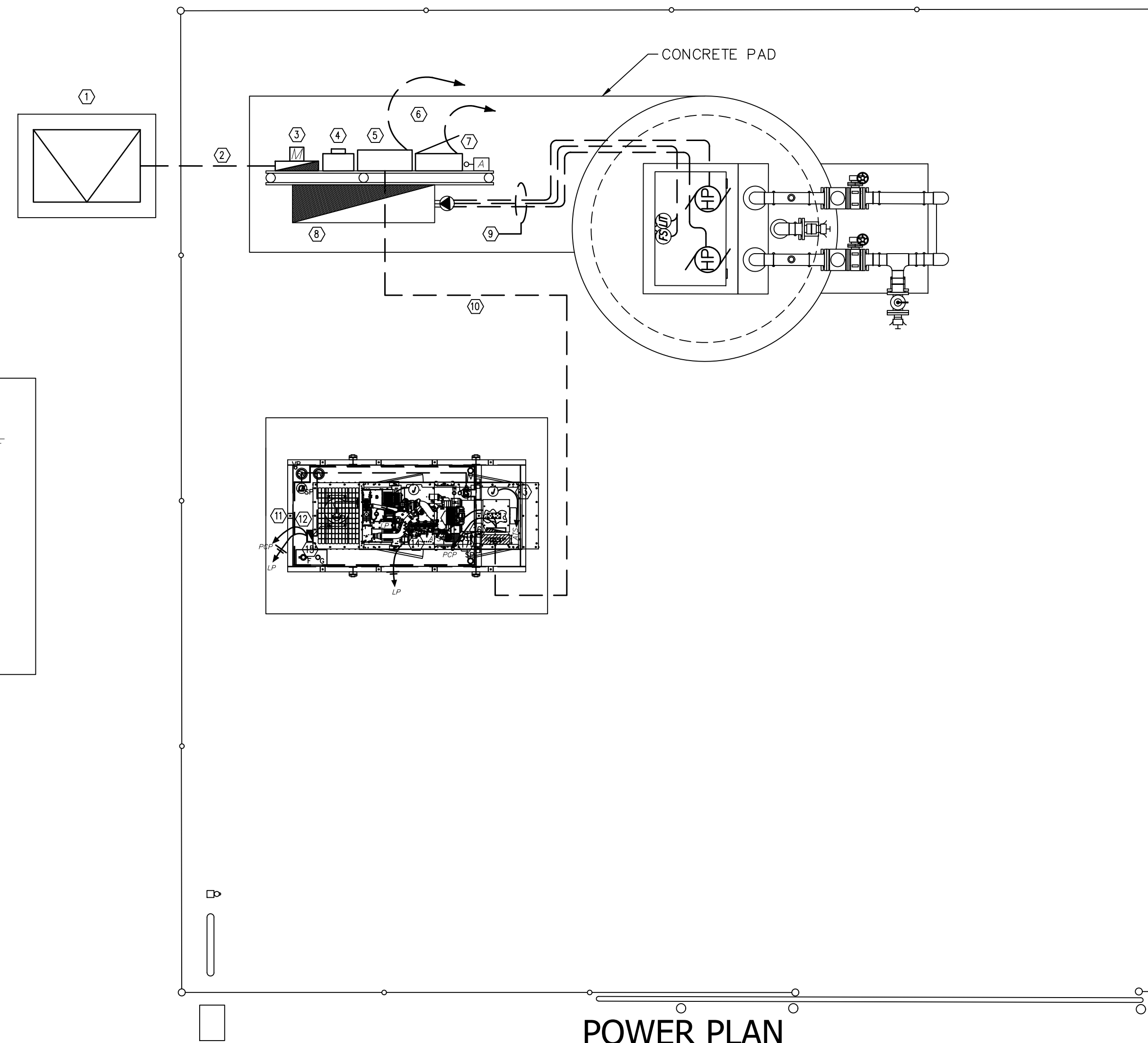
	LEE COUNTY SOUTHWEST FLORIDA <small>1500 MONROE STREET</small>	LEE COUNTY UTILITIES ENGINEERING <small>FORT MYERS, FLORIDA 33901</small>
	SHEET TITLE: DUPLEX PUMP STATION NOTES & ABBREVIATIONS	
TITLE: STANDARD 240V 1PH DUPLEX PUMP STATION w-GEN		
PROJECT: WASTE WATER DUPLEX, TRIPLEX PUMP STA. MASTER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

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

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




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

KEYNOTES

- 1.) 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.
- 2.) UNDERGROUND SERVICE LATERAL.
- 3.) ALUMINUM DIRECT READING UTILITY METER.
- 4.) NEMA 4XSS SE RATED ENCLOSED CIRCUIT BREAKER.
- 5.) NEMA 4XSS AUTOMATIC TRANSFER SWITCH.
- 6.) DEDICATED 2 WIRE UTP CABLE FOR REMOTE GEN-START COMMAND IN 1" C.
- 7.) NEMA 4X, SS 120/208V 3PH-4WIRE PANELBOARD LP.
- 8.) DEP COMPLIANT PUMP CONTROL PANEL (PCP).
- 9.) (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.
- 10.) STAND-BY POWER UNDERGROUND SERVICE LATERAL.
- 11.) GENSET WITH SUBBASE FUEL TANK.
- 12.) (2) PAIR #16 TSP INSTRUMENTATION CABLE IN 1" C. AND (9) CONDUCTOR #14 CONTROL CABLE IN 1.25" C.
- 13.) (2)#8 AND #10G IN 1" C. TO BATTERY CHARGER. FIELD COORDINATE EXACT LOCATION OF BATTERY.
- 14.) GENSET STRIP HEATER AND JACKET WATER HEATER. MINIMUM (3)#10 IN 0.75" C. COORDINATE EXACT LOCATION OF HEATERS.
- 15.) GENERATOR FUEL FILL PANEL WITH FUEL LEVEL TRANSMITTER & TANK LEAK ALARM PANEL MOUNTED WITHIN NEMA4X SS POWDER COATED WHITE ENCLOSURE.
- 16.) GENERATOR CONTROL PANEL; (GCP). COORDINATE EXACT LOCATION PRIOR TO ROUGH-IN. PROGRAM TO PROVIDE MONITORING CONTACTS FOR: GENERATOR FAULT, GENERATOR RUNNING
- 17.) (2)1.25" C. (1) SPARE, (1) WITH (13) CONDUCTOR #14 CONTROL CABLE.

E-3

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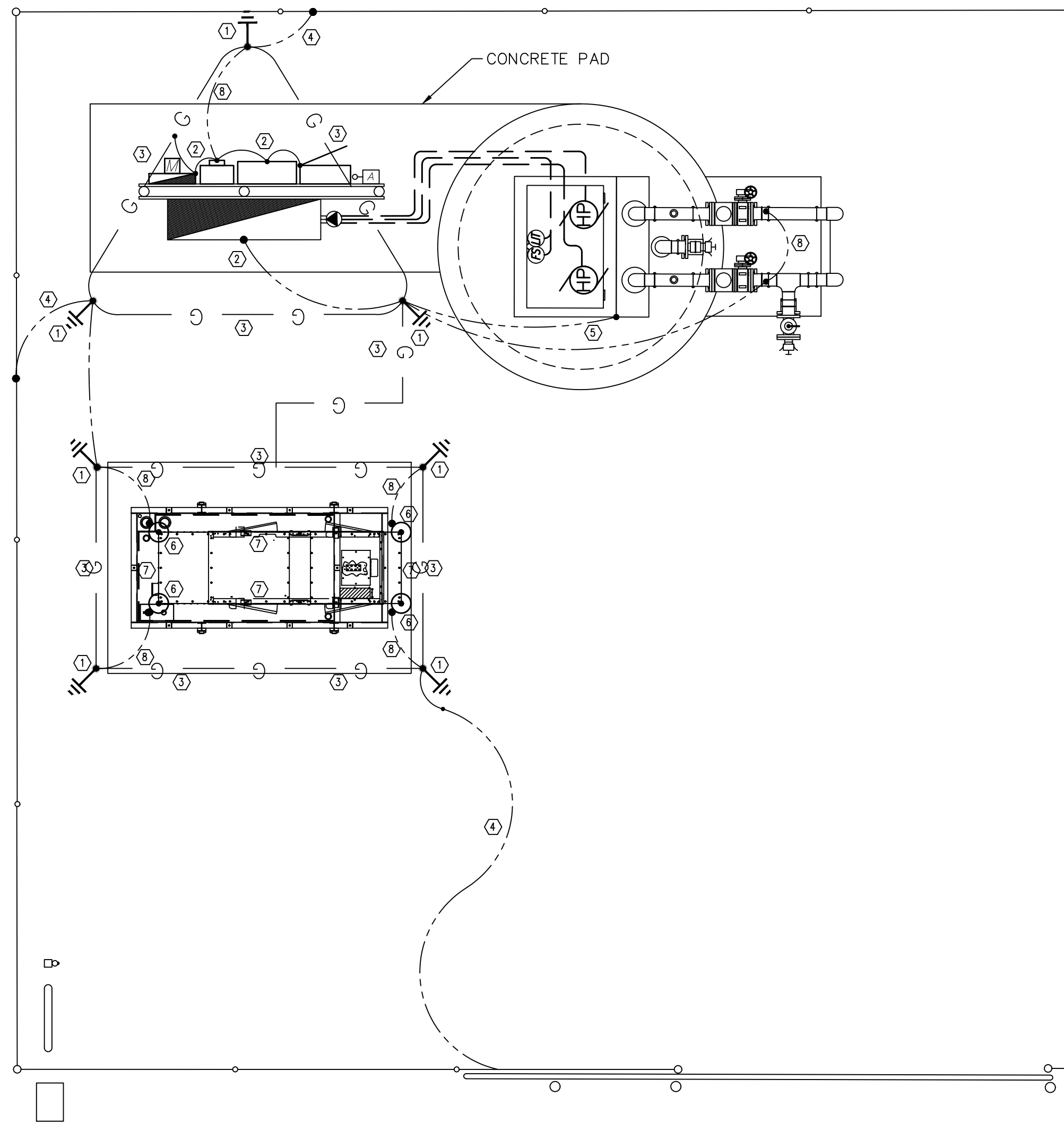
 LEE COUNTY SOUTHWEST FLORIDA 1500 MONROE STREET	LEE COUNTY UTILITIES ENGINEERING FORT MYERS, FLORIDA 33901
	SHEET TITLE: DUPLEX PUMP STATION POWER DISTRIBUTION & CONTROL PLAN
TITLE: STANDARD 240V 1PH DUPLEX PUMP STATION w-GEN	PROJECT: WASTE WATER DUPLEX, TRIPLEX PUMP STA. MASTER PUMP STATION DESIGN STANDARD
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

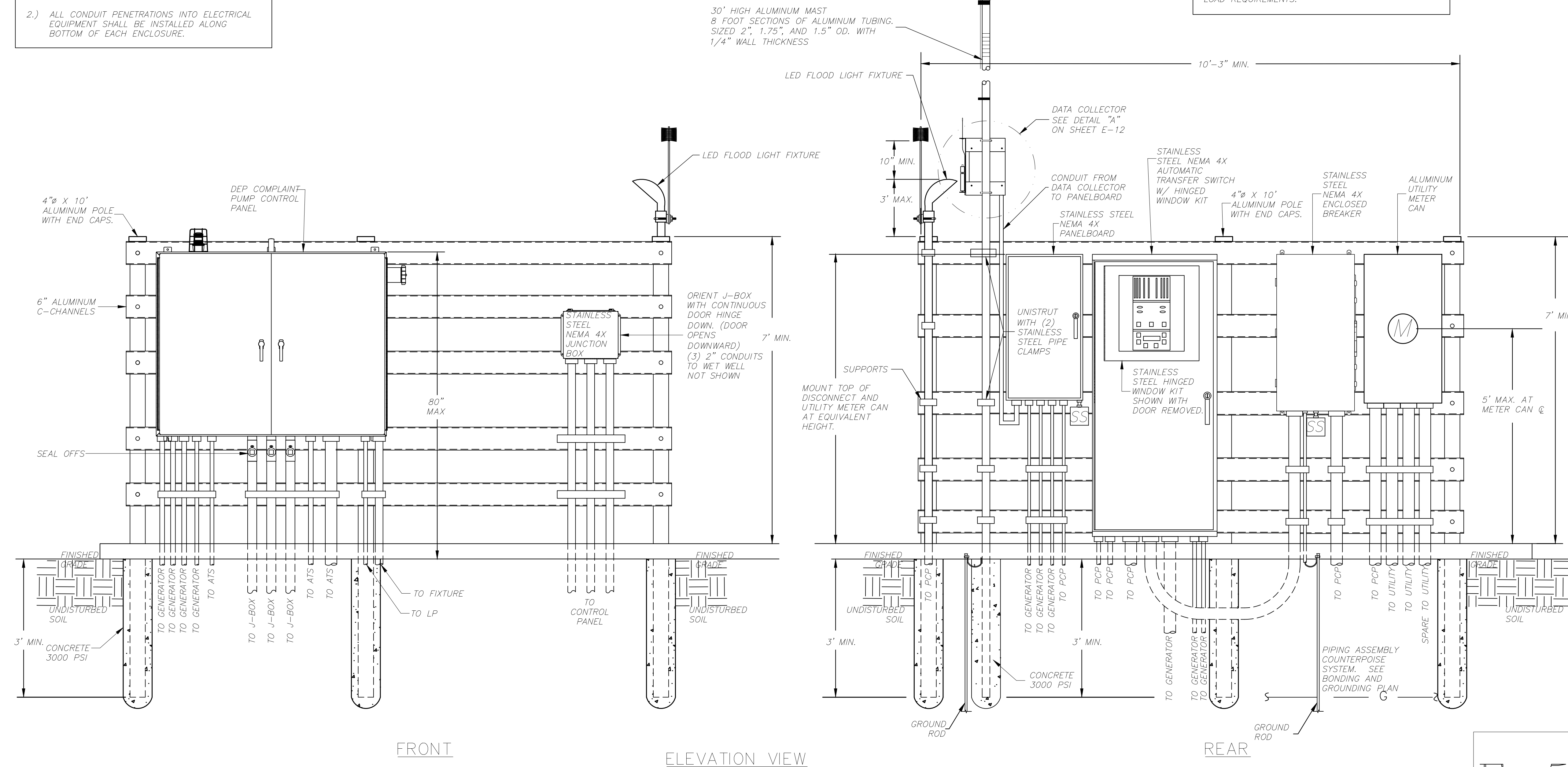
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	LEE COUNTY SOUTHWEST FLORIDA 1500 MONROE STREET	LEE COUNTY UTILITIES ENGINEERING FORT MYERS, FLORIDA 33901
	SHEET TITLE: DUPLEX PUMP STATION LIGHTNING PROTECTION PLAN	
TITLE: STANDARD 240V 1PH DUPLEX PUMP STATION w-GEN		
PROJECT: WASTE WATER DUPLEX,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

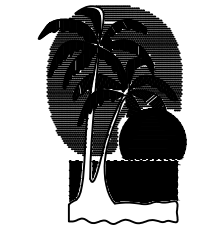
PROVIDE SHOP DRAWINGS FROM A FLORIDA REGISTERED PROFESSIONAL ENGINEER CERTIFYING THAT THE ALUMINUM POST FOUNDATION AND RACK MEET CURRENT FLORIDA BUILDING CODE AND WIND LOAD REQUIREMENTS.

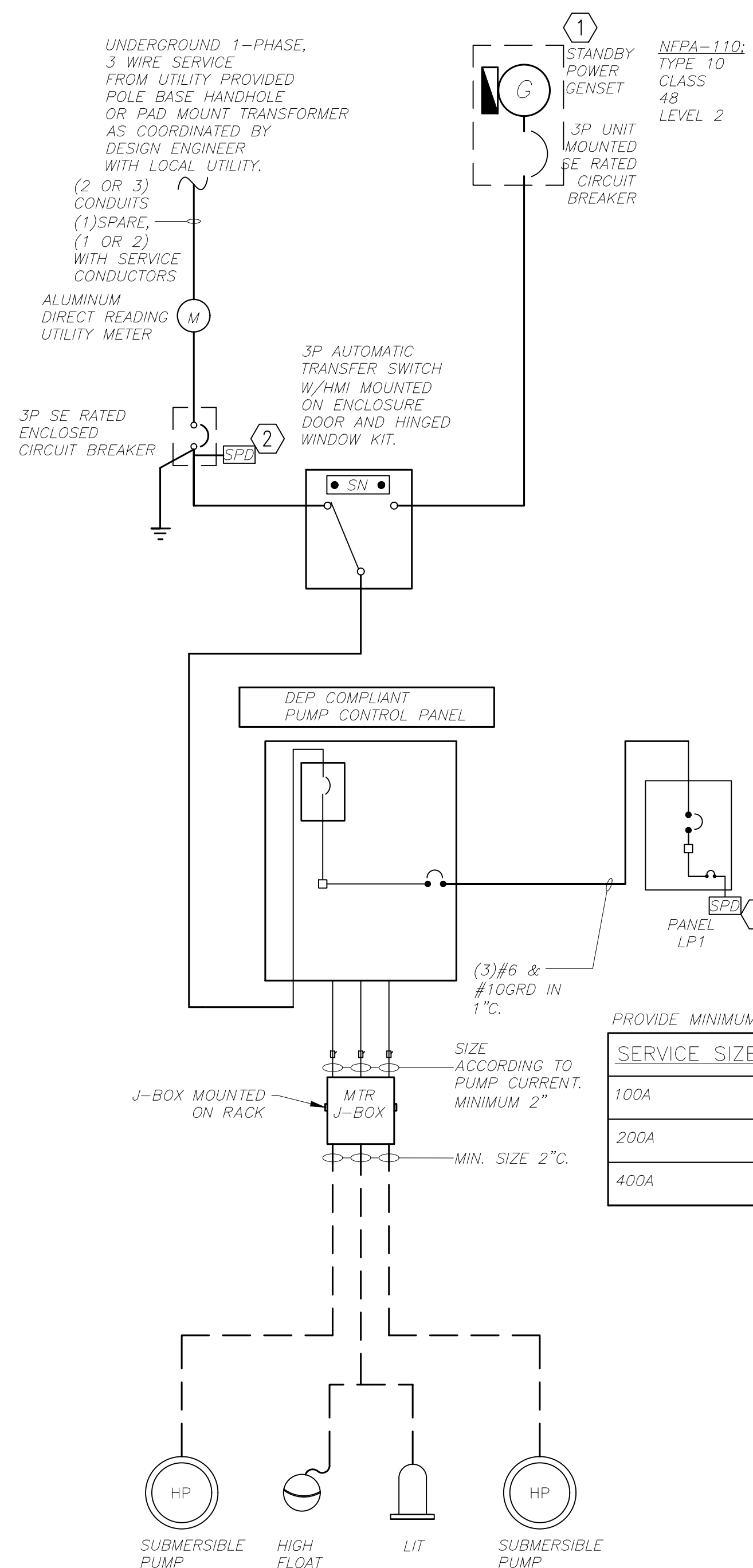


STANDARD 240V-1Ø (0-10HP) DUPLEX PUMP STATION W/
GENERATOR ELECTRICAL EQUIPMENT RACK ELEVATION

E-5

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



ELECTRICAL RISER DIAGRAM (240V 1-PHASE)

N.T.S.

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.

E-6

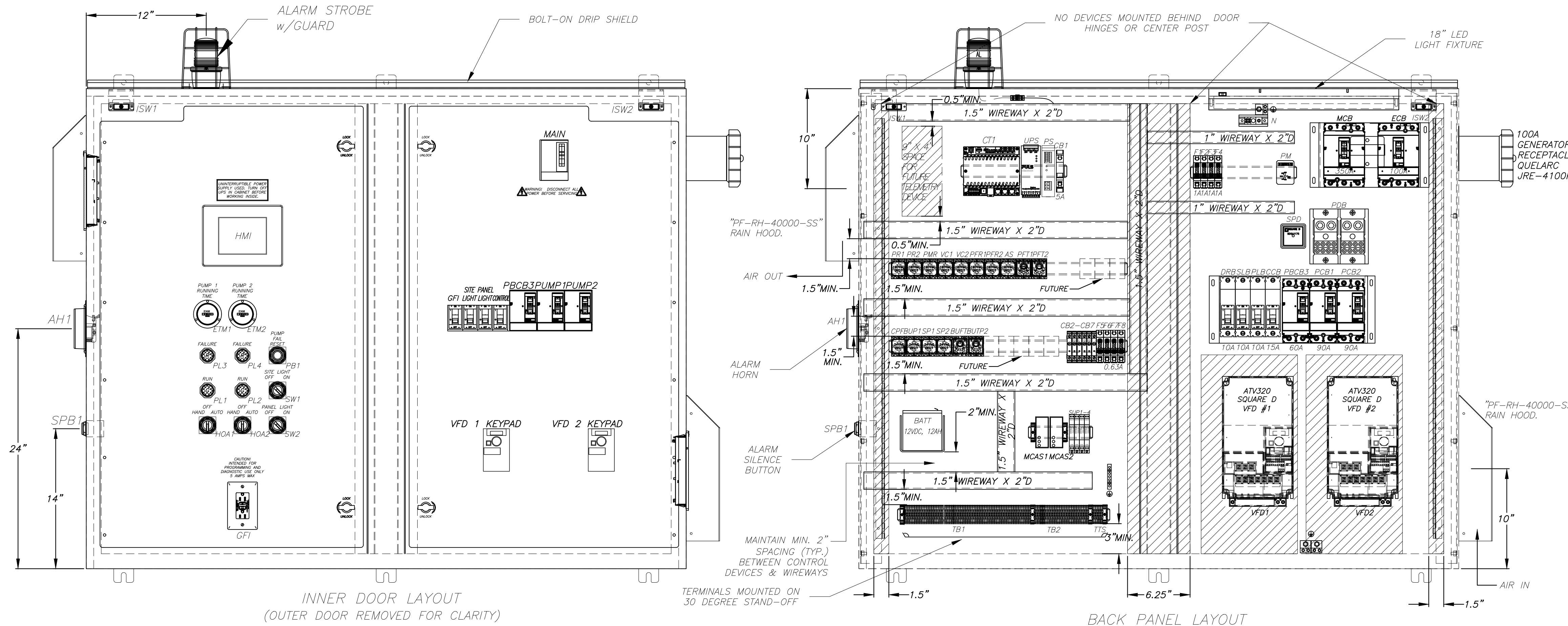
STANDARD 240V-1Ø (0-10HP) DUPLEX PUMP STATION W/ GENERATOR ELECTRICAL RISER DIAGRAM & PANEL SCHEDULE

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	LEE COUNTY UTILITIES ENGINEERING 1500 MONROE STREET FORT MYERS, FLORIDA 33901
	LEE COUNTY UTILITIES ENGINEERING 1500 MONROE STREET FORT MYERS, FLORIDA 33901
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	BROWN/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

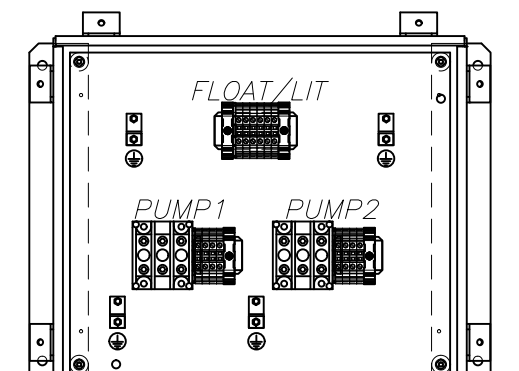
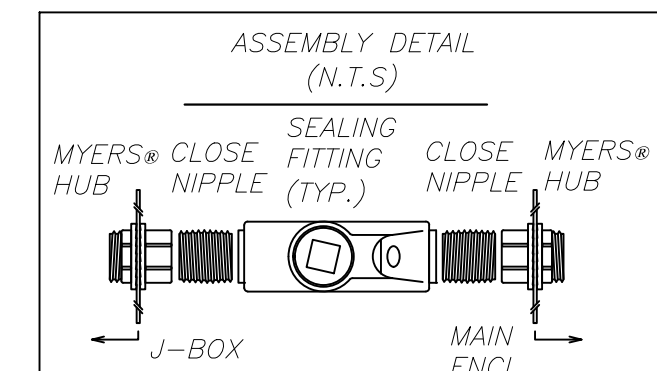


ENCLOSURE:
MIN. SPN4DSS-486016 (48"H x 60"W x 16"D) NEMA 4X RATED, WITH BOLT-ON DRIP SHIELD AND REMOVABLE CENTER POST, FABRICATED FROM TYPE 304 STAINLESS STEEL, WITH POLISHED FINISH. OUTER DOORS HAVE 3-POINT PAD-LOCKABLE HANDLES, AND 90° STOPS.

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.

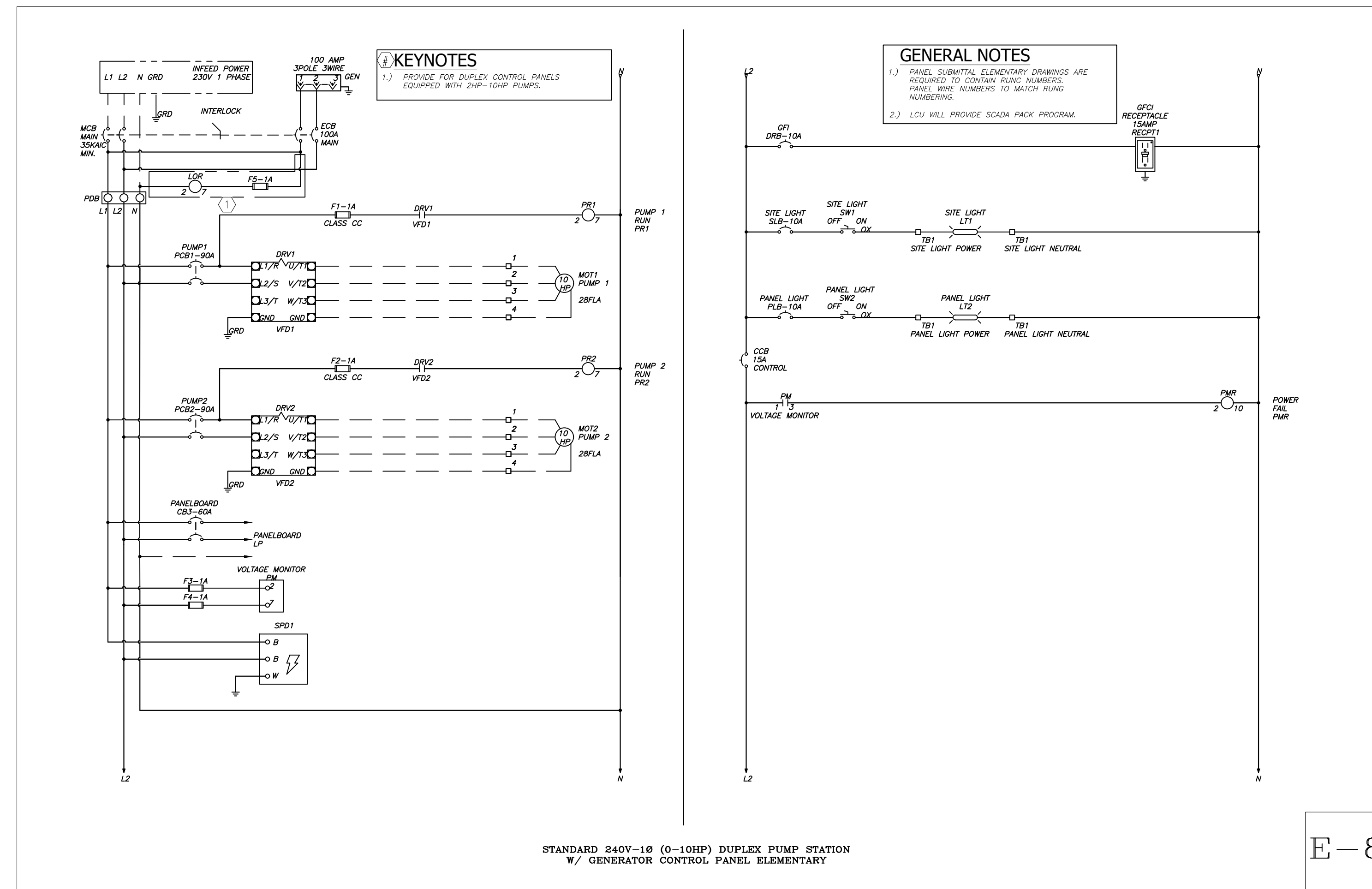
BACK PANEL:
SPPJ-1412 (12.88"H x 10.88"W) FABRICATED FROM 12ga. CARBON STEEL PAINTED WHITE.

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

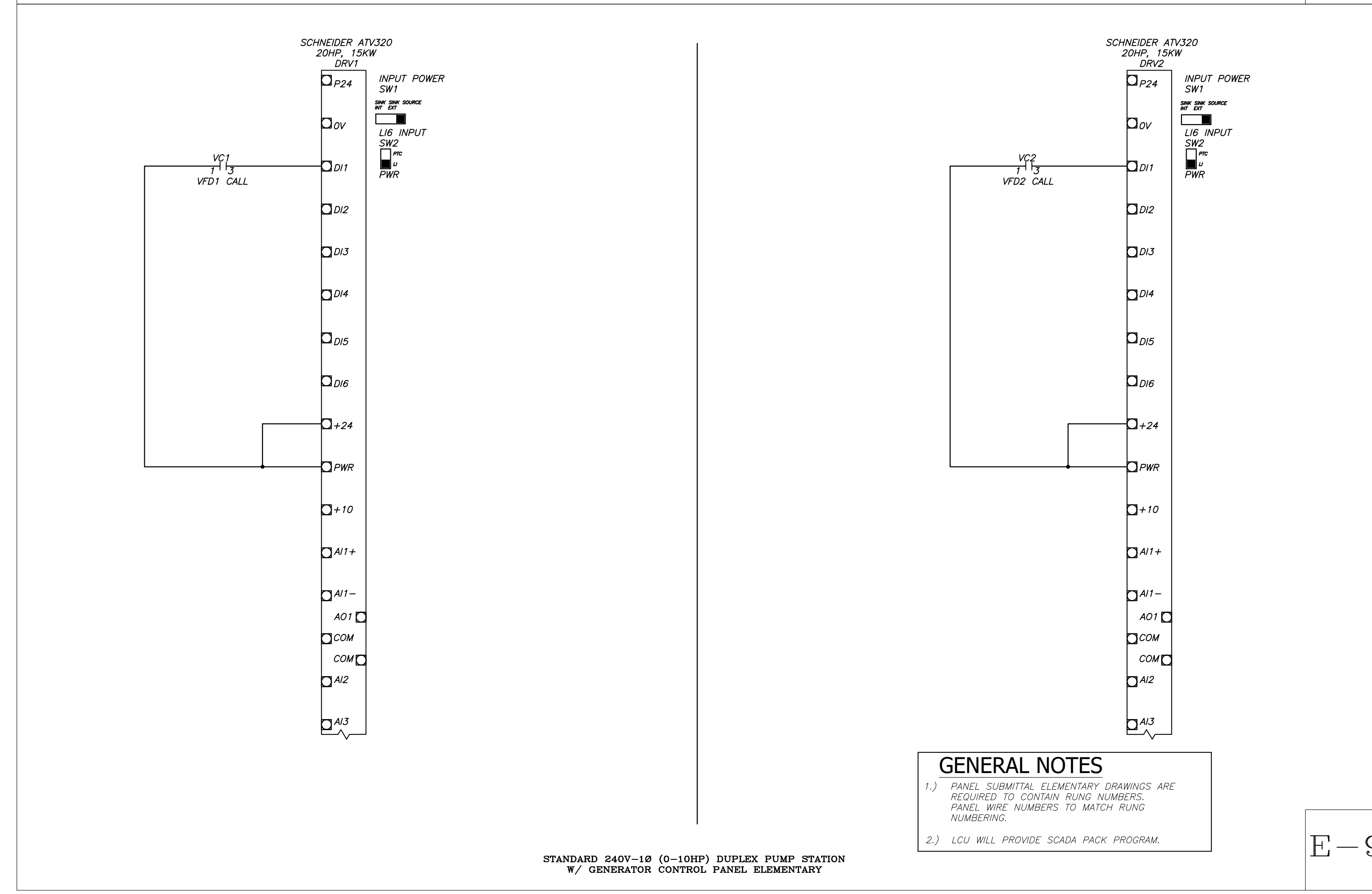
E-7

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

<p>LEE COUNTY SOUTHWEST FLORIDA</p>	<p>LEE COUNTY UTILITIES ENGINEERING</p> <p>1500 MONROE STREET FORT MYERS, FLORIDA 33901</p>
	<p>SHEET TITLE: DUPLEX PUMP STATION CONTROL PANEL ELEVATION</p>
<p>TITLE: STANDARD 240V 1PH DUPLEX PUMP STATION w-GEN</p>	<p>PROJECT: WASTE WATER DUPLEX, TRIPLEX PUMP STA. MASTER PUMP STATION DESIGN STANDARD</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>	



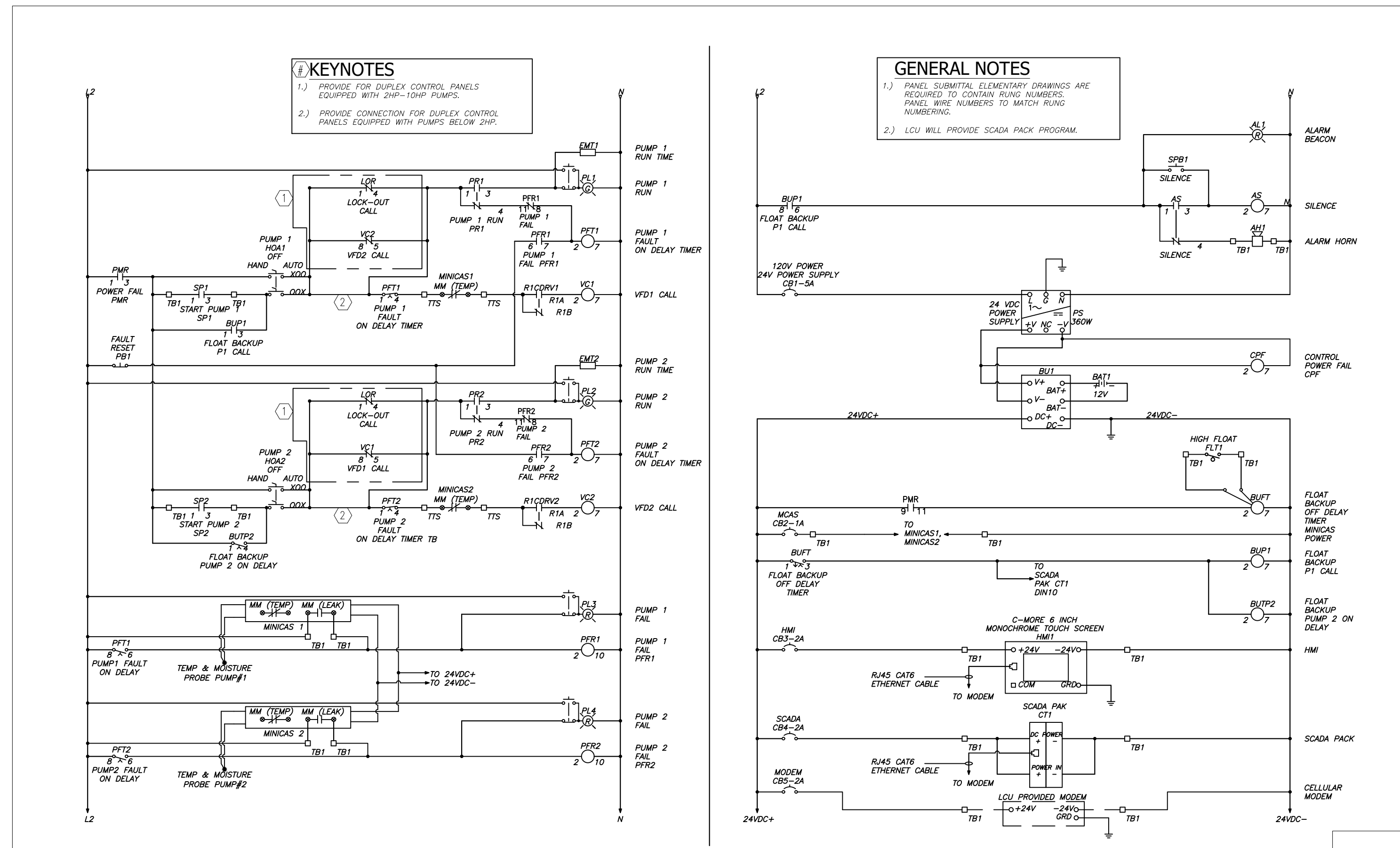
E-8



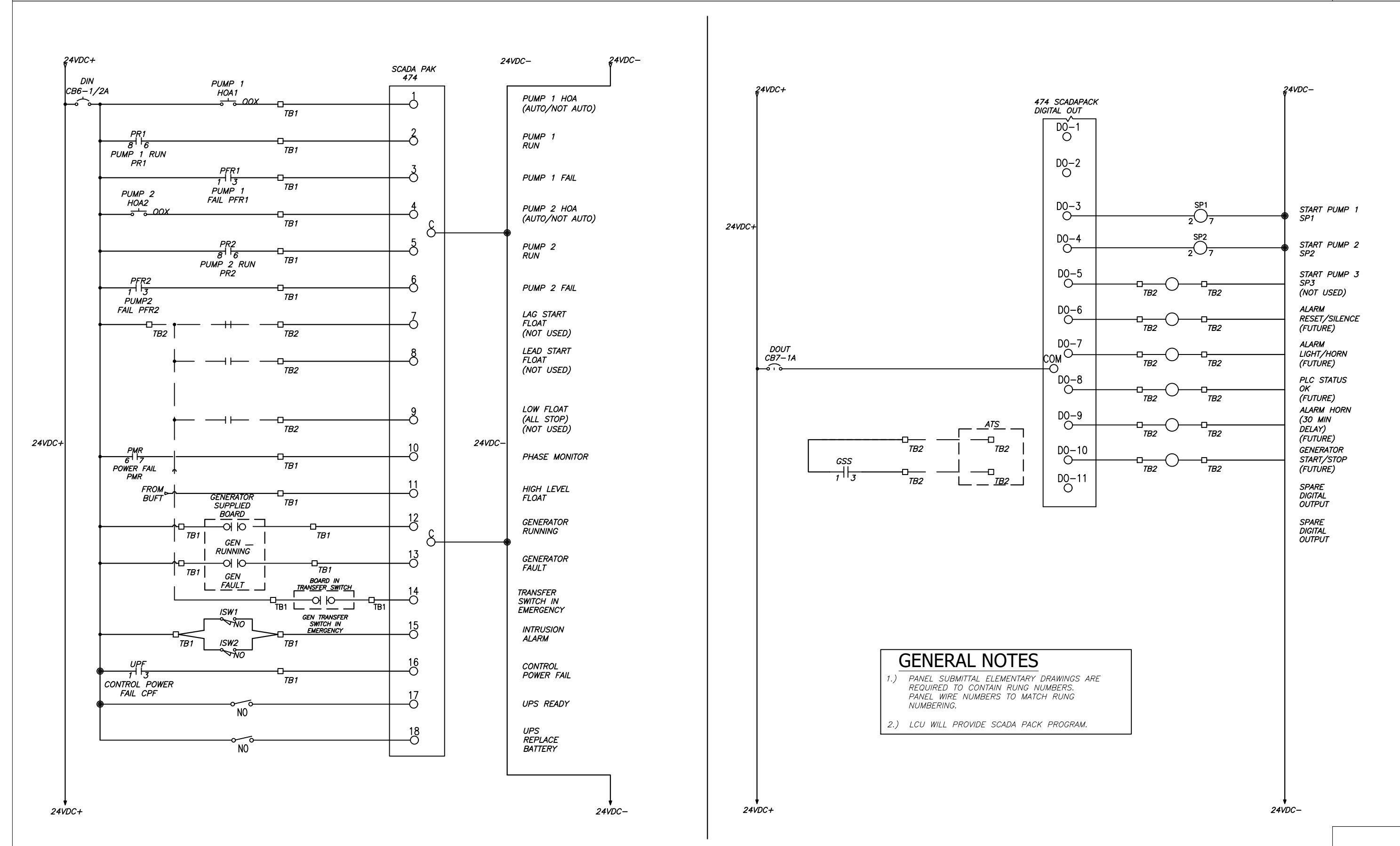
E-9

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

	LEE COUNTY UTILITIES ENGINEERING 1500 MONROE STREET FORT MYERS, FLORIDA 33901
	SHEET TITLE: DUPLEX PUMP STATION ELECTRICAL DIAGRAMS
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: 8 OF 13	



E-10

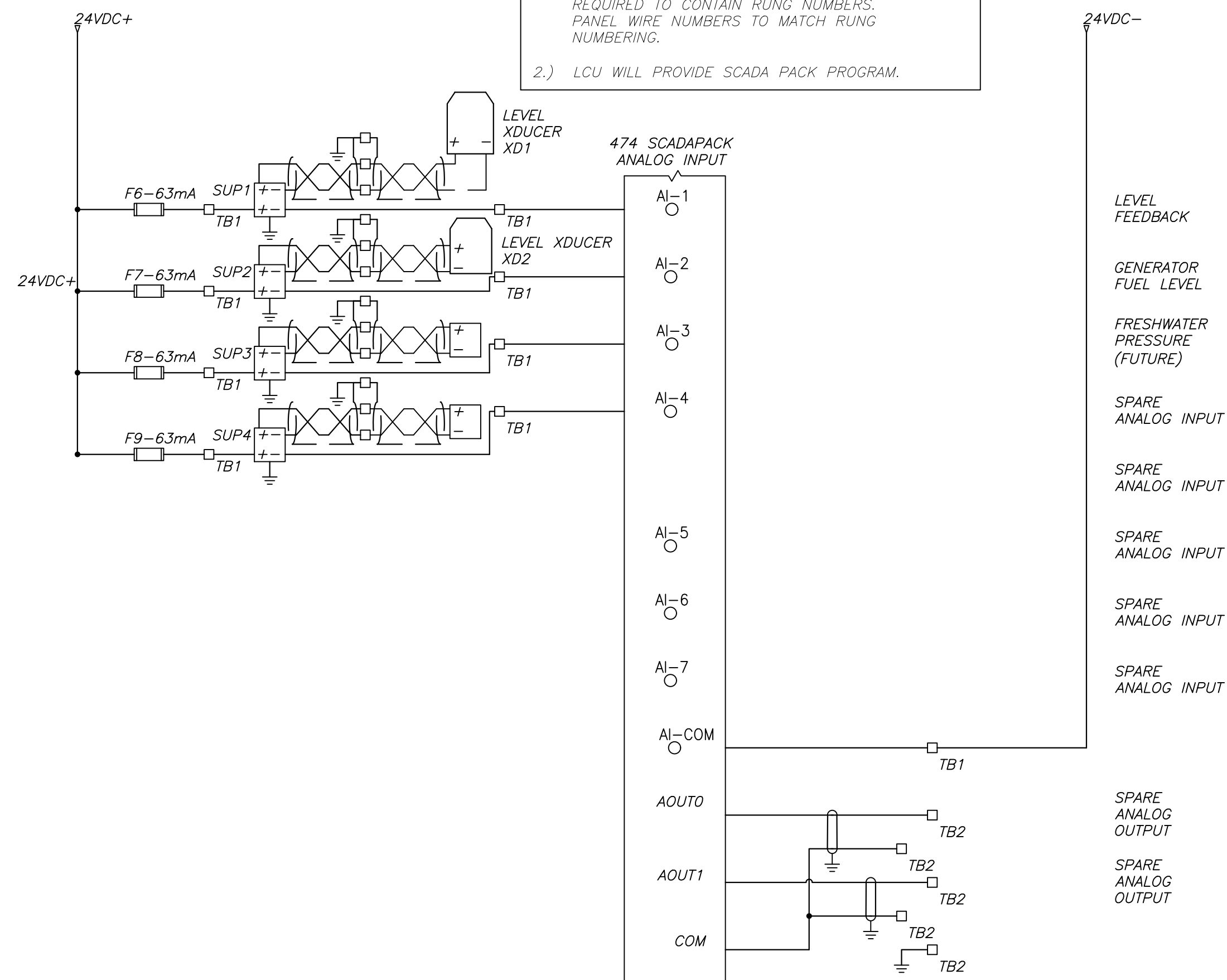


E-11

NOTE:
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	LEE COUNTY SOUTHWEST FLORIDA 1500 MONROE STREET FORT MYERS, FLORIDA 33901	LEE COUNTY UTILITIES ENGINEERING
	SHEET TITLE: DUPLEX PUMP STATION ELECTRICAL DIAGRAMS	
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: 9 OF 13

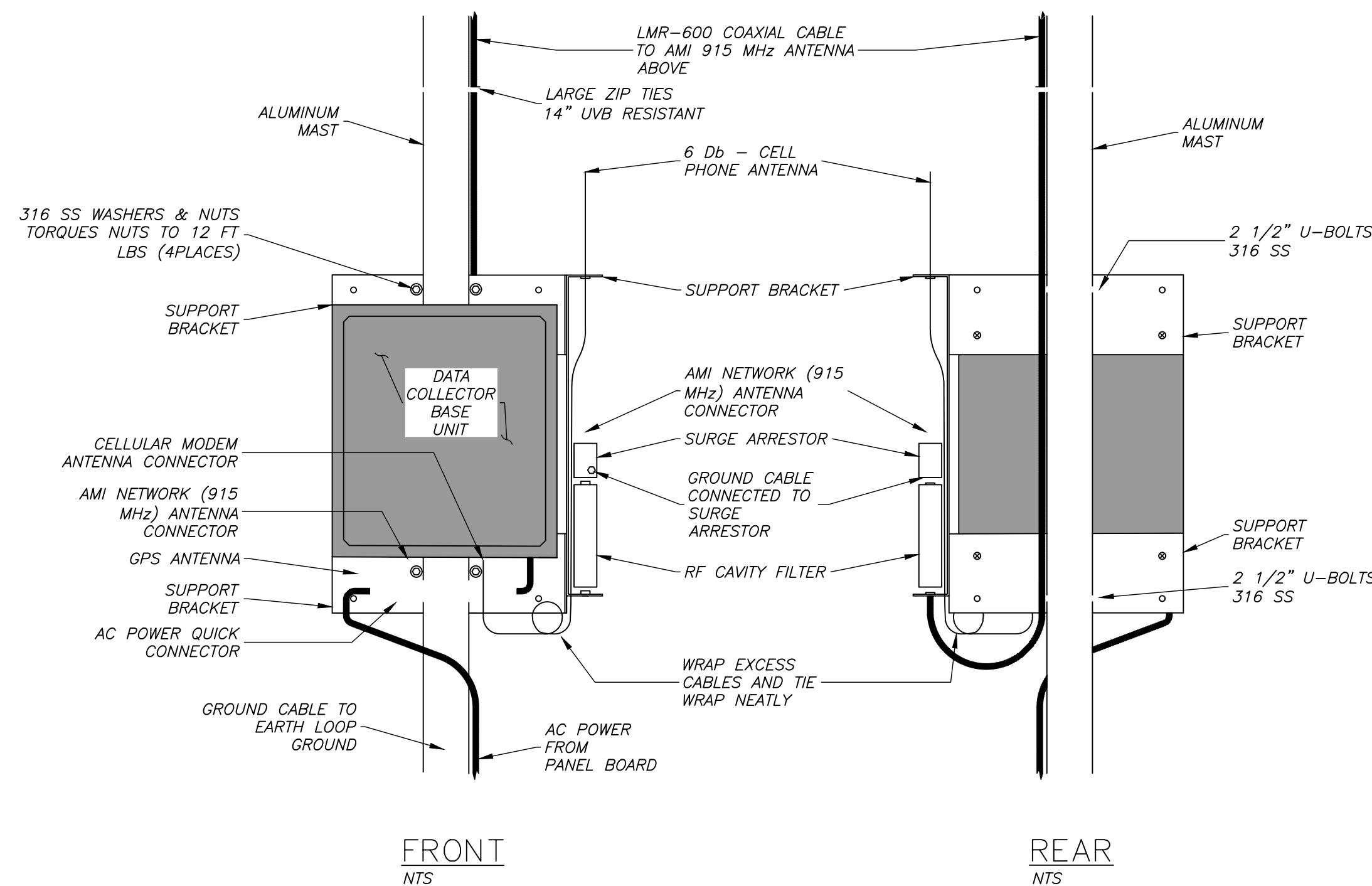
GENERAL NOTES
 1.) PANEL SUBMITTAL ELEMENTARY DRAWINGS ARE REQUIRED TO CONTAIN RUNG NUMBERS. PANEL WIRE NUMBERS TO MATCH RUNG NUMBERING.
 2.) LCU WILL PROVIDE SCADA PACK PROGRAM.



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.

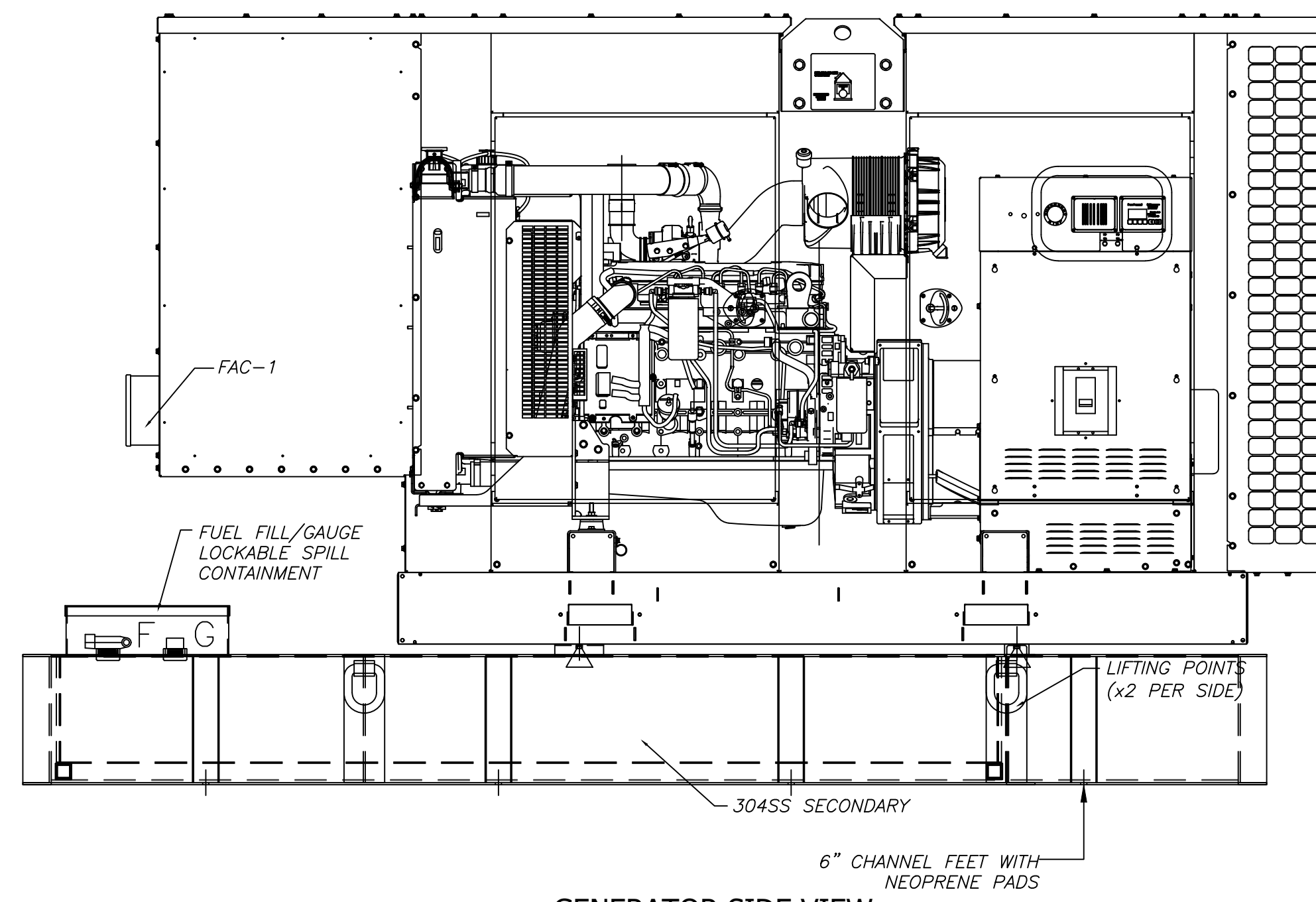
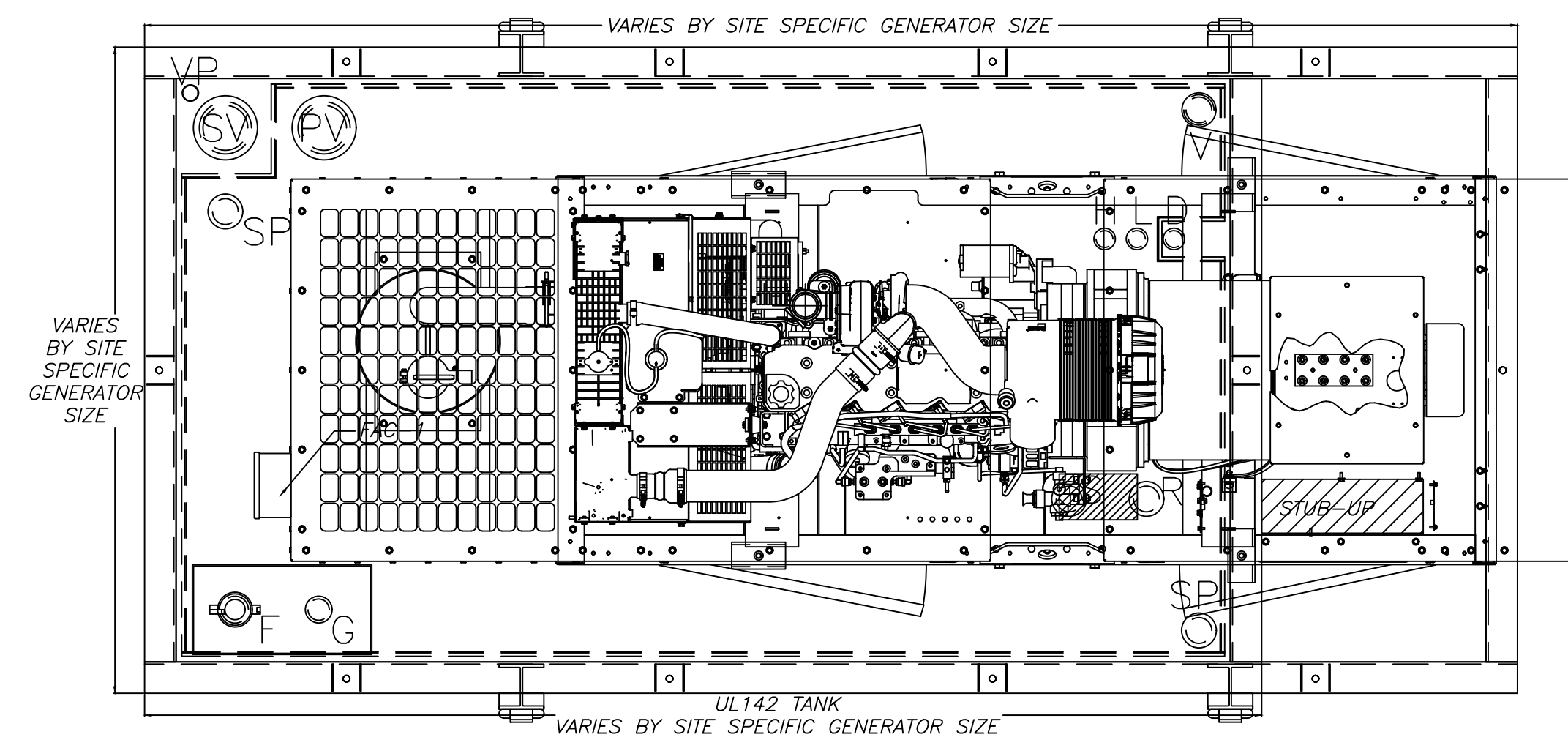


STANDARD 240V-1Ø (0-10HP) DUPLEX PUMP STATION
 DATA COLLECTOR INSTALLATION DETAIL "A"

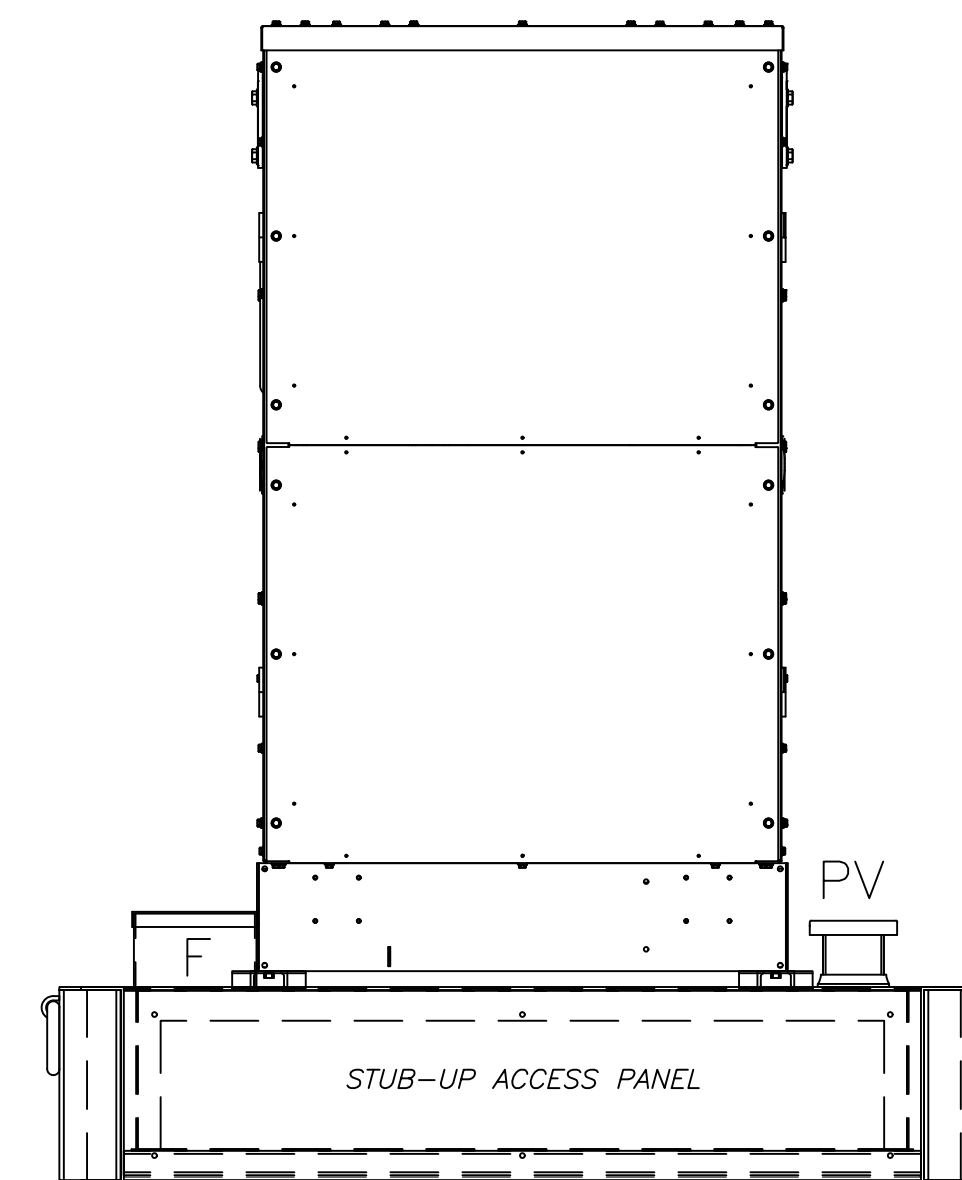
E-13

NOTE:
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	LEE COUNTY SOUTHWEST FLORIDA 1500 MONROE STREET	LEE COUNTY UTILITIES ENGINEERING FORT MYERS, FLORIDA 33901
	SHEET TITLE: DUPLEX PUMP STATION ELECTRICAL DIAGRAM & DATA COLLECTOR	
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: 10 OF 13



GENERATOR SIDE VIEW



GENERATOR INTAKE END VIEW

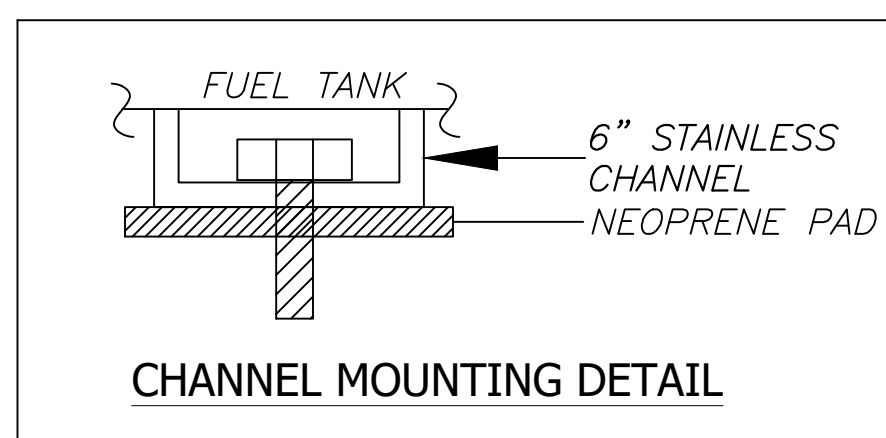
GENERATOR LAYOUT & DETAILS

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



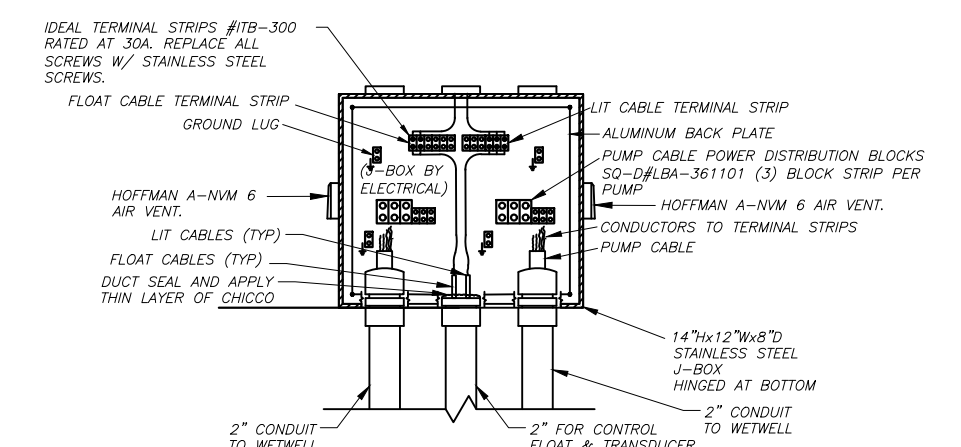
ACOUSTIC RATING: THE ENCLOSURE TO BE LINED WITH ACOUSTIC SOUND FOAM TO ACHIEVE 55 dbA @ 21 FT.

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

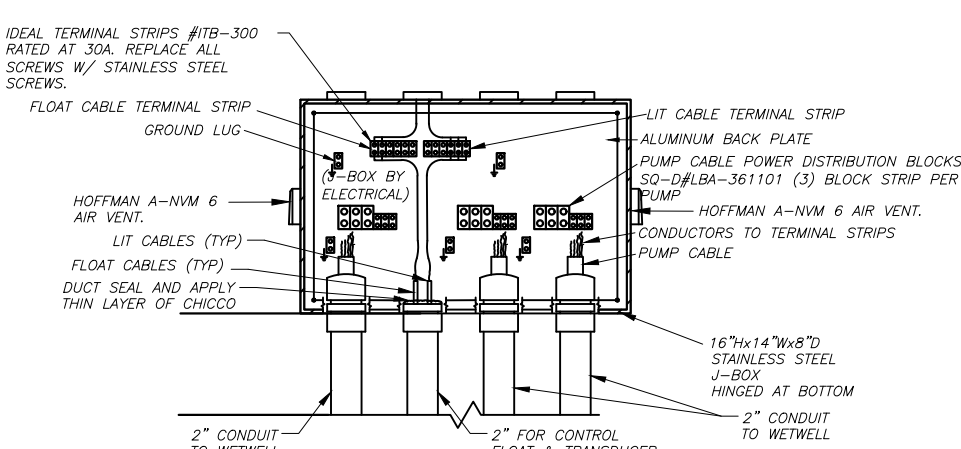
E-14

NOTE:
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	LEE COUNTY SOUTHWEST FLORIDA 1500 MONROE STREET	LEE COUNTY UTILITIES ENGINEERING FORT MYERS, FLORIDA 33901
	SHEET TITLE: DUPLEX PUMP STATION GENERATOR LAYOUT & DETAILS	
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: 11 OF 13

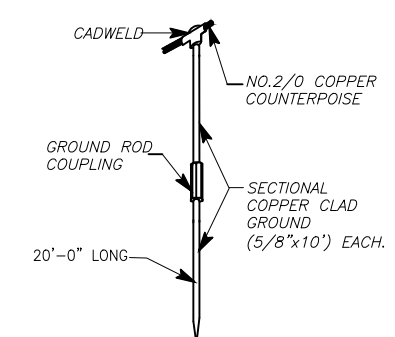


DUPLEX JUNCTION BOX
N.T.S.

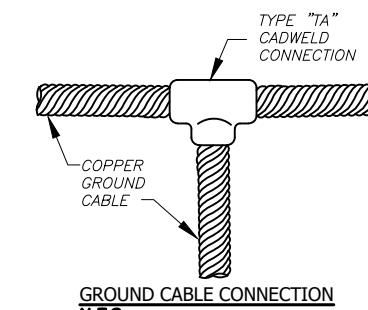


TRIPLEX JUNCTION BOX
N.T.S.

JUNCTION BOX & TERMINAL STRIP INSTALLATION AT CONTROL PANEL LOCATION

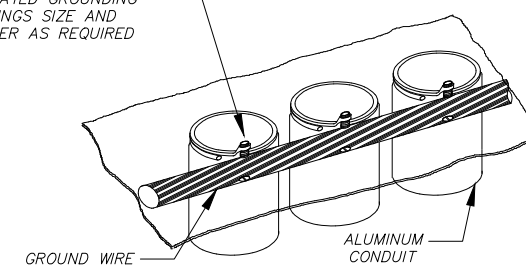


TYPICAL GROUND ROD CONNECTION DETAIL
N.T.S.



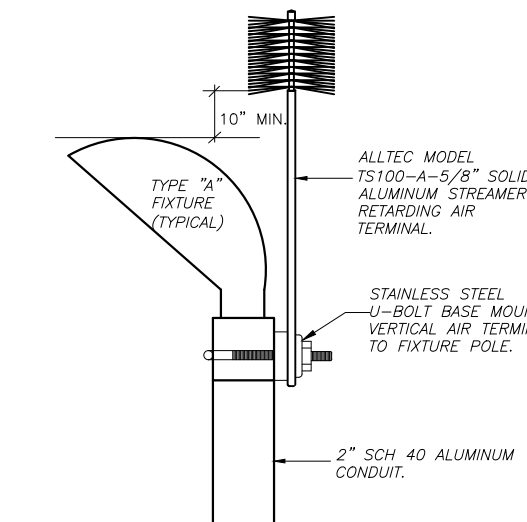
GROUND CABLE CONNECTION
N.T.S.

CONDUIT SHALL BE GROUNDING WITH INSULATED GROUNDING BUSBARS SIZE AND NUMBER AS REQUIRED



PANEL CONDUIT GROUNDING DETAIL
N.T.S.

GROUNDING DETAILS

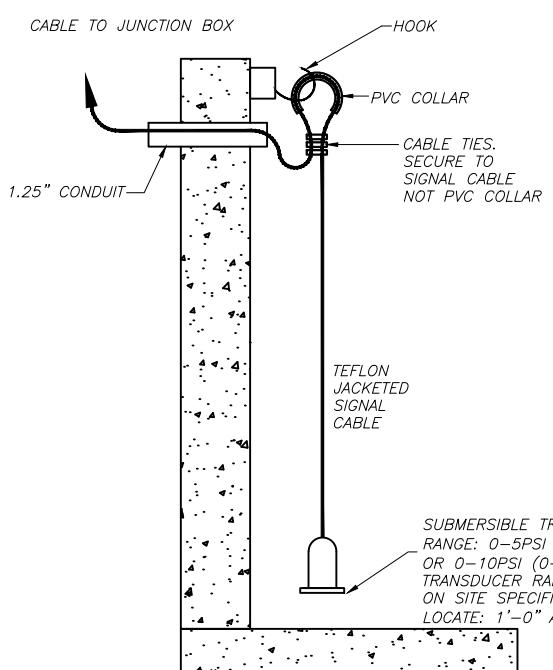


STREAMER RETARDING AIR TERMINAL FIXTURE POLE MOUNTED

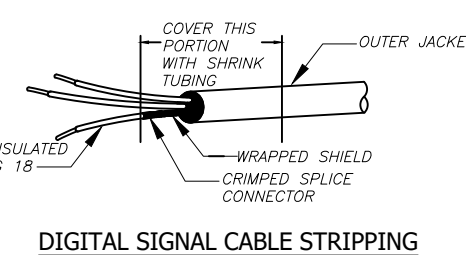
ES-1

ES-2

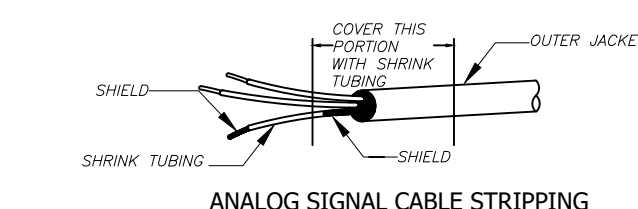
ES-3



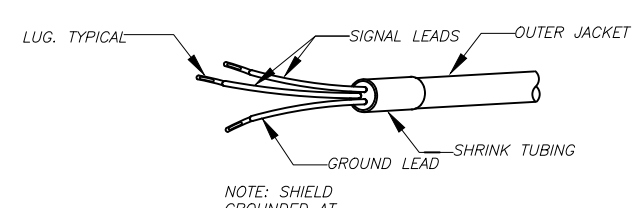
LEVEL TRANSMITTER DETAIL



DIGITAL SIGNAL CABLE STRIPPING



ANALOG SIGNAL CABLE STRIPPING

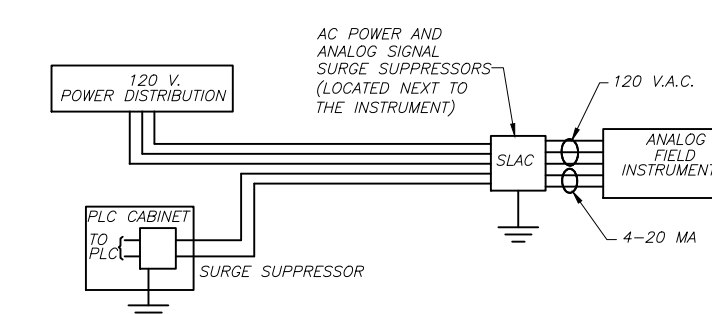


SIGNAL CABLE SHRINK TUBING

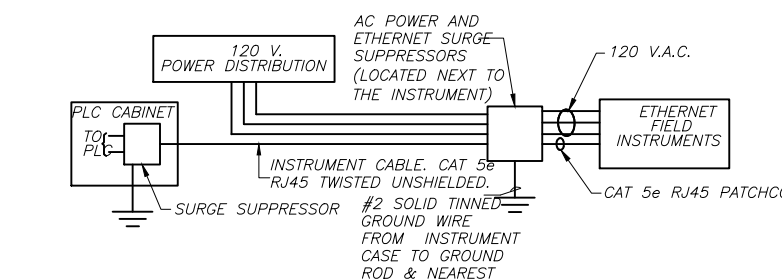
TERMINATION OF SHIELDING INSTRUMENT CONTROL CABLE DETAIL

ES-4

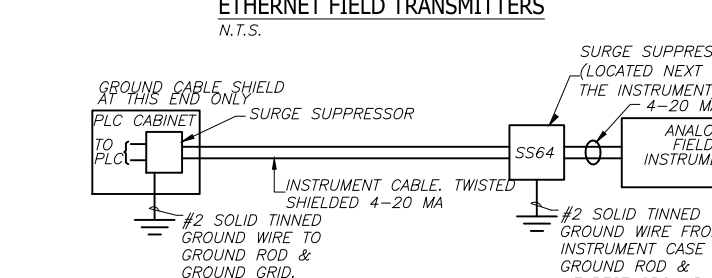
ES-5



4-WIRE FIELD TRANSMITTERS
N.T.S.



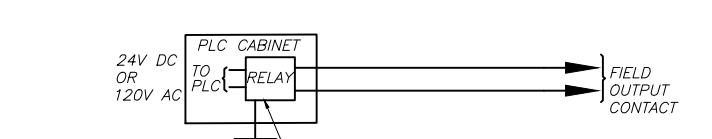
ETHERNET FIELD TRANSMITTERS
N.T.S.



2-WIRE FIELD TRANSMITTERS
N.T.S.



DISCRETE PLC/OUTPUT CIRCUIT
N.T.S.



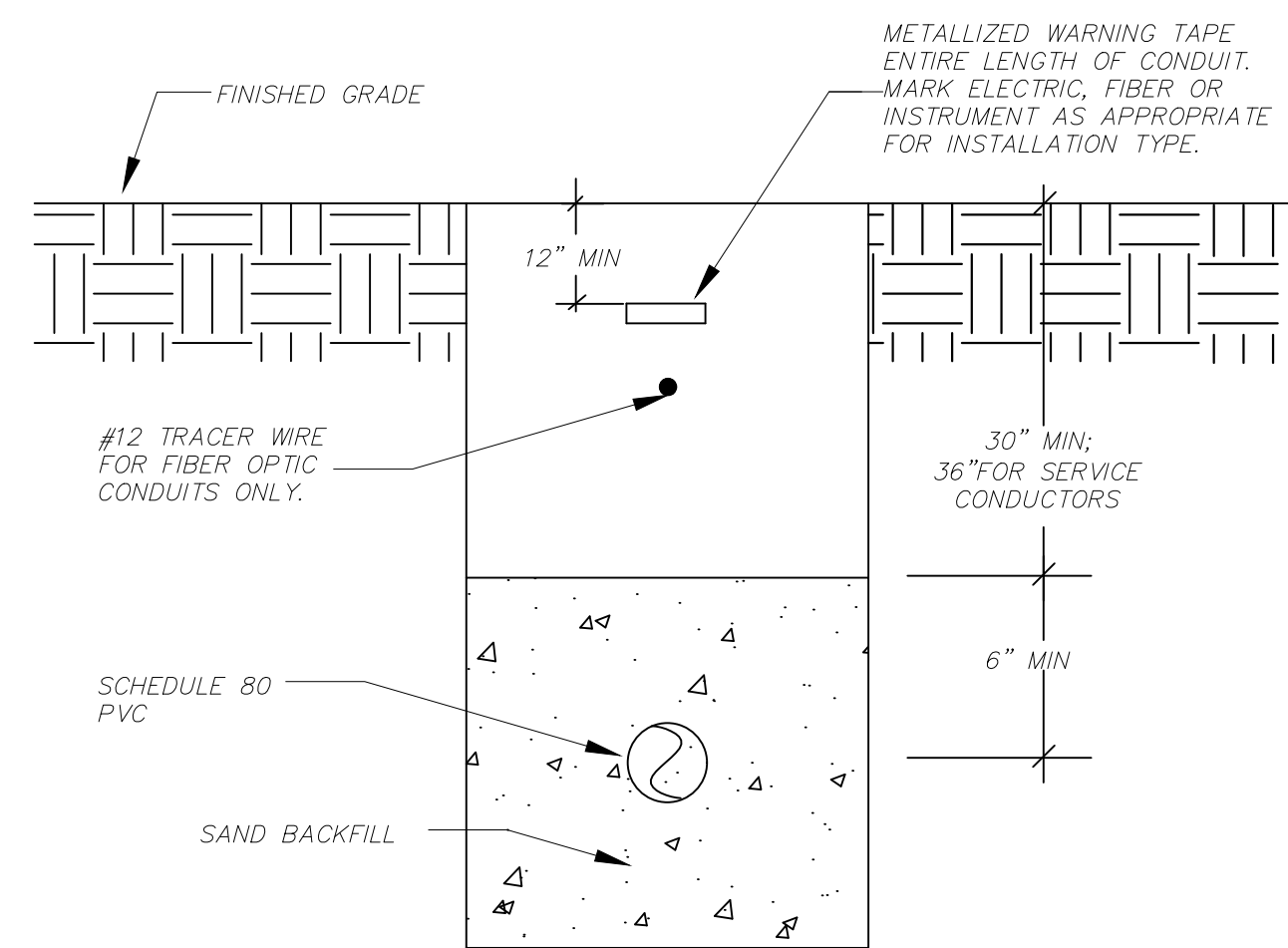
DISCRETE PLC/OUTPUT CIRCUIT
N.T.S.

INSTRUMENTATION GROUNDING & SURGE PROTECTION DETAIL

ES-6

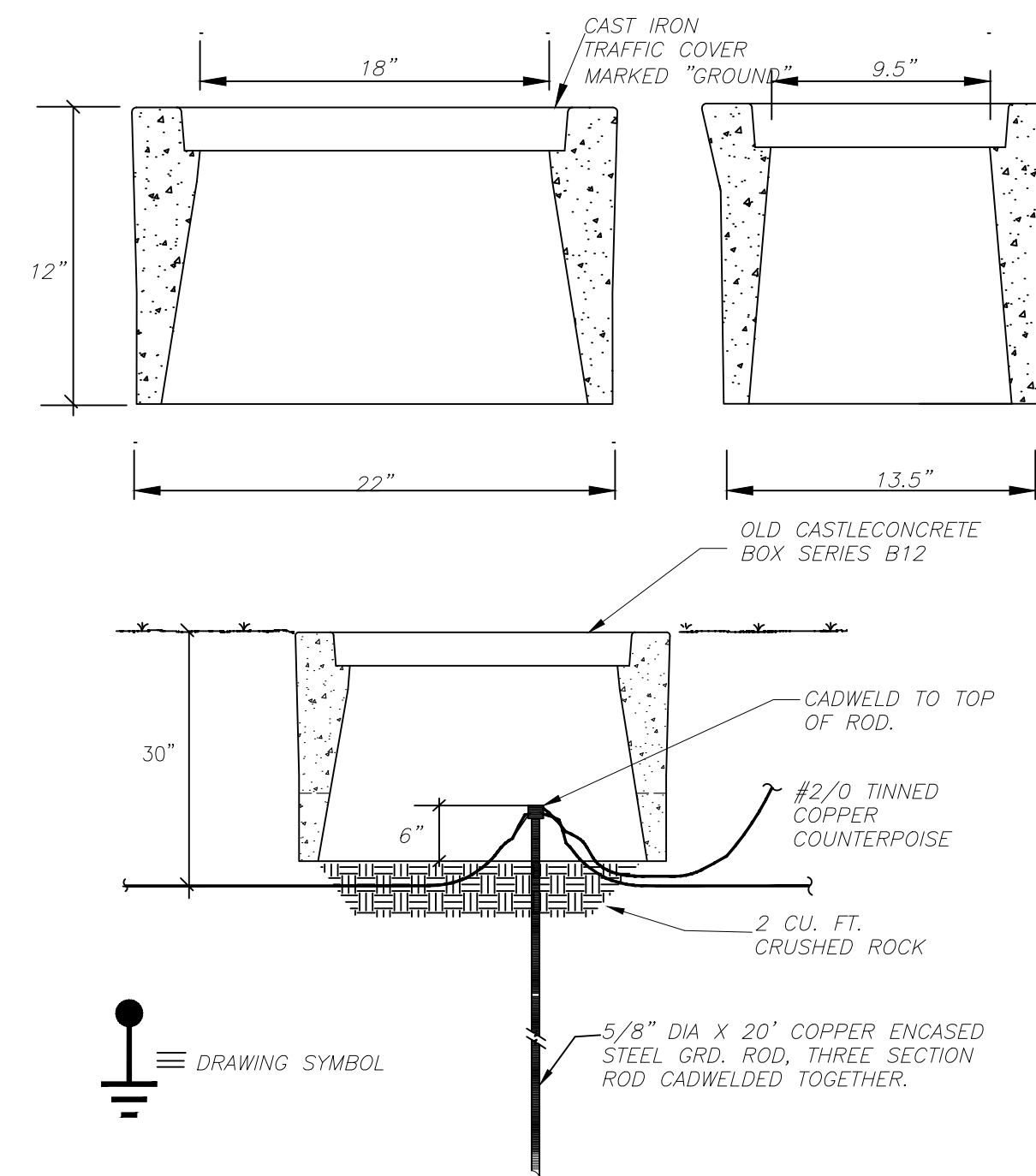
NOTE:
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	LEE COUNTY SOUTHWEST FLORIDA 1500 MONROE STREET FORT MYERS, FLORIDA 33901	LEE COUNTY UTILITIES ENGINEERING 1500 MONROE STREET FORT MYERS, FLORIDA 33901
	SHEET TITLE: DUPLEX PUMP STATION TYPICAL DETAILS	
TITLE: STANDARD 240V 1PH DUPLEX PUMP STATION 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: 12 OF 13



UNDERGROUND CONDUIT INSTALLATION DETAIL


ES-7



GROUND ROD INSTALLATION DETAIL

ES-8

NOTE:
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	LEE COUNTY SOUTHWEST FLORIDA 1500 MONROE STREET	LEE COUNTY UTILITIES ENGINEERING FORT MYERS, FLORIDA 33901
	SHEET TITLE: DUPLEX PUMP STATION TYPICAL DETAILS	
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: 13 OF 13