

SHEET #	SHEET DESCRIPTION
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This is a detailed street map of the area around the Port of Tampa, Florida. The map shows a grid of streets including U.S. 19, S.R. 580, S.R. 590, and S.R. 60. Key locations like the Port of Tampa, various bridges, and surrounding areas like Dunedin and St. Petersburg are labeled. A north arrow and a scale bar (0 to 4000 feet) are in the top left corner.



Tara Kivett, P.E.
City Engineer

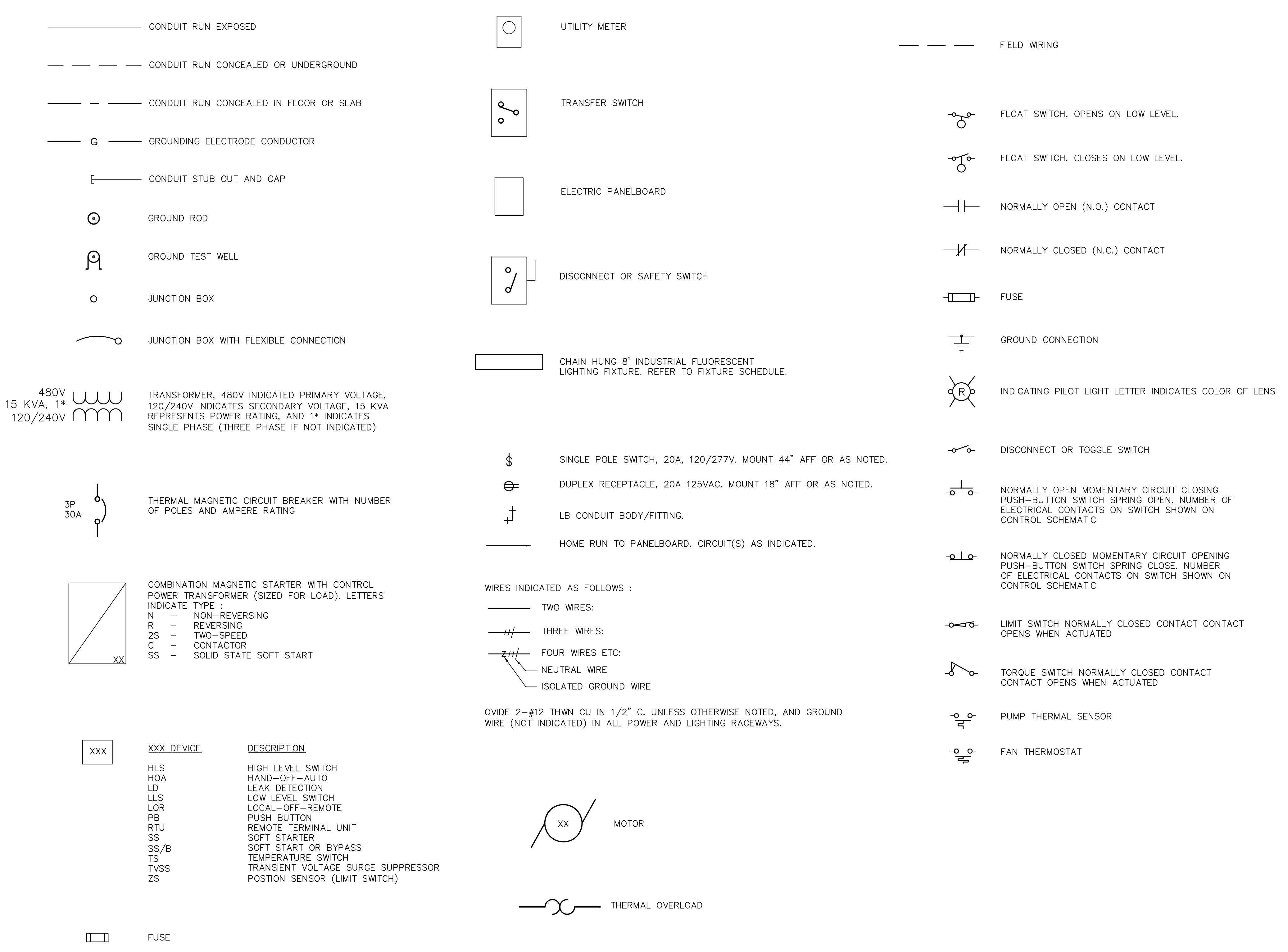
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Construction**

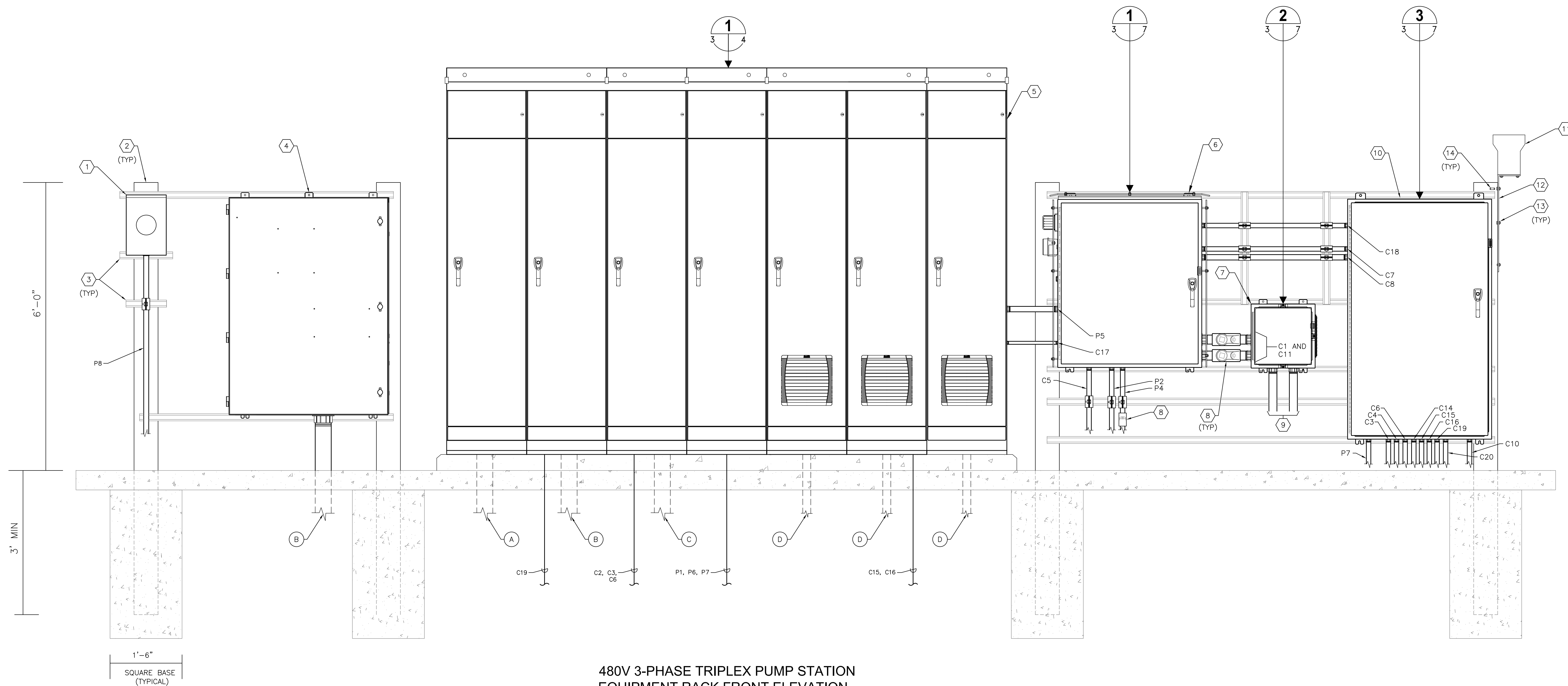
Date Approved

CITY ENGINEER D. TARA KIVETT, P.E. #86611

100% PLANS PRELIMINARY

City Project No. 18-0058-UT
City Plan Set No. 2020011





480V 3-PHASE TRIPLEX PUMP STATION
EQUIPMENT RACK FRONT ELEVATION
SCALE : NONE

KEYED NOTES:

- 1 DUE TO THE SERVICE ENTRANCE SIZE, IT IS ASSUMED CT METERING WILL BE REQUIRED BY THE UTILITY. IF REQUIRED BY THE UTILITY, THE CONTRACTOR SHALL PROVIDE A FEED-THROUGH METER AND A DISCONNECT ON THE LINE SIDE OF THE ELECTRIC METER FOR UTILITY PURPOSES. COORDINATE ALL REQUIREMENTS WITH THE UTILITY INCLUDING SURGE PROTECTION AND EQUIPMENT GROUNDING.
- 2 PROVIDE AND INSTALL 6" X 6" X 9' REINFORCED SQUARE CONCRETE POST.
- 3 PROVIDE AND INSTALL 1-5/8" X 1-5/8" 316 STAINLESS STEEL UNISTRUT WITH STAINLESS STEEL HARDWARE. NOTE: INSTALL ALL BOLTS FOR UNISTRUT COMPLETELY THROUGH CONCRETE POSTS.
- 4 PROVIDE AND INSTALL 480V, 3-POLE, SOLID NEUTRAL GENERATOR DOCKING STATION IN WEATHERPROOF ENCLOSURE. REFER TO EQUIPMENT SCHEDULE FOR SIZE/TYPE REQUIRED.
- 5 PROVIDE AND INSTALL LIFT STATION MOTOR CONTROL CENTER (MCC) IN NEMA 3R STAINLESS STEEL ENCLOSURE. REFER ALSO DETAIL ON SHEET 4.
- 6 PROVIDE AND INSTALL NEW PUMP CONTROL PANEL. REFER TO DETAILS ON SHEET 7.
- 7 PROVIDE AND INSTALL NEW 16" X 16" X 6" NEMA 4X 316 STAINLESS STEEL JUNCTION BOX WITH STEEL BACKPANEL. PROVIDE STAINLESS STEEL LOUVER PLATE AND FILTER. REFER TO DETAIL ON SHEET 7.
- 8 PROVIDE AND INSTALL CROUSE-HINDS EYS TYPE SEALS W/CHICO COMPOUNDS.
- 9 2" CONDUITS TO WET WELL. C12 AND C13. CABLES FOR LEVEL TRANSDUCER AND FLOATS ARE ALL BY RESPECTIVE MANUFACTURER.DATA
- 10 FLOW SYSTEMS (DFS) CABINET. REFER TO DETAIL ON SHEET 7.
- 11 PROVIDE AND INSTALL NEW 8" RAIN GAUGE. XYLEM RG600 WITH 4-20MA 00 4-20MA OUTPUT TIPPING BUCKET CONVERTER MODULE, XYLEM ELA000.
- 12 PROVIDE AND INSTALL 10" SQUARE 1/4" ALUMINUM BRACKET, OVERFLOW LIGHT ALUMINUM BRACKET.
- 13 PROVIDE AND INSTALL 3/4" STAINLESS STEEL NUT AND BOLT (TYP).
- 14 PROVIDE AND INSTALL STAINLESS STEEL WEDGE ANCHOR IN CONCRETE POST TO SECURE RAIN GAUGE BRACKET (TYP).

GENERAL NOTES:

1. ALL PANELS SHALL BE LABELED FOR THE ARC FLASH RISK HAZARD PRESENT AT EACH PIECE OF EQUIPMENT.
2. REFER TO ONE LINE DIAGRAM FOR REQUIRED GROUNDING ELECTRODE CONDUCTORS. ALL CONDUCTORS SHALL BE INSTALLED IN CONDUIT.

TIMOTHY THOMAS P.E. No. 47079

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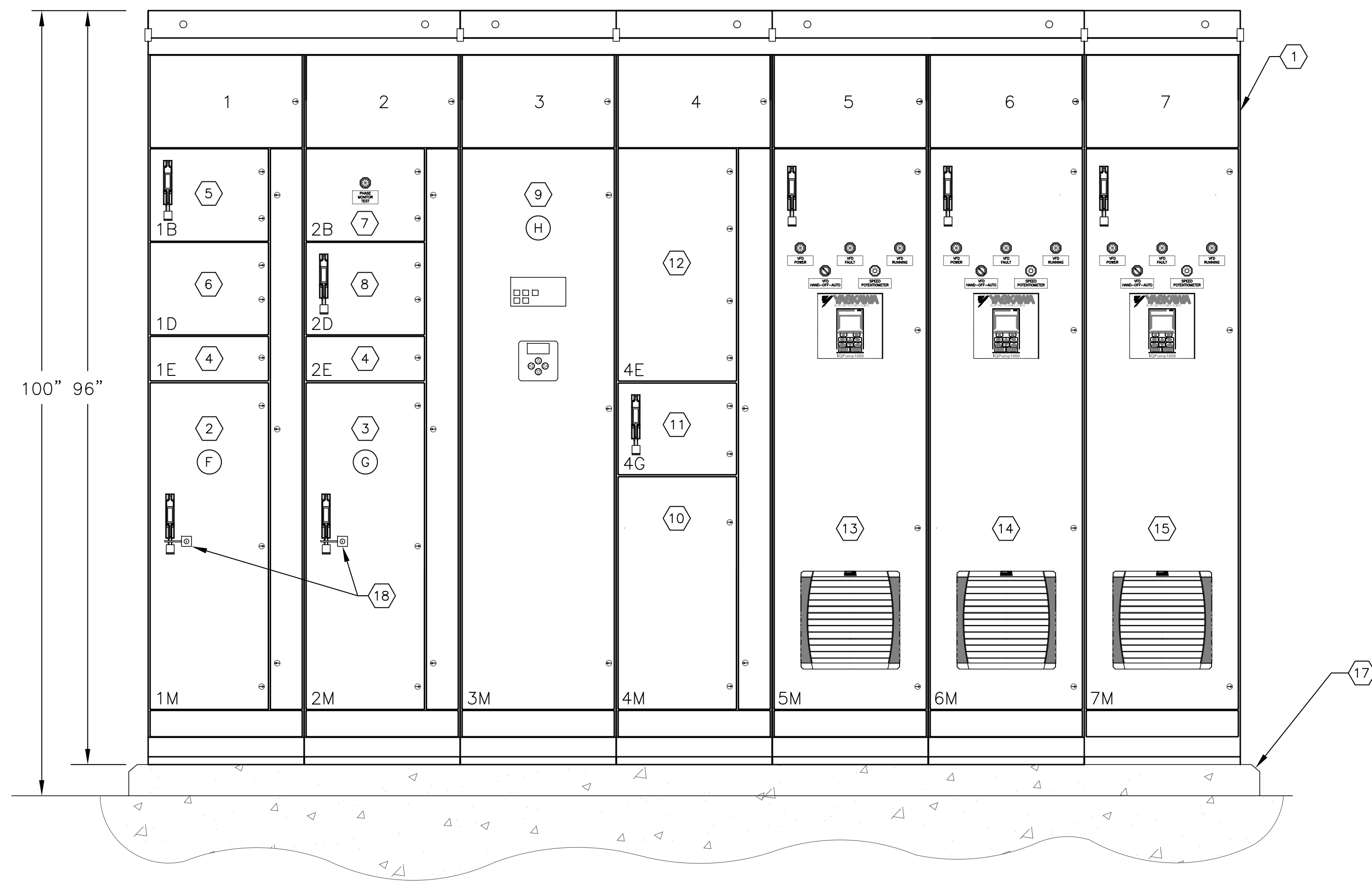
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PROJECT ENGINEER	DATE			
APPROVED BY:				
CITY ENGINEER MICHAEL D. QUILLIN, P.E. # 33721	DATE			
REVISION	BY	DATE		

CITY OF CLEARWATER, FLORIDA
ENGINEERING DEPARTMENT
100 S. MYRTLE AVE.
CLEARWATER, FL 33756

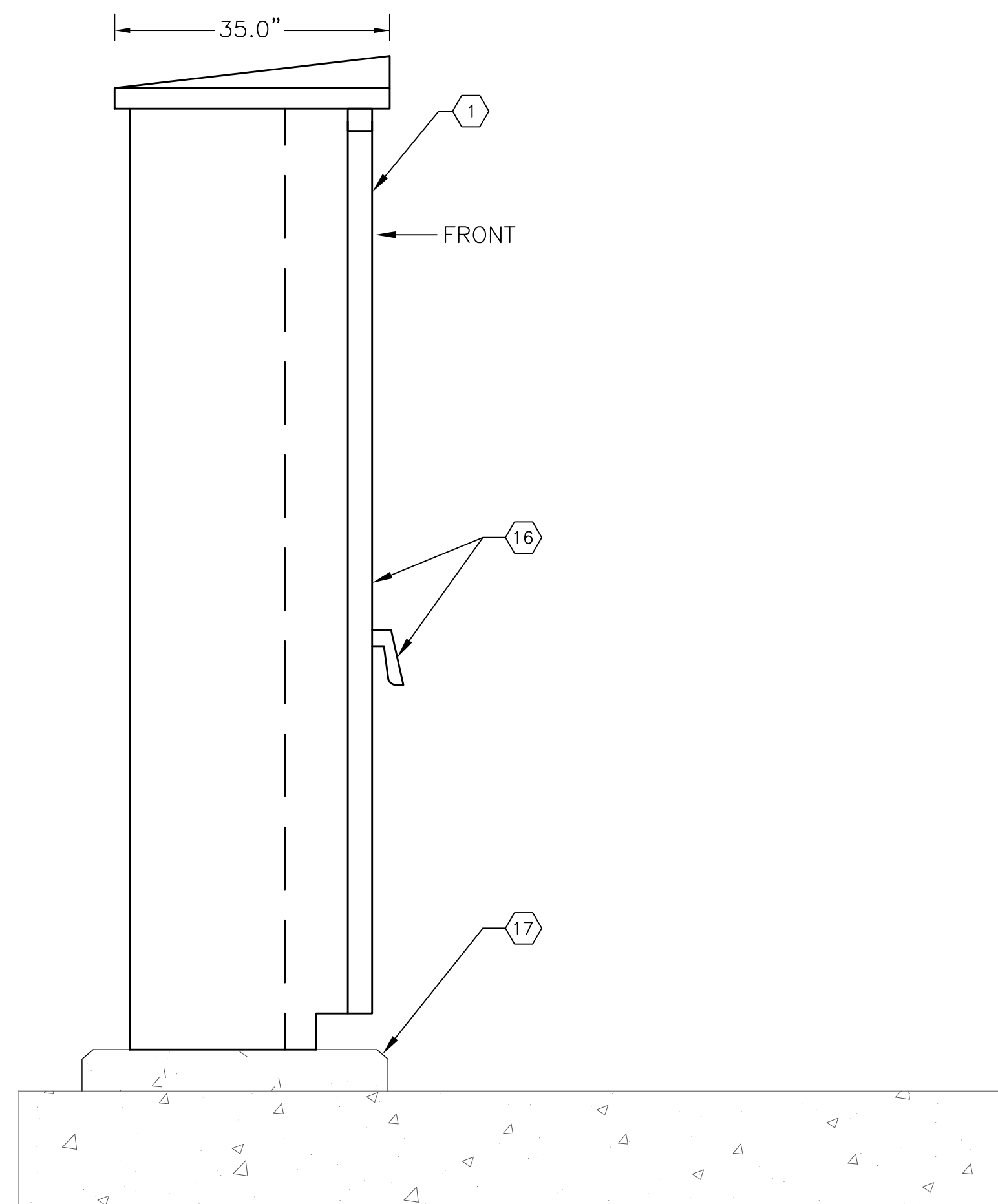
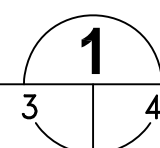


480V 3-PHASE, TRIPLEX PUMP LIFT STATION EQUIPMENT RACK ELEVATION

DWG NAME: ###	FIELD BOOK: N/A	SURVEYED BY: CLEARWATER	SCALE: VERT. N/A
CONTRACT NO.: ###	DATE DRAWN: ###	DRAWN BY: JLH	HORIZ. N/A
JOB NO.: 22609.19	DESIGNED BY: TDT	CHECKED BY: GLW	SHEET NO.: 3 OF 28
APPROVED FOR			



480V 3-PHASE TRIPLEX PUMP STATION
MOTOR CONTROL CENTER FRONT ELEVATION
SCALE : NONE



480V 3-PHASE TRIPLEX PUMP STATION
MOTOR CONTROL CENTER SIDE ELEVATION
SCALE : NONE

KEYED NOTES:

- | | | | |
|---|---|----|--|
| 1 | PUMP STATION MOTOR CONTROL CENTER (MCC) IN NEMA 3R STAINLESS STEEL ENCLOSURE. REFER ALSO TO ONE LINE DIAGRAM ON SHEET 21. | 10 | 15 KVA, 3Ø, 480V-120/208V TRANSFORMER. |
| 2 | 480V, 3-POLE MAIN CIRCUIT BREAKER. REFER TO EQUIPMENT SCHEDULE FOR SIZE/TYPE REQUIRED. | 11 | 40A, 480V, 3-POLE CIRCUIT BREAKER FOR 15 KVA TRANSFORMER. |
| 3 | 480V, 3-POLE CIRCUIT BREAKER FOR DOCKING STATION FEEDER. REFER TO EQUIPMENT SCHEDULE FOR SIZE/TYPE REQUIRED. | 12 | NEW 120/208V, 3Ø, 4-WIRE PANELBOARD WITH 60A M.C.B. PANELBOARD DESIGNATION 'LP'. REFER TO SHEET 25 FOR SCHEDULE. |
| 4 | SPACE | 13 | 480V, VFD FOR NEW SUBMERSIBLE PUMP No. 1. REFER TO EQUIPMENT SCHEDULE FOR SIZE/TYPE REQUIRED. |
| 5 | 30A, 480V, 3-POLE CIRCUIT BREAKER FOR SURGE PROTECTION DEVICE (SPD). | 14 | 480V, VFD FOR NEW SUBMERSIBLE PUMP No. 2. REFER TO EQUIPMENT SCHEDULE FOR SIZE/TYPE REQUIRED. |
| 6 | SURGE PROTECTION DEVICE (SPD). | 15 | 480V, VFD FOR NEW SUBMERSIBLE PUMP No. 3. REFER TO EQUIPMENT SCHEDULE FOR SIZE/TYPE REQUIRED. |
| 7 | CUBICLE FOR PHASE MONITORING EQUIPMENT AND TEST PUSHBUTTON. | 16 | PROVIDE GASKETED RAIN TIGHT DOOR WITH LOCKING HANDLE. |
| 8 | SPARE 20A, 480V, 3-POLE CIRCUIT BREAKER. | 17 | PROVIDE 4" CONCRETE HOUSKEEPING PAD WITH CHAMFERED EDGES. |
| 9 | 3-POLE, SOLID NEUTRAL AUTOMATIC TRANSFER SWITCH. REFER TO EQUIPMENT SCHEDULE FOR SIZE/TYPE REQUIRED. | 18 | PROVIDE KIRK-KEY INTERLOCKS FOR MAIN CIRCUIT BREAKER AND GENERATOR RECEPTACLE. |

GENERAL NOTES:

1. MCC DIMENSIONS SHOWN ARE BASED ON THE INFORMATION FROM A SPECIFIC MANUFACTURER. DIMENSIONS MAY VARY BASED ON THE MCC PROVIDED BY THE CONTRACTOR.

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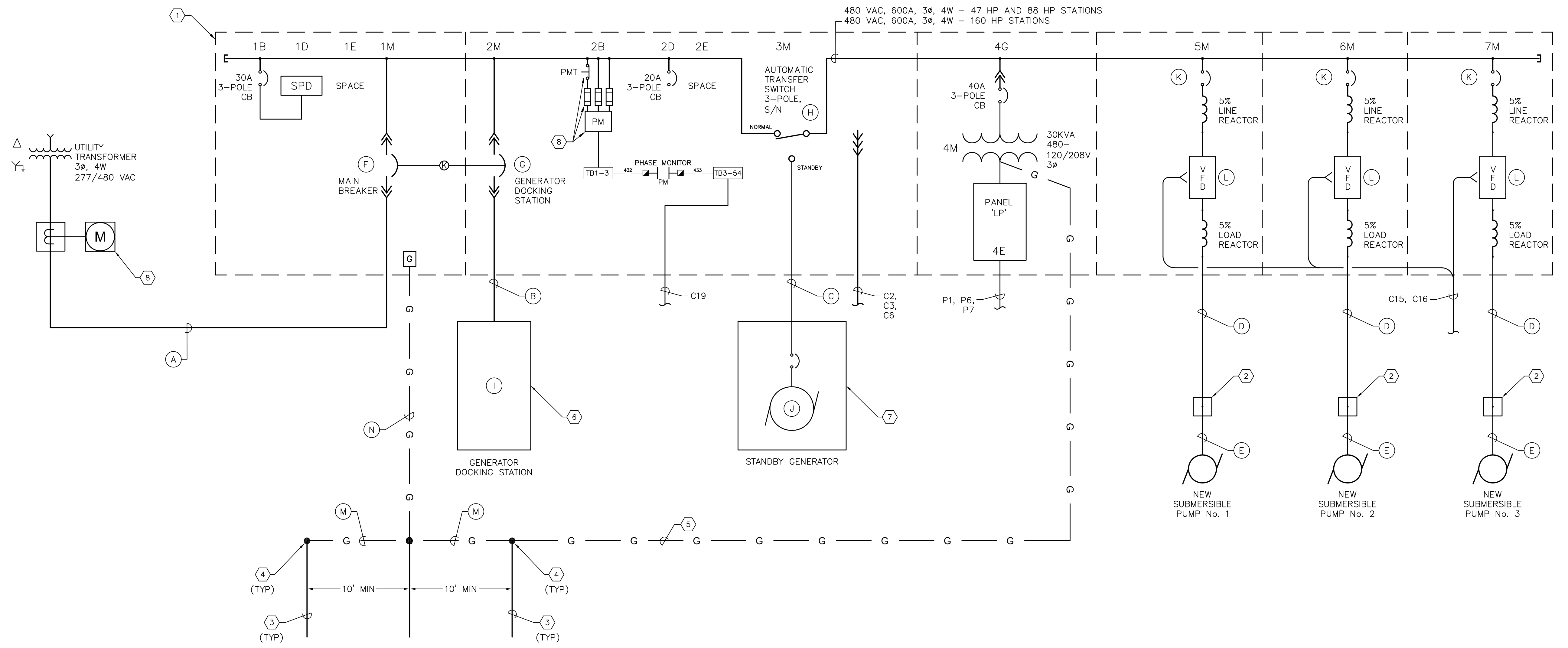
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REVIEWED BY:				
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APPROVED BY:				
CITY ENGINEER MICHAEL D. QUILLLEN, P.E. # 335721	DATE			
REVISION		BY	DATE	

CITY OF CLEARWATER, FLORIDA
ENGINEERING DEPARTMENT
100 S. MYRTLE AVE.
CLEARWATER, FL 33756



480V 3-PHASE, TRIPLEX PUMP LIFT STATION
EQUIPMENT RACK ELEVATION

DWG NAME: ###	FIELD BOOK: N/A	SURVEYED BY: CLEARWATER	SCALE: VERT. N/A
CONTRACT NO.: ###	DATE DRAWN: ###	DRAWN BY: JLH	HORIZ. N/A
JOB NO.: 22609.19	DESIGNED BY: TDT	CHECKED BY: GLW	SHEET NO.: 4 OF 28
APPROVED FOR			



TYPICAL ONE-LINE DIAGRAM

KEYED NOTES:	
1	PROVIDE AND INSTALL NEW PUMP STATION MOTOR CONTROL CENTER.
2	SUBMERSIBLE PUMP MOTOR WET WELL JUNCTION BOX.
3	PROVIDE AND INSTALL 5/8" X 20'-0" GROUNDING ELECTRODE.
4	PROVIDE AND INSTALL EXOTHERMIC WELDS.
5	PROVIDE AND INSTALL #8 BARE COPPER GROUNDING CONDUCTOR IN 1" C. FROM TRANSFORMER TO GROUNDING ELECTRODE GRID.
6	PROVIDE AND INSTALL 480V, 3-POLE, SOLID NEUTRAL GENERATOR DOCKING STATION IN WEATHERPROOF ENCLOSURE. REFER TO EQUIPMENT SCHEDULE FOR SIZE/TYPE REQUIRED.
7	PROVIDE AND INSTALL 480V, 3Ø, 4-WIRE STANDBY GENERATOR IN WEATHERPROOF ENCLOSURE. GENERATOR TO BE PROVIDED WITH SUB-BASE FUEL STORAGE TANK. REFER TO EQUIPMENT SCHEDULE FOR SIZE/TYPE REQUIRED.
8	DUE TO THE SERVICE ENTRANCE SIZE, IT IS ASSUMED CT METERING WILL BE REQUIRED BY THE UTILITY. IF REQUIRED BY THE UTILITY, THE CONTRACTOR SHALL PROVIDE A FEED-THROUGH METER AND A DISCONNECT ON THE LINE SIDE OF THE ELECTRIC METER FOR UTILITY PURPOSES. COORDINATE ALL REQUIREMENTS WITH THE UTILITY INCLUDING SURGE PROTECTION AND EQUIPMENT GROUNDING.

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REVIEWED BY:				
APPROVED BY:	PROJECT ENGINEER	DATE		
CITY ENGINEER MICHAEL G. QUILLEN, P.E. # 33721		DATE	REVISION	BY DATE

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100 S. MYRTLE AVE.
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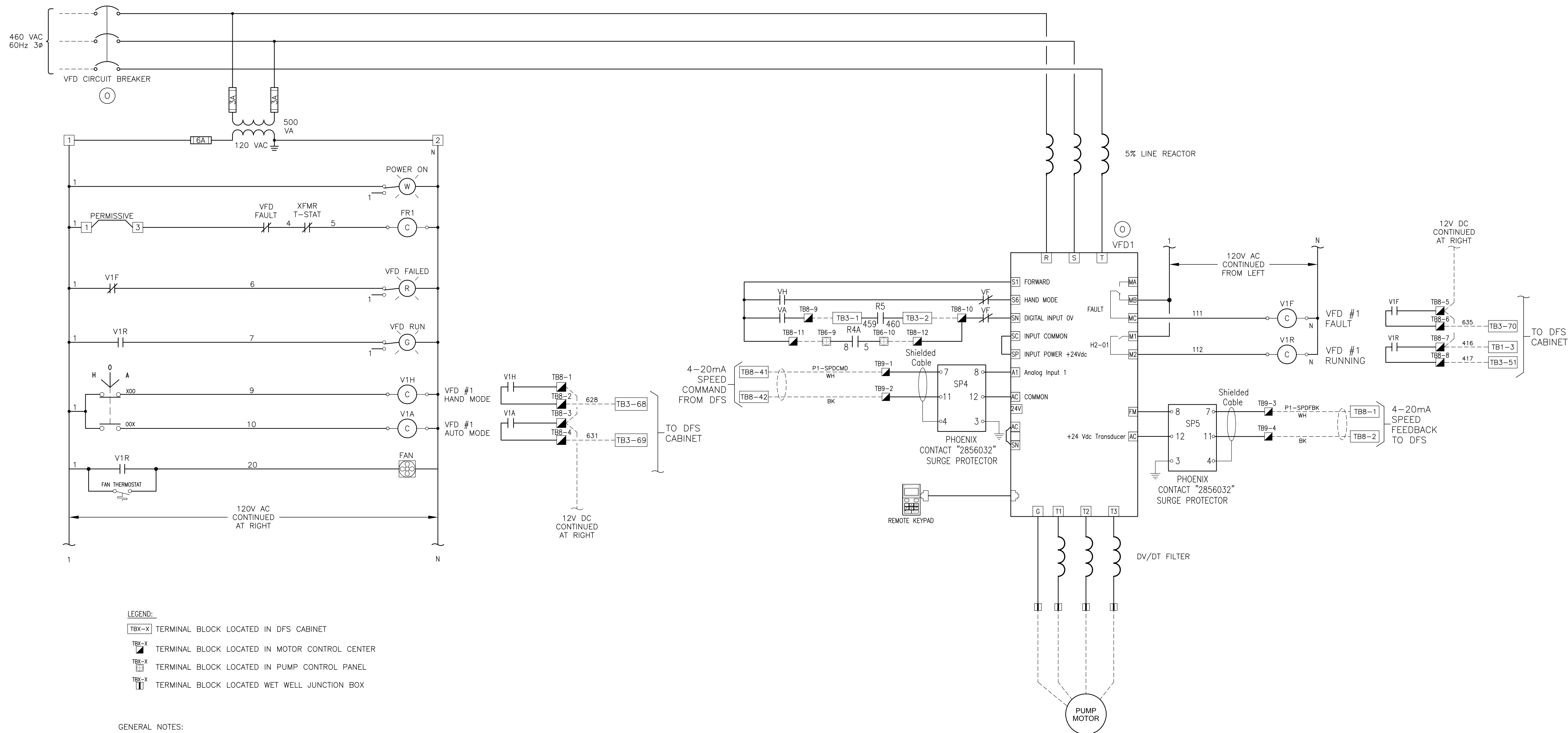
TYPICAL MCC
WIRING SCHEMATIC

DWG NAME: ###	FIELD BOOK: N/A	SURVEYED BY: CLEARWATER	SCALE: VERT. N/A
CONTRACT NO.: ###	DATE DRAWN: ###	DRAWN BY: JLH	HORIZ. N/A
JOB NO.: 22609.19	DESIGNED BY: TDT	CHECKED BY: GLW	SHEET NO.: 5 OF 28
APPROVED FOR			

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LEGEND:

- TBX-X TERMINAL BLOCK LOCATED IN DFS CABINET
 TBX-X TERMINAL BLOCK LOCATED IN MOTOR CONTROL CENTER
 TBX-X TERMINAL BLOCK LOCATED IN PUMP CONTROL PANEL
 TBX-X TERMINAL BLOCK LOCATED WET WELL JUNCTION BOX

GENERAL NOTES:

1. WIRING DIAGRAM SHOWN IS TYPICAL FOR ALL VFD'S.

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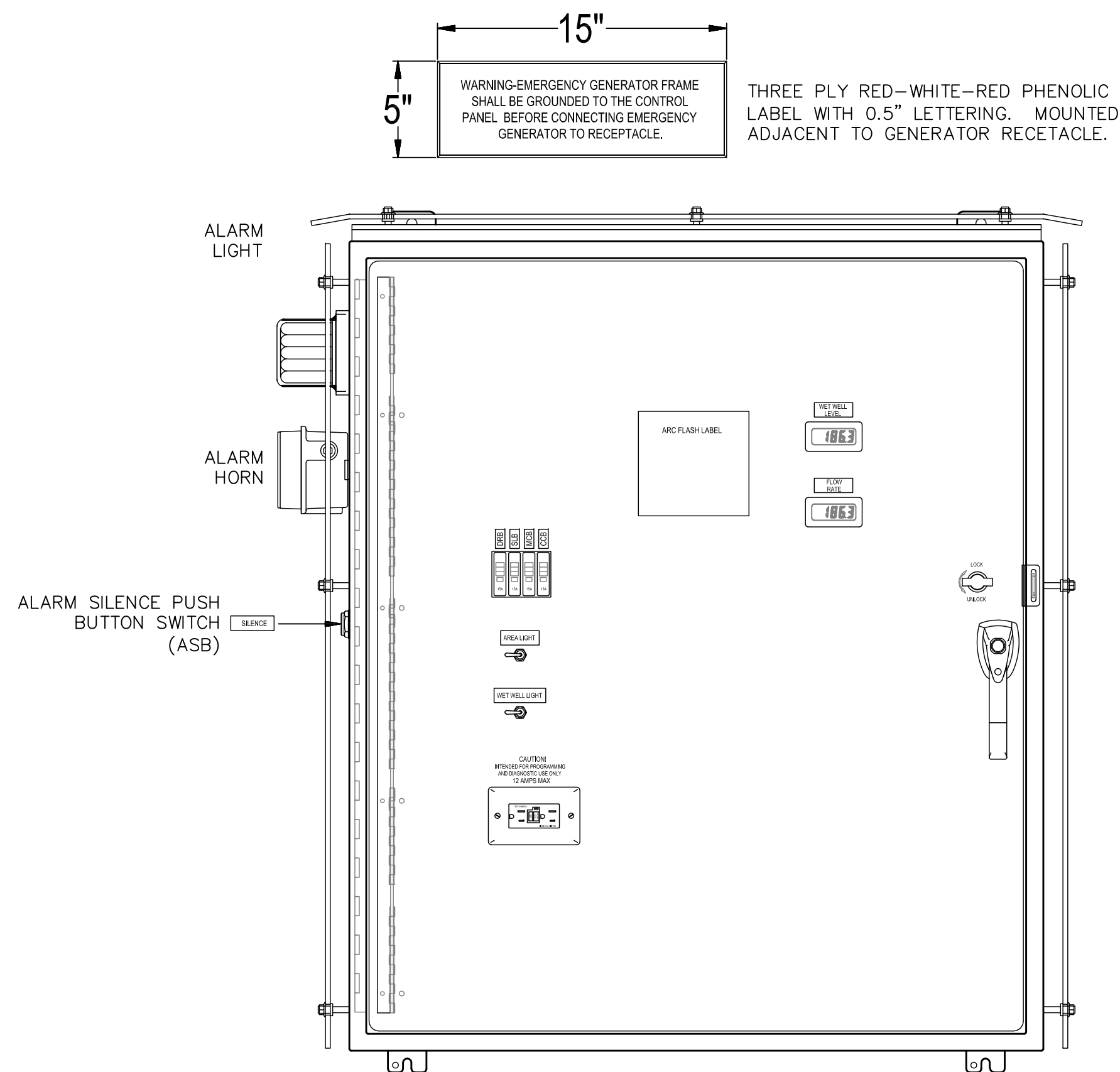
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TYPICAL VFD WIRING SCHEMATIC

DWG NAME: ###	FIELD BOOK: N/A	SURVEYED BY: CLEARWATER	SCALE: VERT. N/A
CONTRACT NO.: ###	DATE DRAWN: ###	DRAWN BY: JLH	HORIZ. N/A
JOB NO.: 22609.19	DESIGNED BY: TDT	CHECKED BY: GLW	SHEET NO.: 6 OF 28
APPROVED FOR			

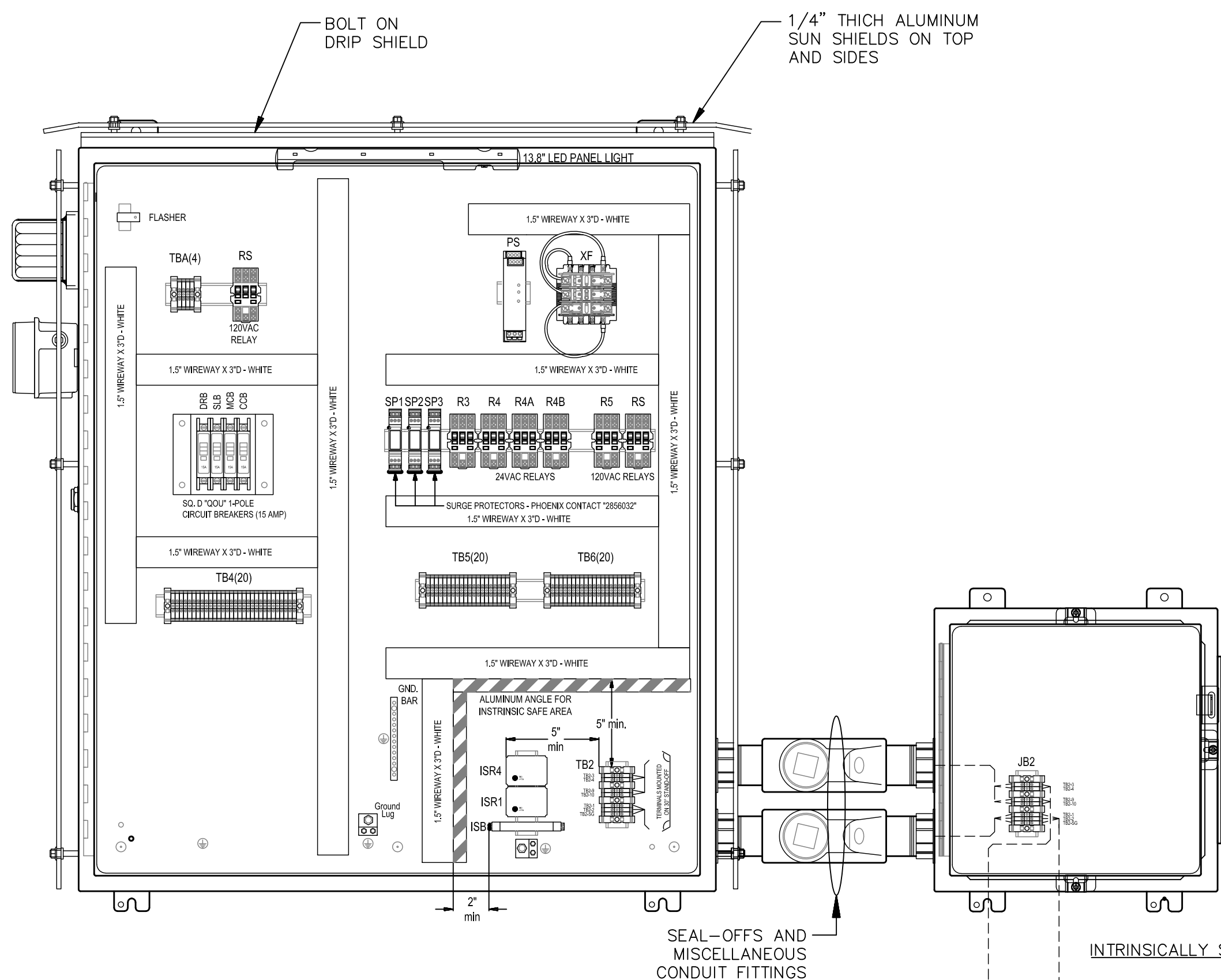


PUMP CONTROL PANEL DETAIL
SCALE : N.T.S.

INNER DOOR VIEW
(OUTER DOOR REMOVED FOR CLARITY)

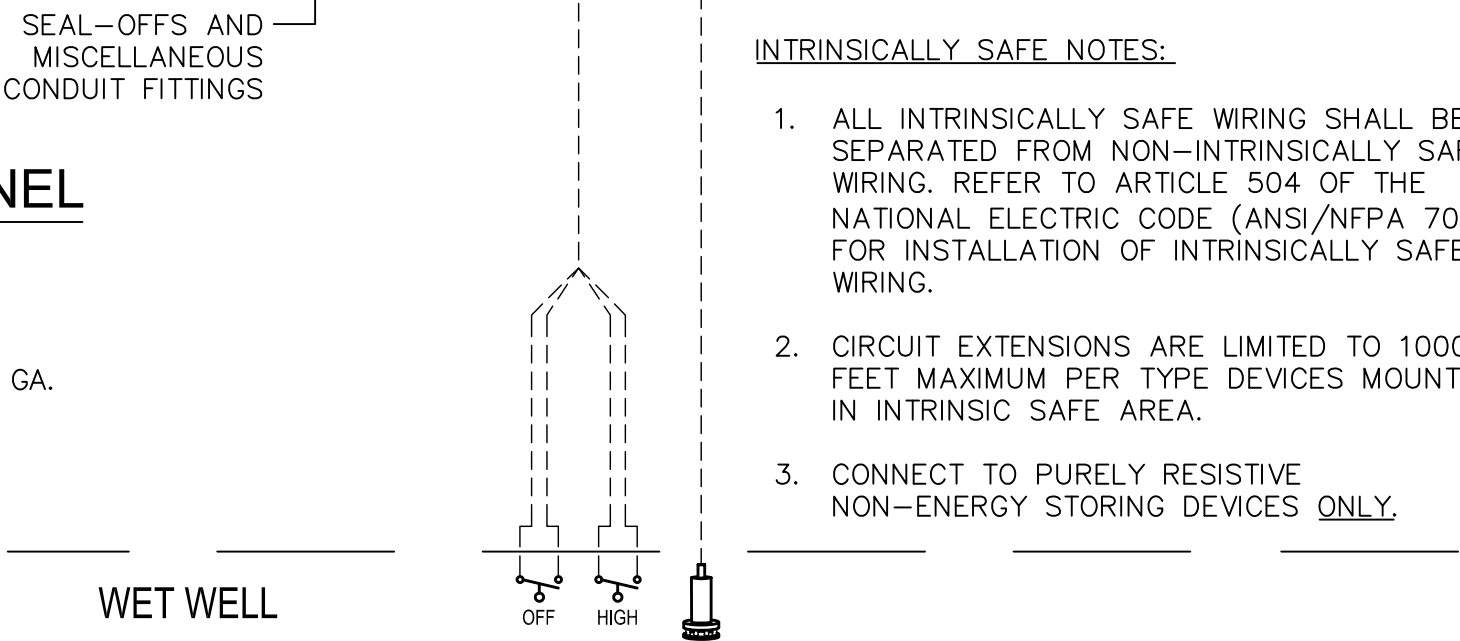
ENCLOSURE:
HAMMOND HW42368S16HK (42"H x 36"W x 8"D) NEMA 4X RATED TYPE 316 STAINLESS STEEL WITH BOLT-ON DRIP SHIELD, PAD-LOCKING HASP AND 0.25" THICK ALUMINUM SUN SHIELDS ON TOP AND SIDES. OUTER DOOR SHALL HAVE ROLLER CAM TYPE 3-POINT, PAD-LOCKABLE HANDLE, WELDED ON STUDS FOR PRINT POCKET AND 90° STOP.

INNER DOOR:
HID-4836, 0.125 BLACK ENGRAVED ALUMINUM WITH CONTINUOUS HINGE, TWIST LATCHES, AND 90° STOP.



PUMP CONTROL PANEL BACK PANEL
SCALE : N.T.S.

BACK PANEL:
HAMMOND 18P3933 (39"H x 33"W) FABRICATED FROM 12 GA. STEEL FINISHED IN WHITE.

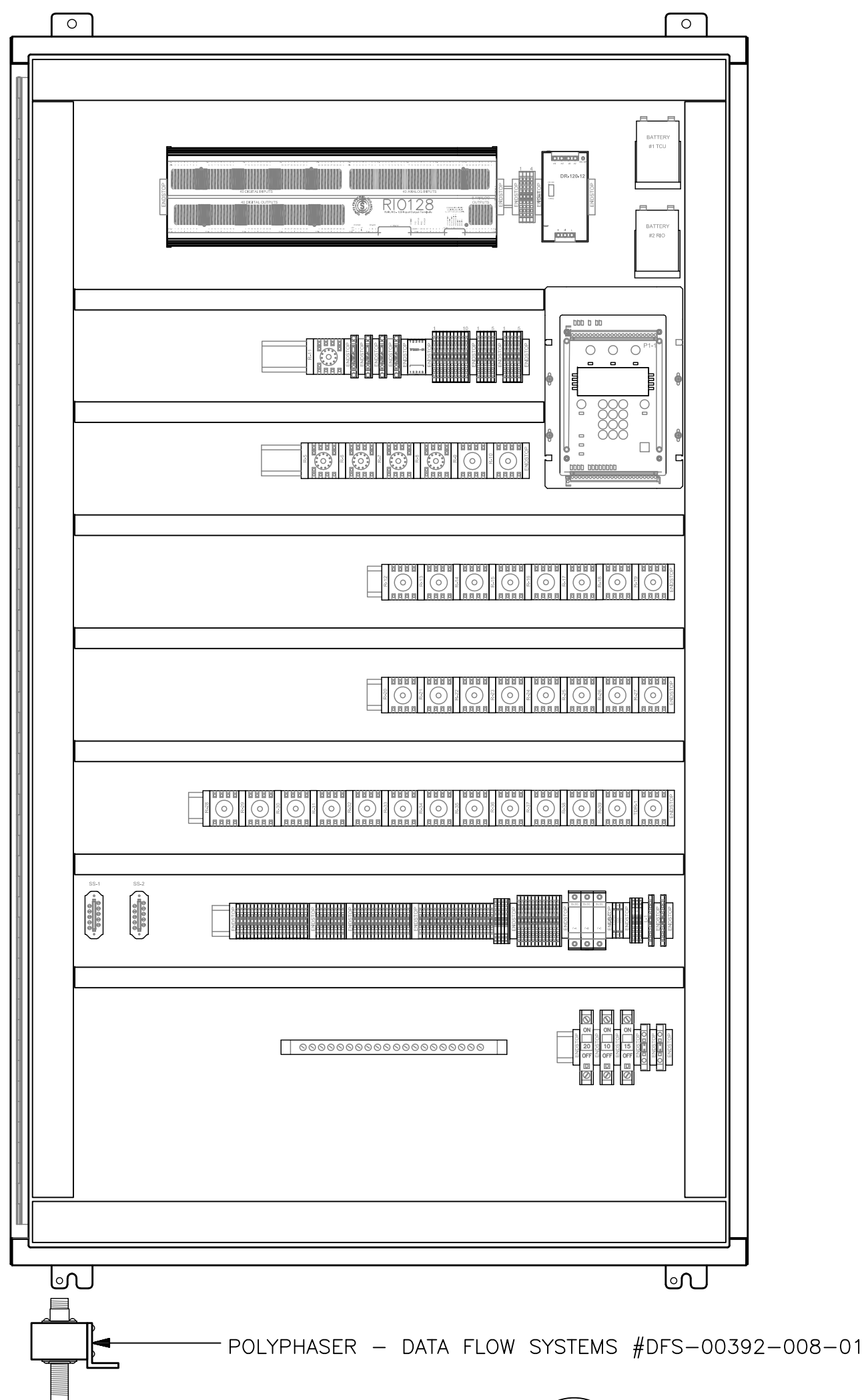


JUNCTION BOX ENCLOSURE DETAIL
SCALE : N.T.S.

JUNCTION BOX:
HAMMOND 1418N4S16G6 (16"H x 16"W x 6"D) NEMA 4X RATED TYPE 316 STAINLESS STEEL WITH BOLT-ON DRIP SHIELD AND INTEGRAL 12 GA. INNER PANEL. OUTER DOOR SHALL HAVE STAINLESS STEEL 1/4-TURN LATCHES AND PAD-LOCKING HASP.

BACK PANEL:
HAMMOND EP1616 (14.2"H x 14.2"W) FABRICATED FROM 12 GA. WHITE ENAMELED STEEL.

LOUVER:
WIEGMANN WAVK0808SSA (10.56"H x 9.5"W) FABRICATED FROM 316 STAINLESS STEEL. PROVIDE WIEGMANN WAFLT88 FILTER KIT FOR LOUVER.



DFS CABINET DETAIL
SCALE : N.T.S.

TCU ENCLOSURE:
(OUTER DOOR REMOVED FOR CLARITY)

ENCLOSURE:
HAMMOND HW603612S16HK (60"H x 36"W x 12"D) NEMA 4X RATED, FABRICATED FROM 14 GA. MILD STEEL WITH 3-POINT LATCHING SYSTEM. ENCLOSURE SHALL BE POWDER COATED WHITE. HASP AND STAPLE SHALL BE PROVIDED FOR PADLOCKING.

BACK PANEL:
HAMMOND 18P5733 (57"H x 33"W) FABRICATED FROM 12 GA. STEEL FINISHED IN WHITE.

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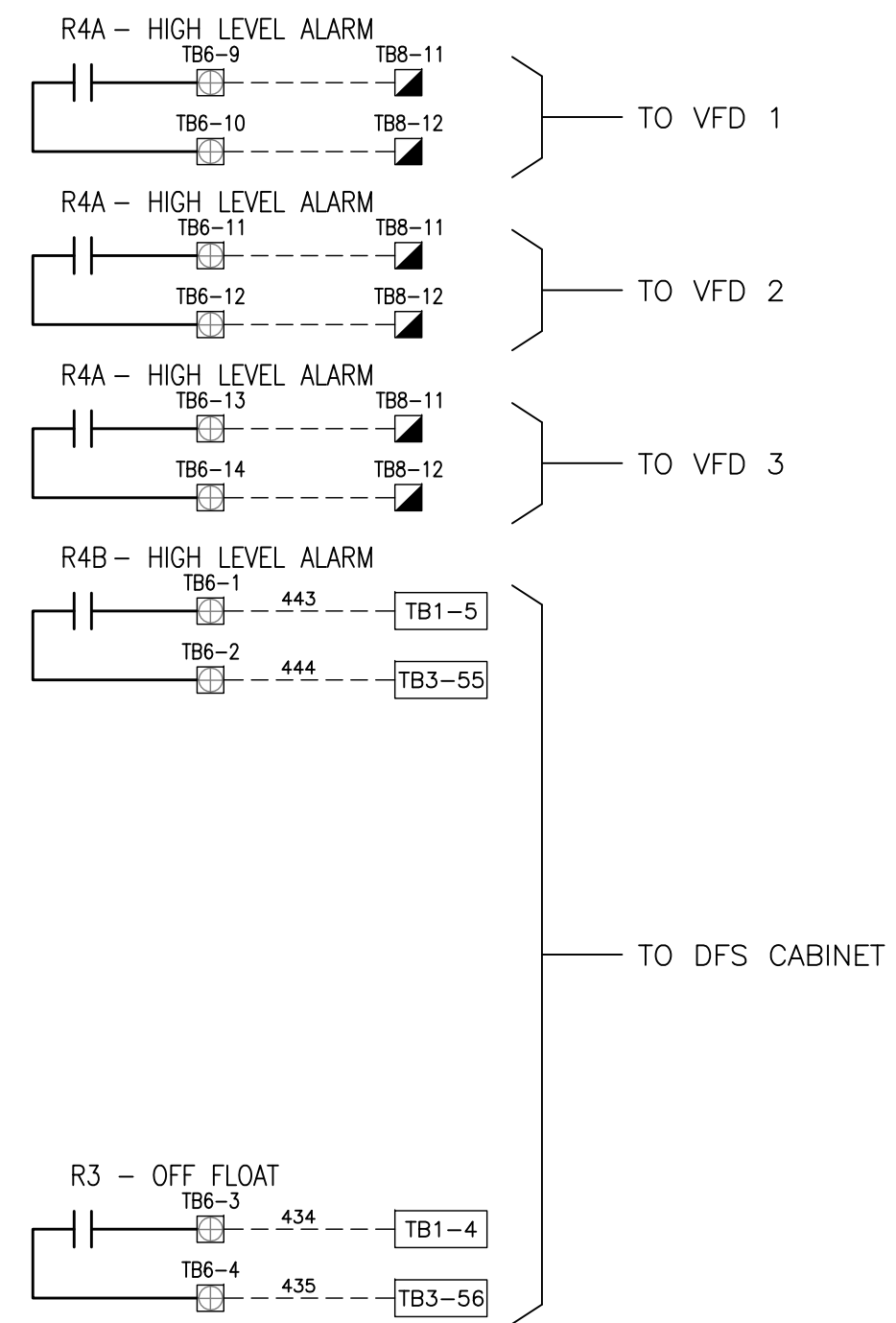
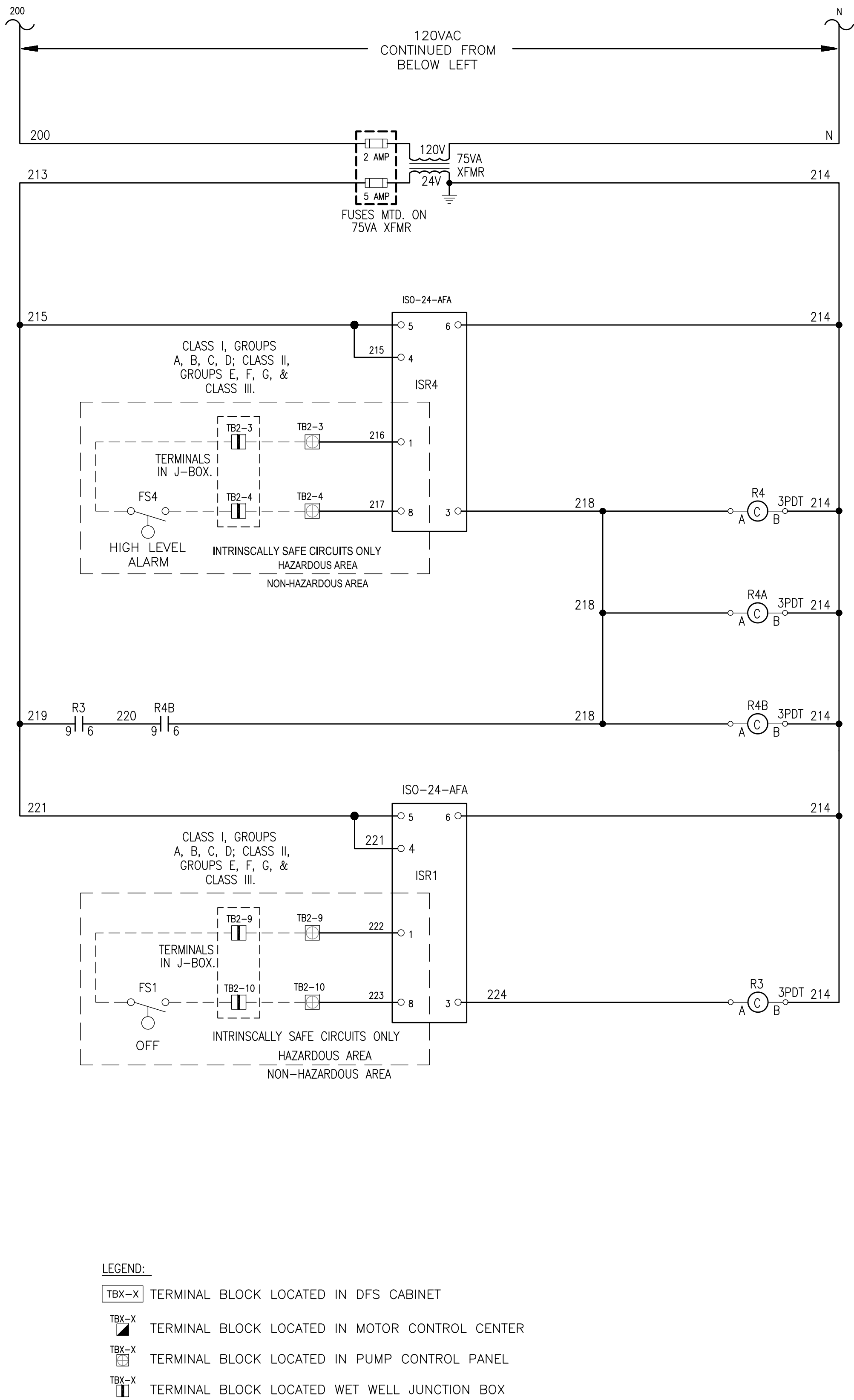
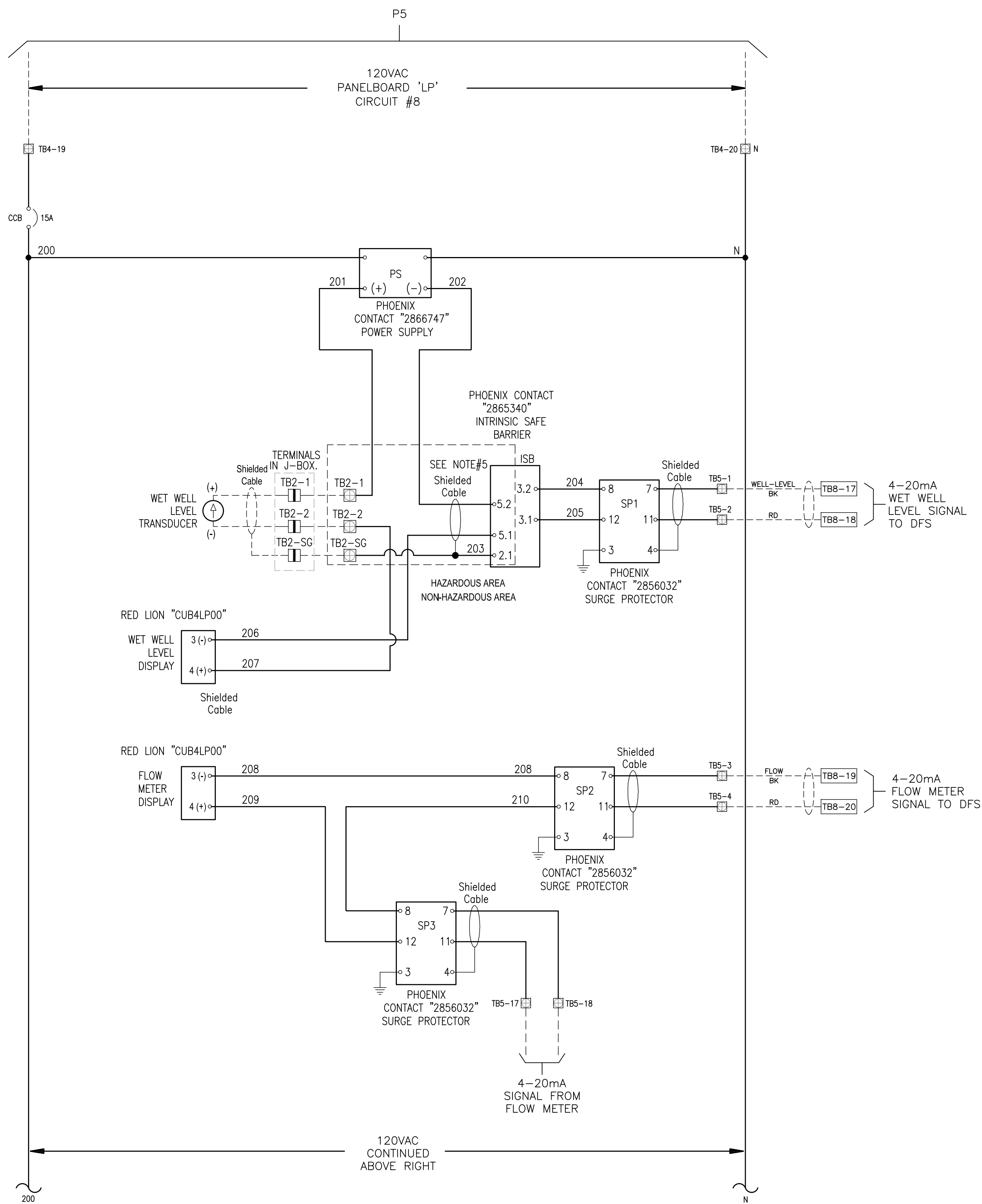
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TYPICAL PUMP CONTROL PANEL DETAILS		DWG NAME: ### CONTRACT NO.: ### JOB NO.: 22609.19 APPROVED FOR: _____	FIELD BOOK: N/A DATE DRAWN: ### DESIGNED BY: TDT	SURVEYED BY: CLEARWATER DRAWN BY: JLH CHECKED BY: GLW	SCALE: VERT. N/A HORIZ. N/A SHEET NO.: 7 OF 28
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LEGEND:

TBX-X TERMINAL BLOCK LOCATED IN DFS CABINET

TBX-X TERMINAL BLOCK LOCATED IN MOTOR CONTROL CENTER

TBX-X TERMINAL BLOCK LOCATED IN PUMP CONTROL PANEL

TBX-X TERMINAL BLOCK LOCATED WET WELL JUNCTION BOX

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CITY OF CLEARWATER, FLORIDA
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100 S. MYRTLE AVE.
CLEARWATER, FL 33756



TYPICAL PUMP CONTROL PANEL SCHEMATIC WIRING DIAGRAMS

DWG NAME: ###	FIELD BOOK: N/A	SURVEYED BY: CLEARWATER	SCALE: VERT. N/A
CONTRACT NO.: ###	DATE DRAWN: ###	DRAWN BY: JLH	HORIZ. N/A
JOB NO.: 22609.19	DESIGNED BY: TDT	CHECKED BY: GLW	SHEET NO.: 9 OF 28
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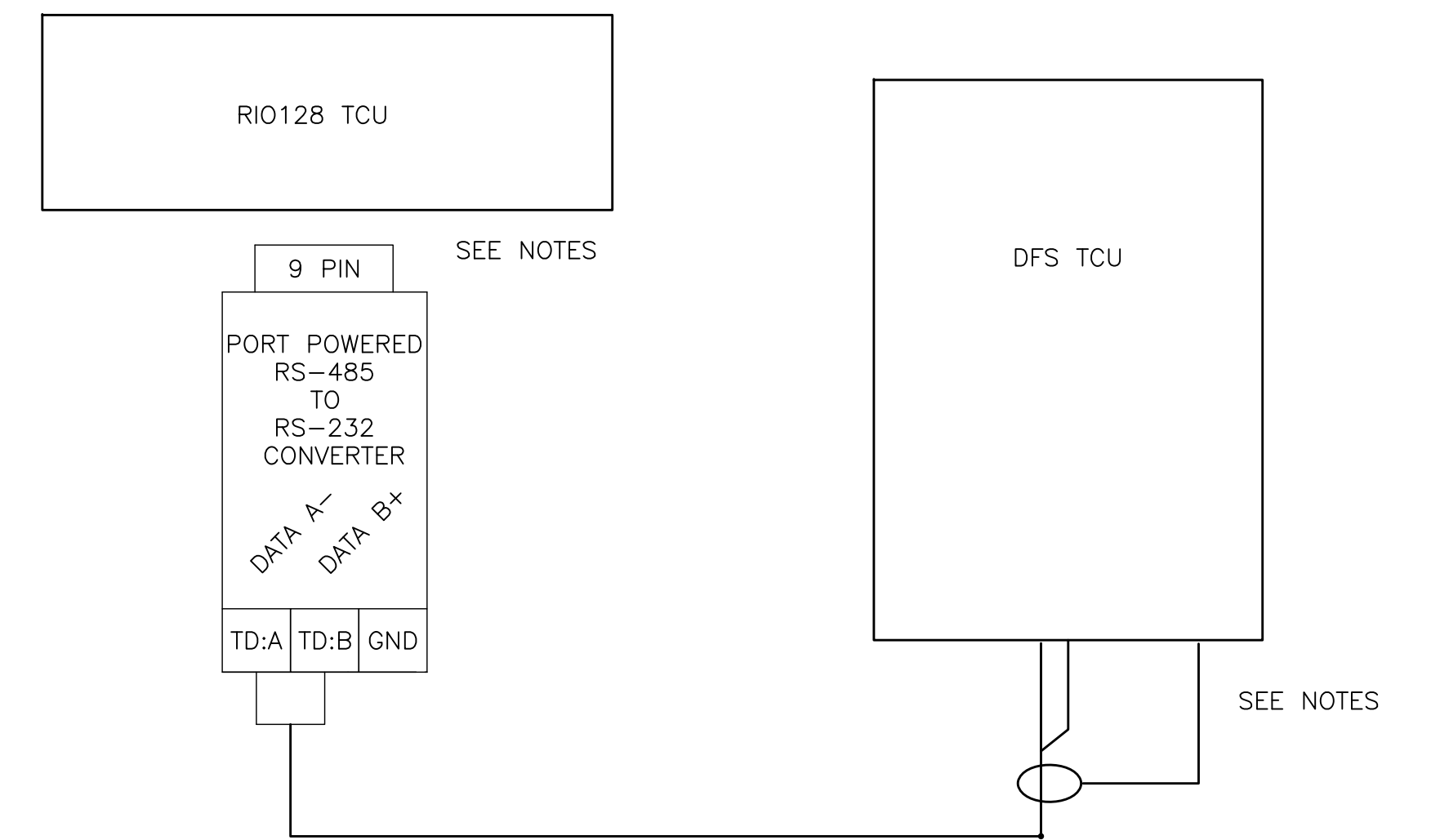
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CONTROL WIRE SIZE #16 UNLESS NOTED
ANALOG WIRE #18 SHIELDED TWISTED PAIR
AC CONTROL WIRES - RED
NEUTRAL WIRES - WHITE
DC+ WIRES - BLUE
DC- WIRES - BLUE/WHITE
POWERED FROM FIELD - YELLOW
FIELD WIRING - - - - -

NOTE:

- (1) ALL GROUNDING CONNECTIONS TO BE SINGLE POINT TO GROUND BUS ONLY.
- (2) AC AND DC BUS ARE TYPICAL TERMINAL BLOCK BUSES.
- (3) WIRES FOLLOW LEGEND UNLESS OTHERWISE MARKED.
- (4) ALL FUSES ARE 1 AMP SLOWBLOW UNLESS NOTED.
- (5) 250VAC RATED FUSES AND HOLDER REQUIRED FOR 240VAC LINE
- (6) ALL POINT CONTACTS TO BE PROTECTED BY ANTIOXIDANT COMPOUND.



COMMUNICATIONS RISER DIAGRAM

NOTE:

- (1) RIO-128 CONNECTOR J1 (RS-232) CONNECT RS-485 PORT POWERED CONNECTOR
- (2) RS-485 TERMINAL BLOCK T:D:B (DATA B+) TERMINATES TO TCU CONNECTOR P4-3
- (3) RS-485 TERMINAL BLOCK T:A (DATA A-) TERMINATES TO TCU CONNECTOR P4-4
- (4) TERMINATE THE SHIELD OF THE COMMUNICATION CABLE TO TCU CONNECTOR P4-5

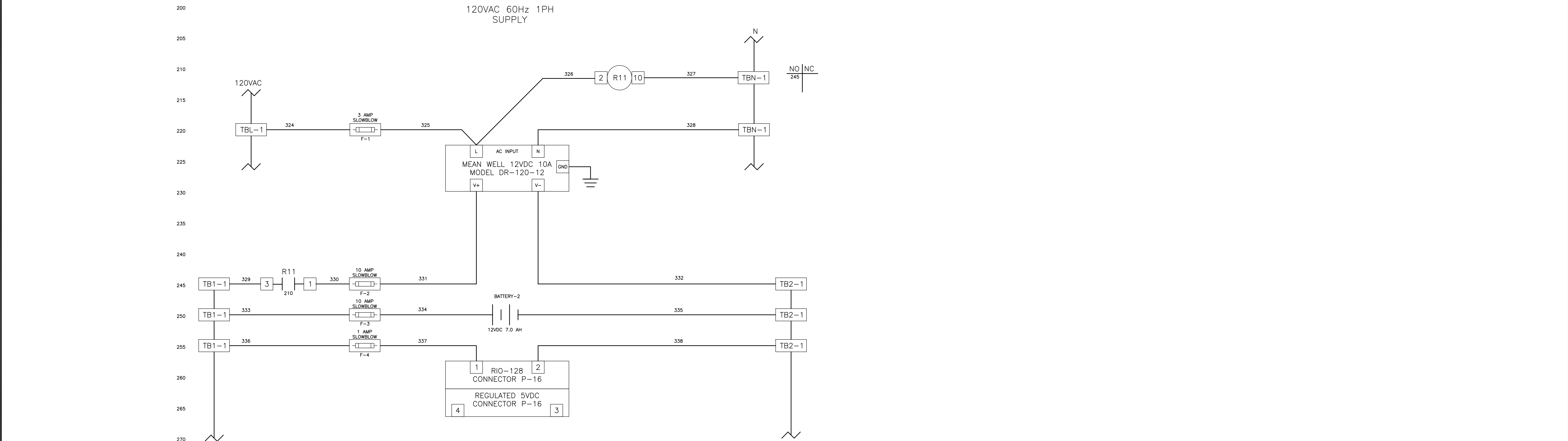
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TYPICAL DFS CABINET SCHEMATIC WIRING DIAGRAM

DAG NAME: ##### CONTRACT NO.: #####		FIELD BOOK: N/A		SURVEYED BY: CLEARWATER		SCALE: VERT. N/A	
JOB NO.: 22609.19		DATE DRAWN: ##### DESIGNED BY: TDT		DRAWN BY: JLH CHECKED BY: GLW		HORIZ. N/A SHEET NO.: 10 OF 28	
APPROVED FOR _____							



280	CONTROL WIRE SIZE #16 UNLESS NOTED ANALOG WIRE #18 SHIELDED TWISTED PAIR AC CONTROL WIRES - RED NEUTRAL WIRES - WHITE DC+ WIRES - BLUE
285	DC- WIRES - BLUE/WHITE POWERED FROM FIELD - YELLOW FIELD WIRING - - - - -

- | | |
|-------|--|
| NOTE: | (1) ALL GROUNDING CONNECTIONS TO BE SINGLE POINT TO GROUND BUS ONLY.
(2) AC AND DC BUS ARE TYPICAL TERMINAL BLOCK BUSES.
(3) WIRES FOLLOW LEGEND UNLESS OTHERWISE MARKED.
(4) ALL POINT CONTACTS TO BE PROTECTED BY ANTIOXIDANT COMPOUND. |
|-------|--|

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CONTRACT NO.:	DATE:	DRAWN BY:	HORIZ.:						
JOB NO.:	DESIGNED BY:	CHECKED BY:	SHEET NO.:						

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REVIEWED BY:				
PROJECT ENGINEER		DATE		
APPROVED BY:				
CITY ENGINEER MICHAEL D. GUILLEN, P.E. # 33921		DATE		
REVISION		BY	DATE	

DWG. NAME:	FIELD BOOK:	SURVEYED BY:	SCALE:
#####	N/A	CLEARWATER	VERT. N/A
CONTRACT NO.:	DATE:	DRAWN BY:	HORIZ. N/A
#####	#####	JLH	
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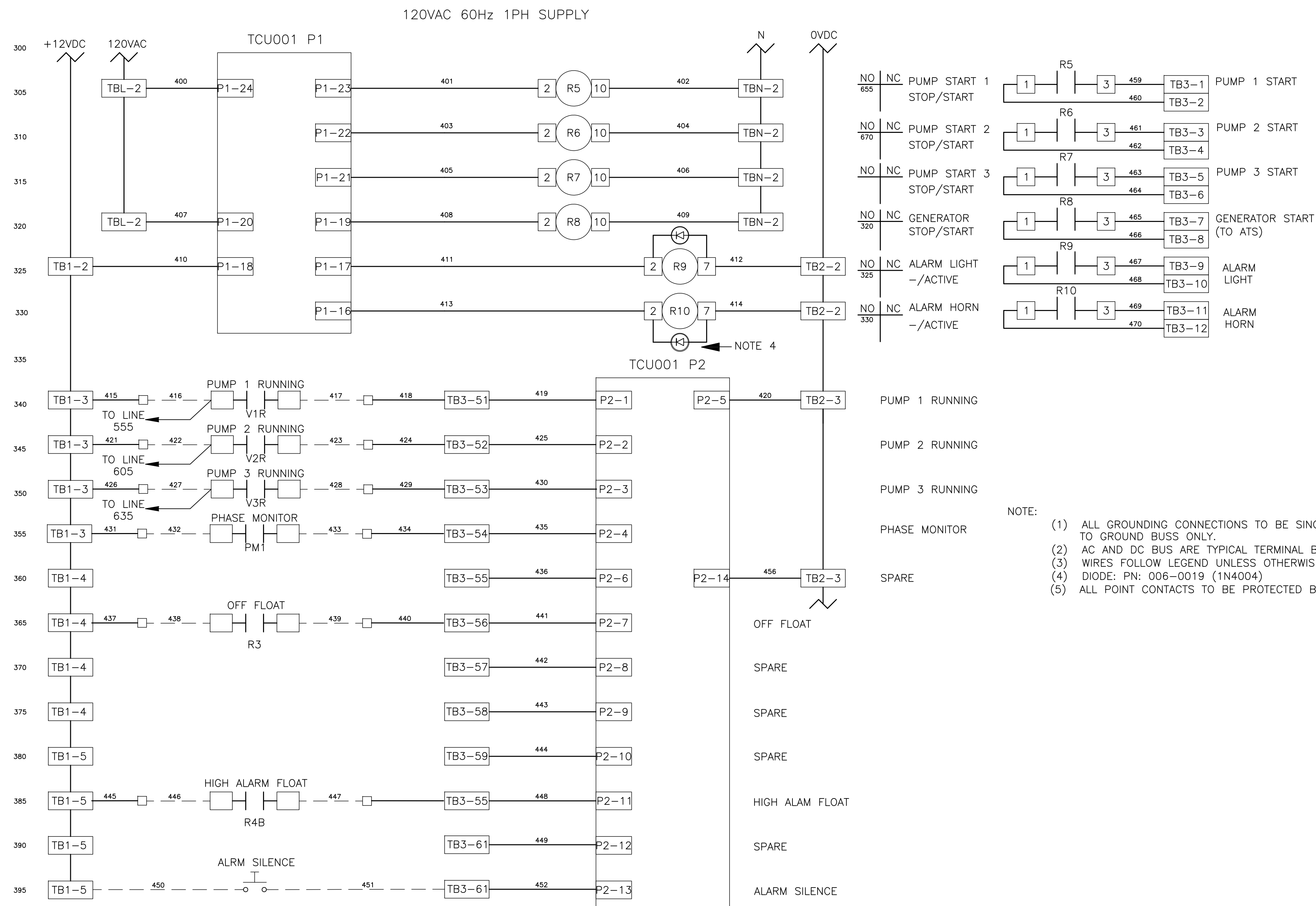
TYPICAL DFS CABINET SCHEMATIC WIRING DIAGRAM			
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TYPICAL DFS CABINET SCHEMATIC WIRING DIAGRAM

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CONTRACT NO.: ###	DATE DRAWN: ###	DRAWN BY: JLH	HORIZ. N/A
JOB NO.: 22609.19	DESIGNED BY: TDT	CHECKED BY: GLW	SHEET NO.: 11 OF 28
APPROVED FOR			



- NOTE:
- (1) ALL GROUNDING CONNECTIONS TO BE SINGLE POINT TO GROUND BUSS ONLY.
 - (2) AC AND DC BUS ARE TYPICAL TERMINAL BLOCK BUSSES.
 - (3) WIRES FOLLOW LEGEND UNLESS OTHERWISE MARKED.
 - (4) DIODE: PN: 006-0019 (1N4004)
 - (5) ALL POINT CONTACTS TO BE PROTECTED BY ANTIOXIDANT COMPOUND.

RECORD DRAWINGS				
SURVEYED BY:	DRAWN BY:			
REVIEWED BY:				
PROJECT ENGINEER	DATE			
APPROVED BY:				
CITY ENGINEER MICHAEL D. QUILLLEN, P.E. # 33721	DATE			
REVISION		BY	DATE	

CITY OF CLEARWATER, FLORIDA
ENGINEERING DEPARTMENT
100 S. MYRTLE AVE.
CLEARWATER, FL 33756



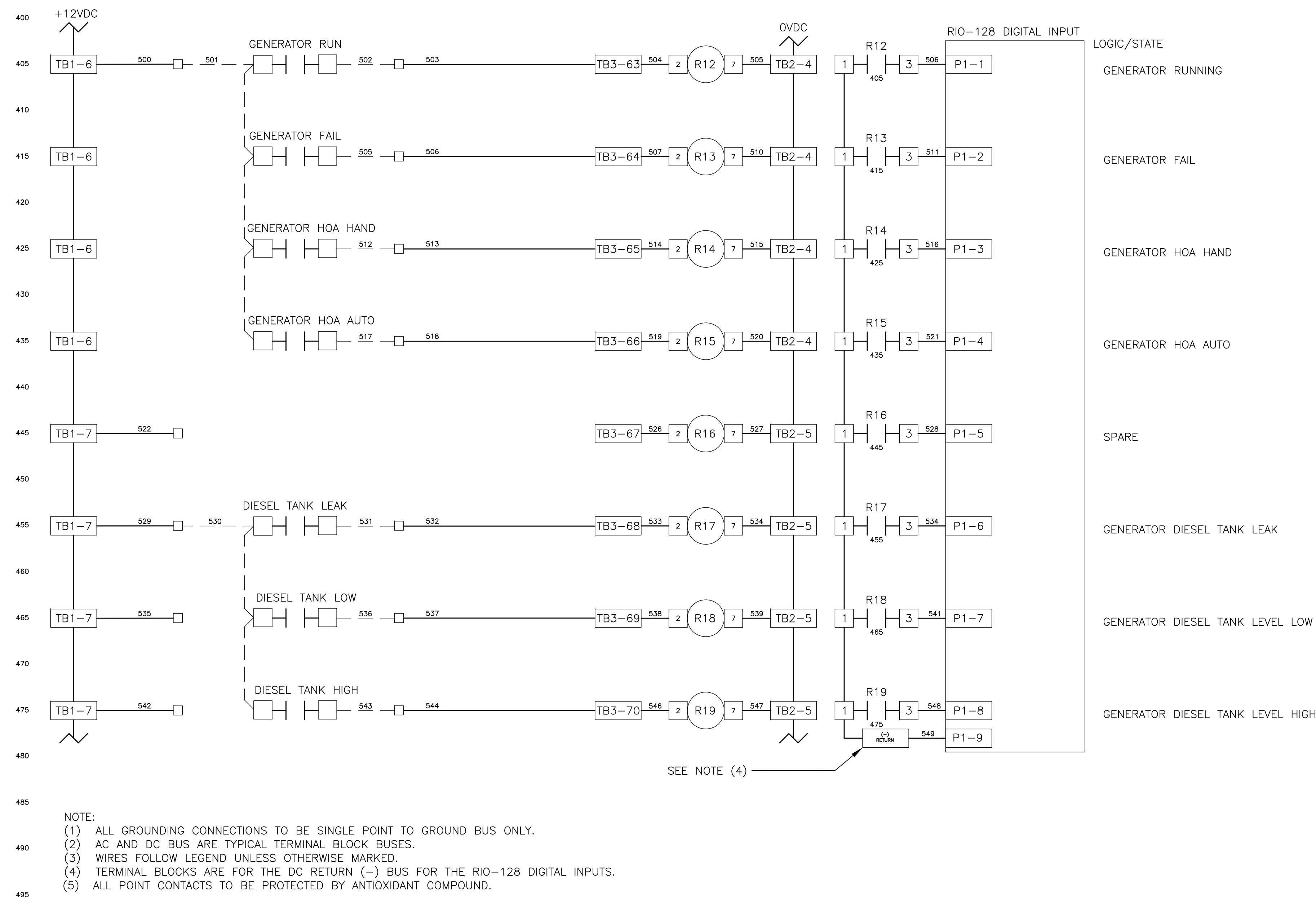
TYPICAL DFS CABINET SCHEMATIC WIRING DIAGRAM

DWG NAME: ###	FIELD BOOK: N/A	SURVEYED BY: CLEARWATER	SCALE: VERT. N/A
CONTRACT NO.: ###	DATE DRAWN: ###	DRAWN BY: JLH	HORIZ. N/A
JOB NO.: 22609.19	DESIGNED BY: TDT	CHECKED BY: GLW	SHEET NO.: 12 OF 28
APPROVED FOR			

TIMOTHY THOMAS P.E. No. 47079

TRICON ENGINEERING

777 S. Harbour Island Blvd.
Suite 350
Tampa, FL 33602
813.227.9100
Certificate of Authorization No. 31028



WIRE LEGEND

CONTROL WIRE SIZE #16 UNLESS NOTED
ANALOG WIRE #18 SHIELDED TWISTED PAIR
AC CONTROL WIRES - RED
NEUTRAL WIRES - WHITE
DC+ WIRES - BLUE
DC- WIRES - BLUE/WHITE
POWERED FROM FIELD - YELLOW
FIELD WIRING - - - - -

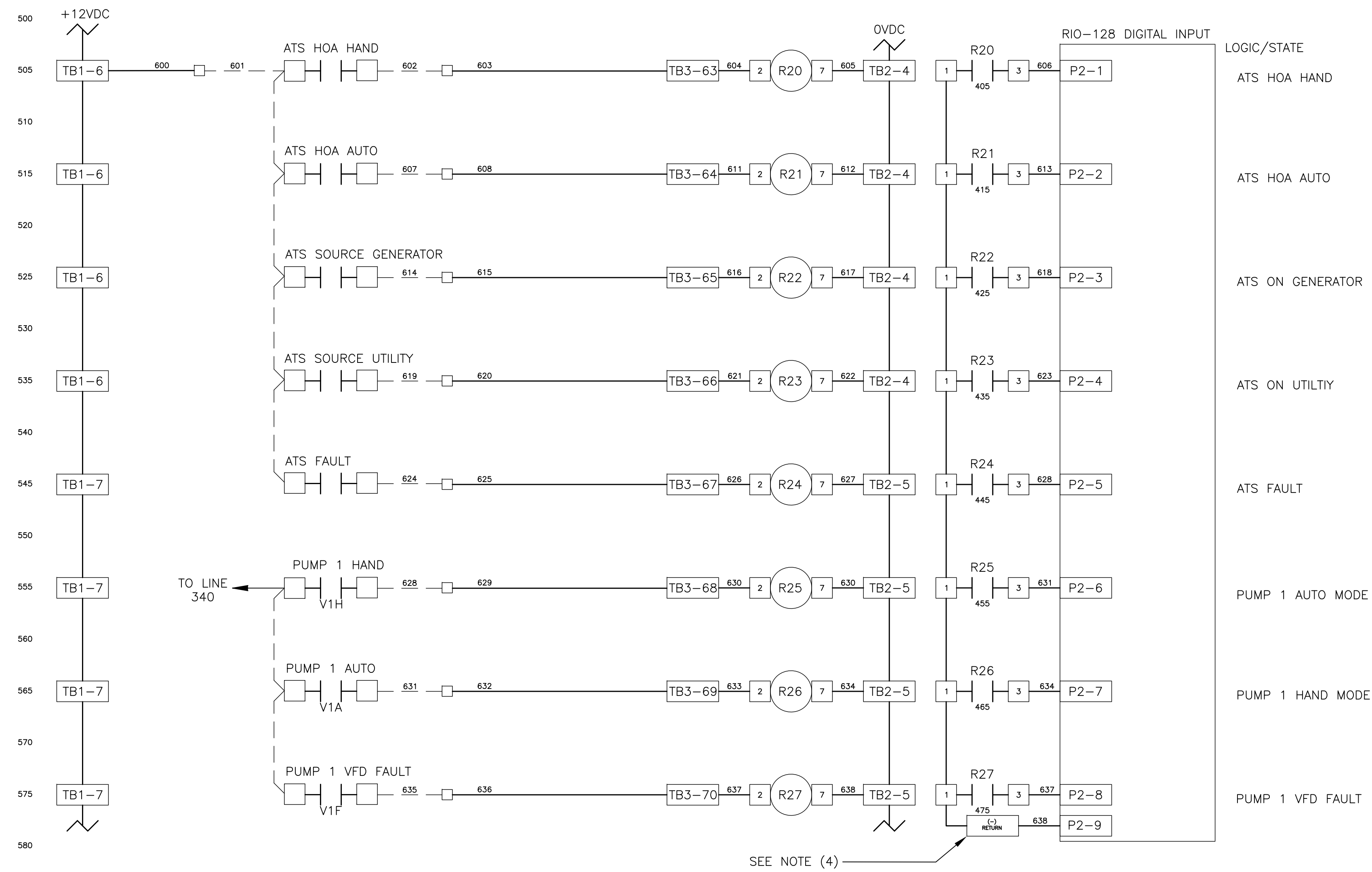
TIMOTHY THOMAS P.E. No. 47079			
TRICON ENGINEERING 777 S. Harbour Island Blvd. Suite 350 Tampa, FL 33602 813.227.9100 Certificate of Authorization No. 31028			
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JOB NO.: 22609.19	DESIGNED BY: TDT	CHECKED BY: GLW	SHEET NO.: 13 OF 28
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RECORD DRAWINGS			
SURVEYED BY:	DRAWN BY:		
REVIEWED BY:			
PROJECT ENGINEER	DATE		
APPROVED BY:			
CITY ENGINEER MICHAEL D. QUILLEN, P.E. # 33721	DATE		
REVISION		BY	DATE

CITY OF CLEARWATER, FLORIDA
ENGINEERING DEPARTMENT
100 S. MYRTLE AVE.
CLEARWATER, FL 33756



TYPICAL DFS CABINET SCHEMATIC WIRING DIAGRAM



NOTE:
(1) ALL GROUNDING CONNECTIONS TO BE SINGLE POINT TO GROUND BUS ONLY.
(2) AC AND DC BUS ARE TYPICAL TERMINAL BLOCK BUSES.
(3) WIRES FOLLOW LEGEND UNLESS OTHERWISE MARKED.
(4) TERMINAL BLOCKS ARE FOR THE DC RETURN (-) BUS FOR THE RIO-128 DIGITAL INPUTS.
(5) ALL POINT CONTACTS TO BE PROTECTED BY ANTIOXIDANT COMPOUND.

WIRE LEGEND

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ANALOG WIRE #18 SHIELDED TWISTED PAIR
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PROJECT ENGINEER	DATE			
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CITY ENGINEER MICHAEL D. QUILLEN, P.E. # 33721	DATE			

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TYPICAL DFS CABINET
SCHEMATIC WIRING DIAGRAM

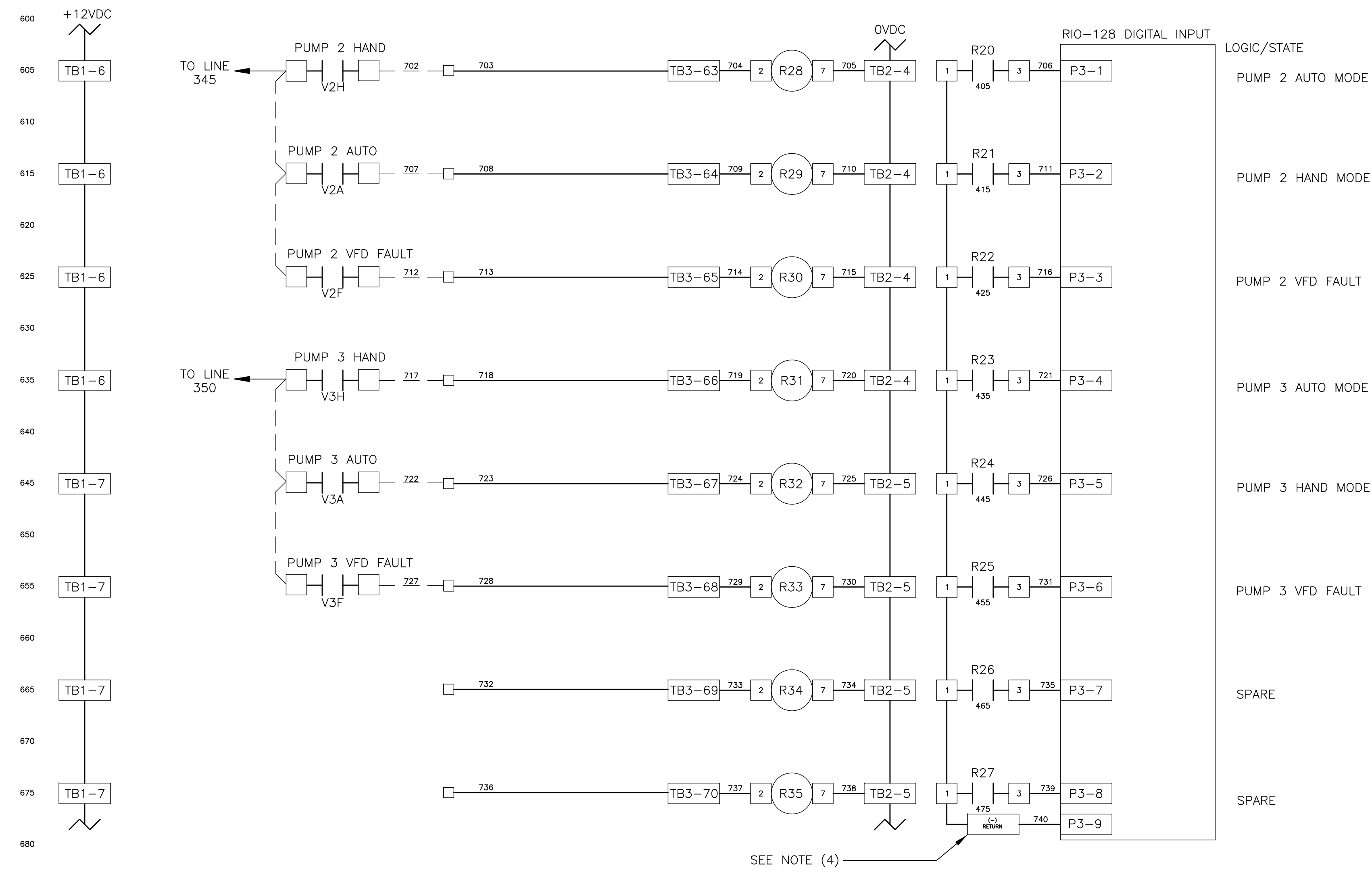
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CONTRACT NO.: ###	DATE DRAWN: ###	DRAWN BY: JLH	HORIZ. N/A
JOB NO.: 22609.19	DESIGNED BY: TDT	CHECKED BY: GLW	SHEET NO.: 14 OF 28
APPROVED FOR			

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REVIEWED BY:				
PROJECT ENGINEER		DATE		
APPROVED BY:				
CITY ENGINEER MICHAEL D. QUILLEN, P.E. # 33721		DATE		

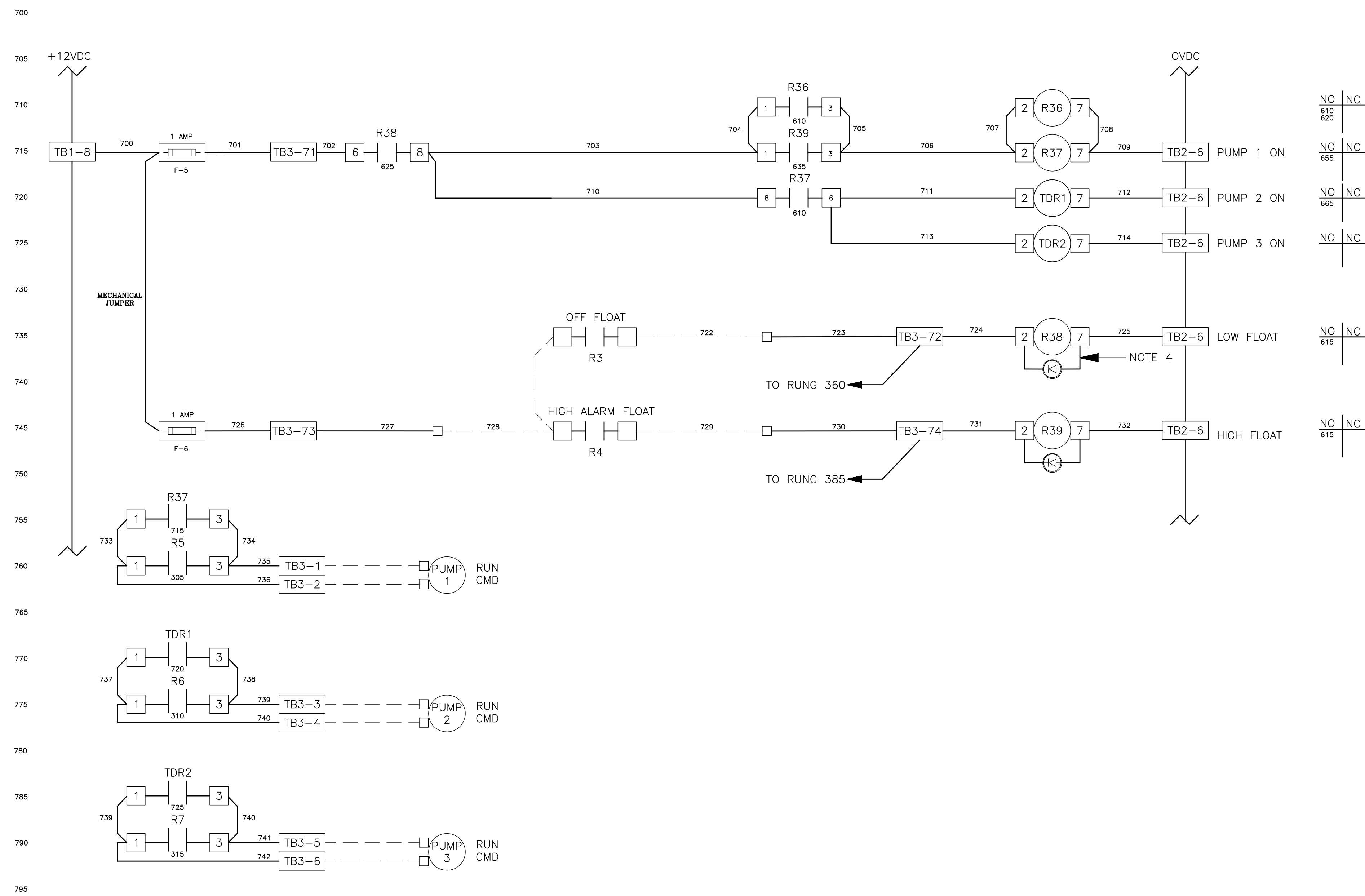
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TYPICAL DFS CABINET
SCHEMATIC WIRING DIAGRAM

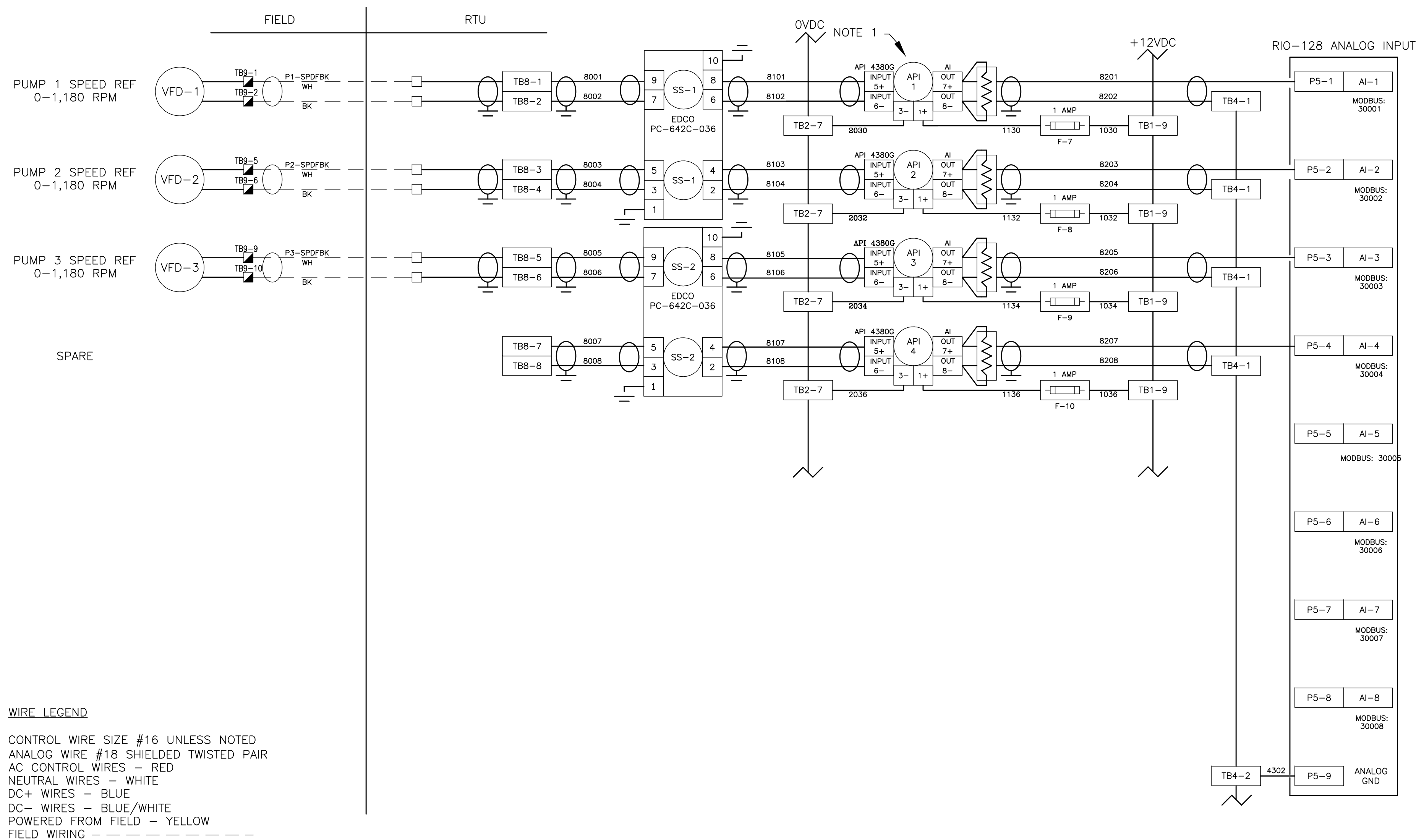
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CONTRACT NO.: ###	DATE DRAWN: ###	DRAWN BY: JLH	HORIZ. N/A
JOB NO.: 22609.19	DESIGNED BY: TDT	CHECKED BY: GLW	SHEET NO.: 15 OF 28
APPROVED FOR			



NOTE:

- (1) ALL GROUNDING CONNECTIONS TO BE SINGLE POINT TO GROUND BUS ONLY.
- (2) AC AND DC BUS ARE TYPICAL TERMINAL BLOCK BUSES.
- (3) WIRES FOLLOW LEGEND UNLESS OTHERWISE MARKED.
- (4) DIODE: PN: 006-0019 (1N4004)
- (5) ALL POINT CONTACTS TO BE PROTECTED BY ANTIOXIDANT COMPOUND.

RECORD DRAWINGS								CITY OF CLEARWATER, FLORIDA ENGINEERING DEPARTMENT 100 S. MYRTLE AVE. CLEARWATER, FL 33756				TYPICAL DFS CABINET SCHEMATIC WIRING DIAGRAM		<table border="1"> <tr> <td>DWG NAME: ####</td> <td>FIELD BOOK: N/A</td> <td>SURVEYED BY: CLEARWATER</td> <td>SCALE: VERT. N/A</td> </tr> <tr> <td>CONTRACT NO.: ####</td> <td>DATE DRAWN: ####</td> <td>DRAWN BY: JLH</td> <td>HORIZ. N/A</td> </tr> <tr> <td>JOB NO.: 22609.19</td> <td>DESIGNED BY: TDT</td> <td>CHECKED BY: GLW</td> <td>SHEET NO.: 16 OF 28</td> </tr> </table>		DWG NAME: ####	FIELD BOOK: N/A	SURVEYED BY: CLEARWATER	SCALE: VERT. N/A	CONTRACT NO.: ####	DATE DRAWN: ####	DRAWN BY: JLH	HORIZ. N/A	JOB NO.: 22609.19	DESIGNED BY: TDT	CHECKED BY: GLW	SHEET NO.: 16 OF 28
DWG NAME: ####	FIELD BOOK: N/A	SURVEYED BY: CLEARWATER	SCALE: VERT. N/A																								
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SURVEYED BY: _____ DRAWN BY: _____																											
REVIEWED BY: _____ PROJECT ENGINEER _____ DATE _____																											
APPROVED BY: _____ CITY ENGINEER MICHAEL D. GUILLEN, P.E. # 33521 _____ DATE _____				REVISION _____		BY _____		DATE _____																			



RECORD DRAWINGS				
SURVEYED BY:	DRAWN BY:			
REVIEWED BY:				
APPROVED BY:				
CITY ENGINEER MICHAEL D. QUILLLEN, P.E. # 33721		DATE		

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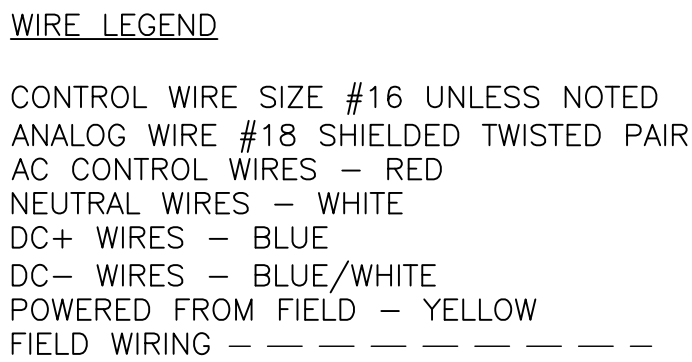
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SCHEMATIC WIRING DIAGRAM

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JOB NO.: 22609.19	DESIGNED BY: TDT	CHECKED BY: GLW	SHEET NO.: 17 OF 28
APPROVED FOR			

TIMOTHY THOMAS P.E. No. 47079

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ENGINEERING

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Suite 350
Tampa, FL 33602
813.227.9100
Certificate of Authorization No. 31028



NOTE:

- (1) LOOP ISOLATORS ON ANALOG INPUTS MUST BE CORRECTLY CONFIGURED FOR 4-20ma INPUT & 4-20ma OUTPUT BEFORE INSTALLING; FAILURE TO DO SO WILL RESULT IN EQUIPMENT DAMAGE AND VOIDS FACTORY WARRANTY
- (2) DO NOT EXCEED 5.5 VOLTS ON ANALOG INPUTS.
- (3) LOOP ISOLATORS ARE RECOMMENDED FOR CIRCUIT PROTECTION.
- (4) STATIC SENSITIVE DEVICES; OBSERVE PROPER ESD PROCEDURES DURING INSTALLATION.
- (5) ALL POINT CONTACTS TO BE PROTECTED BY ANTIOXIDANT COMPOUND.

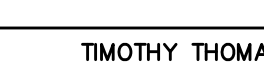
RECORD DRAWINGS			
SURVEYED BY:	DRAWN BY:		
REVIEWED BY:			
PROJECT ENGINEER	DATE		
CITY ENGINEER MICHAEL D. QUILLLEN, P.E. # 33921	DATE	REVISION	BY DATE

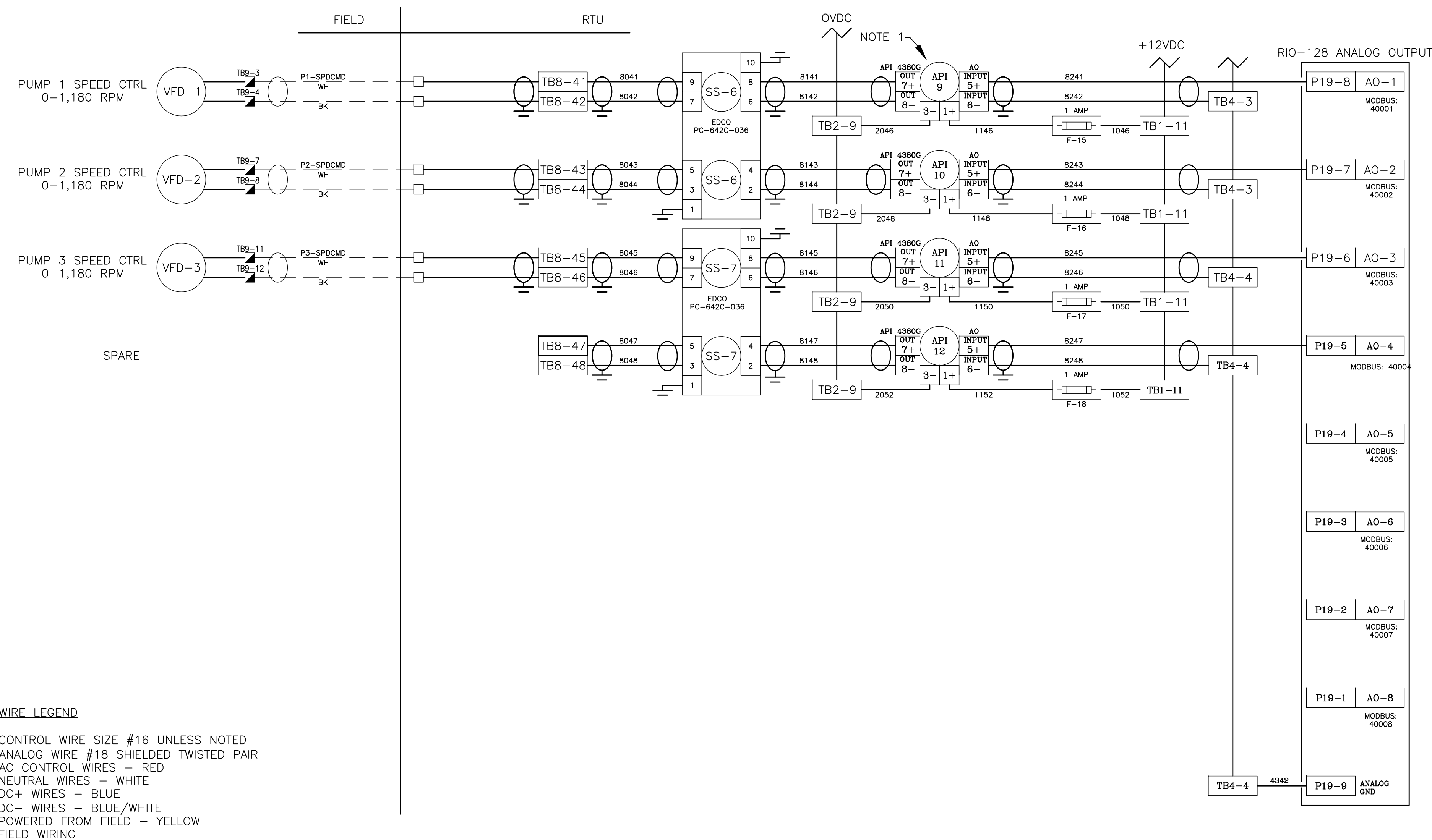
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TYPICAL DFS CABINET SCHEMATIC WIRING DIAGRAM

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CONTRACT NO.: ###	DATE DRAWN: ###	DRAWN BY: JLH	HORIZ. N/A
JOB NO.: 22609.19	DESIGNED BY: TDT	CHECKED BY: GLW	SHEET NO.: 18 OF 28
APPROVED FOR			

TIMOTHY THOMAS P.E. No. 47079	
	777 S. Harbour Island Blvd, Suite 350 Tampa, FL 33602 813.227.9190 Certificate of Authorization No. 31028



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RECORD DRAWINGS			
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REVIEWED BY:			
PROJECT ENGINEER	DATE		
CITY ENGINEER MICHAEL D. QUILLLEN, P.E. # 33921	DATE	REVISION	BY DATE

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100 S. MYRTLE AVE.
CLEARWATER, FL 33756

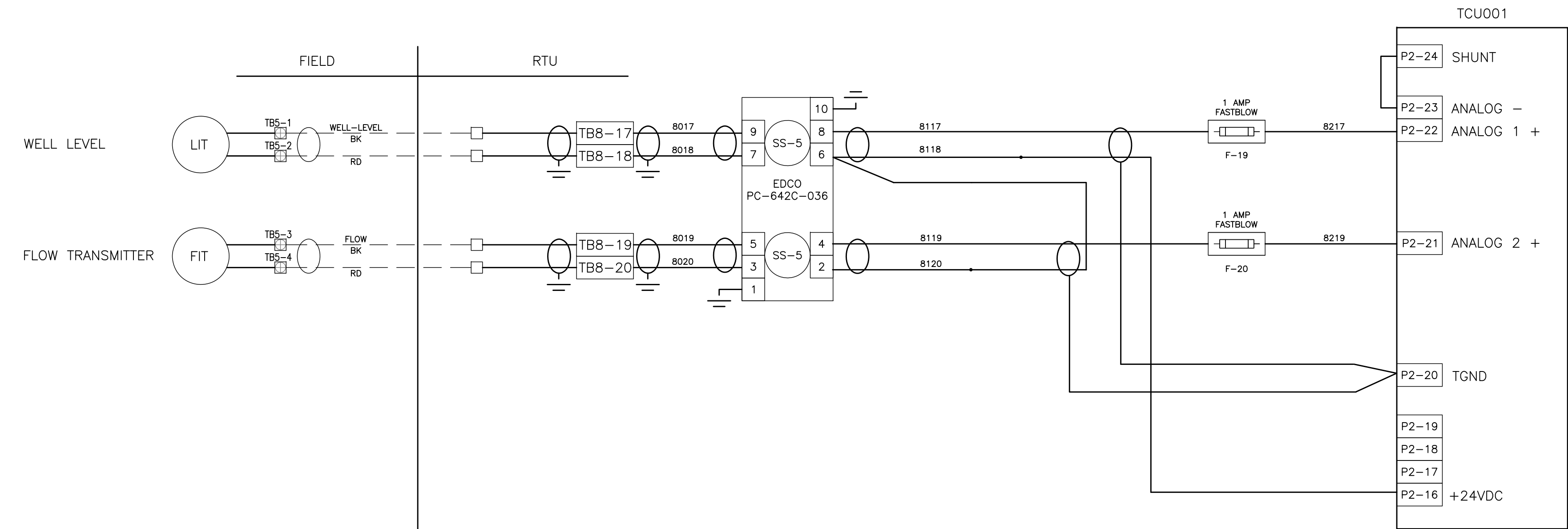


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APPROVED FOR _____			

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Suite 350
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813.227.8190
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WIRE LEGEND

CONTROL WIRE SIZE #16 UNLESS NOTED
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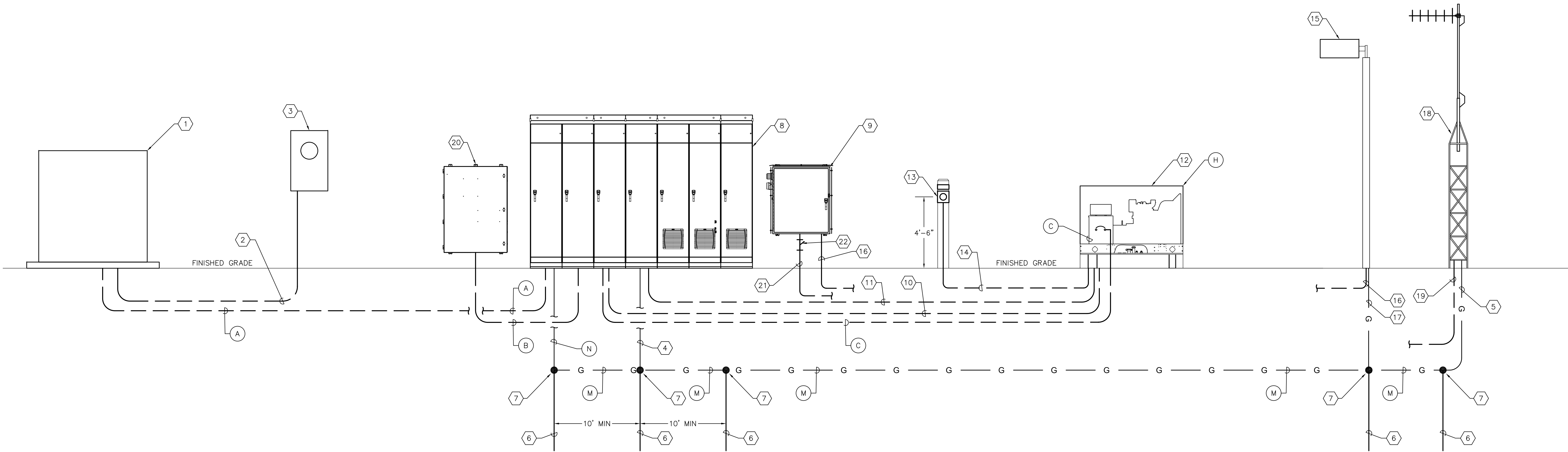
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JOB NO.: 22609.19	DESIGNED BY: TDT	CHECKED BY: GLW	SHEET NO.: 20 OF 28
APPROVED FOR			



TYPICAL ONE LINE DIAGRAM

ONE LINE DIAGRAM NOTES:

- 1 UTILITY PAD-MOUNTED TRANSFORMERS.

2 PROVIDE AND INSTALL SPARE CONDUIT FOR UTILITY CT METERING (P8).

3 DUE TO THE SERVICE ENTRANCE SIZE, IT IS ASSUMED CT METERING WILL BE REQUIRED BY THE UTILITY. IF REQUIRED BY THE UTILITY, THE CONTRACTOR SHALL PROVIDE A FEED-THROUGH METER AND A DISCONNECT ON THE LINE SIDE OF THE ELECTRIC METER FOR UTILITY PURPOSES. COORDINATE ALL REQUIREMENTS WITH THE UTILITY INCLUDING SURGE PROTECTION AND EQUIPMENT GROUNDING.

4 PROVIDE AND INSTALL #8 CU GROUNDING ELECTRODE CONDUCTOR FOR PANELBOARD 'LP' TRANSFORMER.

5 PROVIDE AND INSTALL 1/0 AWG CU GROUNDING ELECTRODE CONDUCTOR.

6 PROVIDE AND INSTALL 5/8" X 20'-0" GROUNDING ELECTRODE.

7 EXOTHERMIC WELD.

8 PROVIDE AND INSTALL MOTOR CONTROL CENTER: 3-POLE, S/N, 480V, TRANSFER SWITCH IN NEMA 3R STAINLESS STEEL ENCLOSURE. REFER TO EQUIPMENT SCHEDULE FOR BREAKER SIZES, ETC. REQUIRED.

9 PROVIDE AND INSTALL PUMP CONTROL PANEL.

10 PROVIDE AND INSTALL 4-#12 THWN CU + 1-#12 THWN CU GND IN 3/4"C. FOR GENERATOR START CONTROL. VERIFY/COORDINATE REQUIREMENTS WITH TRANSFER SWITCH/GENERATOR MANUFACTURER.

11 PROVIDE AND INSTALL THE FOLLOWING CIRCUITS FOR GENERATOR AUXILIARY EQUIPMENT : 2#12 THWN CU + 1-#12 THWN CU GND IN 3/4"C. FOR GENERATOR ALTERNATOR HEATER. 2#12 THWN CU + 1-#12 THWN CU GND IN 3/4"C. FOR GENERATOR BLOCK HEATER. 2-#12 THWN CU + 1-#12 THWN CU GND IN 3/4"C. FOR GENERATOR BATTERY CHARGER. CONFIRM/COORDINATE REQUIREMENTS WITH GENERATOR MANUFACTURER.

12 PROVIDE AND INSTALL NEW 480V, 3Ø, 4-WIRE GENERATOR IN WEATHERPROOF ENCLOSURE. REFER TO SCHEDULE FOR SIZE. REFER ALSO TO SPECIFICATIONS.
- 13 GENERATOR EMERGENCY SHUT DOWN PUSH BUTTON STATION. MAINTAINED 2 POSITION SWITCH w/ 1-5/8" DIA. OPERATOR, 1 N.O. & 1 N.C. CONTACT MOUNTED IN A NEMA 4X SS ENCLOSURE, 4'-6" ABOVE FINISHED GRADE ON 6" X 6" X 9" CONCRETE POST. PROVIDE PHENOLIC NAMEPLATE ABOVE PUSH BUTTON STATION. NAMEPLATE SHALL BE THREE-PLY PHENOLIC RED-WHITE-RED ENGRAVED THROUGH THE FIRST RED LAYER. LETTERING SHALL BE 1/2" MIN., EDGES OF NAMEPLATE SHALL BE BEVELED 45 DEG. NAMEPLATE SHALL READ AS FOLLOWS: "GENERATOR EMERGENCY SHUT DOWN".

14 PROVIDE AND INSTALL 2#12 THWN CU + 1-#12 THWN CU GND IN 3/4"C. FOR GENERATOR EMERGENCY SHUT DOWN CIRCUIT.

15 PROVIDE AND INSTALL AREA LIGHT. QUANTITY VARIES PER LIFT STATION SITE.

16 PROVIDE AND INSTALL 2-#12 THWN CU + 1-#12 THWN CU GND IN 3/4"C. TO PUMP CONTROL PANEL FOR AREA LIGHT POWER.

17 PROVIDE AND INSTALL #8 CU BONDING CONDUCTOR.

18 NEW DFS ANTENNA.

19 PROVIDE AND INSTALL COAXIAL CABLE IN 2"C. TO DFS CONTROL CABINET.

20 PROVIDE AND INSTALL 480V, 3-POLE, SOLID NEUTRAL GENERATOR DOCKING STATION IN WEATHERPROOF ENCLOSURE. REFER TO EQUIPMENT SCHEDULE FOR SIZE/TYPE REQUIRED.

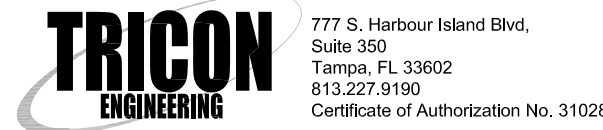
21 2-#12 THWN + 1-#12 THWN CU GND IN 3/4" C. TO WET WELL LIGHT. 3/4" CONDUIT SHALL BE A CONTINUOUS RUN OF RIGID ALUMINUM CONDUIT. THE RIGID ALUMINUM CONDUIT EXTENDING BELOW GRADE SHALL BE COATED WITH TWO COATS OF AN ASPHALTUM-TYPE PAINT ALONG ITS ENTIRE LENGTH BELOW GRADE, EXTENDING 6" ABOVE GRADE (OR ABOVE THE TOP OF THE FINISHED SLAB) AND IN ITS ENTIRETY WITHIN THE WET WELL.

22 PROVIDE AND INSTALL 3/4" EYS SEAL FOR CONDUIT TO WET WELL FOR WET WELL LIGHT

GENERAL NOTES:

1. NOT ALL CONDUITS AND CONDUCTORS REQUIRED SHOWN FOR CLARITY. REFERENCE OTHER SHEETS FOR ADDITIONAL REQUIREMENTS.

TIMOTHY THOMAS P.E. No. 47079



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REVIEWED BY:				
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APPROVED BY:				
CITY ENGINEER MICHAEL D. QUILLLEN, P.E. # 33721	DATE			

CITY OF CLEARWATER, FLORIDA
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100 S. MYRTLE AVE.
CLEARWATER, FL 33756



TYPICAL LIFT STATION
ONE LINE DIAGRAMS

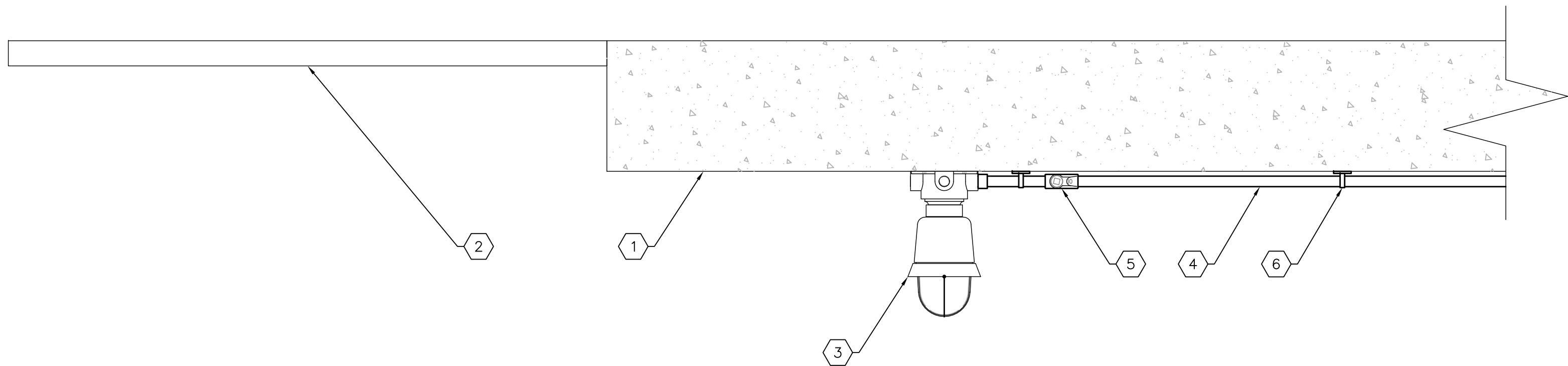
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CONTRACT NO.: ###	DATE DRAWN: ###	DRAWN BY: JLH	HORIZ. N/A
JOB NO.: 22609.19	DESIGNED BY: TDT	CHECKED BY: GLW	SHEET NO.: 21 OF 28
APPROVED FOR			

EQUIPMENT, CONDUIT AND CONDUCTOR SCHEDULES									
	47 HP STATIONS		88 HP STATIONS		160 HP STATIONS		FROM:	TO:	NOTES:
CONDUIT/CONDUCTORS	CONDUCTORS	CONDUIT	CONDUCTORS	CONDUIT	CONDUCTORS	CONDUIT			
Ⓐ	3-#250 MCM THWN CU + 1-#250 MCM THWN CU NEUTRAL	3" C.	3-#500 MCM THWN CU + 1-250 MCM THWN CU NEUTRAL	4" C.	2 PARALLEL RUNS OF 3-#500 MCM THWN CU + 1-#250 MCM THWN CU NEUTRAL	2 - 4" C.	UTILITY TRANSFORMER	MOTOR CONTROL CENTER	
Ⓑ	3-#250 MCM THWN CU + 1-#250 MCM THWN CU NEUTRAL + 1-#4 THWN CU GND	3" C.	3-#500 MCM THWN CU + 1-250 MCM THWN CU NEUTRAL + 1-1/0 THWN CU GND	4" C.	2 PARALLEL RUNS OF 3-#500 MCM THWN CU + 1-#250 MCM THWN CU NEUTRAL + 1-1/0 THWN CU GND	2 - 4" C.	MOTOR CONTROL CENTER	GENERATOR DOCKING STATION	
Ⓒ	3-#250 MCM THWN CU + 1-#250 MCM THWN CU NEUTRAL + 1-#4 THWN CU GND	3" C.	3-#500 MCM THWN CU + 1-250 MCM THWN CU NEUTRAL + 1-1/0 THWN CU GND	4" C.	2 PARALLEL RUNS OF 3-#500 MCM THWN CU + 1-#250 MCM THWN CU NEUTRAL + 1-1/0 THWN CU GND	2 - 4" C.	MOTOR CONTROL CENTER	GENERATOR SET	
Ⓓ	3-#4 THWN CU + 1-#8 THWN CU GND	3" C.	3-1/0 THWN CU + 1-#6 THWN CU GND	3" C.	3-500 MCM CU + #4 THWN CU GND	4" C.	MOTOR CONTROL CENTER	SUBMERSIBLE PUMP WET WELL JUNCTION BOX	
Ⓔ	SUBMERSIBLE PUMP CABLE PROVIDED BY MANUFACTURER	3" C.	SUBMERSIBLE PUMP CABLE PROVIDED BY MANUFACTURER	3" C.	SUBMERSIBLE PUMP CABLE PROVIDED BY MANUFACTURER	4" C.	SUBMERSIBLE PUMP WET WELL JUNCTION BOX	SUBMERSIBLE PUMP	CONDUIT SIZE TO BE VERIFIED BASED ON SUBMERSIBLE PUMP MOTOR POWER CABLE PROVIDED
MOTOR CONTROL CENTER									
							NOTES:		
Ⓕ	250 AMPERE MAIN CIRCUIT BREAKER		400 AMPERE MAIN CIRCUIT BREAKER		800 AMPERE MAIN CIRCUIT BREAKER		MAIN CIRCUIT BREAKERS SHALL BE 100% RATED.		
Ⓖ	250 AMPERE DOCKING STATION CIRCUIT BREAKER		400 AMPERE DOCKING STATION CIRCUIT BREAKER		800 AMPERE DOCKING STATION CIRCUIT BREAKER		DOCKING STATION CIRCUIT BREAKERS SHALL BE 100% RATED.		
Ⓗ	480V, 250 AMPERE TRANSFER SWITCH		480V, 400 AMPERE TRANSFER SWITCH		480V, 800 AMPERE TRANSFER SWITCH				
Ⓘ	300 AMPERE, 480V, 3-POLE GENERATOR DOCKING STATION		400 AMPERE, 480V, 3-POLE GENERATOR DOCKING STATION		400 AMPERE, 480V, 3-POLE GENERATOR DOCKING STATION				
Ⓙ	480V, 3ø, 4-WIRE 150 KW GENERATOR WITH 250 AMPERE MAIN CIRCUIT BREAKER		480V, 3ø, 4-WIRE 300 KW GENERATOR WITH 400 AMPERE MAIN CIRCUIT BREAKER		480V, 3ø, 4-WIRE 500 KW GENERATOR WITH 800 AMPERE MAIN CIRCUIT BREAKER				
Ⓚ	100 AMP MOTOR CIRCUIT BREAKERS		200 AMP MOTOR CIRCUIT BREAKERS		300 AMP MOTOR CIRCUIT BREAKERS				
Ⓛ	YASKAWA VFD - PW4A088FAA RATED OUTPUT - 88 AMPERES		YASKAWA VFD - PW4A0139FAA RATED OUTPUT - 139 AMPERES		YASKAWA VFD - PW4A0250FAA RATED OUTPUT - 250 AMPERES				
GROUNDING									
							NOTES:		
Ⓜ	1/0 AWG COPPER		1/0 AWG COPPER		2/0 AWG COPPER		GROUNDING GRID CONDUCTOR		
Ⓝ	#2 AWG COPPER		1/0 AWG COPPER		2/0 AWG COPPER		ELECTRICAL SERVICE GROUNDING ELECTRODE CONDUCTOR		

LOAD CALCULATION: 47 HP	
MOTORS:	
PUMP NO. 1:	<u>47</u> HP, <u>480</u> VAC, <u>3</u> ø, <u>62</u> A
PUMP NO. 2:	<u>47</u> HP, <u>480</u> VAC, <u>3</u> ø, <u>62</u> A
PUMP NO. 3:	<u>47</u> HP, <u>480</u> VAC, <u>3</u> ø, <u>62</u> A
MOTOR SUB-TOTAL	<u>186</u> A
+ 25% OF LARGEST MOTOR	<u>15.5</u> A
SUB-TOTAL	<u>201.5</u> A
AUXILIARY EQUIPMENT	<u>10.0</u> A
TOTAL MAXIMUM PHASE AMPERES	<u>211.5</u> A
SERVICE SIZE:	
<u>250</u> A, <u>480</u> VAC, <u>3</u> ø, <u>4</u> - WIRE MINIMUM.	

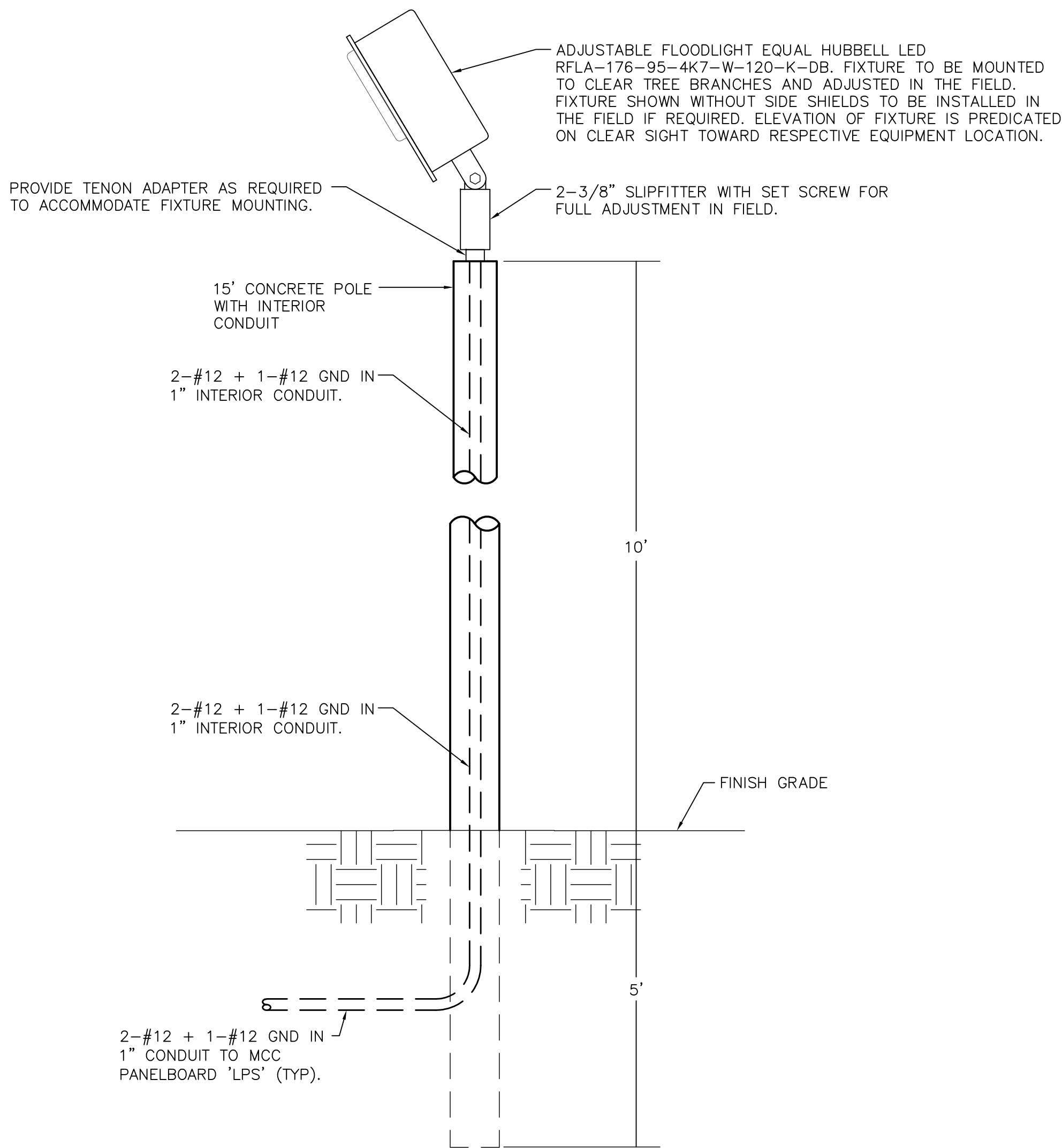
LOAD CALCULATION: 88 HP	
MOTORS:	
PUMP NO. 1:	<u>88</u> HP, <u>480</u> VAC, <u>3</u> ø, <u>112</u> A
PUMP NO. 2:	<u>88</u> HP, <u>480</u> VAC, <u>3</u> ø, <u>112</u> A
PUMP NO. 3:	<u>88</u> HP, <u>480</u> VAC, <u>3</u> ø, <u>112</u> A
MOTOR SUB-TOTAL	<u>336</u> A
+ 25% OF LARGEST MOTOR	<u>28</u> A
SUB-TOTAL	<u>364</u> A
AUXILIARY EQUIPMENT	<u>10.0</u> A
TOTAL MAXIMUM PHASE AMPERES	<u>374.0</u> A
SERVICE SIZE:	
<u>400</u> A, <u>480</u> VAC, <u>3</u> ø, <u>4</u> - WIRE MINIMUM.	

LOAD CALCULATION: 160 HP	
MOTORS:	
PUMP NO. 1:	<u>160</u> HP, <u>480</u> VAC, <u>3</u> ø, <u>228</u> A
PUMP NO. 2:	<u>160</u> HP, <u>480</u> VAC, <u>3</u> ø, <u>228</u> A
PUMP NO. 3:	<u>160</u> HP, <u>480</u> VAC, <u>3</u> ø, <u>228</u> A
MOTOR SUB-TOTAL	<u>684</u> A
+ 25% OF LARGEST MOTOR	<u>57</u> A
SUB-TOTAL	<u>741</u> A
AUXILIARY EQUIPMENT	<u>10.0</u> A
TOTAL MAXIMUM PHASE AMPERES	<u>751.0</u> A
SERVICE SIZE:	
<u>800</u> A, <u>480</u> VAC, <u>3</u> ø, <u>4</u> - WIRE MINIMUM.	



TYPICAL WET WELL LIGHT DETAIL
SCALE: NONE

KEYED NOTES:	
1	UNDERSIDE OF PROPOSED WET WELL SLAB.
2	PROPOSED WET WELL HATCH.
3	PROVIDE AND INSTALL WET WELL LED LIGHT. CROUSE HINDS 120V WITH 19W LED DRIVER. PROVIDE GLOBE AND GUARD, SUITABLE FOR USE IN CLASS 1, DIVISION 1 ENVIRONMENT. UL WET LABEL. CROUSE HINDS MODEL #EVLDBX2C701.
4	2-#12 THWN + 1-#12 THWN CU GND IN 3/4" C. TO WET WELL LIGHT. 3/4" CONDUIT SHALL BE A CONTINUOUS RUN OF RIGID ALUMINUM CONDUIT TO PUMP CONTROL PANEL. THE RIGID ALUMINUM CONDUIT SHALL BE COATED WITH TWO COATS OF AN ASPHALTUM-TYPE PAINT IN ITS ENTIRETY.
5	PROVIDE AND INSTALL 3/4" EYS SEAL.
6	PROVIDE AND INSTALL STAINLESS STEEL CONDUIT STRAPS SECURED WITH STAINLESS STEEL TAPCONS AND STAINLESS STEEL WASHERS.



TYPICAL AREA LIGHT DETAIL
SCALE: NONE

TIMOTHY THOMAS P.E. No. 47079

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ENGINEERING

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Suite 350
Tampa, FL 33602
813.227.9100
Certificate of Authorization No. 31028

DWG NAME: ###	FIELD BOOK: N/A	SURVEYED BY: CLEARWATER	SCALE: VERT. N/A
CONTRACT NO.: ###	DATE DRAWN: ###	DRAWN BY: JLH	HORIZ. N/A
JOB NO.: 22609.19	DESIGNED BY: TDT	CHECKED BY: GLW	SHEET NO.: 23 OF 28
APPROVED FOR _____			

RECORD DRAWINGS				
SURVEYED BY:	DRAWN BY:			
REVIEWED BY:				
PROJECT ENGINEER	DATE			
APPROVED BY:				
CITY ENGINEER MICHAEL G. QUILLEN, P.E. # 33721	DATE			
REVISION		BY	DATE	

CITY OF CLEARWATER, FLORIDA
ENGINEERING DEPARTMENT
100 S. MYRTLE AVE.
CLEARWATER, FL 33756

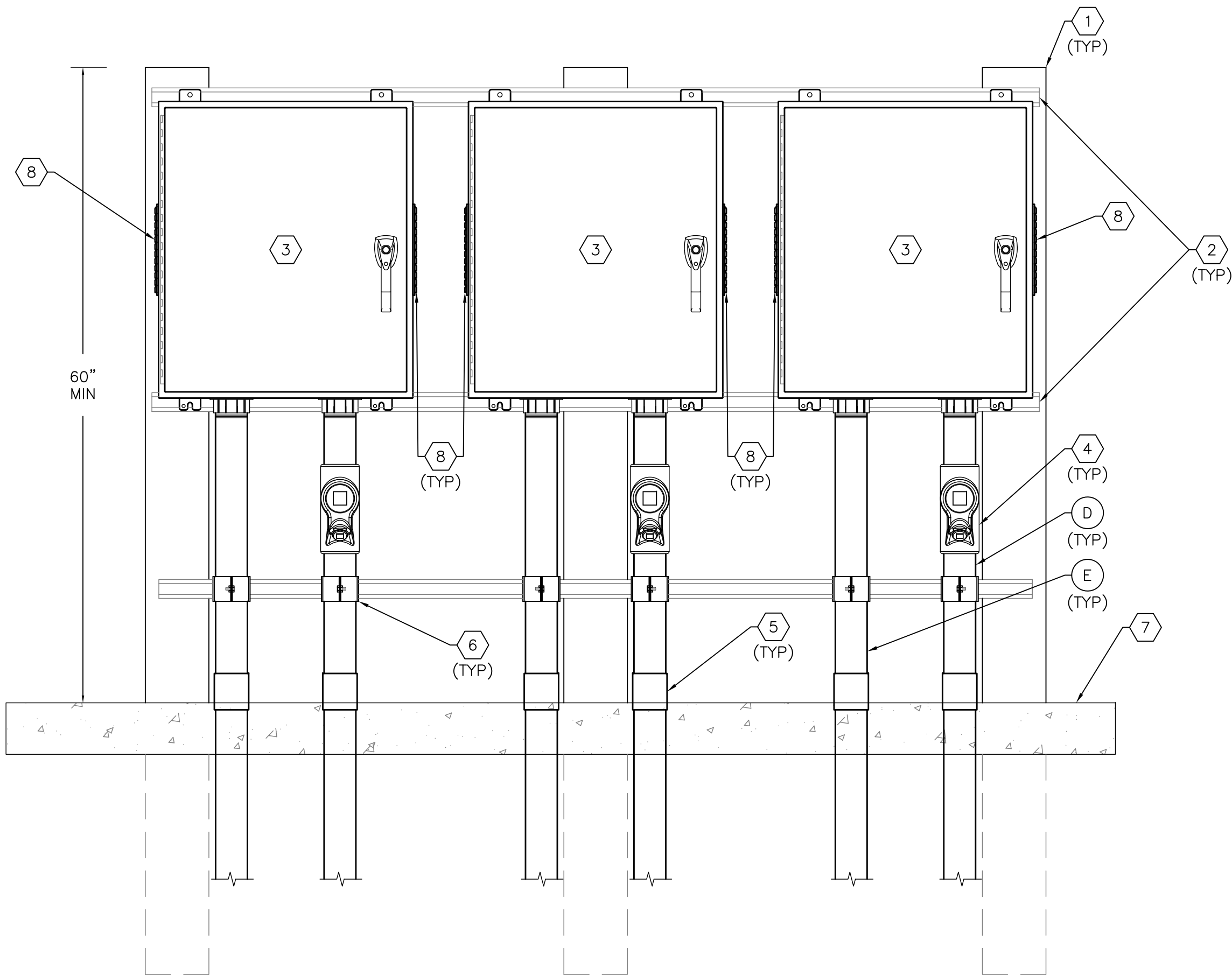
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TYPICAL LIFT STATION
ELECTRICAL DETAILS

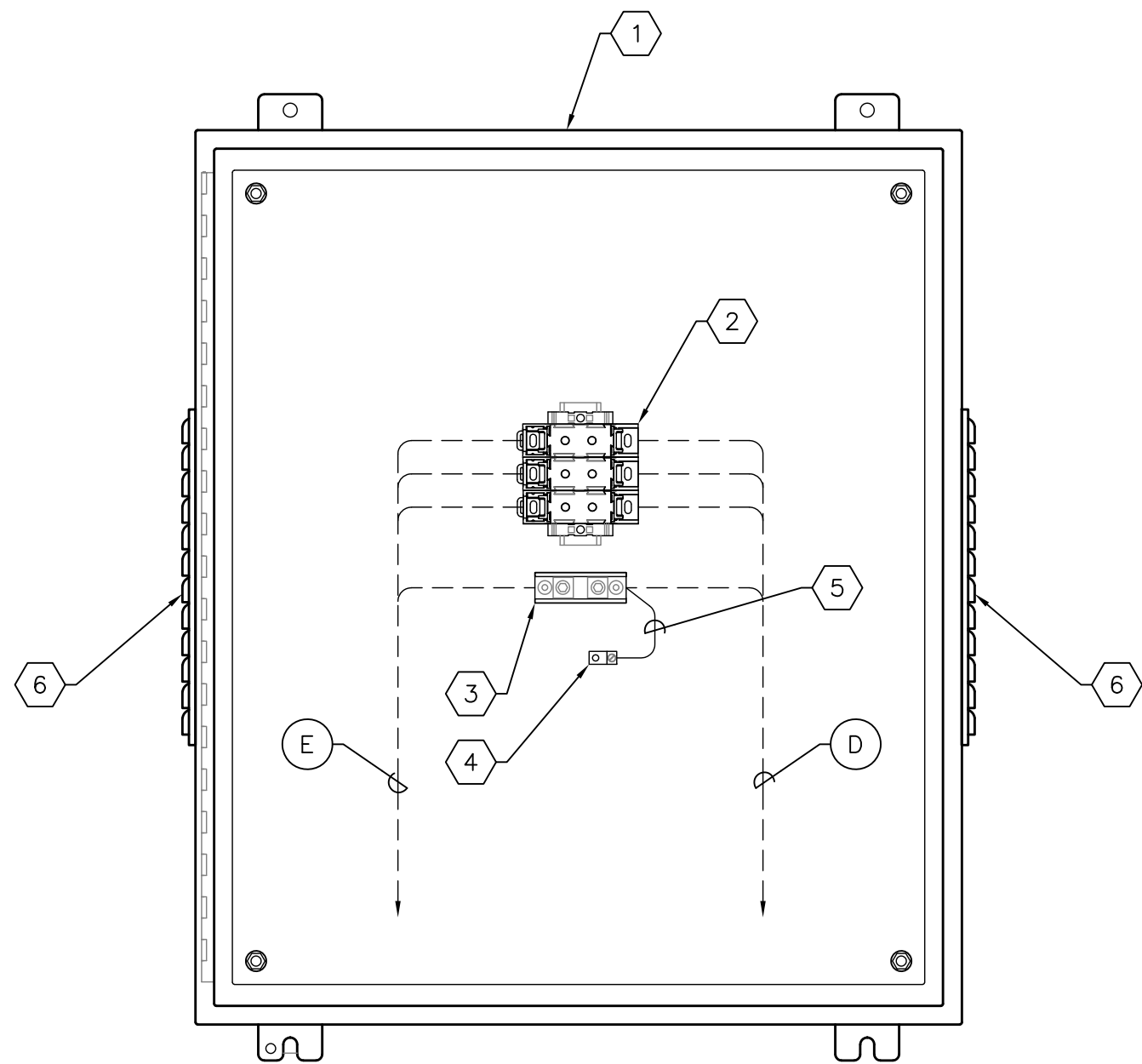
DWG NAME: ###	FIELD BOOK: N/A	SURVEYED BY: CLEARWATER	SCALE: VERT. N/A
CONTRACT NO.: ###	DATE DRAWN: ###	DRAWN BY: JLH	HORIZ. N/A
JOB NO.: 22609.19	DESIGNED BY: TDT	CHECKED BY: GLW	SHEET NO.: 23 OF 28
APPROVED FOR _____			



TYPICAL WET WELL JUNCTION BOX RACK DETAIL
SCALE: NONE

KEYED NOTES:

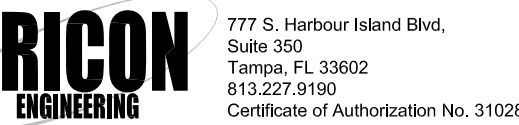
- 1 PROVIDE AND INSTALL 6" X 6" REINFORCED SQUARE CONCRETE POSTS. LENGTH AS REQUIRED. BURY POSTS TO A DEPTH OF 3'-0".
- 2 PROVIDE AND INSTALL 1-5/8" x 1-5/8" 316 STAINLESS STEEL UNISTRUT WITH 316 STAINLESS STEEL HARDWARE. NOTE: INSTALL ALL BOLTS FOR UNISTRUT COMPLETELY THROUGH CONCRETE POSTS. PROVIDE END CAPS FOR UNISTRUT.
- 3 PUMP MOTOR CONNECTIONS JUNCTION BOX USED AS A DEMARCATION BOX TO PROVIDE ISOLATION BETWEEN THE WET WELL AND MOTOR CABLE. PROVIDE AND INSTALL A 24" x 24" x 8" NEMA 4X, STAINLESS STEEL JUNCTION BOX WITH HINGED DOOR, HAMMOND HW2424BS16 HK WITH BACK PANEL 18P2121. REFER ALSO TO JUNCTION BOX DETAIL ON THIS SHEET.
- 4 PROVIDE AND INSTALL CROUSE-HINDS EYS TYPE SEAL W/CHICO COMPOUNDS. EYS SIZE TO MATCH REQUIRED CONDUIT.
- 5 TRANSITION FROM PVC CONDUIT (BELOW GRADE) TO RIGID ALUMINUM CONDUIT (ABOVE GRADE).
- 6 PROVIDE AND INSTALL ALUMINUM CONDUIT STRAPS (TYPICAL).
- 7 PROPOSED CONCRETE SLAB (TYP).
- 8 PROVIDE AND INSTALL LOUVER. WIEGMANN WAWK0808SSA (10.56"H x 9.5"W) FABRICATED FROM 316 STAINLESS STEEL. PROVIDE WIEGMANN WAFLT88 FILTER KIT FOR LOUVER.



TYPICAL WET WELL JUNCTION BOX DETAIL
SCALE: NONE

KEYED NOTES:

- 1 PUMP MOTOR CONNECTIONS JUNCTION BOX USED AS A DEMARCATION BOX TO PROVIDE ISOLATION BETWEEN THE WET WELL AND MOTOR CABLE. PROVIDE AND INSTALL A 24" x 24" x 8" NEMA 4X, STAINLESS STEEL JUNCTION BOX WITH HINGED DOOR, HAMMOND HW2424BS16 HK WITH BACK PANEL 18P2121. REFER ALSO TO JUNCTION BOX DETAIL ON THIS SHEET.
- 2 PROVIDE AND INSTALL THREE (3) FINGER-SAFE POWER DISTRIBUTION BLOCKS. BUSSMANN PDBFS204 FOR 47 HP AND 88 HP STATIONS. BUSSMANN PDBFS303 FOR 160 HP STATIONS.
- 3 PROVIDE AND INSTALL POWER DISTRIBUTION BLOCK FOR GROUND CONDUCTORS. BUSSMANN 16204.
- 4 PROVIDE AND INSTALL GROUND LUG FOR #8 AWG BONDING CONDUCTOR.
- 5 PROVIDE AND INSTALL #8 AWG BONDING CONDUCTOR.
- 6 PROVIDE AND INSTALL LOUVER. WIEGMANN WAWK0808SSA (10.56"H x 9.5"W) FABRICATED FROM 316 STAINLESS STEEL. PROVIDE WIEGMANN WAFLT88 FILTER KIT FOR LOUVER.



RECORD DRAWINGS				
SURVEYED BY:	DRAWN BY:			
REVIEWED BY:				
PROJECT ENGINEER	DATE			
APPROVED BY:				
CITY ENGINEER MICHAEL G. QUILLIN, P.E. # 33721	DATE			

CITY OF CLEARWATER, FLORIDA
ENGINEERING DEPARTMENT
100 S. MYRTLE AVE.
CLEARWATER, FL 33756



TYPICAL LIFT STATION
ELECTRICAL DETAILS

DWG NAME: ###	FIELD BOOK: N/A	SURVEYED BY: CLEARWATER	SCALE: N/A
CONTRACT NO.: ###	DATE DRAWN: ###	DRAWN BY: JLH	HORIZ: N/A
JOB NO.: 22609.19	DESIGNED BY: TDT	CHECKED BY: GLW	SHEET NO.: 24 OF 28
APPROVED FOR			

POWER CONDUIT AND CABLE SCHEDULE					
CONDUIT No.	QTY/SIZE	NUMBER OF CONDUCTORS/SIZE	FROM	TO	REMARKS
P1	3/4"	2-#12 + 1-#12 GND	PANELBOARD 'LP'	FLOW METER TRANSMITTER	120V POWER FOR FLOW METER TRANSMITTER. COORDINATE CONNECTION REQUIREMENTS WITH FLOW METER MANUFACTURER. 'LP' CIRCUIT 13.
P2	3/4"	2-#12 + 1-#12 GND	PUMP CONTROL PANEL	AREA LIGHT(S)	
P3	3/4"	2-#12 + 1-#12 GND	1ST AREA LIGHT	2ND AREA LIGHT	WHEN REQUIRED.
P4	3/4"	2-#12 + 1-#12 GND	PUMP CONTROL PANEL	WET WELL LIGHT	
P5	3/4"	4-#12 + 4-#12 NEU + 1-#12 GND	PANELBOARD 'LP'	PUMP CONTROL PANEL	120V POWER CIRCUITS FOR RECEPTACLE, LIGHTS AND CONTROLS. 'LP' CIRCUITS 2, 4, 6 AND 8.
P6	1"	6-#12 + 2-#12 NEU + 1-#12 GND	PANELBOARD 'LP'	GENERATOR	POWER FOR GENERATOR BLOCK HEATER, ALTERNATOR HEATER AND BATTERY CHARGER. 'LP' CIRCUITS 5/7, 9 AND 11.
P7	3/4"	2-#12 + 1-#12 GND	PANELBOARD 'LP'	DFS CABINET	120V POWER FOR DFS CABINET. 'LP' CIRCUIT 10.
P8	1-1/4"	COORDINATE WITH UTILITY	UTILITY TRANSFORMER	CT METER	COORDINATE CONDUIT SIZE AND ALL OTHER REQUIREMENTS WITH THE UTILITY.
C1	2"	4-#12 + 1-#12 GND	PUMP CONTROL PANEL	WET WELL JUNCTION BOX	CONDUCTORS FOR FLOATS.
C2	3/4"	4-#12 + 1-#12 GND	ATS	GENERATOR	GENERATOR STOP/START SIGNAL. COUNT INCLUDES SPARES.
C3	1"	16-#12 + 1-#12 GND	ATS	DFS CABINET	SIGNALS FOR ATS IN AUTO, ATS IN MANUAL, SOURCE - UTILITY, SOURCE - GENERATOR, ATS FAIL AND SCADA START GENERATOR. COUNT INCLUDES SPARES.
C4	1"	10-#12 + 1-#12 GND	GENERATOR	DFS CABINET	SIGNALS FOR GENERATOR RUNNING, GENERATOR IN AUTO, GENERATOR IN MANUAL AND GENERATOR FAIL. COUNT INCLUDES SPARES.
C5	3/4"	2/C-#16 TWISTED SHIELDED	PUMP CONTROL PANEL	FLOW METER TRANSMITTER	4-20mA FLOW METER SIGNAL.
C6	3/4"	2-#12 + 1-#12 GND	ATS	DFS CABINET	GENERATOR STOP/START SIGNAL FROM DFS (SCADA REMOTE START SIGNAL).
C7	1"	TWO (2) 2/C-#16 TWISTED SHIELDED	PUMP CONTROL PANEL	DFS CABINET	4-20mA FLOW METER AND LEVEL TRANSMITTER SIGNALS. BOTH CABLES SHALL BE BELDEN 8719.
C8	1"	10-#14 + 1-#14 GND	PUMP CONTROL PANEL	DFS CABINET	12V DC I/O SIGNALS BETWEEN PUMP CONTROL PANEL AND DFS CABINET. REFER TO PUMP CONTROL PANEL SCHEMATIC WIRING DIAGRAMS. COUNT INCLUDES SPARES.
C9		2/C-#16 TWISTED SHIELDED	DFS CABINET	RAIN GAUGE	CABLE BY RAIN GAUGE MANUFACTURER. CABLE NOT SHOWN ON PLANS FOR CLARITY. PROVIDE CABLE GROMMET FOR DFS CABINET.
C10	2"	EMPTY	DFS CABINET	DFS ANTENNA	CONDUIT FOR ANTENNA COAXIAL CABLE. CABLE TO BE INSTALLED BY DFS.
C11	2"	2/C-#16 TWISTED SHIELDED	PUMP CONTROL PANEL	WET WELL JUNCTION BOX	CONDUCTORS FOR LEVEL TRANSMITTER. BELDEN 8719.
C12	2"	FLOAT CABLES SUPPLIED WITH FLOAT	WET WELL JUNCTION BOX	WET WELL	OFF AND HIGH FLOAT CABLES.
C13	2"	CABLE SUPPLIED WITH TRANSMITTER	WET WELL JUNCTION BOX	WET WELL	LEVEL TRANSMITTER CABLE.
C14	3/4"	2/C-#16 TWISTED SHIELDED	DFS CABINET	GENERATOR	4-20mA GENERATOR DIESEL TANK LEVEL SIGNAL.
C15	1-1/2"	SIX (6) 2/C-#16 TWISTED SHIELDED	VFD 1, VFD 2 & VFD 3	DFS CABINET	4-20mA VFD #1 SPEED REFERENCE, VFD #2 SPEED REFERENCE, VFD #3 SPEED REFERENCE, VFD #1 SPEED COMMAND, VFD #2 SPEED COMMAND AND VFD #3 SPEED COMMAND SIGNALS. BELDEN 8719.
C16	1-1/2"	30-#14 + 1-#14 GND	VFD 1, VFD 2 & VFD 3	DFS CABINET	12V DC I/O SIGNALS BETWEEN VFD'S AND DFS CABINET. REFER TO TYPICAL VFD WIRING SCHEMATIC DRAWING. COUNT INCLUDES SPARES.
C17	3/4"	10-#14 + 1-#14 GND	PUMP CONTROL PANEL	VFD 1, VFD 2 & VFD 3	HIGH FLOAT ALARMS TO VFD RUN CIRCUITS.
C18	3/4"	10-#14 + 1-#14 GND	PUMP CONTROL PANEL	DFS CABINET	120V AC I/O SIGNALS BETWEEN PUMP CONTROL PANEL AND DFS CABINET. REFER TO PUMP CONTROL PANEL SCHEMATIC WIRING DIAGRAMS. COUNT INCLUDES SPARES.
C19	3/4"	2-#14 + 1-#14 GND	MOTOR CONTROL CENTER	DFS CABINET	PHASE MONITOR SIGNAL.
C20	1"	8-#14 + 1-#14 GND	DFS CABINET	GENERATOR	I/O SIGNALS BETWEEN GENERATOR AND DFS CABINET FOR LEAK, LOW LOW LEVEL AND HIGH LEVEL ALARM SIGNALS. COUNT INCLUDES SPARES.

PROPOSED PANEL SCHEDULE															
PANEL 'LP' : SQUARE D CO. : 120/208 VOLTS, 3ø, 4W : 100 AMP MAIN : CIRCUIT BREAKER : 42K AIC RATING : INSTALLED IN MCC															
EQUIPMENT SERVED	CIRCUIT BREAKER			KVA/PHASE			CIRC. NO.	CIRC. NO.	KVA/PHASE			CIRCUIT BREAKER			EQUIPMENT SERVED
	POLE	AMPS	FRAME	A	B	C			A	B	C	POLE	AMPS	FRAME	
SPARE	1	20	QOB	0.0			1	2	0.8			1	20	QOB	PUMP CONTROL PANEL REC
SPARE	1	20	QOB		0.0		3	4		1.0		1	20	QOB	PUMP CONTROL PANEL LTS
GENERATOR BLOCK HEATER	1	20	QOB			1.2	5	6			0.4	1	20	QOB	PUMP CONTROL PANEL CNTLS
" "	-	-	-	1.2			7	8	0.4			1	20	QOB	PUMP CONTROL PANEL CNTLS
GENERATOR ALT HEATER	1	20	QOB		0.8		9	10		0.6		1	20	QOB	DFS CABINET
BATTERY CHARGER	1	20	QOB			1.0	11	12				1	20	QOB	SPARE
FLOW METER TRANSMITTER	1	20	QOB	0.2			13	14				1	20	QOB	SPARE
SPACE	--	--	--				15	16				1	20	QOB	SPARE
SPACE	--	--	--				17	18				1	20	QOB	SPARE
SPACE	--	--	--				19	20				--	--	--	SPACE
SPACE	--	--	--				21	22				--	--	--	SPACE
SPACE	--	--	--				23	24				--	--	--	SPACE
SPACE	--	--	--				25	26				--	--	--	SPACE
SPACE	--	--	--				27	28				--	--	--	SPACE
SPACE	--	--	--				29	30				--	--	--	SPACE
SUB-TOTAL KVA				1.4	0.8	2.2				1.2	1.6	0.4			
TOTAL CONNECTED LOAD = 7.6 KVA															
TOTAL DEMAND LOAD = 7.6 KVA															

RECORD DRAWINGS

SURVEYED BY:

DRAWN BY:

REVIEWED BY:

APPROVED BY:

PROJECT ENGINEER

DATE

CITY ENGINEER MICHAEL D. QUILLÉN, P.E. # 33721

DATE

REVISION

BY

DATE

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CONDUIT AND CABLE SCHEDULE
AND PANEL SCHEDULE

DWG NAME: ###

CONTRACT NO.: ###

JOB NO.: 22609.19

APPROVED FOR

FIELD BOOK: N/A

DATE DRAWN: ###

DESIGNED BY: TDT

SURVEYED BY: CLEARWATER

DRAWN BY: JLH

CHECKED BY: GLW

SCALE: VERT. N/A

HORIZ. N/A

SHEET NO.: 25 OF 28

FUNCTION SYMBOL SCHEDULE

IDENTIFICATION LETTERS					
	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION		PROGRAMMER		
C	CONDUCTIVITY			CONTROL	CLOSED
D	DENSITY	DIFFERENTIAL			
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO (FRACTION)			
G	GAGING		GLASS VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW
M	MOTOR	MOMENTARY			MIDDLE, INTERMEDIATE
N	VIBRATION		IGNITOR	ISOLATOR	
O	OPERATION	OFFSET	ORIFICE, RESTRICTION		OPEN
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY, EVENT	INTEGRATE, TOTALIZE	INTEGRATE		
R	RADIATION		RECORD, PRINT		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE	TREND	MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VISCOSITY	VACUUM		VALVE, DAMPER, LOUVER, GATE	
W	WEIGHT, FORCE, TORQUE		WELL		
X	UNCLASSIFIED		UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y				RELAY, COMPUTE, CONVERT	
Z	POSITION			FINAL CONTROL ELEMENT	UNCLASSIFIED

LINE DESIGNATIONS

INSTRUMENTATION SIGNAL _____
ELECTRICAL POWER _____
DATA LINK — D — D —
RADIO LINK — R — R —
FIBER OPTIC DATA — F — F —

MISCELLANEOUS NOTATIONS

S/D = SHUTDOWN
O/R = OVERRIDE
MCS = MASTER CONTROL STATION
VFD = VARIABLE FREQUENCY DRIVE
PCC = PROCESS CONTROL CABINET
LCP = LOCAL CONTROL PANEL
ES = ELECTRICAL SUPPLY (120VAC)

CONTROLLER NOTATION

PV= PROCESS VARIABLE INPUT
SP= SET POINT INPUT
C= CONTROL OUTPUT

EQUIPMENT NOTATION

B = BLOWER OR FAN
E = ENGINE
G = GENERATOR
F = FILTER
GS = GRINDER/SCREEN
K = COMPRESSOR
H = HOIST
ME = MECHANICAL EQUIPMENT
MX = MIXER
P = PUMP
T = TANK OR SUMP

INPUT/OUTPUT NOTATIONS

AI = ANALOG INPUT
AO= ANALOG OUTPUT
DI = DISCRETE INPUT
DO= DISCRETE OUTPUT

HAND SWITCH NOTATION

HOA = HAND-OFF-AUTO
S/S = START/STOP
SEL = SELECTOR
O/C = OPEN/CLOSE
O/O = ON/OFF
LOS = LOCKOUT-START
LOR = LOCAL-OFF-REMOTE
OAC = OPEN-AUTO CLOSE
CAO = CLOSED-AUTO OPEN

VALVE DESIGNATIONS

MOV = MOTOR OPERATED VALVE

GENERAL ABBREVIATIONS

SCADA – SUPERVISORY CONTROL AND DATA ACQUISITION.
PLC – PROGRAMMABLE LOGIC CONTROL
SA – SURGE SUPPRESSOR DEVICE



INTERLOCK



CONTINUATION OF SIGNAL OR DATA TO/FROM SHEET NUMBER INDICATED

BASIC SYMBOLS

SINGLE FUNCTION



OR



OR



OR



OR



OR



OR



OR

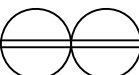


OR

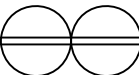
MUTIPLE FUNCTION



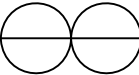
FIELD MOUNTED INSTRUMENT OR DEVICE



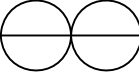
FRONT OF PANEL MOUNTED INSTRUMENT ON LCP, PCC, MCS, OR VFD



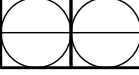
REAR OF PANEL MOUNTED INSTRUMENT ON LCP, PCC, MCS, OR VFD



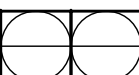
FRONT OF PANEL MOUNTED INSTRUMENT ON MAIN PANEL



REAR OF PANEL MOUNTED INSTRUMENT ON MAIN PANEL



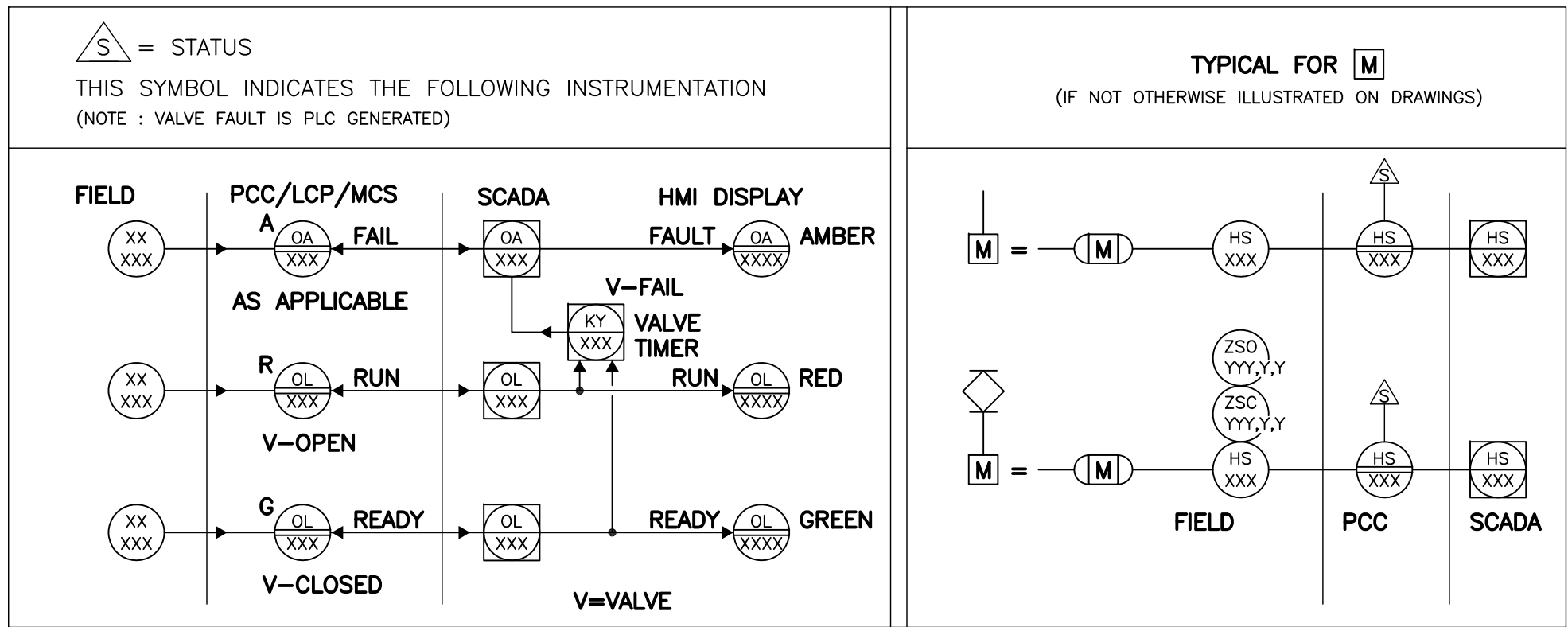
PLC AND/OR COMPUTER SOFTWARE COMPONENT (OPERATOR ACCESSIBLE UNDER NORMAL CONDITIONS) OR



PLC AND/OR COMPUTER GENERATED COMPONENT (NOT OPERATOR ACCESSIBLE UNDER NORMAL CONDITIONS)



DATA FLOW SYSTEMS RTU INPUT/OUTPUT



RECORD DRAWINGS				
SURVEYED BY:	DRAWN BY:			
REVIEWED BY:				
APPROVED BY:				
CITY ENGINEER MICHAEL D. QUILLEN, P.E. # 33721		REVISION	BY	DATE

CITY OF CLEARWATER, FLORIDA
ENGINEERING DEPARTMENT
100 S. MYRTLE AVE.
CLEARWATER, FL 33756



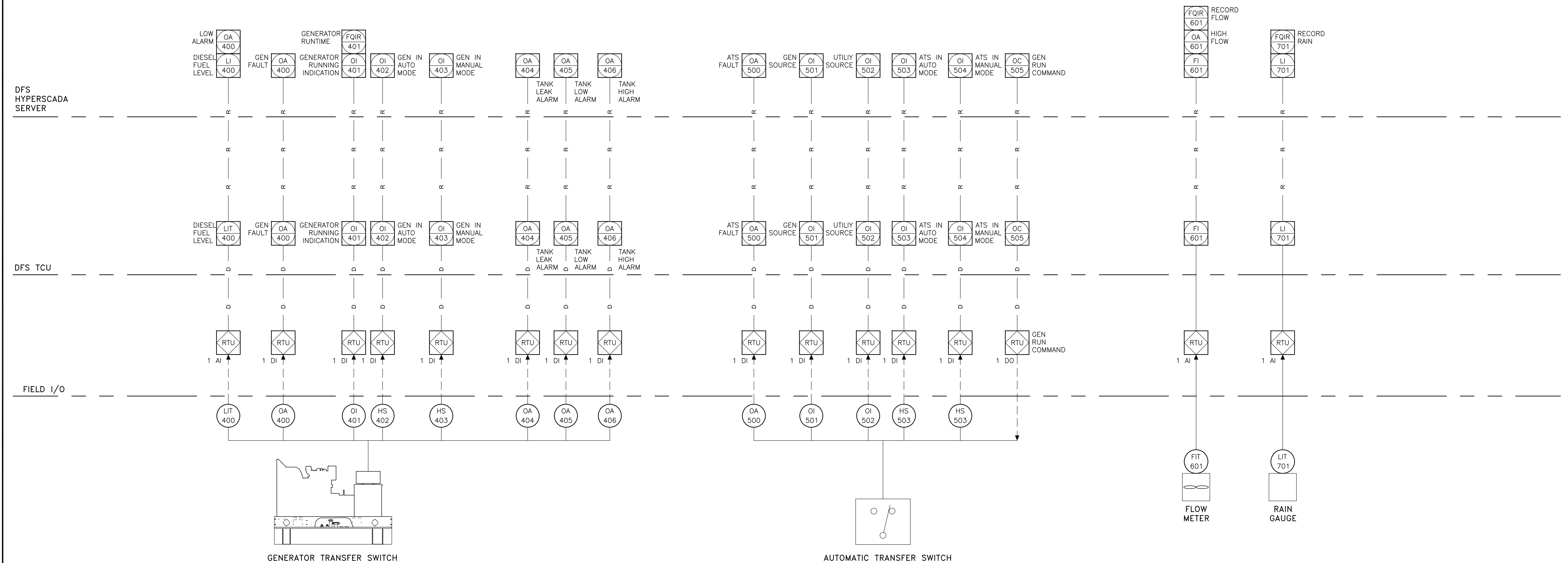
INSTRUMENTATION LEGEND
ABBREVIATIONS AND SYMBOLS

DWG NAME: ###	FIELD BOOK: N/A	SURVEYED BY: CLEARWATER	SCALE: VERT. N/A
CONTRACT NO.: ###	DATE DRAWN: ###	DRAWN BY: JLH	HORIZ. N/A
JOB NO.: 22609.19	DESIGNED BY: TDT	CHECKED BY: GLW	SHEET NO.: 26 OF 28
APPROVED FOR			

TIMOTHY THOMAS P.E. No. 47079

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ENGINEERING

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Tampa, FL 33602
813.227.9100
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RECORD DRAWINGS				
SURVEYED BY:	DRAWN BY:			
REVIEWED BY:				
PROJECT ENGINEER	DATE			
APPROVED BY:				
CITY ENGINEER MICHAEL D. QUILLLEN, P.E. # 33721	DATE			
REVISION		BY	DATE	

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ENGINEERING DEPARTMENT
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P&ID'S

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CONTRACT NO.: ###	DATE DRAWN: ###	DRAWN BY: JLH	HORIZ. N/A
JOB NO.: 22609.19	DESIGNED BY: TDT	CHECKED BY: GLW	SHEET NO.: 28 OF 28
APPROVED FOR			

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