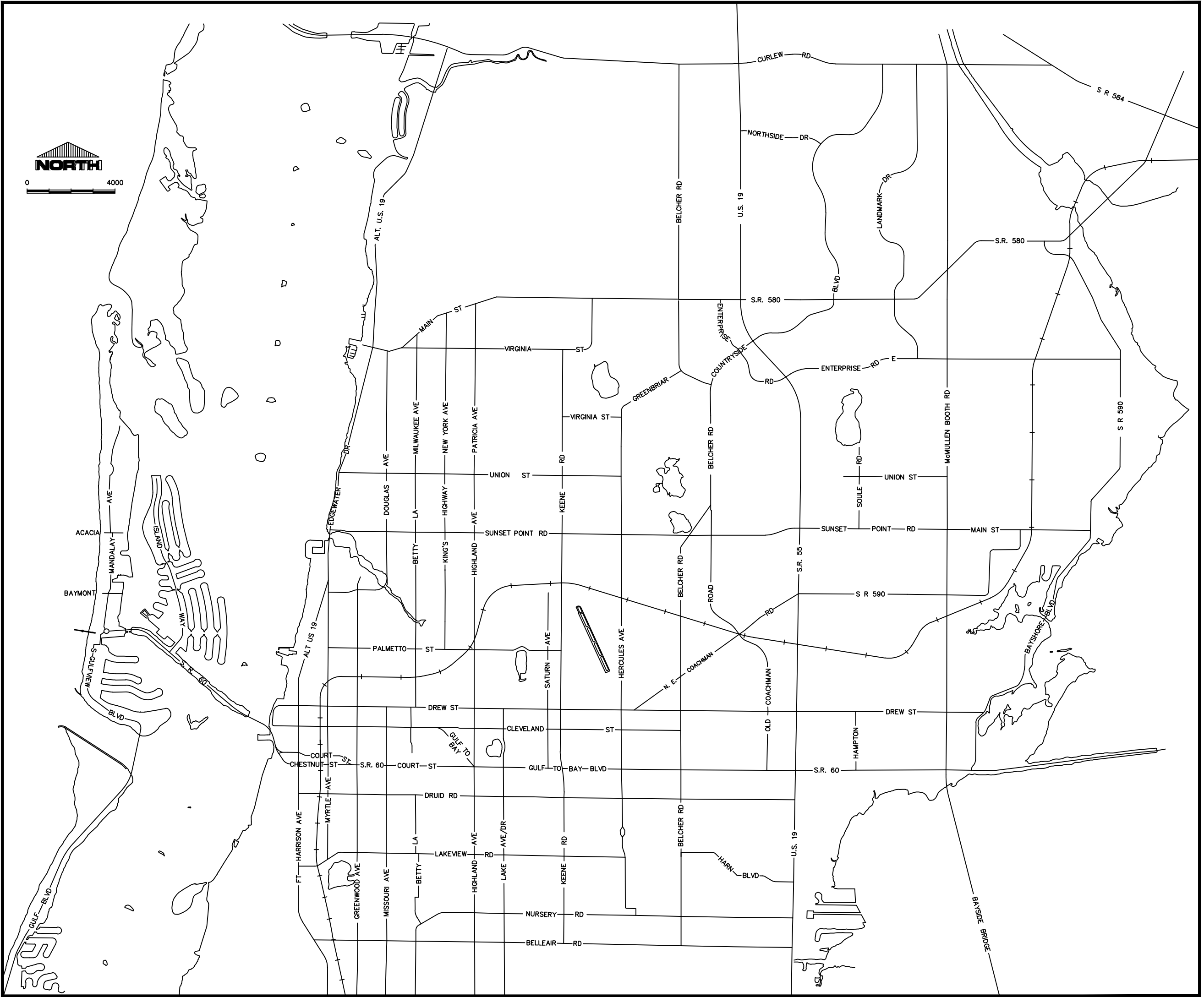


SHEET INDEX

SHEET #	SHEET DESCRIPTION
1	COVER SHEET
2	480V 3-PHASE, DUPLEX PUMP LIFT STATION 47 TO 88 HP ELECTRICAL STANDARDS WITH VFDs
3	480V 3-PHASE, DUPLEX PUMP LIFT STATION EQUIPMENT RACK ELEVATION
4	480V 3-PHASE, TRIPLEX PUMP LIFT STATION EQUIPMENT RACK ELEVATION
5	TYPICAL MCC WIRING SCHEMATIC
6	TYPICAL VFD WIRING SCHEMATIC
7	TYPICAL PUMP CONTROL PANEL DETAILS
8	TYPICAL PUMP CONTROL PANEL SCHEMATIC WIRING DIAGRAM
9	TYPICAL PUMP CONTROL PANEL SCHEMATIC WIRING DIAGRAMS
10	TYPICAL DFS CABINET SCHEMATIC WIRING DIAGRAM
11	TYPICAL DFS CABINET SCHEMATIC WIRING DIAGRAM
12	TYPICAL DFS CABINET SCHEMATIC WIRING DIAGRAM
13	TYPICAL DFS CABINET SCHEMATIC WIRING DIAGRAM
14	TYPICAL DFS CABINET SCHEMATIC WIRING DIAGRAM
15	TYPICAL DFS CABINET SCHEMATIC WIRING DIAGRAM
16	TYPICAL DFS CABINET SCHEMATIC WIRING DIAGRAM
17	TYPICAL DFS CABINET SCHEMATIC WIRING DIAGRAM
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19	TYPICAL DFS CABINET SCHEMATIC WIRING DIAGRAM
20	TYPICAL DFS CABINET SCHEMATIC WIRING DIAGRAM
21	TYPICAL LIFT STATION ONE LINE DIAGRAMS
22	ELECTRICAL SCHEDULES AND LOAD CALCULATIONS
23	TYPICAL LIFT STATION ELECTRICAL DETAILS
24	TYPICAL LIFT STATION ELECTRICAL DETAILS
25	CONDUIT AND CABLE SCHEDULE AND PANEL SCHEDULE
26	INSTRUMENTATION LEGEND ABBREVIATIONS AND SYMBOLS
27	TYPICAL LIFT STATION P&IDs
28	TYPICAL LIFT STATION P&IDs



PUMP STATION STANDARD ELECTRICAL DETAILS 480V 3-PH PUMP 47 TO 88 HP



CITY OFFICIALS

Frank Hibbard	Mayor
Mark Bunker	Councilmember
Kathleen Beckman	Councilmember
David Allbritton	Councilmember
Hoyt Hamilton	Councilmember
William B. Horne II	City Manager

Tara Kivett, P.E.
City Engineer

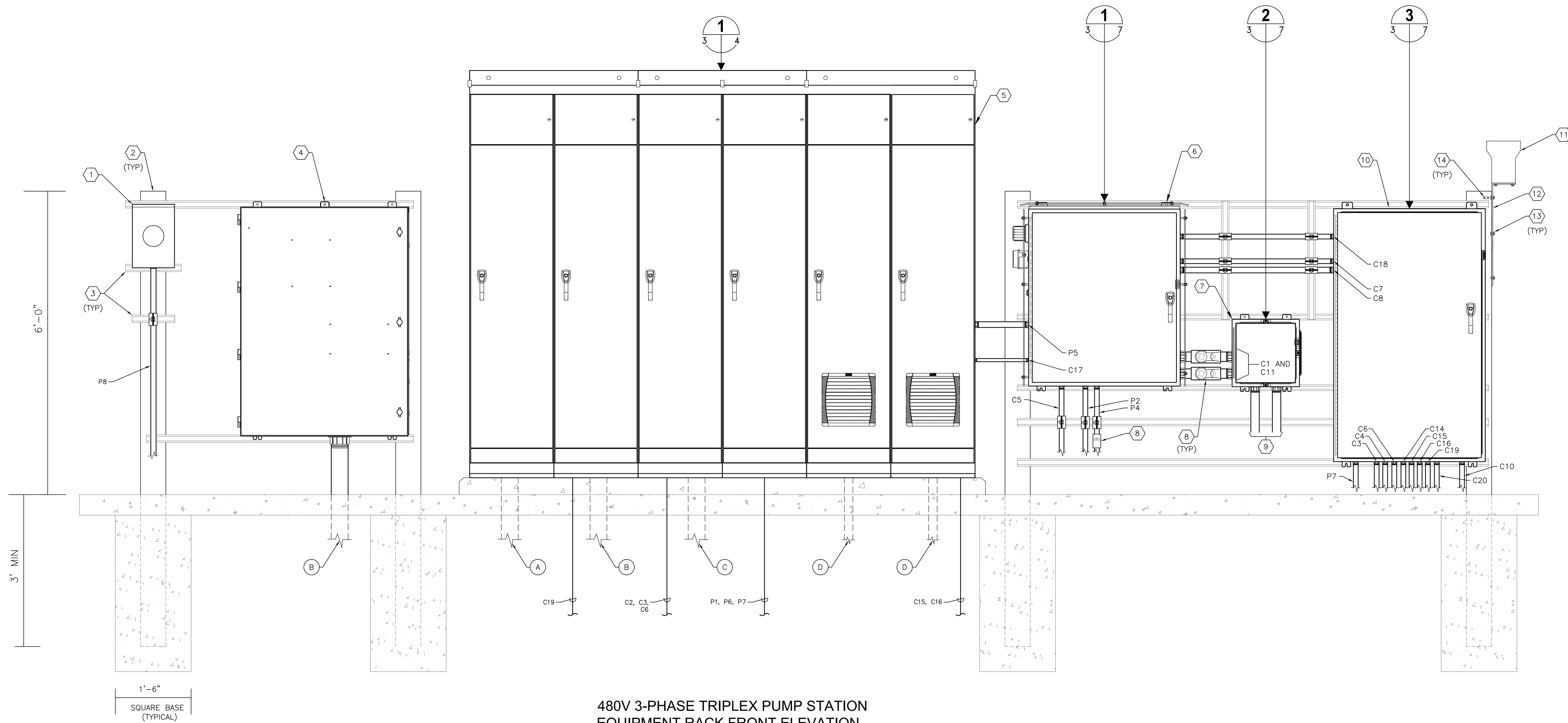
Approved For
Construction

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

Date Approved

100% PLANS PRELIMINARY

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



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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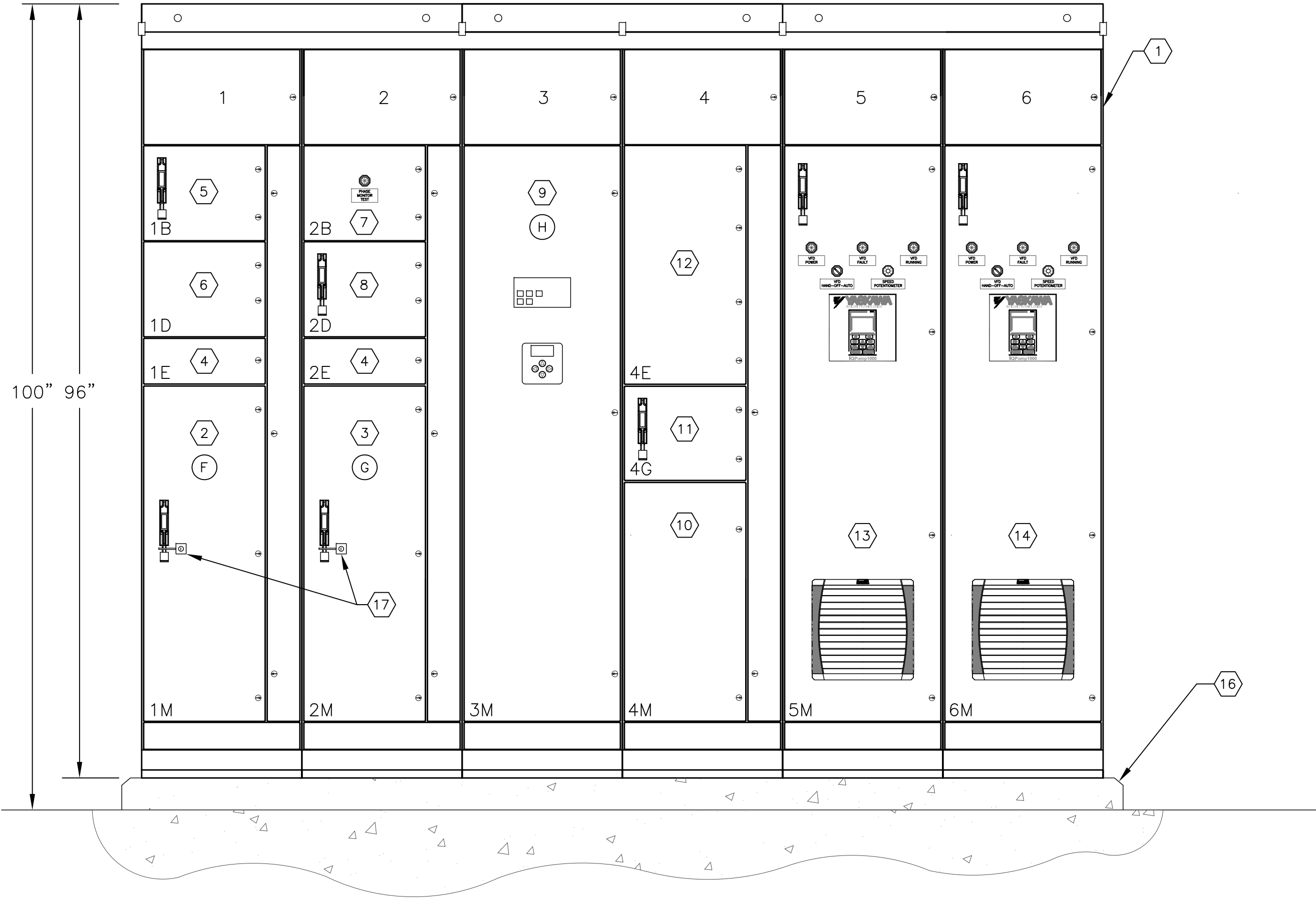
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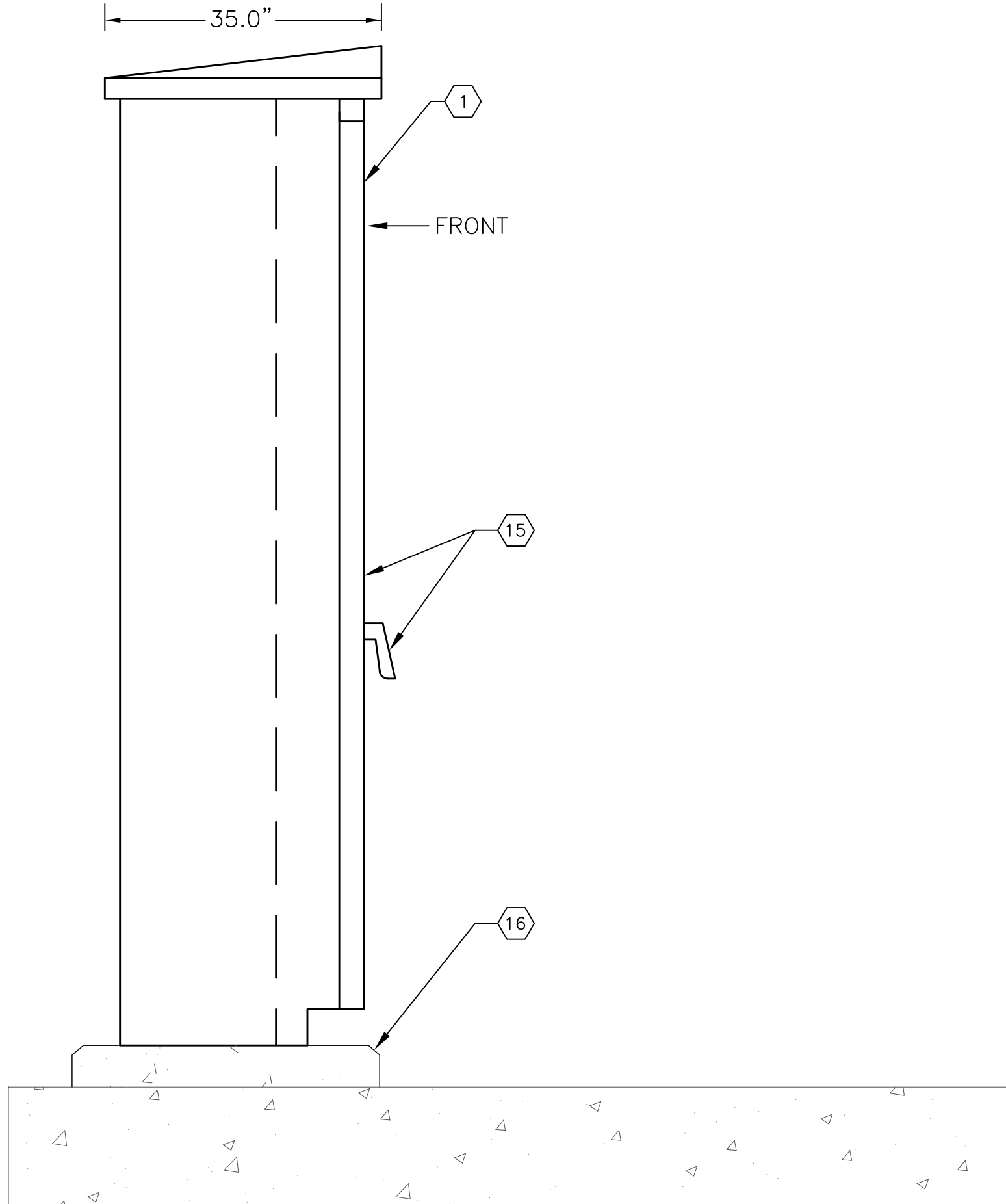


480V 3-PHASE, DUPLEX PUMP LIFT STATION EQUIPMENT RACK ELEVATION

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
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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, 3 ϕ , 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, 3 ϕ , 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 | PROVIDE GASKETED RAIN TIGHT DOOR WITH LOCKING HANDLE. |
| 7 | CUBICLE FOR PHASE MONITORING EQUIPMENT AND TEST PUSHBUTTON. | 16 | PROVIDE 4" CONCRETE HOUSKEEPING PAD WITH CHAMFERED EDGES. |
| 8 | SPARE 20A, 480V, 3-POLE CIRCUIT BREAKER. | 17 | PROVIDE KIRK-KEY INTERLOCKS FOR MAIN CIRCUIT BREAKER AND GENERATOR RECEPTACLE. |
| 9 | 3-POLE, SOLID NEUTRAL AUTOMATIC TRANSFER SWITCH. REFER TO EQUIPMENT SCHEDULE FOR SIZE/TYPE REQUIRED. | | |

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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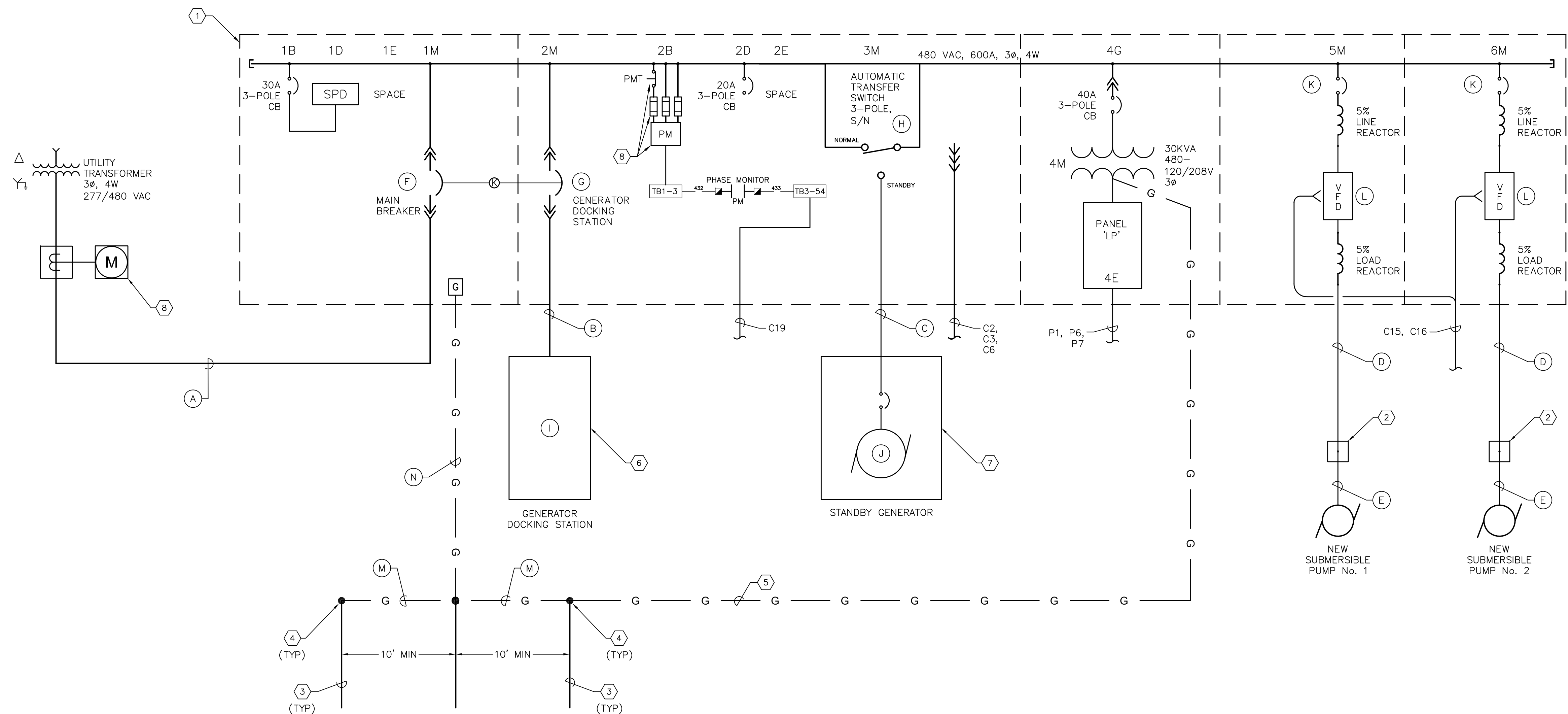


480V 3-PHASE, TRIPLEX PUMP LIFT STATION
EQUIPMENT RACK ELEVATION

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
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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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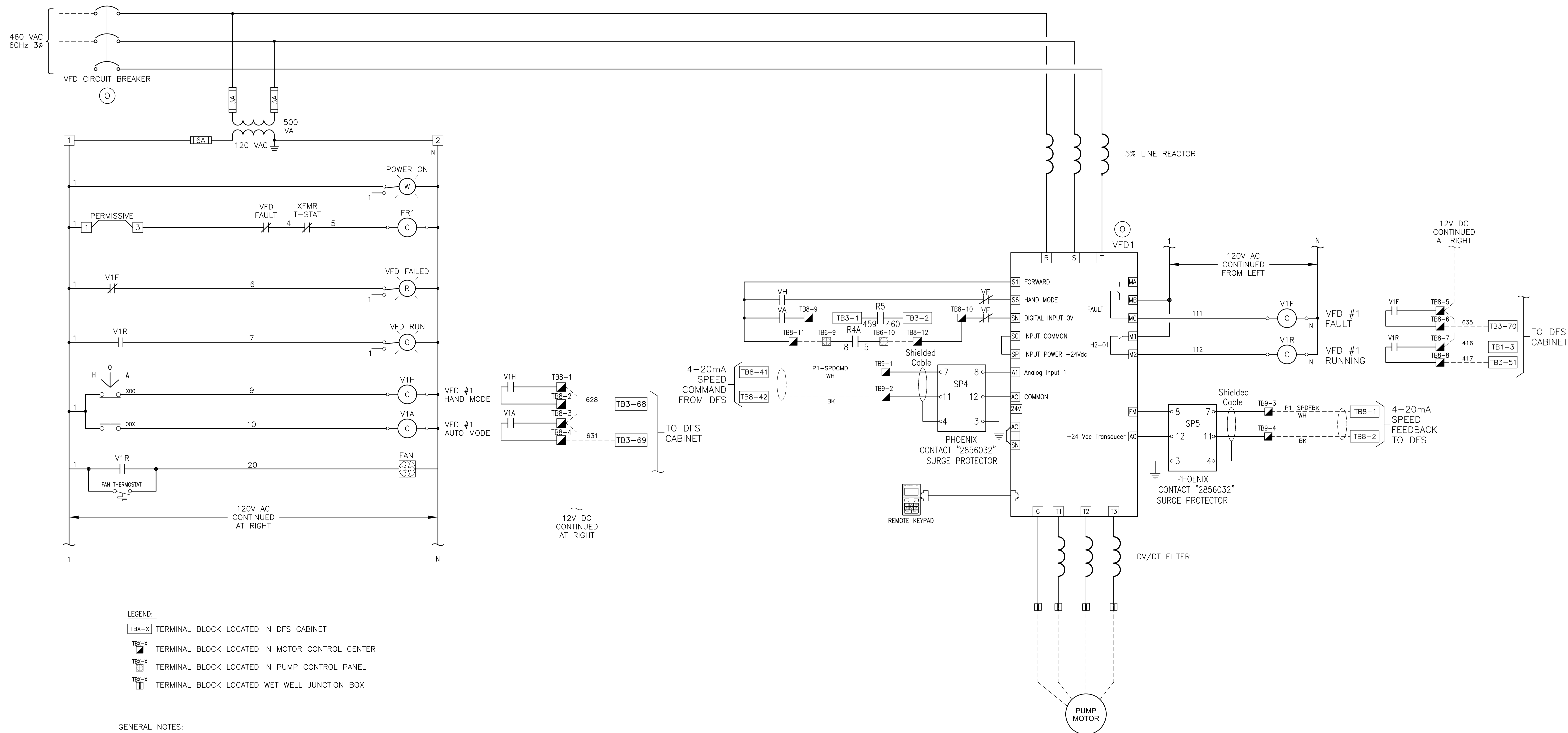
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TYPICAL MCC
WIRING SCHEMATIC

DWG NAME: ###	FIELD BOOK: N/A	SURVEYED BY: CLEARWATER	SCALE: VERT. N/A
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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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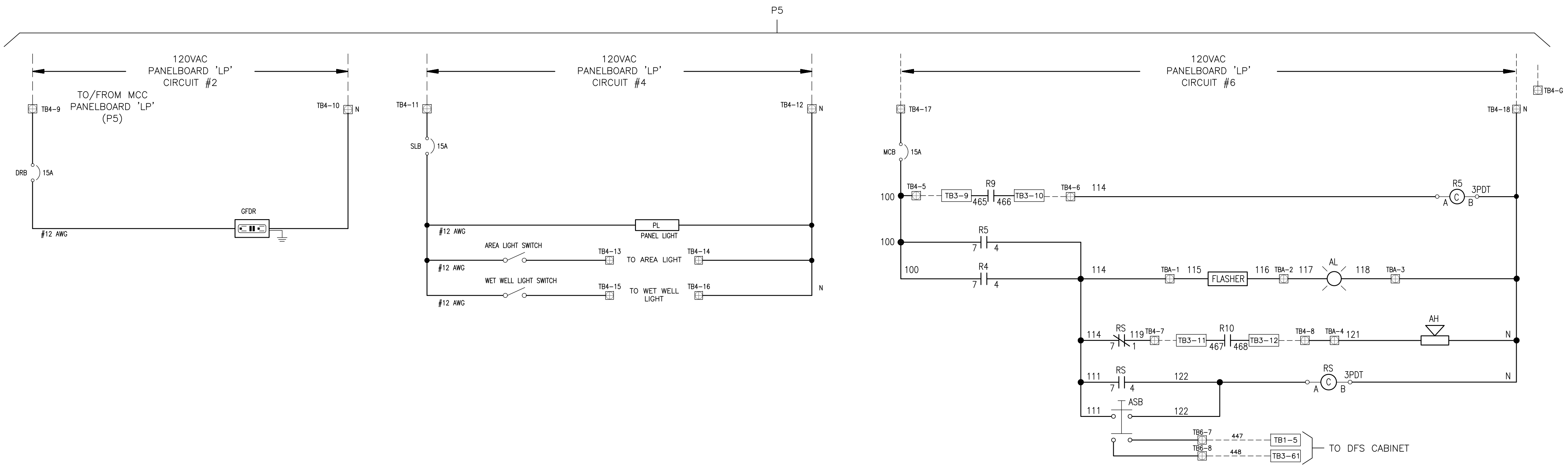
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TYPICAL VFD WIRING SCHEMATIC

DWG NAME: ###	FIELD BOOK: N/A	SURVEYED BY: CLEARWATER	SCALE: VERT. N/A
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- LEGEND**
- AH — ALARM HORN
 - AL — ALARM LIGHT
 - ASB — ALARM SILENCE BUTTON
 - CCB — CONTROL CIRCUIT BREAKER
 - CB — CIRCUIT BREAKER
 - DRB — DUPLEX RECEPTACLE BREAKER
 - ECB — EMERGENCY CIRCUIT BREAKER
 - F — FUSE
 - FB — FUSE BLOCK
 - FL — FLASHER
 - FS — FLOAT SW ITCH
 - GFDR — GROUND FAULT DUPLEX RECEP.
 - GFM — GROUND FAULT MONITOR
 - GR — GENERATOR RECEPTACLE
 - ISB — INTRINSIC SAFE BARRIER
 - ISR — INTRINSIC SAFE RELAY
 - MB — MOTOR BREAKER
 - MCB — MAIN CIRCUIT BREAKER
 - MS — MOTOR STARTER
 - OL — OVERLOAD
 - PM — PHASE MONITOR
 - PMT — PHASE MONITOR TEST
 - PS — POW ER SUPPLY
 - R — RELAY
 - RES — RESISTER
 - SCB — SPARE CIRCUIT BREAKER
 - SLB — SITE LIGHT BREAKER
 - SP — SURGE PROTECTOR
 - TB — TERMINAL BLOCK
 - TCU — TELEMETRY CONTROL UNIT
 - TS — TRANSIENT SUPPRESSOR
 - XFMR — TRANSFORMER
 - 3PDT — THREE-POLE, DOUBLE-THROW

- 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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TYPICAL PUMP CONTROL PANEL
SCHEMATIC WIRING DIAGRAM

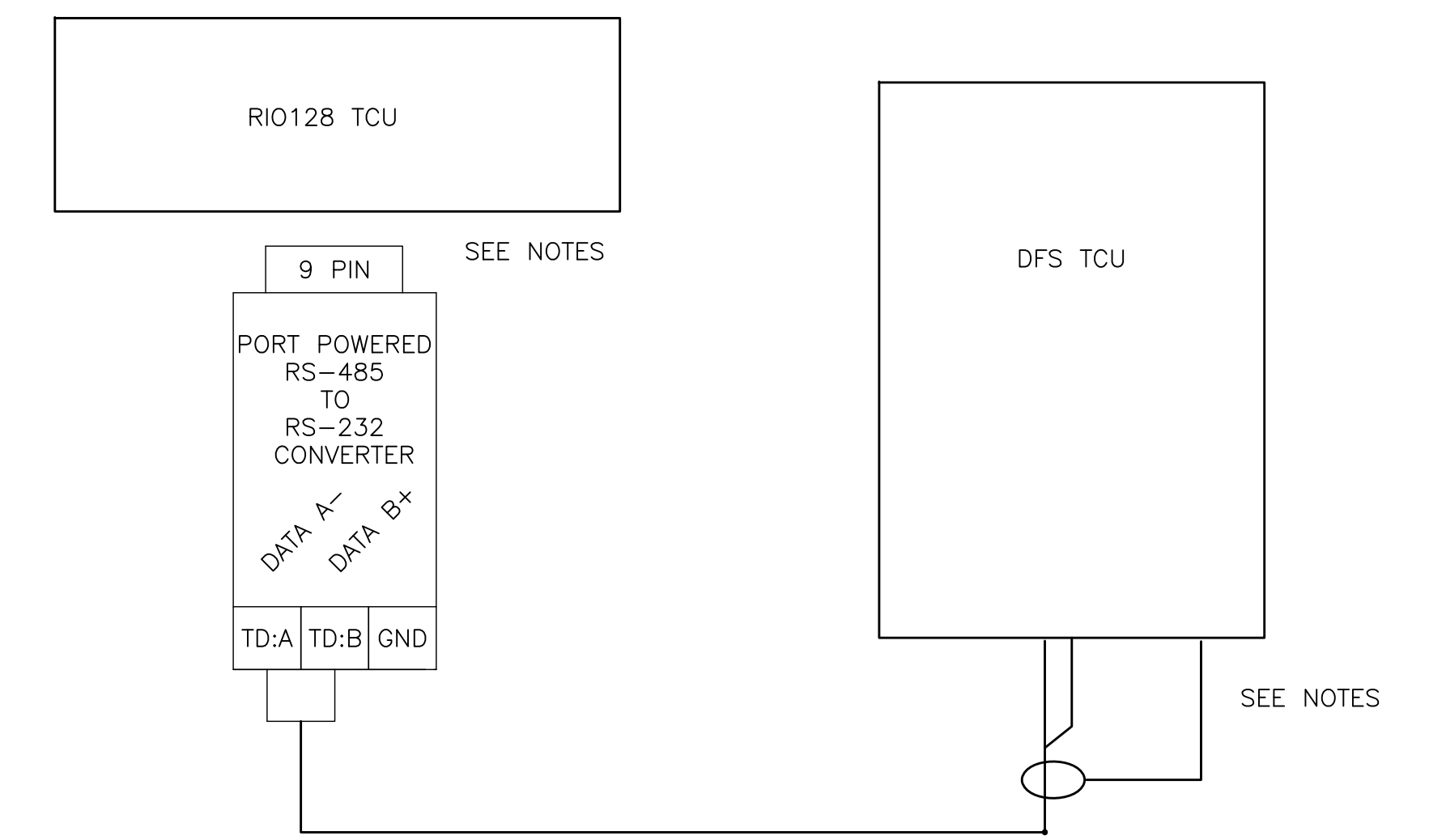
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APPROVED FOR:

FIELD BOOK: N/A
DATE DRAWN: N/A
DRAWN BY: JLH
SHEET NO.: 8 OF 28

SURVEYED BY: CLEARWATER
SCALE: VERT. N/A
HORIZ. N/A



- 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 FOR LOW 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 TD:B (DATA B+) TERMINATES TO TCU CONNECTOR P4-3
 - (3) RS-485 TERMINAL BLOCK TD:A (DATA A-) TERMINATES TO TCU CONNECTOR P4-4
 - (4) TERMINATE THE SHIELD OF THE COMMUNICATION CABLE TO TCU CONNECTOR P4-5

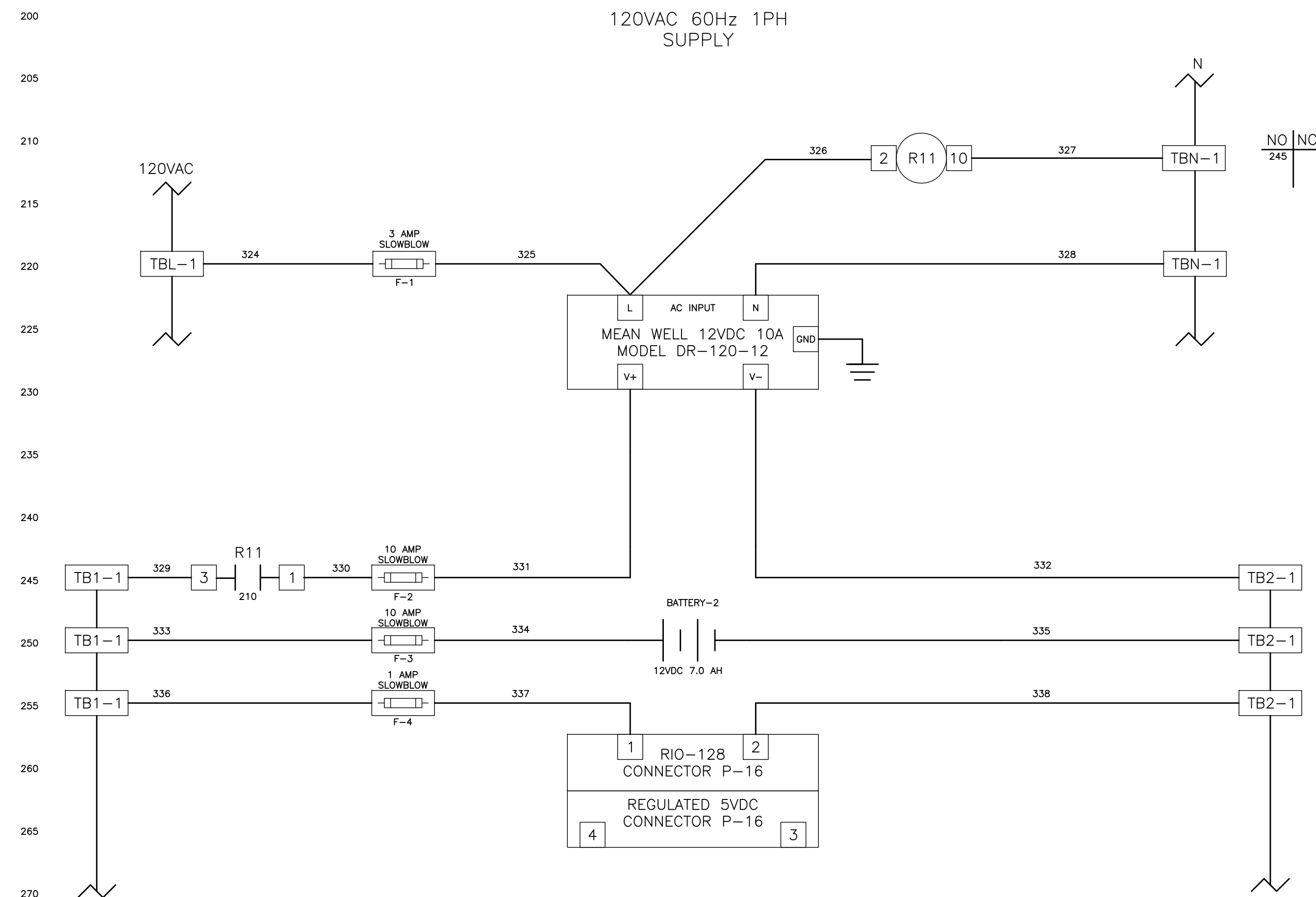
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TYPICAL DFS CABINET SCHEMATIC WIRING DIAGRAM

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JOB NO.: 22609.19	DATE DRAWN: ##### DESIGNED BY: TDT	DRAWN BY: JLH	HORIZ. N/A
APPROVED FOR		CHECKED BY: GLW	SHEET NO. 10 OF 28



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 - - - - -

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.

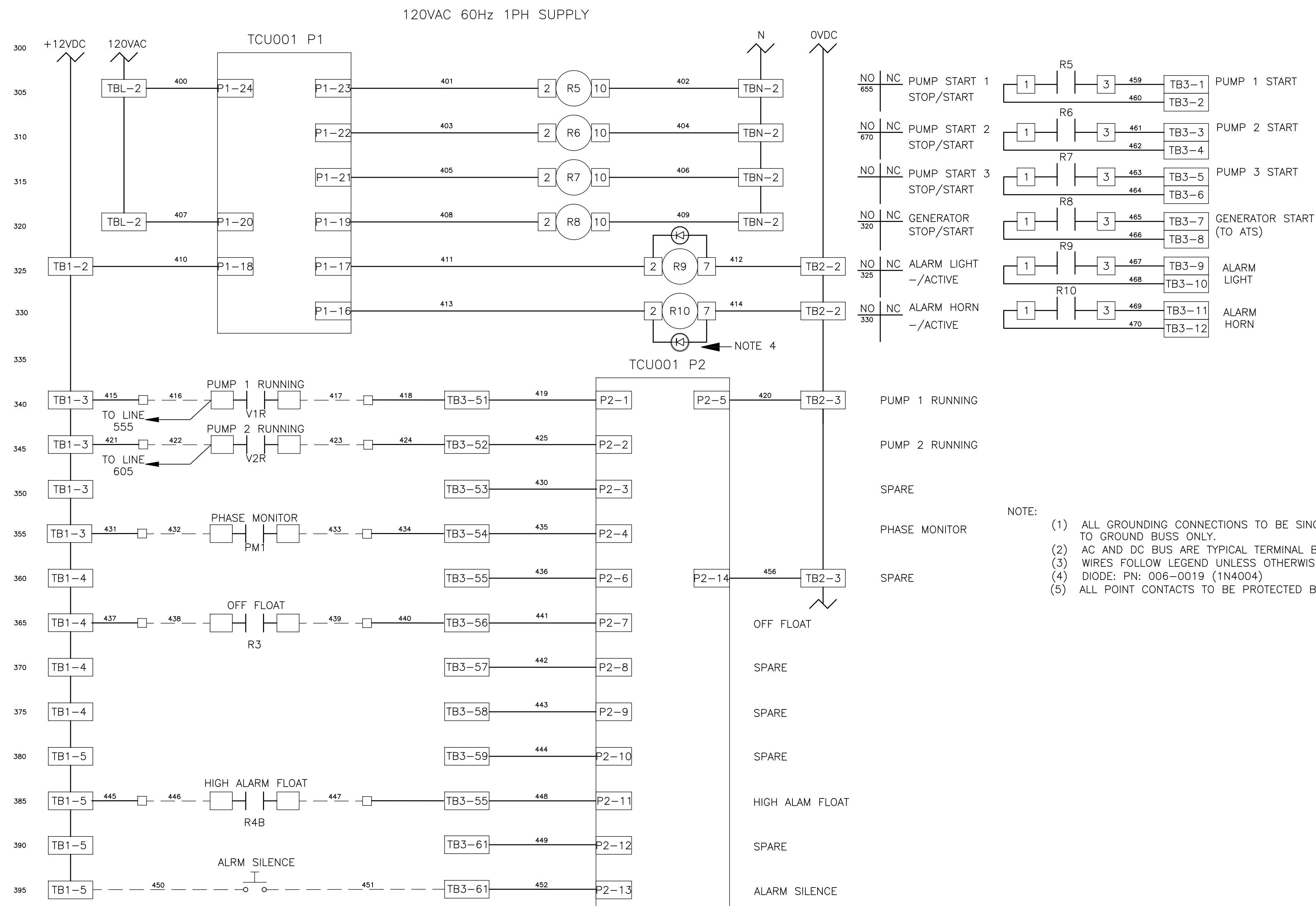
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100 S. MYRTLE AVE.
CLEARWATER, FL 33756



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
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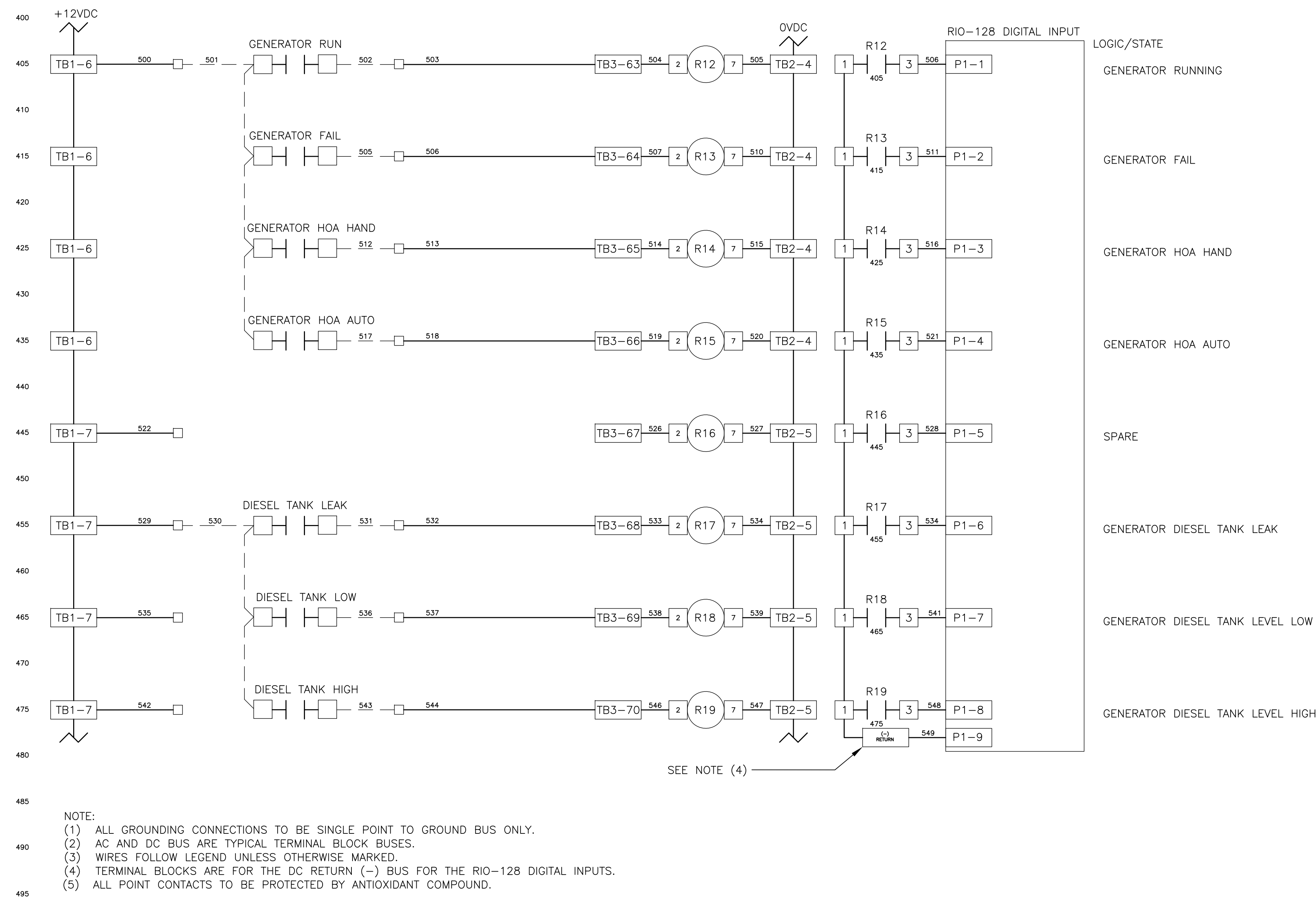
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100 S. MYRTLE AVE.
CLEARWATER, FL 33756



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
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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 - - - - -

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APPROVED FOR			

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

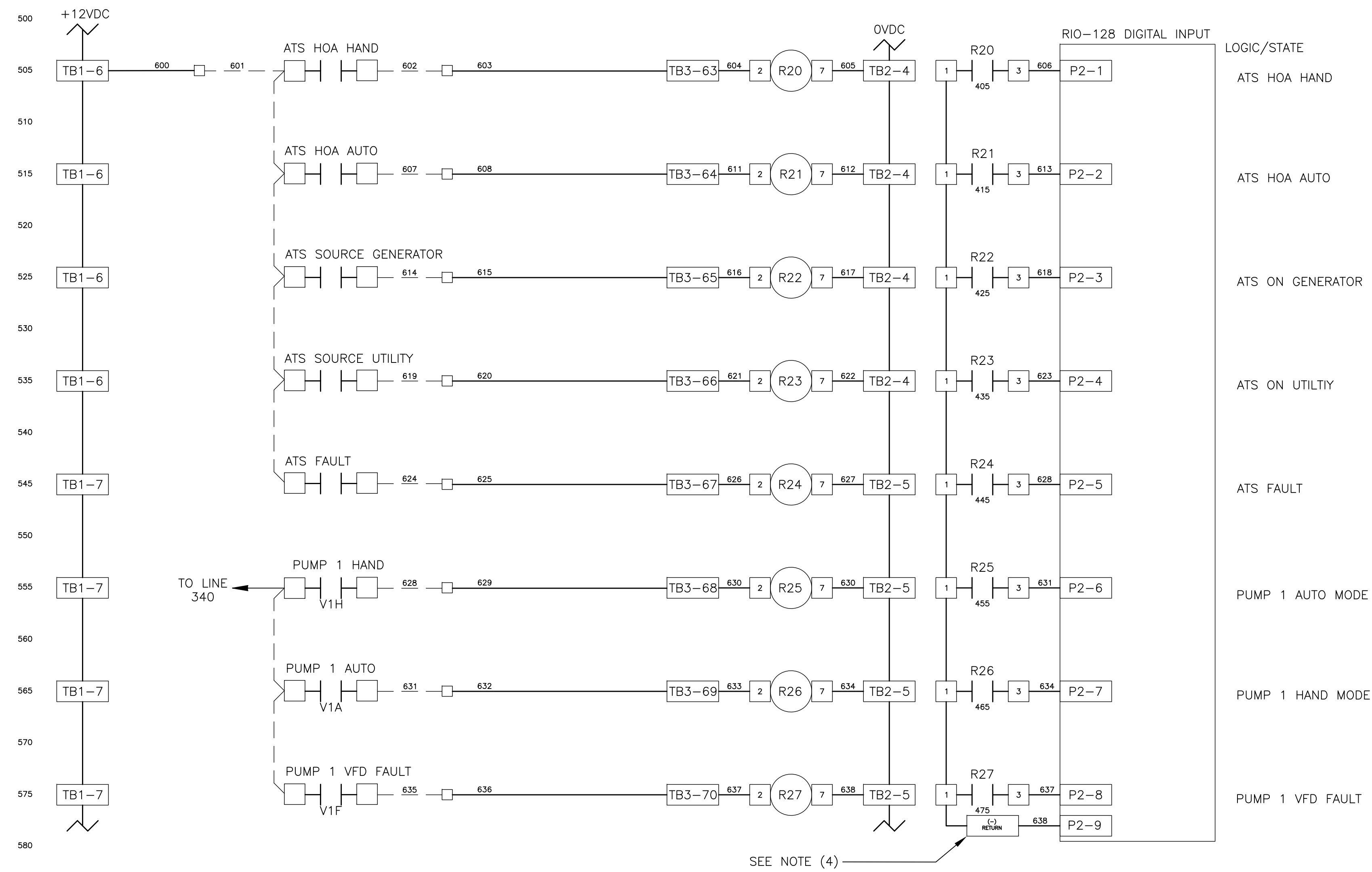
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TYPICAL DFS CABINET
SCHEMATIC WIRING DIAGRAM



LOGIC/STATE

ATS HOA HAND

ATS HOA AUTO

ATS ON GENERATOR

ATS ON UTILITY

ATS FAULT

PUMP 1 AUTO MODE

PUMP 1 HAND MODE

PUMP 1 VFD FAULT

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 - - - - -

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.

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

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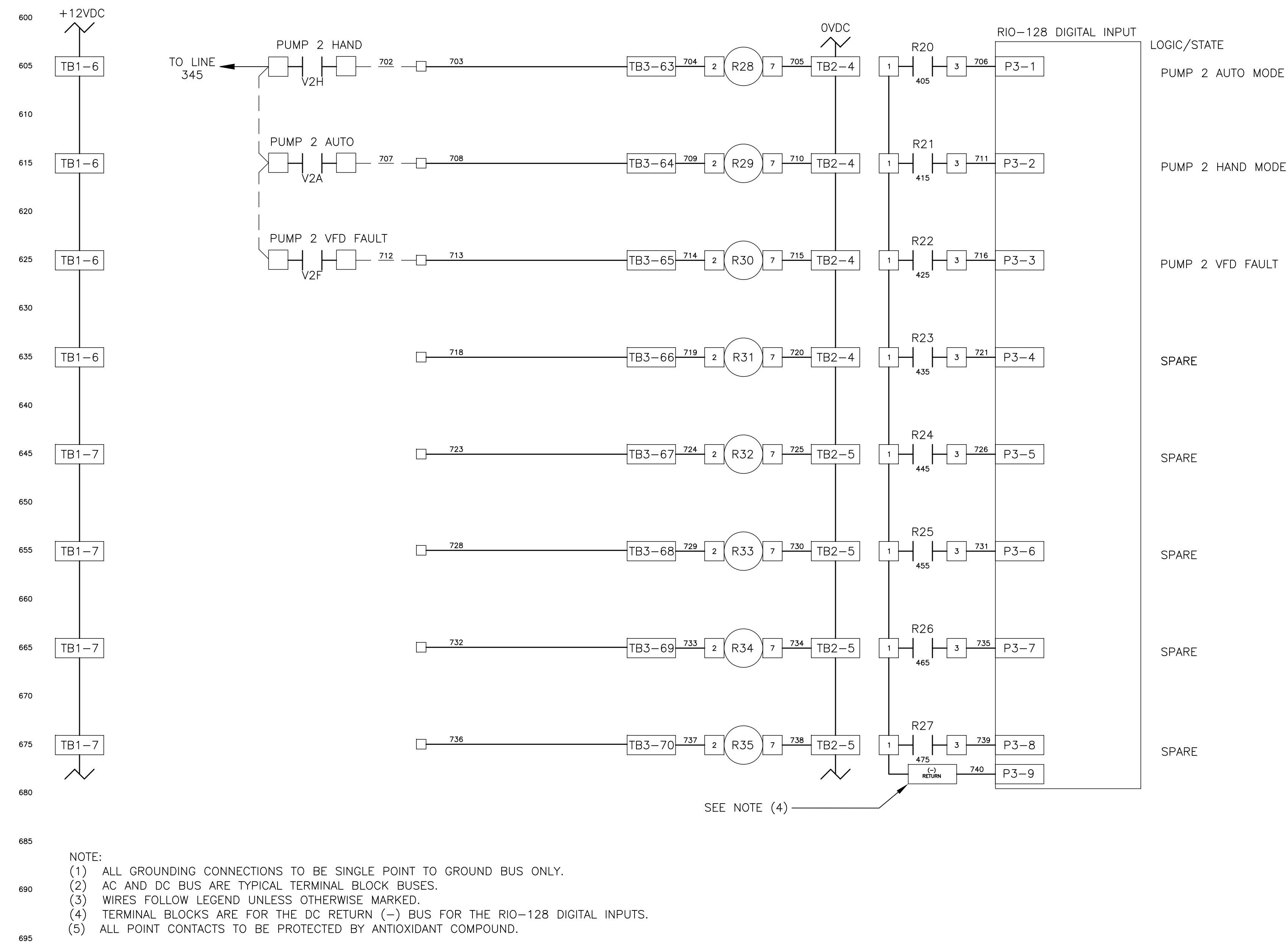
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TYPICAL DFS CABINET SCHEMATIC WIRING DIAGRAM

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.: 14 OF 28
APPROVED FOR			



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 - - - - -

RECORD DRAWINGS				
SURVEYED BY:	DRAWN BY:			
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

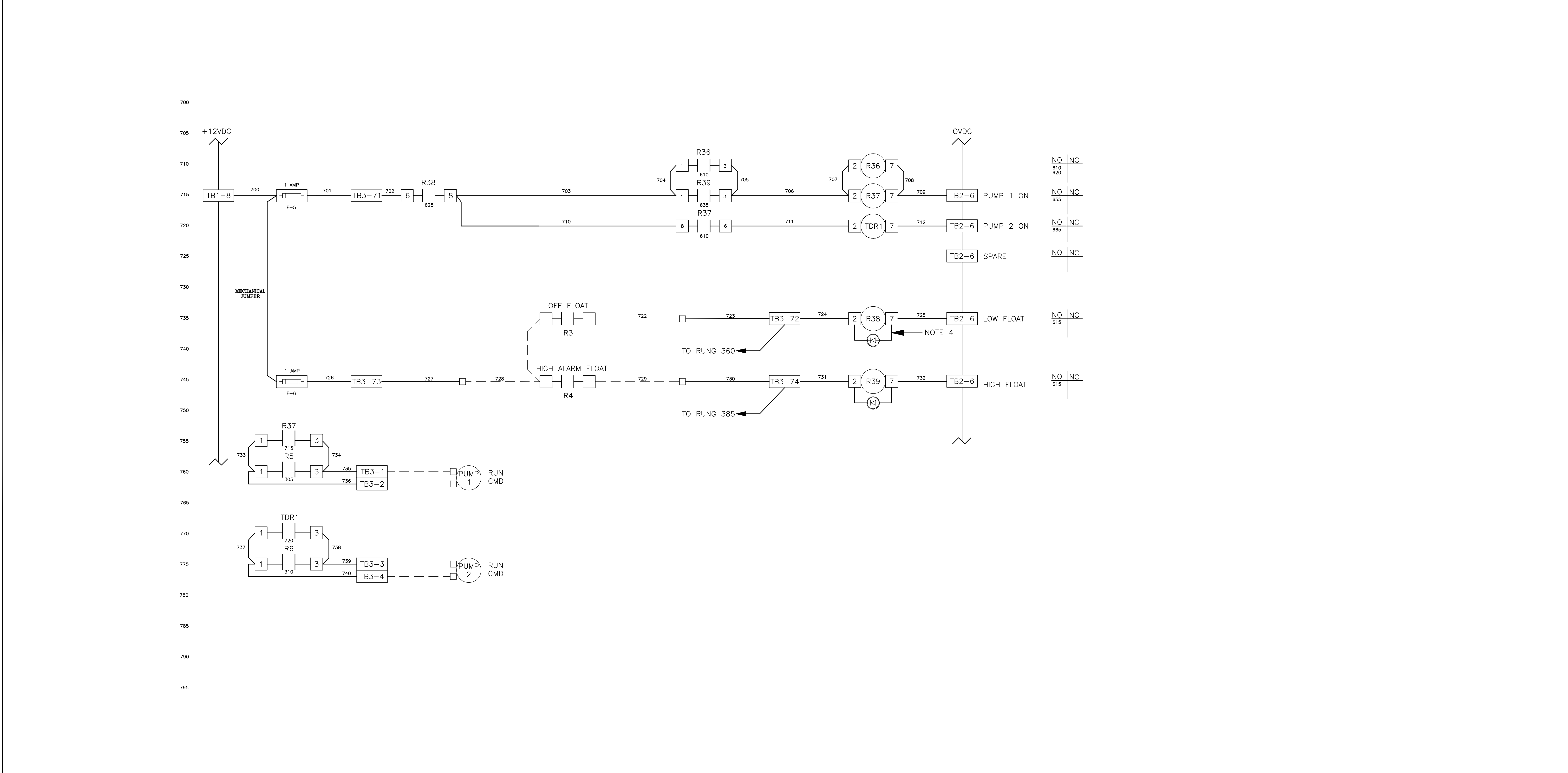
DWG NAME: ###	FIELD BOOK: N/A	SURVEYED BY: CLEARWATER	SCALE: VERT. N/A
CONTRACT NO.: ###	DATE DRAWN: ###	DRAWN BY: JLH	HORIZ. N/A
JOB NO.: 22609.19	DESIGNED BY: TDT	CHECKED BY: GLW	SHEET NO.: 15 OF 28
APPROVED FOR			

TIMOTHY THOMAS P.E. No. 47079

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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.

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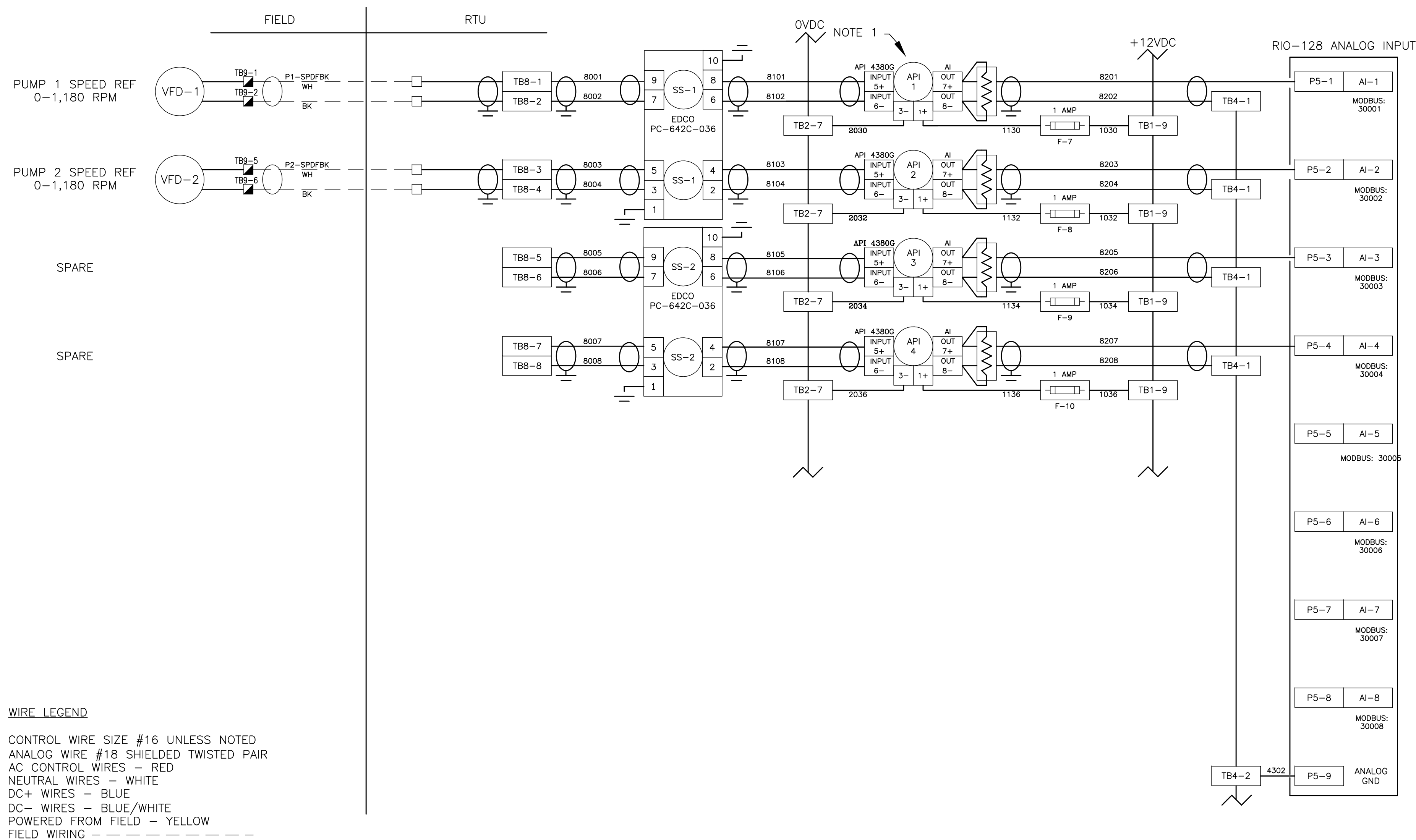
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REVIEWED BY:			
PROJECT ENGINEER	DATE		
APPROVED BY:			
CITY ENGINEER MICHAEL D. QUILLLEN, P.E. # 33721	DATE	REVISION	BY DATE

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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.: 16 OF 28
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REVIEWED BY:				
APPROVED BY:	PROJECT ENGINEER	DATE		
	CITY ENGINEER MICHAEL D. QUILLIN, P.E. # 33721	DATE	REVISION	BY DATE

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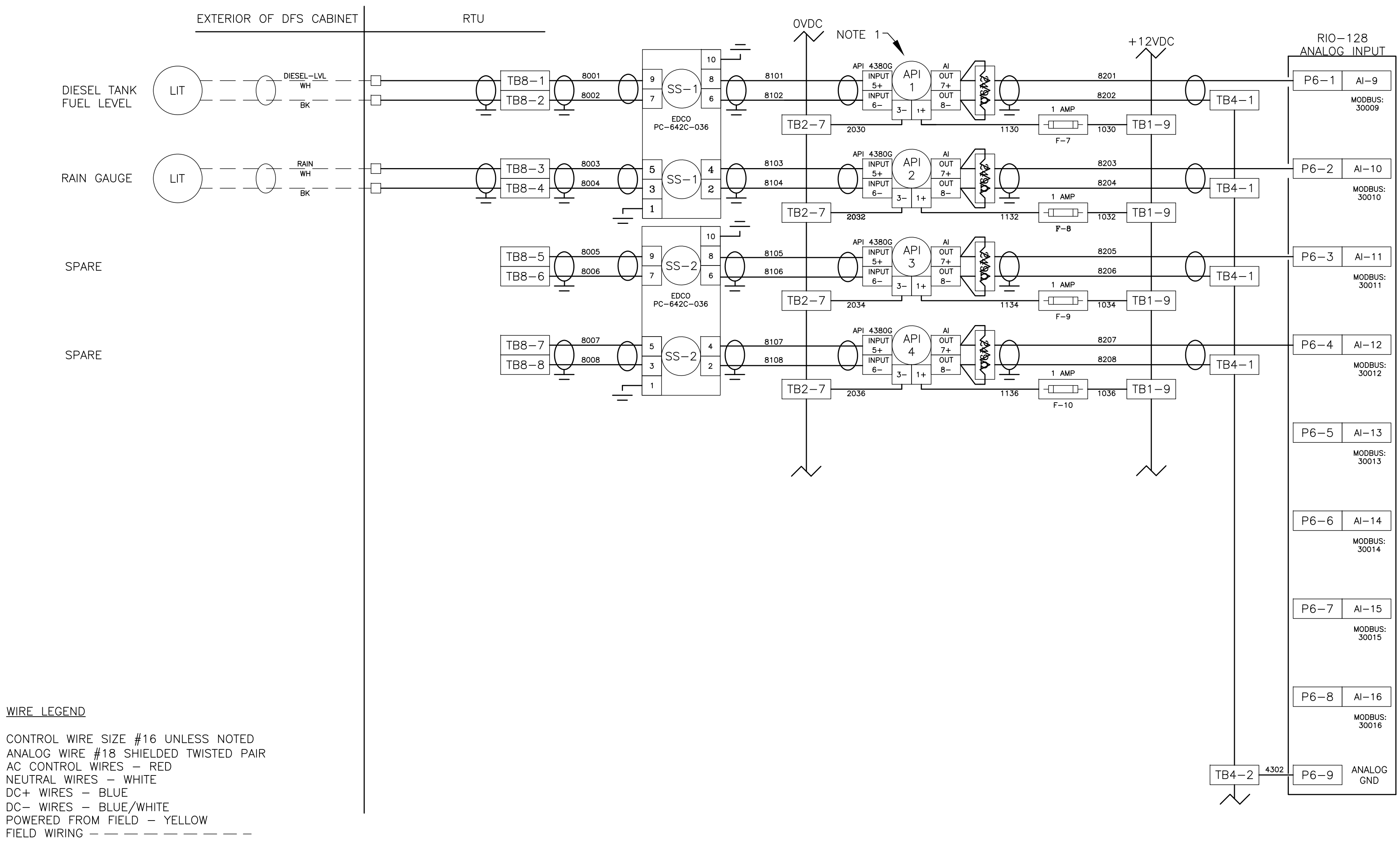
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TYPICAL DFS CABINET
SCHEMATIC WIRING DIAGRAM

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.: 17 OF 28
APPROVED FOR			



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

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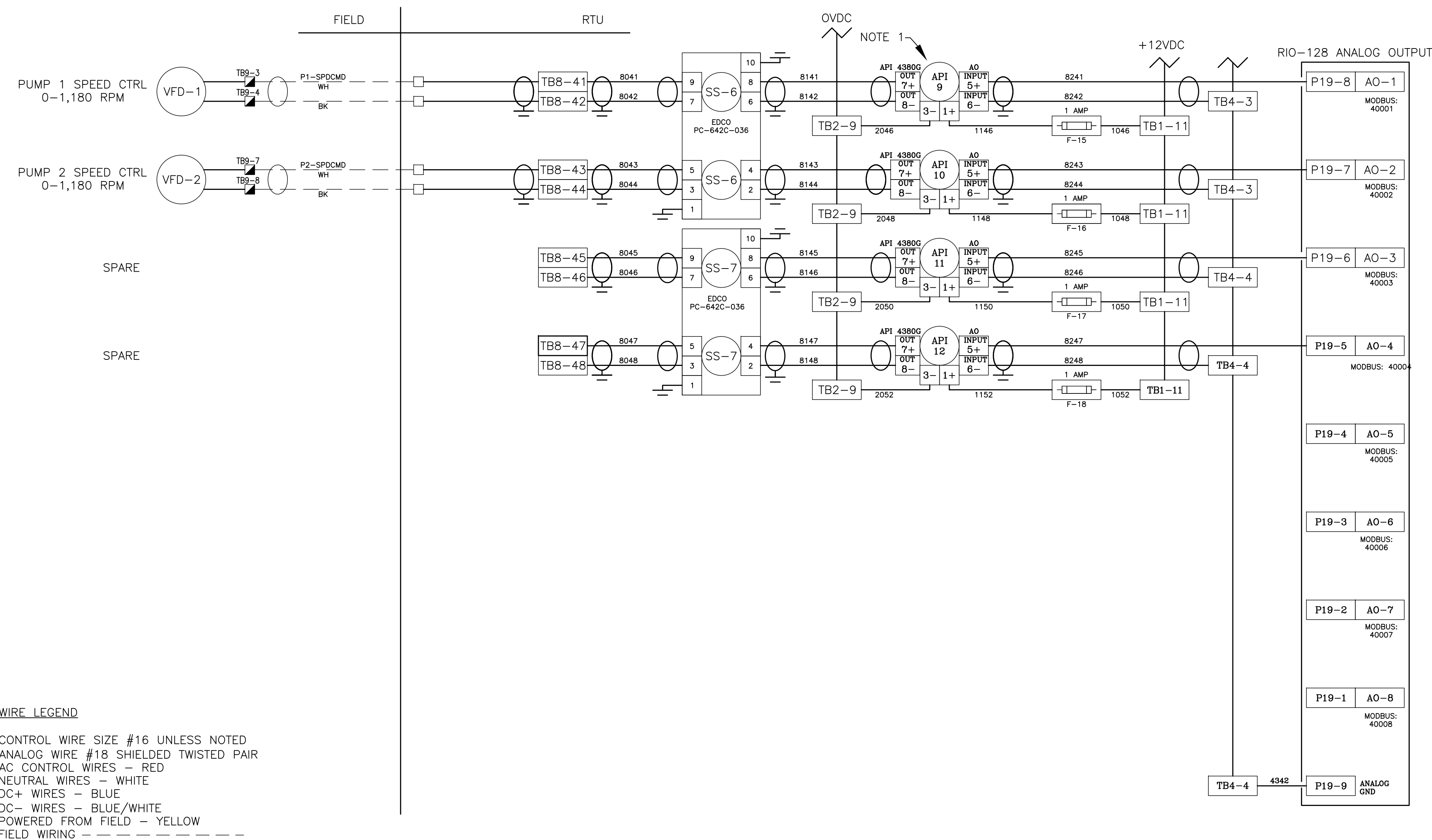
TYPICAL DFS CABINET SCHEMATIC WIRING DIAGRAM

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.: 18 OF 28
APPROVED FOR			

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- (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.

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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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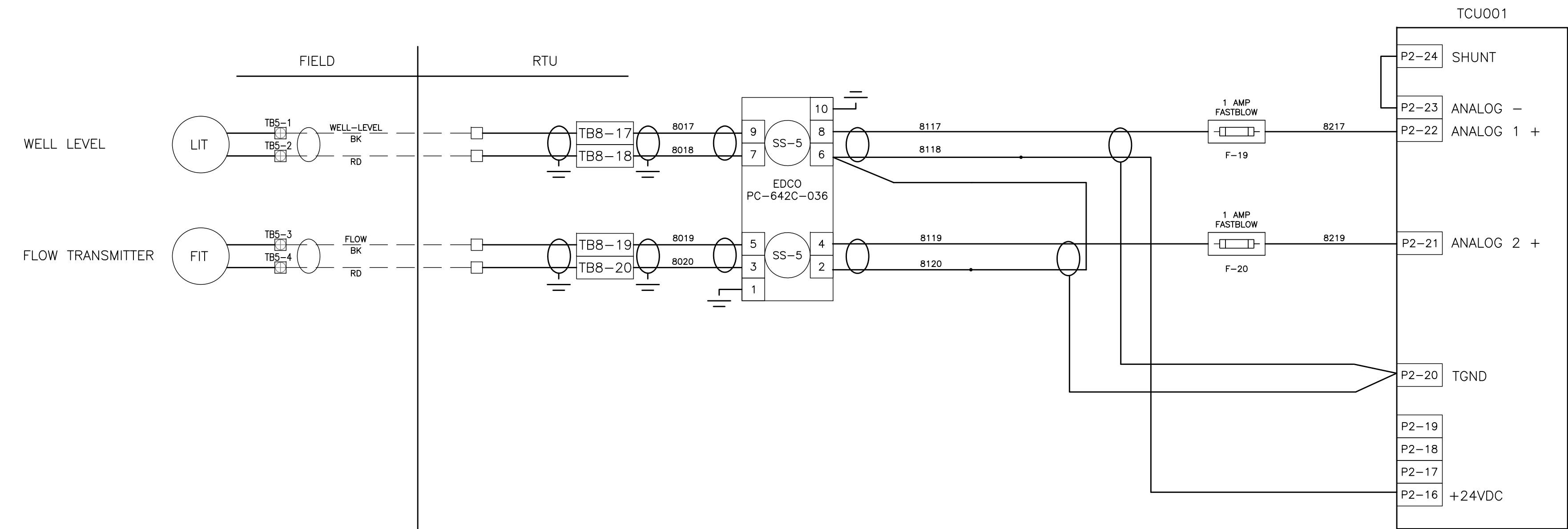
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CONTRACT NO.: #####	DATE DRAWN: #####	DRAWN BY: JLH	HORIZ. N/A
JOB NO.: 22609.19	DESIGNED BY: TDT	CHECKED BY: GLW	SHEET NO.: 19 OF 28
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WIRE LEGEND

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 - - - - -

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

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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.: 20 OF 28
APPROVED FOR			

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

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

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

EQUIPMENT, CONDUIT AND CONDUCTOR SCHEDULES

	47 HP STATIONS		60 HP STATIONS		88 HP STATIONS		FROM:	TO:	NOTES:
CONDUIT/CONDUCTORS	CONDUCTORS	CONDUIT	CONDUCTORS	CONDUIT	CONDUCTORS	CONDUIT			
(A)	3-3/0 THWN CU + 1-1/0 THWN CU NEUTRAL	3" C.	3-#250 MCM THWN CU + 1-#250 MCM THWN CU NEUTRAL	3" C.	3-#350 MCM THWN CU + 1-#250 MCM THWN CU NEUTRAL	4" C.	UTILITY TRANSFORMER	MOTOR CONTROL CENTER	
(B)	3-3/0 THWN CU + 1-1/0 THWN CU NEUTRAL + 1-#6 THWN CU GND	3" C.	3-#250 MCM THWN CU + 1-#250 MCM THWN CU NEUTRAL + 1-#4 THWN CU GND	3" C.	3-#350 MCM THWN CU + 1-#250 MCM THWN CU NEUTRAL + 1-1/0 THWN CU GND	4" C.	MOTOR CONTROL CENTER	GENERATOR DOCKING STATION	
(C)	3-3/0 THWN CU + 1-1/0 THWN CU NEUTRAL + 1-#6 THWN CU GND	3" C.	3-#250 MCM THWN CU + 1-#250 MCM THWN CU NEUTRAL + 1-#4 THWN CU GND	3" C.	3-#350 MCM THWN CU + 1-#250 MCM THWN CU NEUTRAL + 1-#4 THWN CU GND	4" C.	MOTOR CONTROL CENTER	GENERATOR SET	
(D)	3-#4 THWN CU + 1-#8 THWN CU GND	3" C.	3-#3 THWN CU + 1-#6 THWN CU GND	3" C.	3-1/0 THWN CU + 1-#6 THWN CU GND	3" C.	MOTOR CONTROL CENTER	SUBMERSIBLE PUMP WET WELL JUNCTION BOX	
(E)	SUBMERSIBLE PUMP CABLE PROVIDED BY MANUFACTURER	3" C.	SUBMERSIBLE PUMP CABLE PROVIDED BY MANUFACTURER	3" C.	SUBMERSIBLE PUMP CABLE PROVIDED BY MANUFACTURER	3" 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									
(F)	200 AMPERE MAIN CIRCUIT BREAKER		250 AMPERE MAIN CIRCUIT BREAKER		300 AMPERE MAIN CIRCUIT BREAKER		NOTES:		
(G)	200 AMPERE DOCKING STATION CIRCUIT BREAKER		250 AMPERE DOCKING STATION CIRCUIT BREAKER		300 AMPERE DOCKING STATION CIRCUIT BREAKER		DOCKING STATION CIRCUIT BREAKERS SHALL BE 100% RATED.		
(H)	480V, 200 AMPERE TRANSFER SWITCH		480V, 250 AMPERE TRANSFER SWITCH		480V, 300 AMPERE TRANSFER SWITCH				
(I)	300 AMPERE, 480V, 3-POLE GENERATOR DOCKING STATION		300 AMPERE, 480V, 3-POLE GENERATOR DOCKING STATION		300 AMPERE, 480V, 3-POLE GENERATOR DOCKING STATION				
(J)	480V, 3Ø, 4-WIRE 100 KW GENERATOR WITH 200 AMPERE MAIN CIRCUIT BREAKER		480V, 3Ø, 4-WIRE 150 KW GENERATOR WITH 250 AMPERE MAIN CIRCUIT BREAKER		480V, 3Ø, 4-WIRE 200 KW GENERATOR WITH 300 AMPERE MAIN CIRCUIT BREAKER				
(K)	100 AMP MOTOR CIRCUIT BREAKERS		110 AMP MOTOR CIRCUIT BREAKERS		200 AMP MOTOR CIRCUIT BREAKERS				
(L)	YASKAWA VFD - PW4A088FAA RATED OUTPUT - 88 AMPERES		YASKAWA VFD - PW4A103FAA RATED OUTPUT - 103 AMPERES		YASKAWA VFD - PW4A0139FAA RATED OUTPUT - 139 AMPERES				
GROUNDING									
(M)	1/0 AWG COPPER		1/0 AWG COPPER		1/0 AWG COPPER		NOTES:		
(N)	#4 AWG COPPER		#4 AWG COPPER		#2 AWG COPPER		ELECTRICAL SERVICE GROUNDING ELECTRODE CONDUCTOR		

LOAD CALCULATION: 47 HP

MOTORS:

PUMP NO. 1: 47 HP, 480 VAC, 3 ϕ , 62 A
PUMP NO. 2: 47 HP, 480 VAC, 3 ϕ , 62 A

MOTOR SUB-TOTAL 124 A

+ 25% OF LARGEST MOTOR 15.5 A

SUB-TOTAL	<u>139.5</u>	A
-----------	--------------	---

AUXILIARY EQUIPMENT 10.0 A

TOTAL MAXIMUM PHASE AMPERES 149.5 A

SERVICE SIZE:

200 A, 480 VAC, 3 ϕ , 4 - WIRE MINIMUM.

LOAD CALCULATION: 60 HP

MOTORS:

PUMP NO. 1: 60 HP, 480 VAC, 3 ϕ , 77 A
PUMP NO. 2: 60 HP, 480 VAC, 3 ϕ , 77 A

MOTOR SUB-TOTAL 154 A

+ 25% OF LARGEST MOTOR 19.3 A

SUB-TOTAL	<u>173.3</u>	A
-----------	--------------	---

AUXILIARY EQUIPMENT 10.0 A

TOTAL MAXIMUM PHASE AMPERES 193.3 A

SERVICE SIZE:

250 A, 480 VAC, 3 ϕ , 4 - WIRE MINIMUM.

LOAD CALCULATION: 88 HP

MOTORS:

PUMP NO. 1: 88 HP, 480 VAC, 3 ϕ , 112 A
PUMP NO. 2: 88 HP, 480 VAC, 3 ϕ , 112 A

MOTOR SUB-TOTAL 224 A

+ 25% OF LARGEST MOTOR 28 A

SUB-TOTAL	<u>252</u> A
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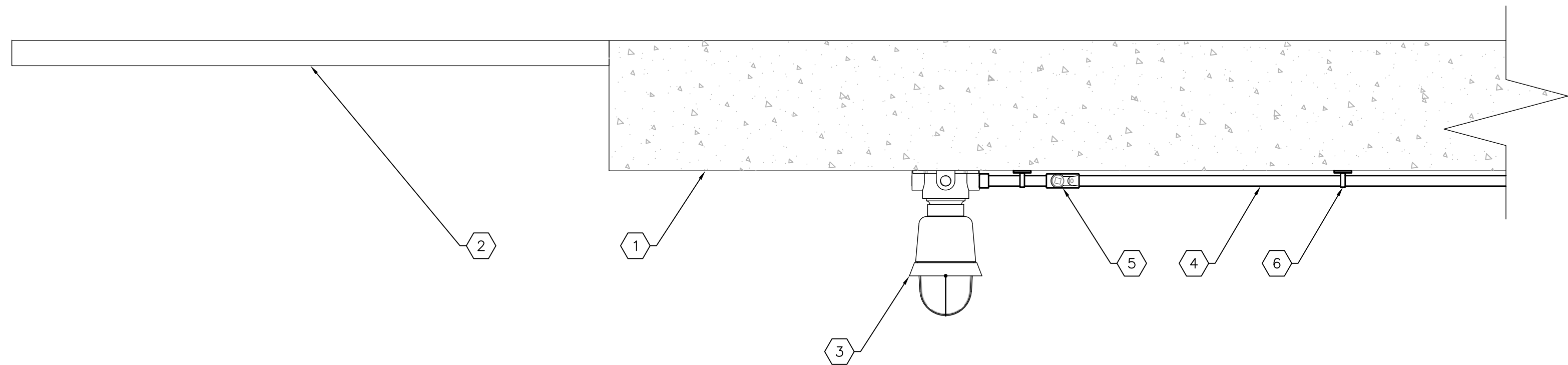
AUXILIARY EQUIPMENT	<u>10.0</u>	A
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TOTAL MAXIMUM PHASE AMPERES 262 A

SERVICE SIZE:

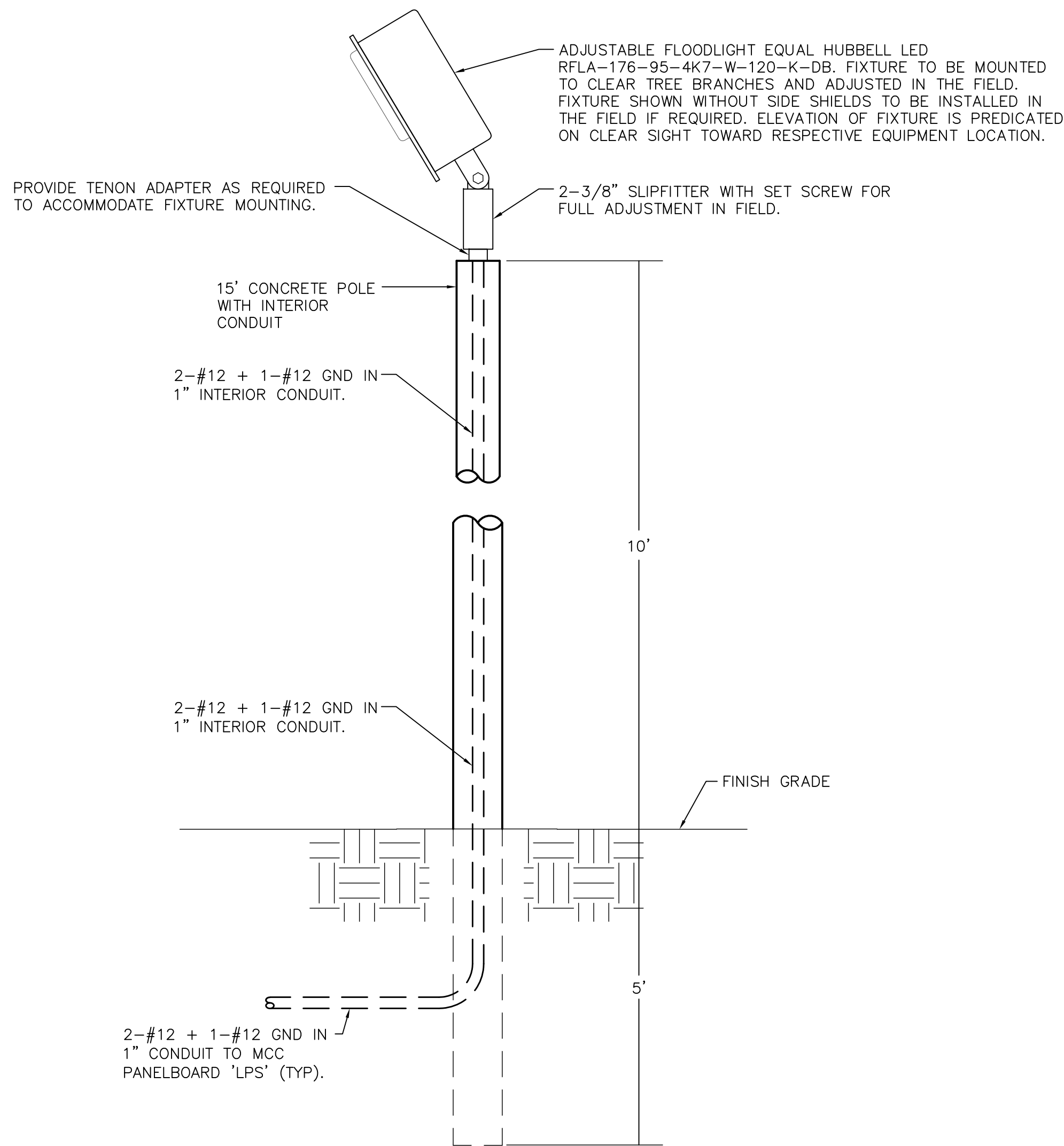
300 A, 480 VAC, 3 ϕ , 4 - WIRE MINIMUM.

RECORD DRAWINGS				<div><div><div><div><div><div></div><div>1</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</div></div></div><div><div><div>1</div><div>2</div></div><div><div><div>1</div><div>2</di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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

TRICON

ENGINEERING

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

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

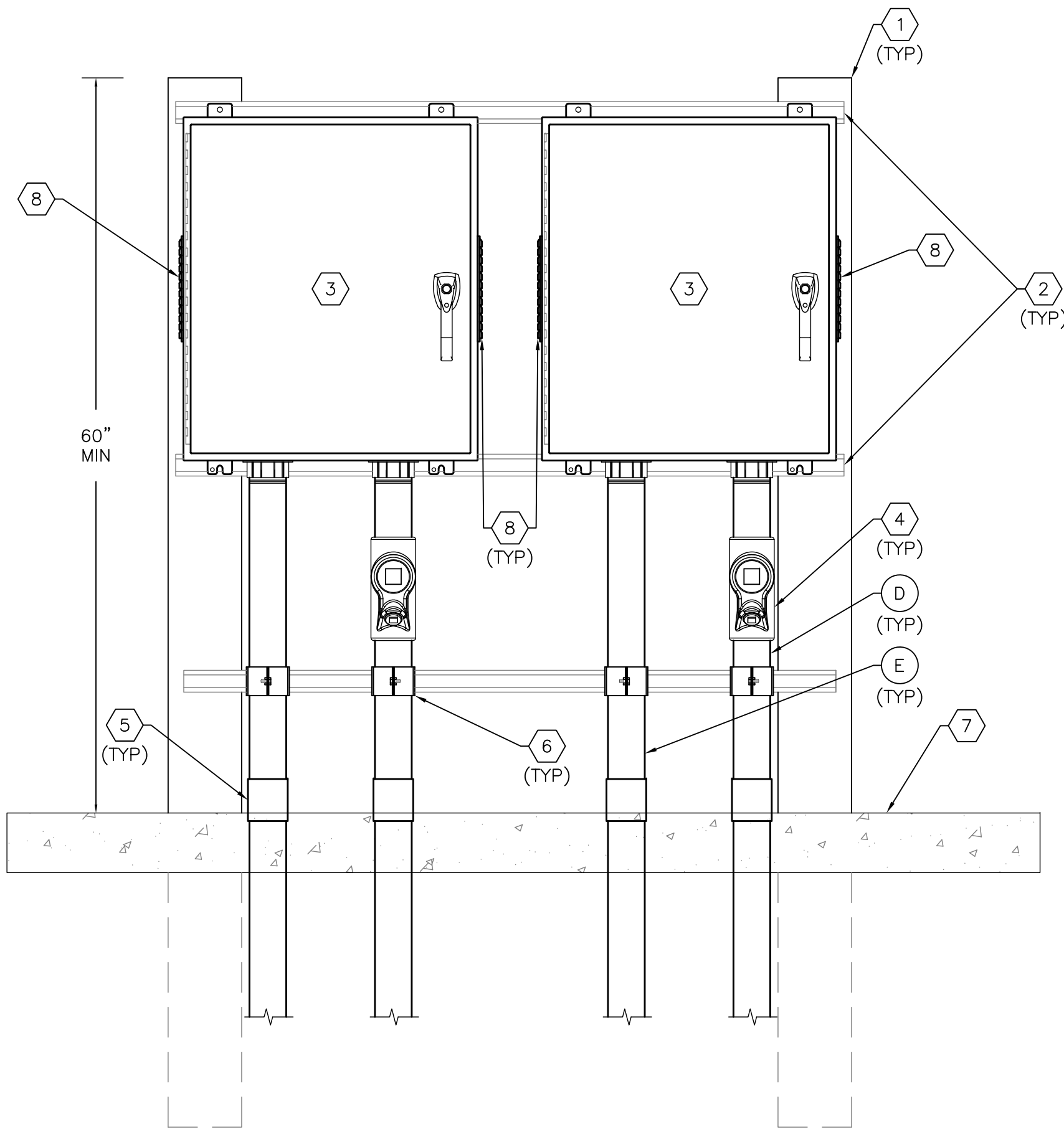
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TYPICAL LIFT STATION
ELECTRICAL DETAILS

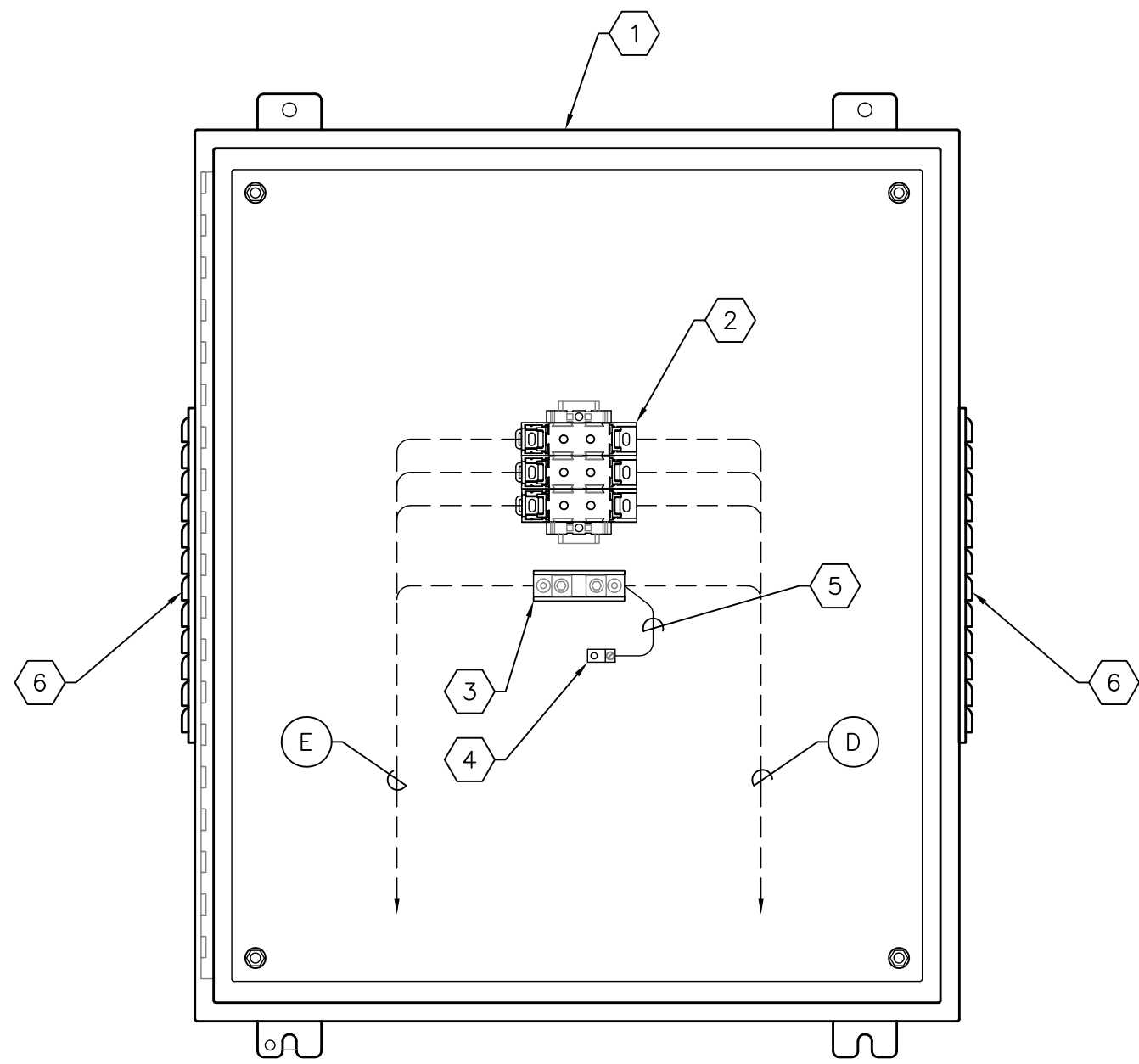
DWG NAME: ###	FIELD BOOK: N/A	SURVEYED BY: CLEARWATER	SCALE: VERT. N/A
CONTRACT NO.: ###	DATE DRAWN: ###	DRAWN BY: JLH	HORIZ. N/A
JOB NO.: 22609.19	DESIGNED BY: TDT	CHECKED BY: GLW	SHEET NO.: 23 OF 28
APPROVED FOR			



TYPICAL WET WELL JUNCTION BOX RACK DETAIL
SCALE: NONE

KEYED NOTES:

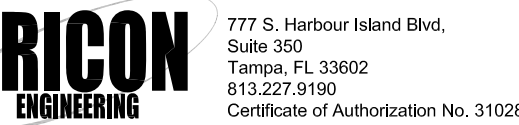
- 1 PROVIDE AND INSTALL 6" X 6" REINFORCED SQUARE CONCRETE POSTS. LENGTH AS REQUIRED. BURY POSTS TO A DEPTH OF 3'-0".
- 2 PROVIDE AND INSTALL 1-5/8" x 1-5/8" 316 STAINLESS STEEL UNISTRUT WITH 316 STAINLESS STEEL HARDWARE. NOTE: INSTALL ALL BOLTS FOR UNISTRUT COMPLETELY THROUGH CONCRETE POSTS. PROVIDE 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.



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Tampa, FL 33602
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Certificate of Authorization No. 31028

TIMOTHY THOMAS P.E. No. 47079

RECORD DRAWINGS				
SURVEYED BY:	DRAWN BY:			
REVIEWED BY:				
PROJECT ENGINEER		DATE		
APPROVED BY:				
CITY ENGINEER MICHAEL G. QUILLLEN, 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	NUMER 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"	FOUR (4) 2/C-#16 TWISTED SHIELDED	VFD 1 & VFD 2	DFS CABINET	4-20mA VFD #1 SPEED REFERENCE, VFD #2 SPEED REFERENCE, VFD #1 SPEED COMMAND AND VFD #2 SPEED COMMAND SIGNALS. BELDEN 8719.
C16	1-1/2"	20-#14 + 1-#14 GND	VFD 1 & VFD 2	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 : TYPE NQOB : 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:				
PROJECT ENGINEER		DATE		
APPROVED BY:				
CITY ENGINEER MICHAEL D. QUILLÉN, P.E. # 33721		DATE		

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



CONDUIT AND CABLE SCHEDULE
AND PANEL SCHEDULE

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.: 25 OF 28
APPROVED FOR			

TIMOTHY THOMAS P.E. No. 47079

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

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

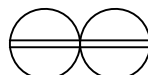


OR

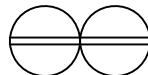
MUTIPLE FUNCTION



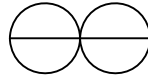
FIELD MOUNTED INSTRUMENT OR DEVICE



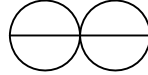
FRONT OF PANEL MOUNTED INSTRUMENT ON LCP, PCC, MCS, OR VFD



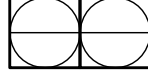
REAR OF PANEL MOUNTED INSTRUMENT ON LCP, PCC, MCS, OR VFD



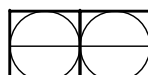
FRONT OF PANEL MOUNTED INSTRUMENT ON MAIN PANEL



REAR OF PANEL MOUNTED INSTRUMENT ON MAIN PANEL



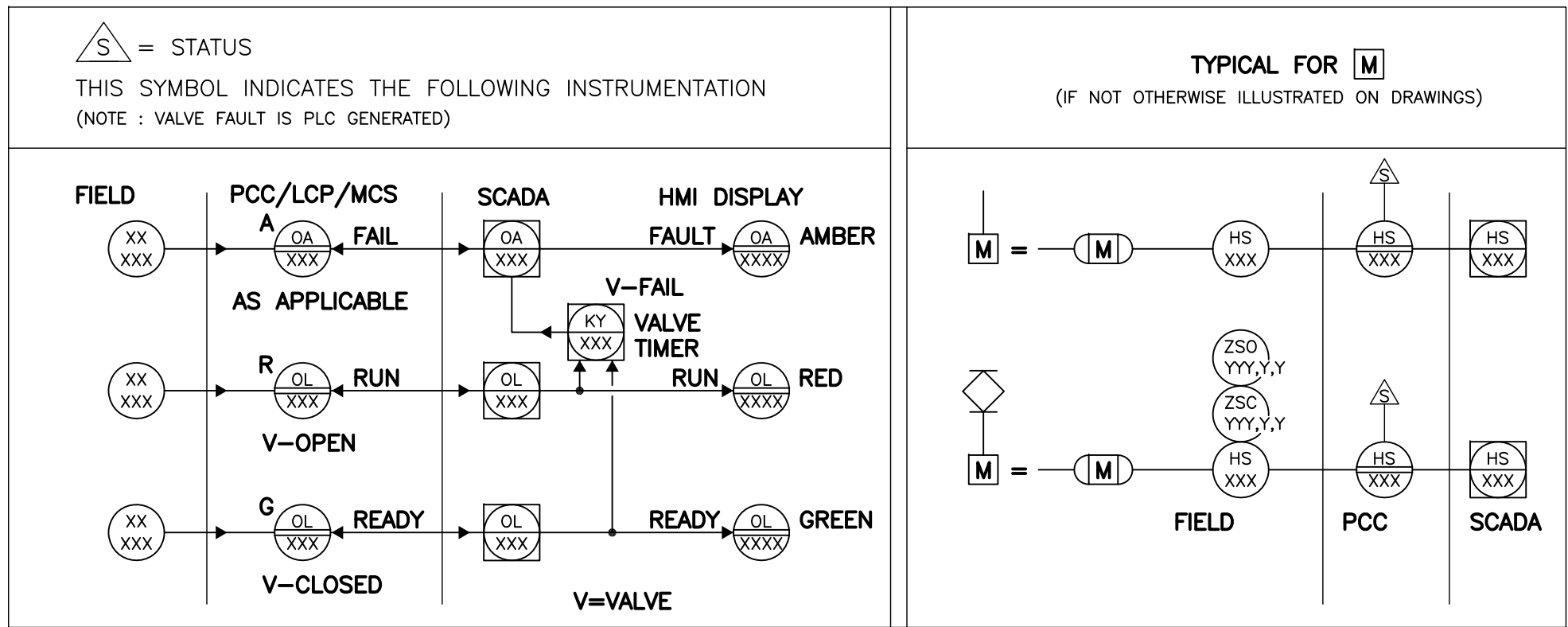
PLC AND/OR COMPUTER SOFTWARE COMPONENT (OPERATOR ACCESSIBLE UNDER NORMAL CONDITIONS) OR



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. # 335721		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
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TRICON
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