



# CITY OF TAMPA

Bob Buckhorn, Mayor

CONTRACT ADMINISTRATION DEPARTMENT

Michael W. Chucran, Director

## ADDENDUM NO. 1

**DATE: December 9, 2016**

Contract 16-C-00019; University Pumping Station Pump #1 Replacement

Bidders on the above referenced project are hereby notified that the following addendum is made to the Contract Documents. BIDS TO BE SUBMITTED SHALL CONFORM TO THIS NOTICE.

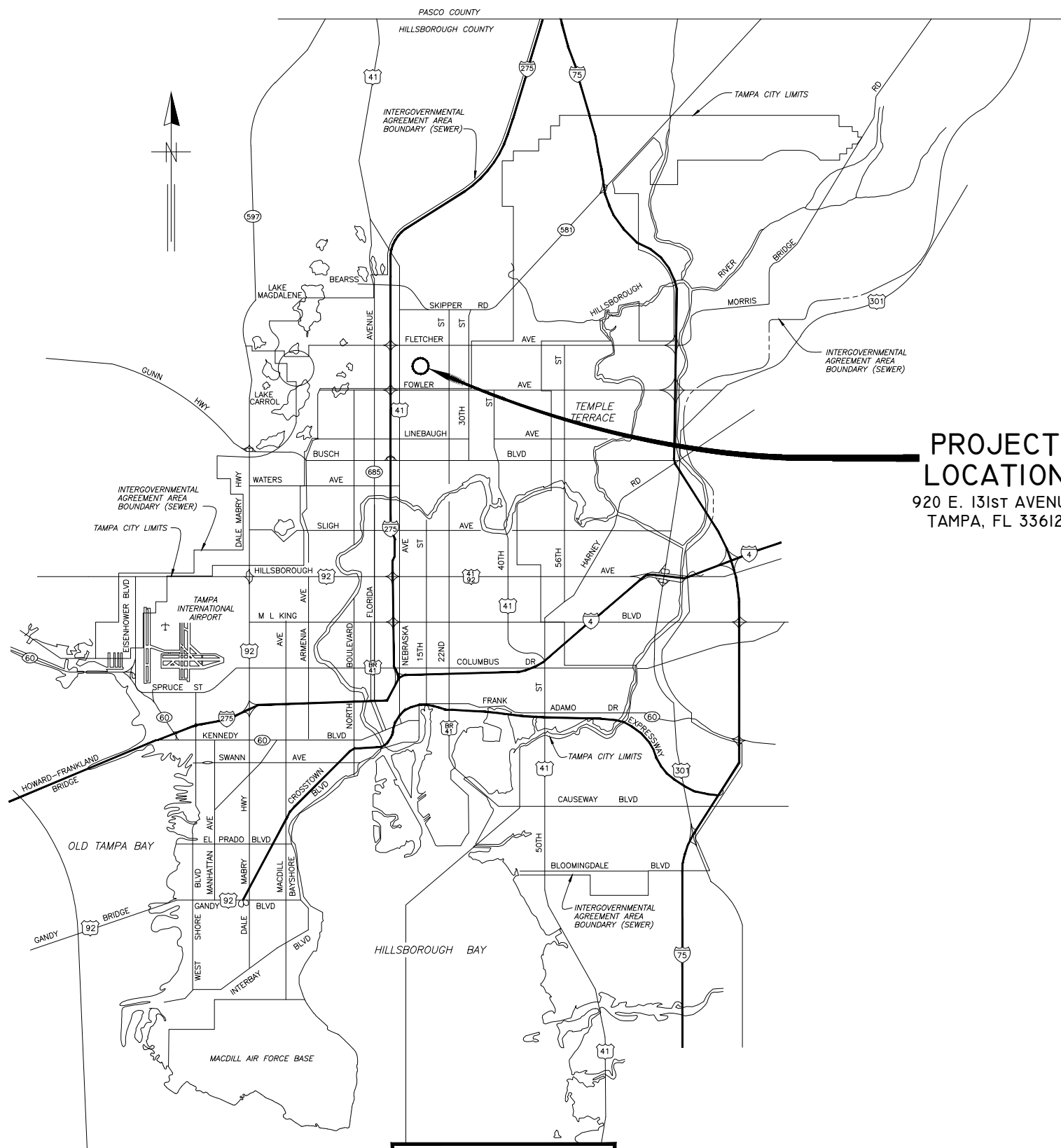
Item 1: Replace the plans set with the attached plans set.

All other provisions of the Contract Documents and Specifications not in conflict with this Addendum shall remain in full force and effect. Questions are to be e-mailed to [ContractAdministration@tampagov.net](mailto:ContractAdministration@tampagov.net).

*Jim Greiner*

\_\_\_\_\_  
Jim Greiner, P.E., Contract Management Supervisor

LOCATION MAP



**PROJECT LOCATION**  
 920 E. 131st AVENUE  
 TAMPA, FL 33612

CITY of TAMPA



**WASTEWATER DEPARTMENT**

PLANS FOR  
**UNIVERSITY PUMPING STATION  
 PUMP #1 REPLACEMENT**

CONTRACT: 16-C-00019

C:\PROGRAMFILES\AUTOCAD\CIVIL3D2010\DWGFILES\PS\UNIVERSITY.P.S.\4511-SHEET-01.DWG

777 S. Harbour Island Blvd, STE 870, TAMPA, FL 33602  
 813.227.9190 FAX 813.227.9195  
 Certificate of Authorization No. 00008363

JACINTO CARLOS FERRAS, P.E. #49454  
 DESIGN DIVISION HEAD  
 WASTEWATER DEPARTMENT

TIMOTHY D. THOMAS, PE - FPE 47079  
 TRICON CONSULTING ENGINEERS  
 ELECTRICAL / INSTRUMENTATION DESIGN

No.	DATE	REVISIONS
3		
2		
1		

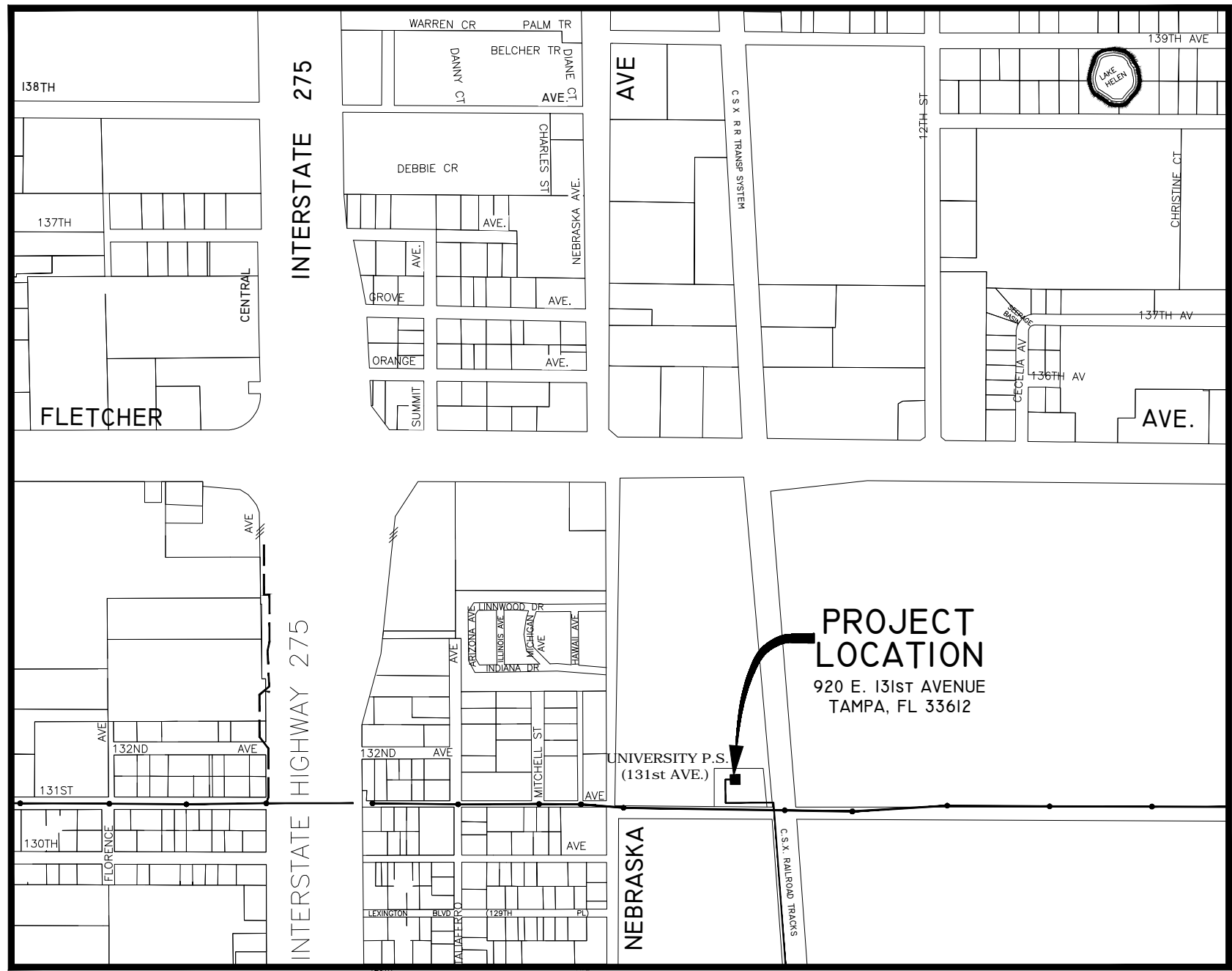
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CITY of TAMPA  
 WASTEWATER DEPARTMENT

COVER SHEET

SHEET  
 1

K:\WASTEWATERPROJECTS\UNIVERSITYPUMP#1\DESIGN\PLANS\DRAWING\DWG



**PROJECT MAP**  
NOT TO SCALE

INDEX	
SH. No.	DESCRIPTION
1	COVER SHEET
2	INDEX & PROJECT MAP
3	SITE PLAN
4	GENERAL NOTES
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6	DEMOLITION SECTION
7	PROPOSED PLAN AT ELEV. 15.00 AND SECTION
8	PROPOSED SECTION
9	MISCELLANEOUS PUMP ROOM DETAILS
10	WET WELL ISOLATION DETAILS
E0	ELECTRICAL – TIMING DIAGRAM, LEGEND & ABBREVIATIONS
E1	ELECTRICAL – ELECTRICAL POWER PLAN – ELEV. 41.25
E2	ELECTRICAL – ELECTRICAL POWER PLAN – ELEV. 15.00
E3	ELECTRICAL – ELECTRICAL POWER SECTION
E4	ELECTRICAL – CONTROL CENTER FRONT ELEVATION
E5	ELECTRICAL – SECTION 3 MODIFICATIONS
E6	ELECTRICAL – LLC AND VFD FRONT ELEVATIONS
E7	ELECTRICAL – ELECTRICAL ONE-LINE DIAGRAM
E8	ELECTRICAL – VFD INTERCONNECTIONS
E9	ELECTRICAL – PUMP No. 1 CONTROL PANEL
E10	ELECTRICAL – PUMP No. 1 CONTROLS (SHEET 1 OF 3)
E11	ELECTRICAL – PUMP No. 1 CONTROLS (SHEET 2 OF 3)
E12	ELECTRICAL – PUMP No. 1 CONTROLS (SHEET 3 OF 3)
E13	ELECTRICAL – PUMP No. 2 CONTROL PANEL
E14	ELECTRICAL – PUMP No. 2 CONTROLS (SHEET 1 OF 2)
E15	ELECTRICAL – PUMP No. 2 CONTROLS (SHEET 2 OF 2)
E16	ELECTRICAL – MOTOR CONTROL CENTER ELEVATION
E17	ELECTRICAL – ANNUNCIATOR PLC DETAILS
E18	ELECTRICAL – ANNUNCIATOR PLC WIRING DIAGRAMS
E19	ELECTRICAL – DISCRETE I/O WIRING DIAGRAMS
E20	ELECTRICAL – PROPOSED ANNUNCIATOR SCREENS
E21	ELECTRICAL – CONDUIT AND CABLE SCHEDULE

JACINTO CARLOS FERRAS, P.E. #49454  
DESIGN DIVISION HEAD  
WASTEWATER DEPARTMENT

No.	DATE	REVISIONS
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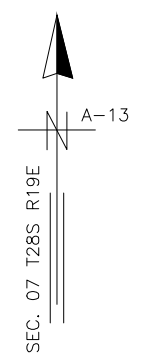
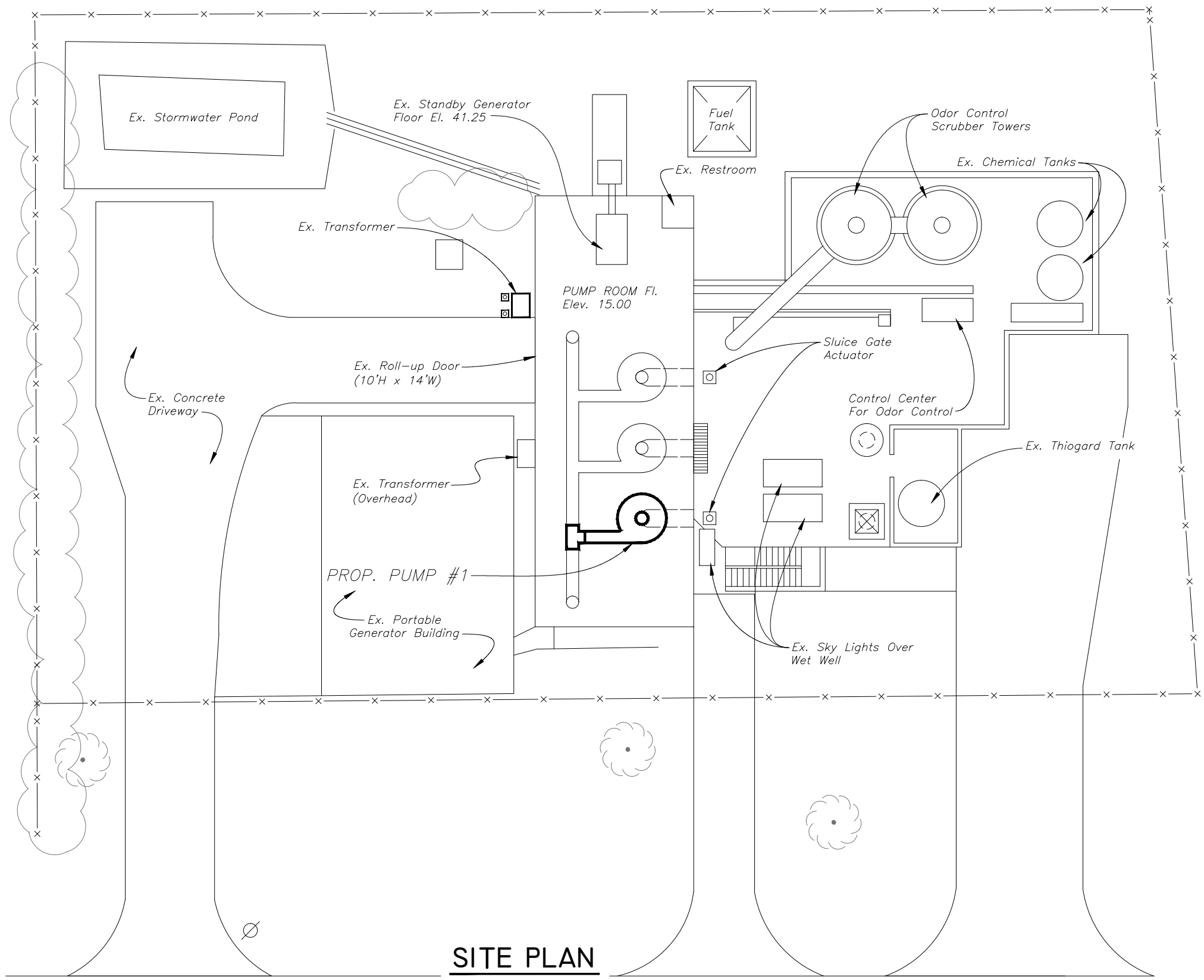
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DRN: BB  
CKD:  
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CITY of TAMPA  
WASTEWATER DEPARTMENT

UNIVERSITY PUMPING STATION  
PUMP No. 1 REPLACEMENT  
INDEX & PROJECT MAP

SHEET  
**2**

User: ss17 - Drawing Name: K:\Wastewater Projects\University H's pump #1\Design\Plans\Wratting\UWG\University H's - Pump#1 - Sheets J-6-a-d.dwg  
 Date: Nov 21, 2016 - 2:44pm



**SITE PLAN**

NOT TO SCALE

JACINTO CARLOS FERRAS, P.E. #49454 DESIGN DIVISION HEAD WASTEWATER DEPARTMENT	No.	DATE	REVISIONS	DES: J.H.	<b>CITY of TAMPA</b> WASTEWATER DEPARTMENT	UNIVERSITY PUMPING STATION PUMP #1 REPLACEMENT SITE PLAN	SHEET
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	2			CKD:			
	1			DATE:			

# NOTES

## GENERAL NOTES

- G-1. CONTRACTOR SHALL COORDINATE ALL CONSTRUCTION ACTIVITIES WITH DEPARTMENT PERSONNEL AND PUMPING STATION OPERATIONS.
- G-2. EXISTING DIMENSIONS AND ELEVATIONS ARE BASED ON THE BEST INFORMATION AVAILABLE. TRUE DIMENSIONS AND ELEVATIONS SHALL BE DETERMINED IN THE FIELD PRIOR TO LAYOUT AND SHOP DRAWING SUBMITTALS.
- G-3. ALL SUBMITTALS AND SHOP DRAWINGS SHALL BE ORIGINALS OR HIGH QUALITY COPIES (EASILY READABLE). NO FAXED SHEETS OR POOR QUALITY COPIES WILL BE ACCEPTED FOR SUBMITTAL REVIEW.
- G-4. PRIOR TO PUMP #1 DEMOLITION, CITY FORCES WILL CLOSE THE NECESSARY PLUG VALVES INSIDE THE PUMPING STATION TO ISOLATE THE DISCHARGE SIDE OF PUMP #1. THE CITY REQUIRES A MIN. 1 WEEK ADVANCE NOTICE FOR THIS WORK.
- G-5. CONTRACTOR SHALL INSTALL TWO STOP LOGS AND A 42" INFLATABLE PLUG IN WET WELL IN ORDER TO ISOLATE SUCTION SIDE OF PUMP #1. SEE WET WELL DETAILS ON SHEET 10.
- G-6. MECHANICAL AND ELECTRICAL EQUIPMENT TO BE LOCKED OUT SHALL BE LOCKED OUT WITH A MULTIPLE-LOCK MASTER LOCK-OUT DEVICE, WHICH SHALL BE INSTALLED BY CITY PERSONNEL AND LOCKED BY BOTH THE CITY PERSONNEL AND THE CONTRACTOR.
- G-7. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING, INSTALLING, LEVELING AND ALIGNING MOTOR AND PUMP. PROCEDURES FOR INSTALLATION, AS OUTLINED IN THE HYDRAULIC INSTITUTE STANDARDS, MOST CURRENT EDITION, SHALL BE ADHERED TO. SEE SPECIFIC PROVISION SP-80. IF CONFLICT BETWEEN THE SPECS AND THE H.I.S. PROCEDURE ARISE, THE MOST STRINGENT STANDARD SHALL BE FOLLOWED.
- G-8. PROPOSED PUMP SHALL BE A 400 HORSEPOWER, 24-INCH, 600 RPM FAIRBANKS MORSE VERTICAL CLOSE-COUPLED ANGLEFLOW PUMP MODEL #C5741. PUMP SHALL BE RATED FOR 29.3 MGD @ 62.0 FEET TDH. SEE SPECIFICATIONS FOR MOTOR INFORMATION.
- G-9. PROPOSED KNIFE GATE VALVE SHALL BE A MODEL 145, "PERFORMANCE PLUS" KNIFE GATE, AS MADE BY TYCO VALVE AND CONTROLS; SEE SPECIFICATIONS FOR DETAILS. KNIFE GATE VALVE SHALL BE EQUIPPED WITH ELECTRIC POWERED ACTUATOR, AS MADE BY ROTORK, LIMITORQUE, OR EQUAL; SEE SPECIFICATIONS FOR DETAILS.
- G-10. EXISTING 30" PUMP CHECK VALVE AND PNEUMATIC ACTUATOR SHALL BE REMOVED AND PLACED IN SAFE STORAGE DURING DEMOLITION ACTIVITIES. PUMP CHECK VALVE ASSEMBLY SHALL BE RE-INSTALLED IN NEW LOCATION WITH PROPOSED PUMP #1, PIPE AND FITTINGS. CONTRACTOR SHALL BE RESPONSIBLE FOR RE-CONNECTING PUMP CHECK VALVE ACTUATOR TO PNEUMATIC AIR SUPPLY, POWER AND CONTROLS SOURCES. SEE ELECTRICAL SHEETS FOR DETAILS.
- G-11. AIR SUPPLY FOR PNEUMATICALLY ACTUATED PUMP-CHECK VALVE SHALL BE FROM EXISTING STATION AIR. ARRANGEMENT OF PIPING AND CONNECTIONS TO EXISTING PIPES SHALL BE MADE BY THE CONTRACTOR UNDER THE DIRECTION OF THE ENGINEER.
- G-12. ANCHOR BOLTS SHALL BE AS PER PUMP MANUFACTURER'S RECOMMENDATIONS. ANCHOR BOLTS SHALL BE DOUBLE-NUTTED AND FINISHED WITH NON-SHRINK GROUT. ALL BOLTS SHALL EXTEND BEYOND THE FASTENING NUTS BY A MINIMUM OF 1/2-INCH.

- G-13. ALL HARDWARE, UNLESS OTHERWISE NOTED, SHALL BE TYPE 316 STAINLESS STEEL.
- G-14. PROP. 30"x 30"x 24" REDUCING TEE SHALL BE FABRICATED TO SUIT THE DIMENSIONS OF THE PROPOSED EQUIPMENT AND SHALL BE A36-STEEL WITH A 150 PSI RATING. STEEL FITTINGS SHALL BE MANUFACTURED BY AN AWWA CERTIFIED FABRICATOR.
- G-15. ALL CEMENTITIOUS CONCRETE AND GROUT, UNLESS OTHERWISE SPECIFIED, SHALL BE CLASS "B" 4000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.
- G-16. EXPOSED CONCRETE CORNERS SHALL HAVE A 3/4" CHAMFER AND RE-ENTRANT CORNERS SHALL HAVE A 3/4" FLAT FILLET UNLESS OTHERWISE NOTED.
- G-17. CONCRETE PEDESTAL SHOP DRAWINGS INCLUDING FLANGE SUPPORT DETAILS SHALL BE SUBMITTED FOR APPROVAL.
- G-18. ALL STEEL REINFORCING SHALL BE DETAILED ACCORDING TO THE LATEST "ACI MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES". ACTUAL PLACEMENT OF STEEL REINFORCING SHALL BE SHOWN ON SHOP DRAWINGS. ALL LAPS AND SPLICES SHALL BE AT LEAST 32 BAR DIAMETERS OR 24 INCHES.
- G-19. CERTAIN PORTIONS OF THIS PROJECT MAY REQUIRE NIGHT TIME WORK.
- G-20. ALL NOTES PERTAINING TO PROPOSED WORK INSIDE SCREEN ROOM ARE LOCATED ON PERTINENT SHEETS.
- G-21. PROP. FLOW METER SHALL BE A 24" ABB ELECTROMAGNETIC FLOW METER, WATERMASTER SERIES, AS MADE BY ABB. SEE SPECIFICATIONS FOR DETAILS.
- G-22. ALL DUCTILE IRON PIPE AND FITTINGS SHALL BE LINED WITH PROTECTO 401 CERAMIC EPOXY (40 MILS DFT), OR EQUAL. ALL STEEL PIPE AND FITTINGS SHALL BE LINED WITH 40 MILS (DFT) OF "SG-14" GLASS LINING (PORCELAIN ENAMEL), AS MADE BY U.S. PIPE, OR EQUAL.
- G-23. THE PUMPING STATION SHALL REMAIN IN OPERATION DURING THE ENTIRE PUMP No.1 REPLACEMENT PROJECT. THE CONTRACTOR SHALL PLAN HIS WORK ACCORDINGLY.
- G-24. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE FLORIDA BUILDING CODE 5th EDITION 2014, AND CHAPTER 5 OF THE CITY OF TAMPA CODE.
- G-25. CONTRACTOR SHALL REMOVE EX. WET WELL #1 (42") SLUICE GATE AND ENTIRE ELECTRIC ACTUATOR ASSEMBLY.
- G-26. CONFIGURATION FOR THREE PROPOSED KNIFE GATE VALVE ACTUATORS SHALL BE AS INDICATED IN THE PLANS.
- G-27. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE FLORIDA BUILDING CODE 5TH EDITION 2014, CHAPTER 5 OF THE CITY OF TAMPA CODE AND THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) SERIES 70/NATIONAL ELECTRICAL CODE (NEC) 2011 EDITION.

## DEMOLITION NOTES

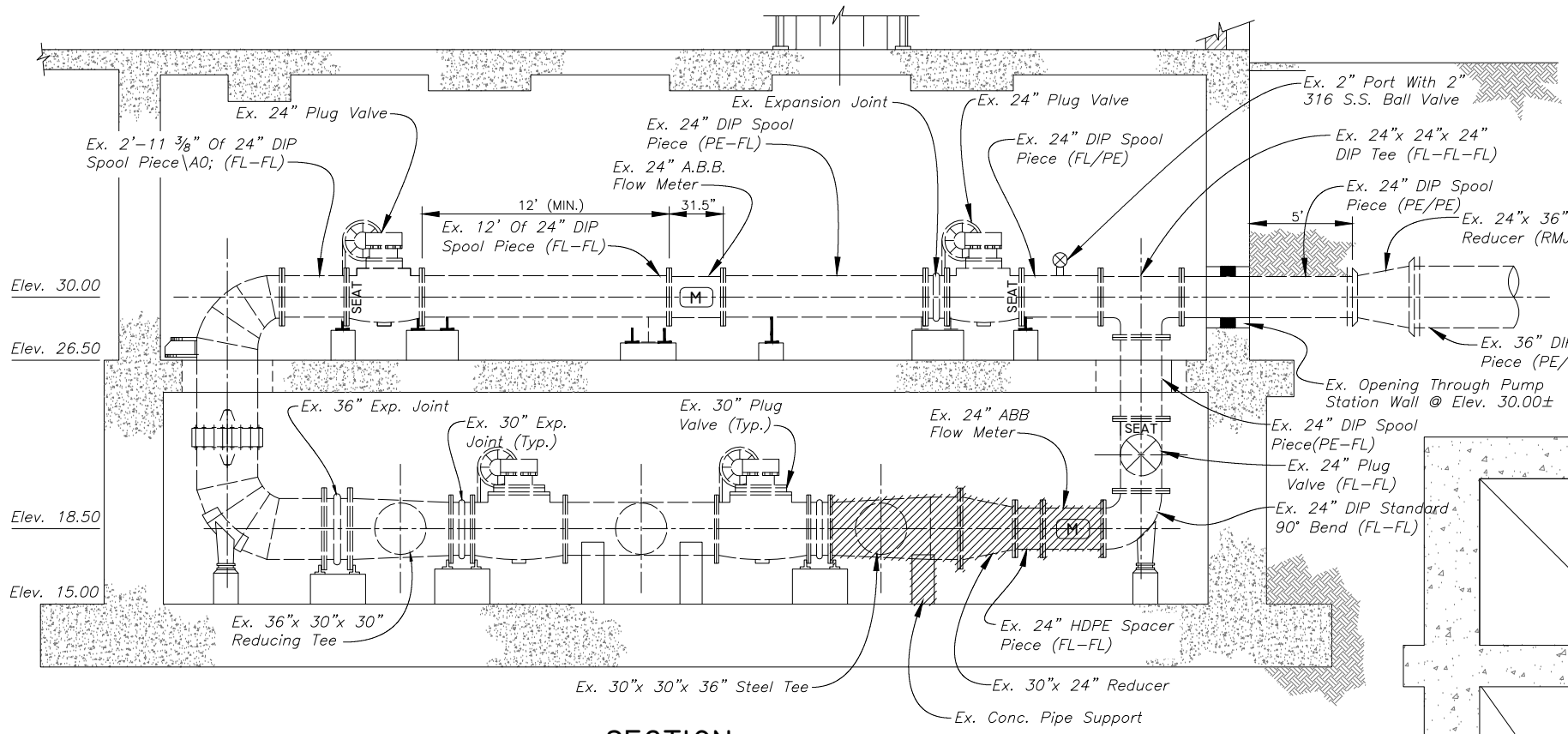
- D-1. ALL DIMENSIONS ARE APPROXIMATE. TRUE DIMENSIONS SHALL BE DETERMINED IN THE FIELD.
- D-2. SALVAGEABLE MATERIAL, AS DETERMINED BY DEPARTMENT PERSONNEL, SHALL BE DELIVERED TO THE CITY OF TAMPA'S HOWARD F. CURREN AWTP AT 2700 MARITIME BOULEVARD. NON-SALVAGEABLE MATERIALS ARE TO BE REMOVED FROM THE SITE AND PROPERLY DISPOSED OF AT THE CONTRACTOR'S EXPENSE. IN GENERAL, ALL PUMP AND CONTROLS EQUIPMENT SHALL REMAIN PROPERTY OF THE CITY AND SHALL BE DELIVERED TO THE TREATMENT PLANT.
- D-3. ALL ALUMINUM FRAMES AND PLATFORMS ON PUMP #1 SHALL BE SALVAGED AND DELIVERED TO THE TREATMENT PLANT.
- D-4. THE PUMP STATION SITE SHALL BE MAINTAINED IN AS NEAT AND ORDERLY CONDITION AS POSSIBLE DURING CONSTRUCTION OPERATIONS. WALKWAYS AND DRIVEWAYS SHALL BE KEPT CLEAR FOR DEPARTMENT PERSONNEL TO PASS THROUGH.
- D-5. CONTRACTOR SHALL CUT ALL EXPOSED REINFORCING STEEL TO A DEPTH OF 1-INCH BELOW THE EXPOSED SURFACE AND GROUT OVER.
- D-6. CONTRACTOR SHALL SUBMIT A PLAN FOR APPROVAL THAT WILL PREVENT THE EXPANSION JOINTS IN THE 30"-36" DISCHARGE HEADER FROM EXPANDING AFTER THE EXISTING 30"x 30"x 36' TEE HAS BEEN REMOVED IN THE PUMP ROOM.

## "POSSIBLE" CONSTRUCTION SEQUENCE

- S-1. CITY FORCES CLOSE EX. 30" & 24" PLUG VALVES IN PUMP ROOM TO ISOLATE DISCHARGE SIDE OF PUMP #1. CONTRACTOR TO INSTALL STOP LOGS AND 42" PLUG IN SCREEN ROOM TO ISOLATE SUCTION SIDE OF PUMP #1.
- S-2. PROCEED WITH DEMOLITION AND INSTALL 24" KNIFE GATE VALVE AS SOON AS POSSIBLE.
- S-3. INSTALL PROPOSED PUMP #1, PUMP CHECK VALVE, FLOW METER, PIPE AND FITTINGS (INCLUDING ELECTRICAL WORK).
- S-4. PERFORM REQUIRED TESTS ON PROPOSED PUMPING EQUIPMENT.
- S-5. PERFORM TRAINING, COMPLETE PUNCH LIST ITEMS.

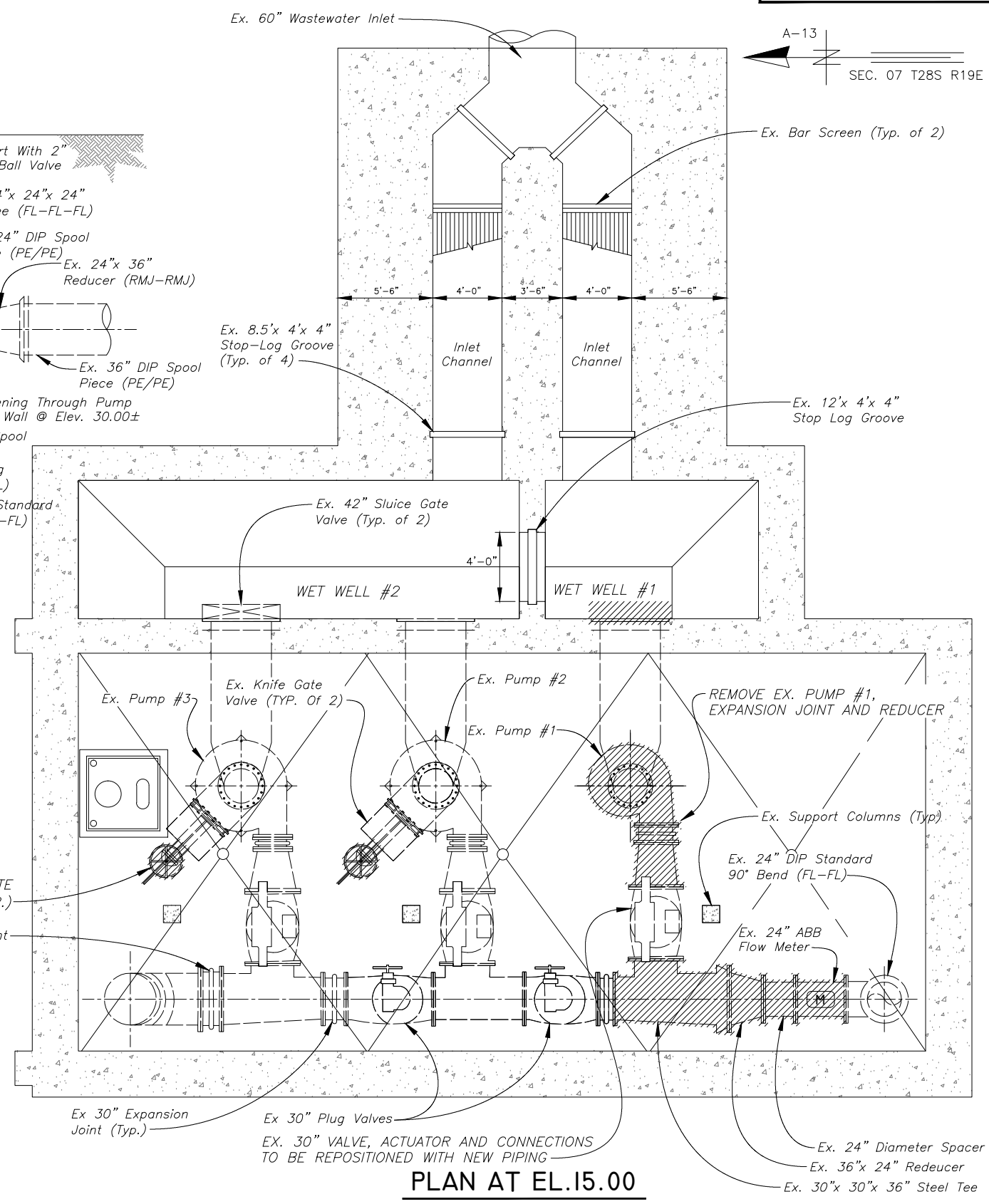
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 11/22/2016 9:55am

JACINTO CARLOS FERRAS, P.E. #49454 DESIGN DIVISION HEAD WASTEWATER DEPARTMENT	No.    DATE    REVISIONS	DES: J.H. DRN: BB CKD: DATE:	<b>CITY of TAMPA</b> WASTEWATER DEPARTMENT	<b>UNIVERSITY PUMPING STATION                  PUMP #1 REPLACEMENT                  GENERAL NOTES</b>	SHEET <b>4</b>
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**SECTION**  
APPROXIMATE SCALE: 1/8" = 1'-0"

(\* ) — EBAA MEGA-FLANGE FLANGE ADAPTOR



**PLAN AT EL. 15.00**  
APPROXIMATE SCALE: 1/8" = 1'-0"

ITEMS SHOWN AS HATCHED ARE TO BE DEMOLISHED AND REMOVED

Layout: Nov 21, 2016 - 2:24pm  
 JACINTO CARLOS FERRAS, P.E. #49454  
 DESIGN DIVISION HEAD  
 WASTEWATER DEPARTMENT

JACINTO CARLOS FERRAS, P.E. #49454  
DESIGN DIVISION HEAD  
WASTEWATER DEPARTMENT

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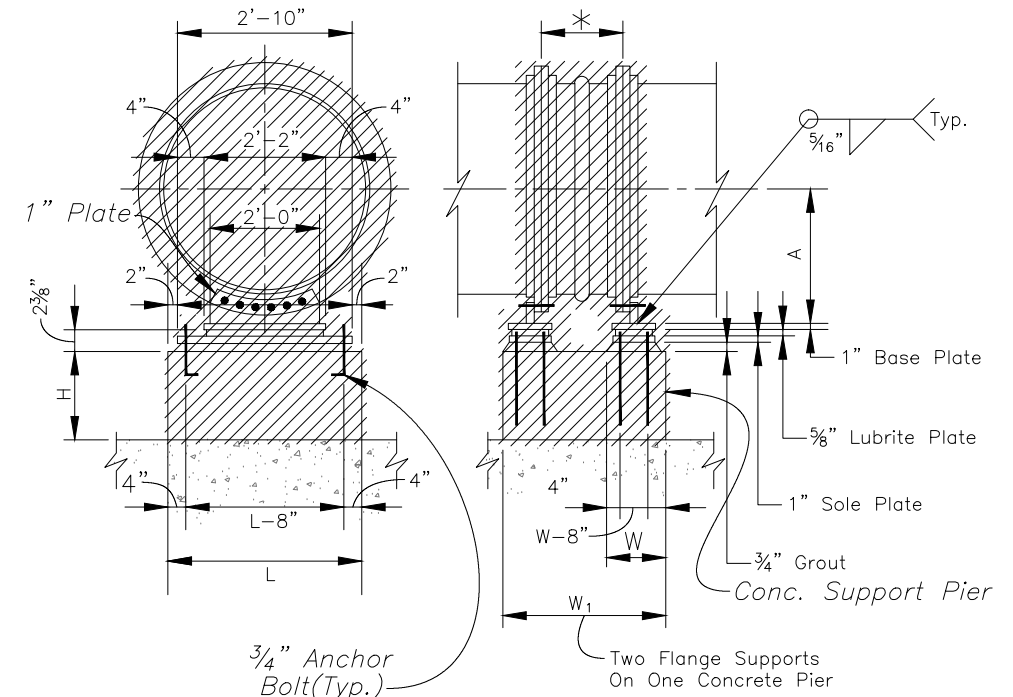
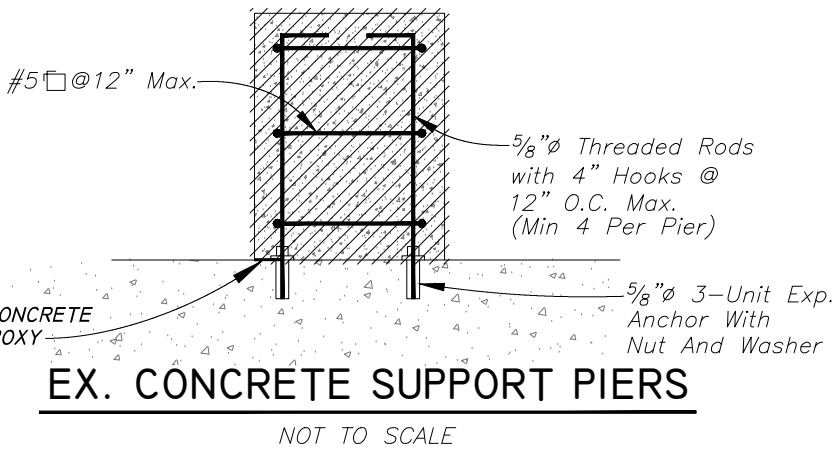
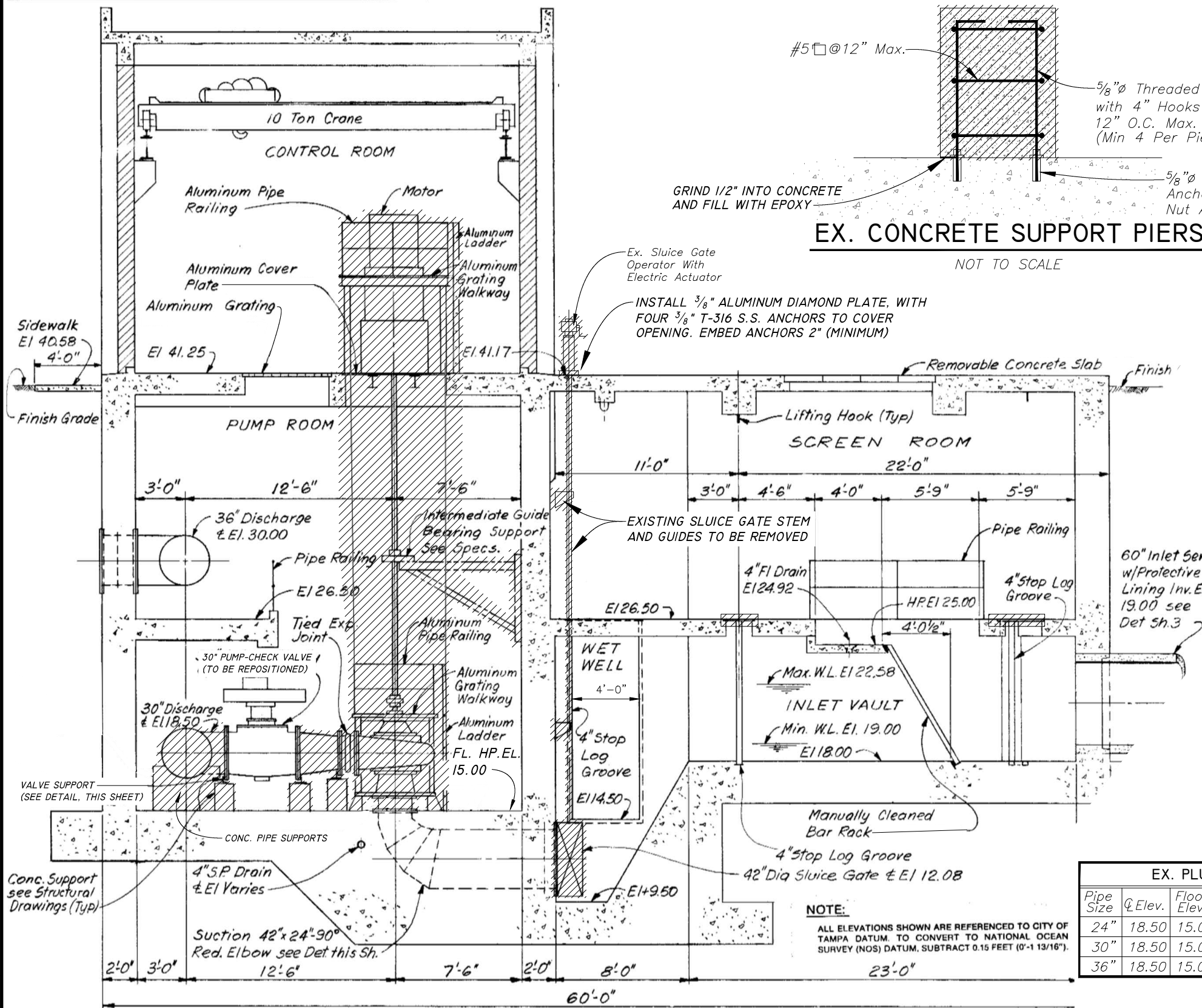
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**CITY of TAMPA**  
WASTEWATER DEPARTMENT

**UNIVERSITY PUMPING STATION**  
**PUMP #1 REPLACEMENT**  
**DEMOLITION PLAN AND SECTION**

SHEET  
**5**

User: sst1 - Drawing Name: K:\WasteWater Projects\University P.S. - Pump#1 - Sheets 5-6-8-d.dwg



**EX. PLUG VALVE AND EXPANSION JOINT SUPPORT DIMENSIONS (TO BE FIELD VERIFIED)**

Pipe Size	Q Elev.	Floor Elev.	Location	A	B	C	D	E	W	W <sub>1</sub>	L	H
24"	18.50	15.00	Low Discharge Header	1'-6"	2'-10"	10"	2'-2"	10"	1'-2"	*	3'-2"	1'-8 <sup>5</sup> / <sub>8</sub> "
30"	18.50	15.00	Low Discharge Hdr & Pumps	1'-9 <sup>3</sup> / <sub>8</sub> "	2'-10"	10"	2'-2"	10"	1'-2"	*	3'-2"	1'-5 <sup>1</sup> / <sub>4</sub> "
36"	18.50	15.00	Low Discharge Hdr & Pumps	2'-1"	2'-10"	10"	2'-2"	10"	—	*	3'-2"	1'-1 <sup>5</sup> / <sub>8</sub> "

\* Shown For Information Only. Not Included In This Contract

JACINTO CARLOS FERRAS, P.E. #49454  
DESIGN DIVISION HEAD  
WASTEWATER DEPARTMENT

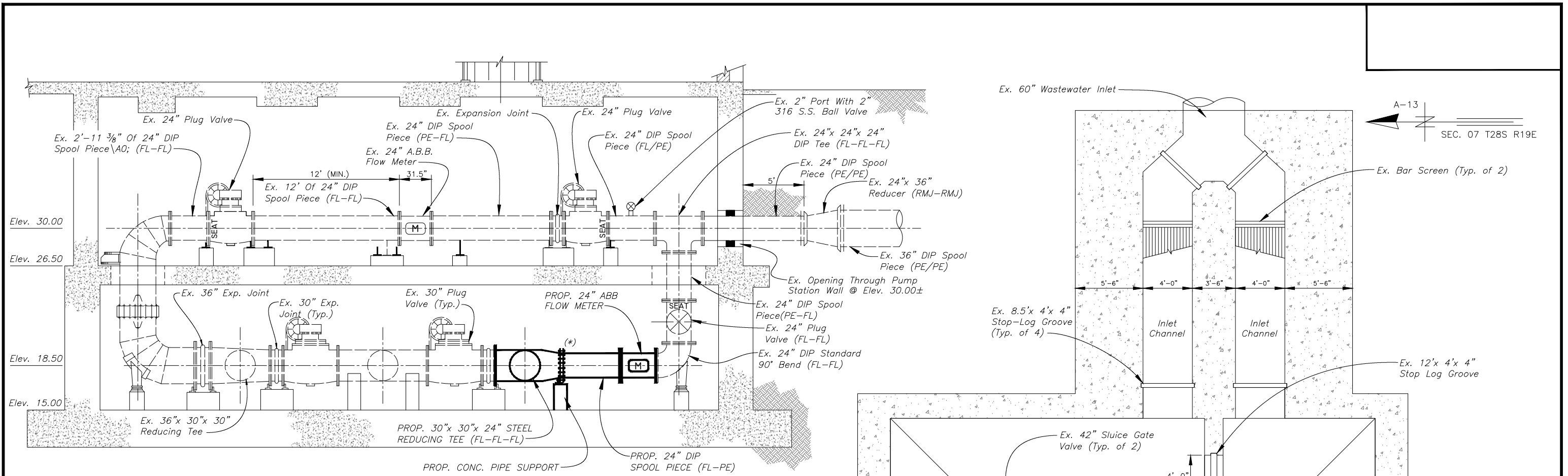
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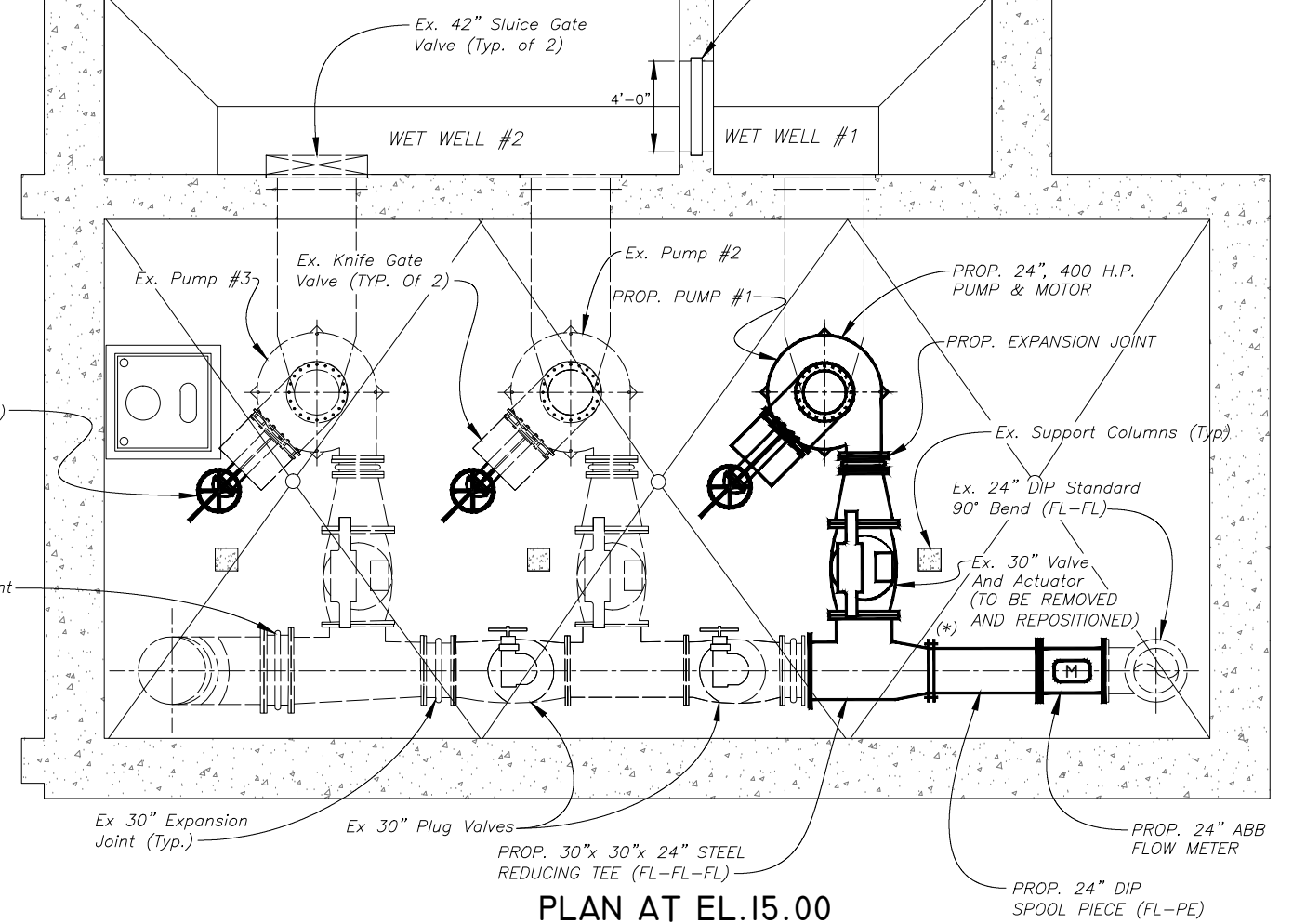
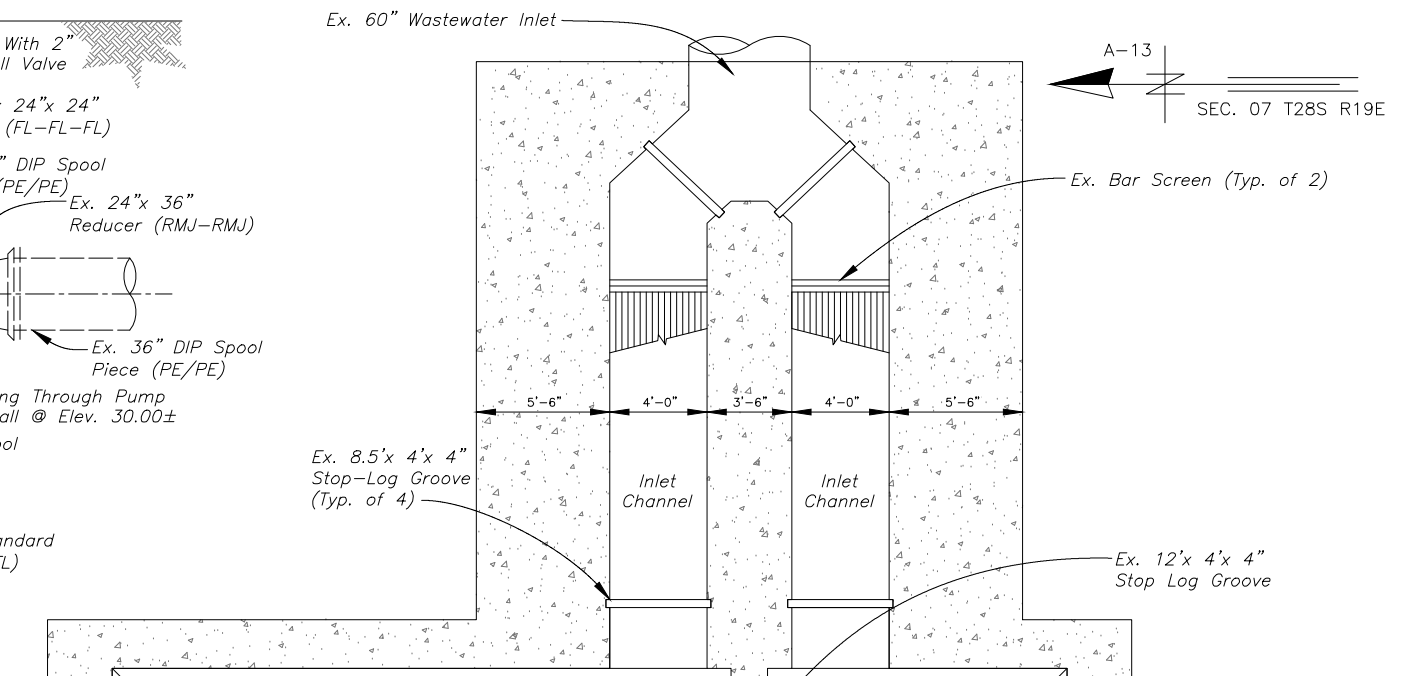
**CITY of TAMPA**  
WASTEWATER DEPARTMENT

**UNIVERSITY PUMPING STATION**  
PUMP #1 REPLACEMENT  
DEMOLITION SECTION

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**6**



**SECTION**  
 APPROXIMATE SCALE: 1/8" = 1'-0" (\*) — EBAA MEGA-FLANGE FLANGE ADAPTOR



**PLAN AT EL.15.00**  
 APPROXIMATE SCALE: 1/8" = 1'-0"



PROP. ELECTRIC KNIFE GATE VALVE ACTUATORS (TYP. OF 3)

**PROPOSED CONFIGURATION FOR KNIFE GATE VALVE ACTUATORS**

Nov 21, 2016 - 2:24pm  
 Layout -

JACINTO CARLOS FERRAS, P.E. #49454 DESIGN DIVISION HEAD WASTEWATER DEPARTMENT
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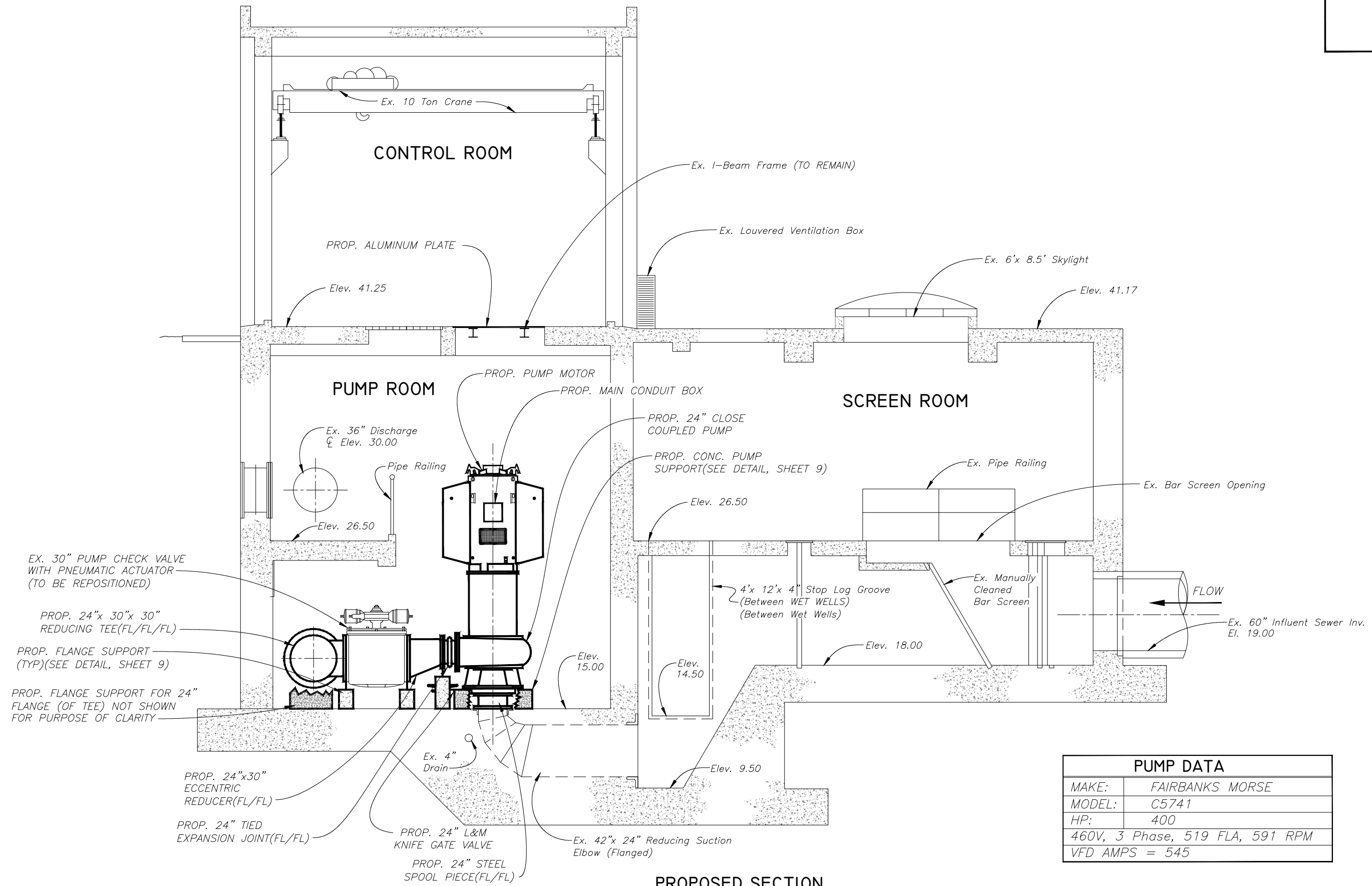
**CITY of TAMPA**  
 WASTEWATER DEPARTMENT

**UNIVERSITY PUMPING STATION  
 PUMP #1 REPLACEMENT  
 PROPOSED PLAN AND SECTION**

SHEET  
**7**



User: sst1 - Drawing Name: K:\WasteWater Projects\University P's pump #1\Design\Plans\Dratting\UWG\University P.S. - Pump#1 - Sheets 5-6-8-dwg



PUMP DATA	
MAKE:	FAIRBANKS MORSE
MODEL:	C5741
HP:	400
460V, 3 Phase, 519 FLA, 591 RPM	
VFD AMPS = 545	

**PROPOSED SECTION**  
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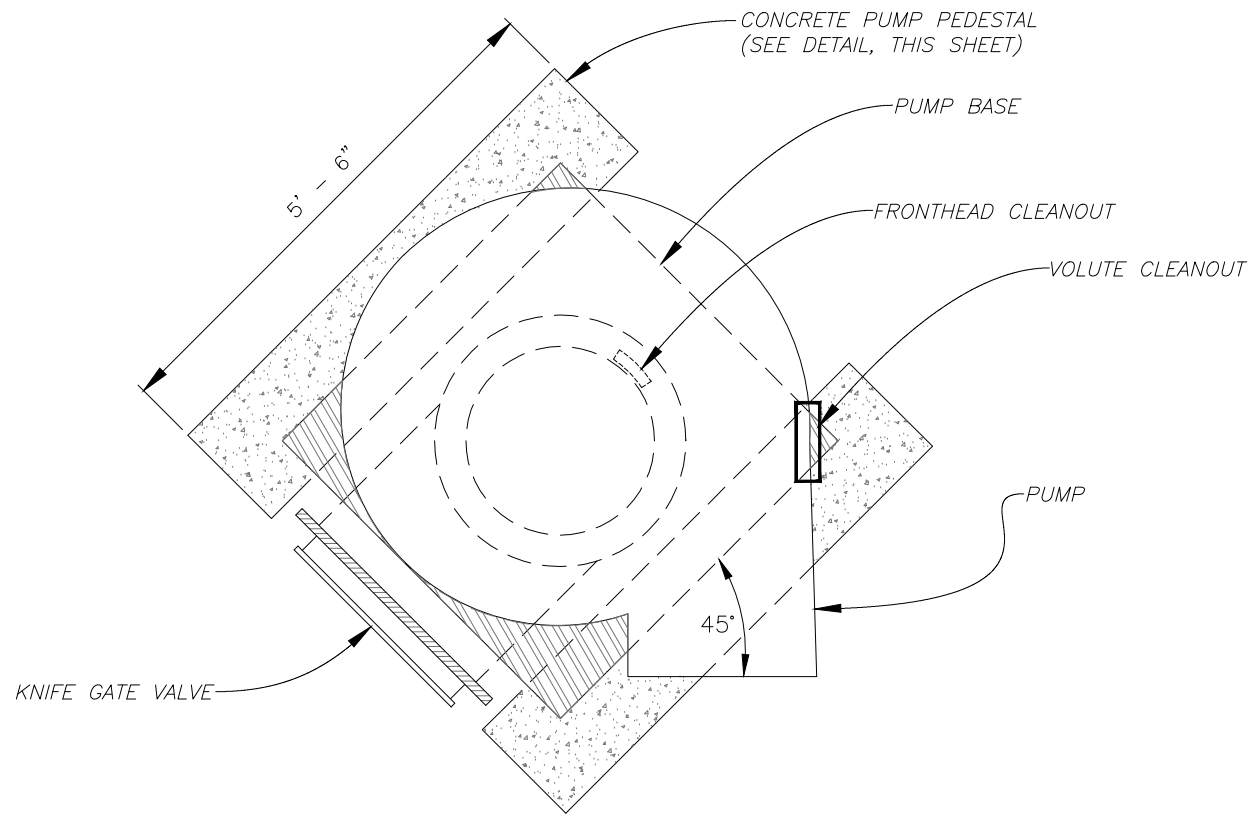
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**CITY of TAMPA**  
WASTEWATER DEPARTMENT

**UNIVERSITY PUMPING STATION**  
**PUMP #1 REPLACEMENT**  
**PROPOSED SECTION**

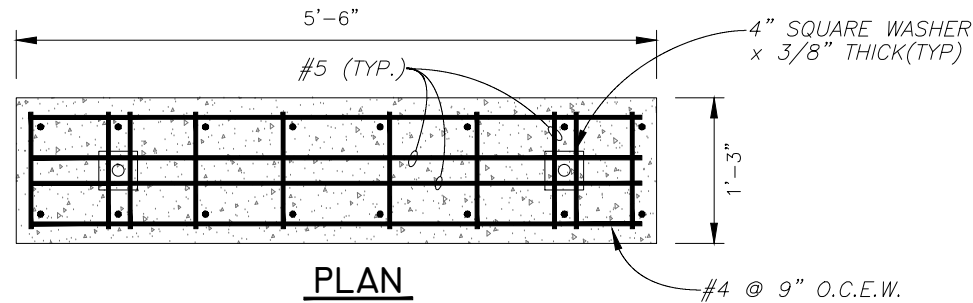
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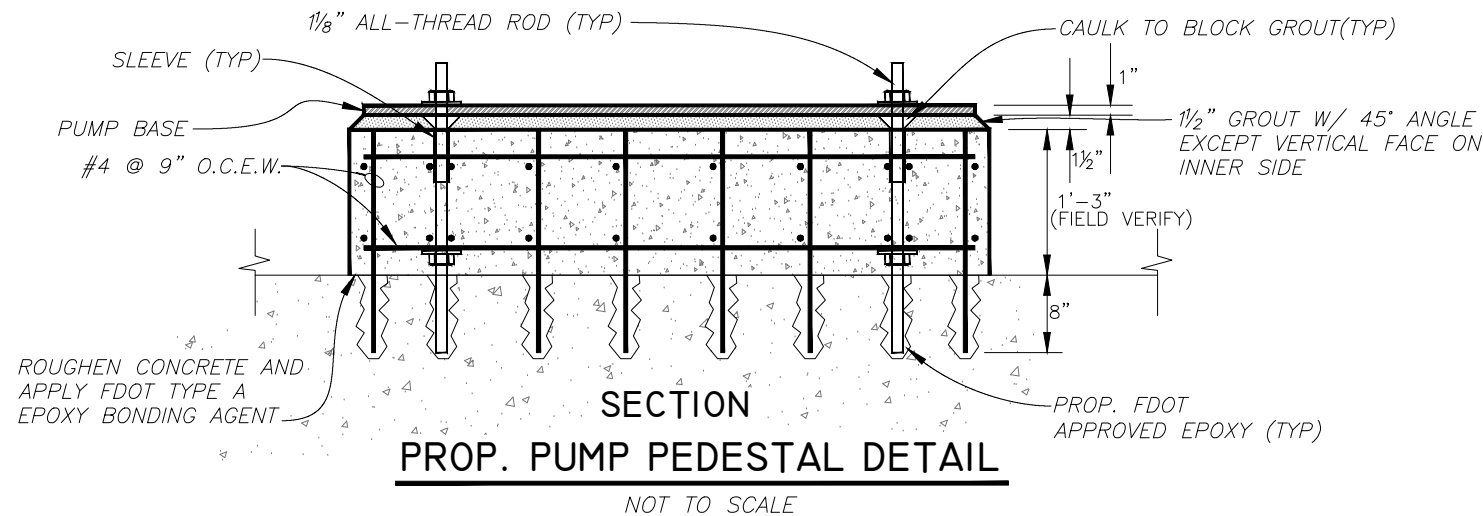


**PROP. PUMP SUPPORT  
PLAN**

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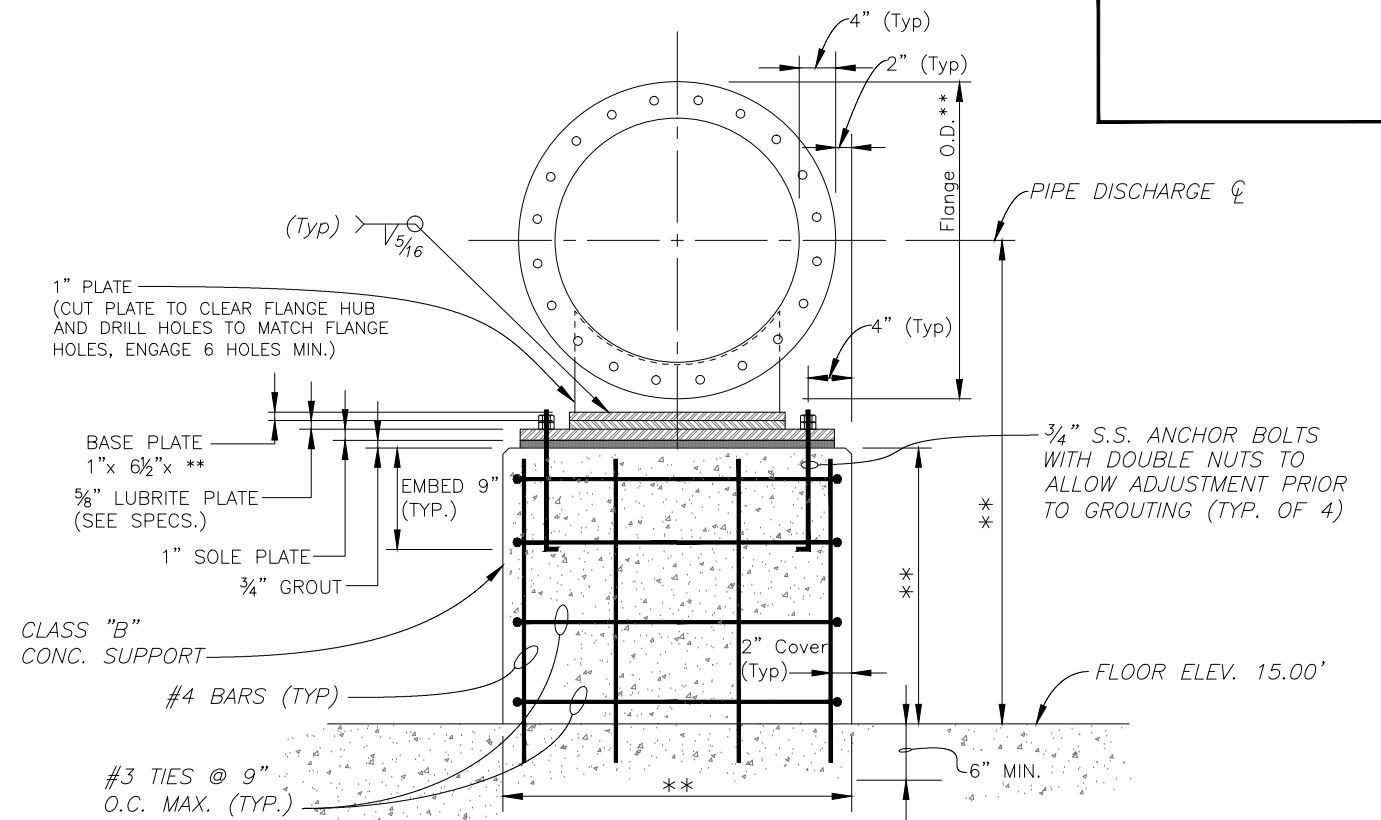


**PLAN**



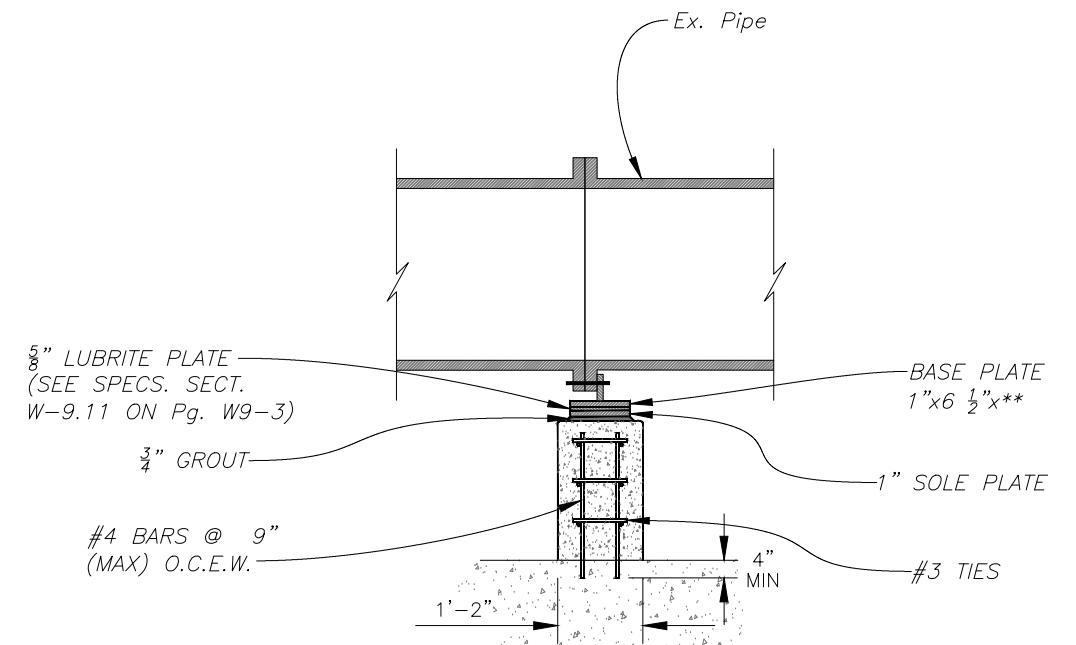
**PROP. PUMP PEDESTAL DETAIL  
SECTION**

NOT TO SCALE



**PROP. FLANGE SUPPORT DETAIL I  
N.T.S.**

\*\* Dimension Dependent on Pipe Diameter



**PROP. FLANGE SUPPORT DETAIL 2**

NOT TO SCALE

JACINTO CARLOS FERRAS, P.E. #49454 DESIGN DIVISION HEAD WASTEWATER DEPARTMENT	
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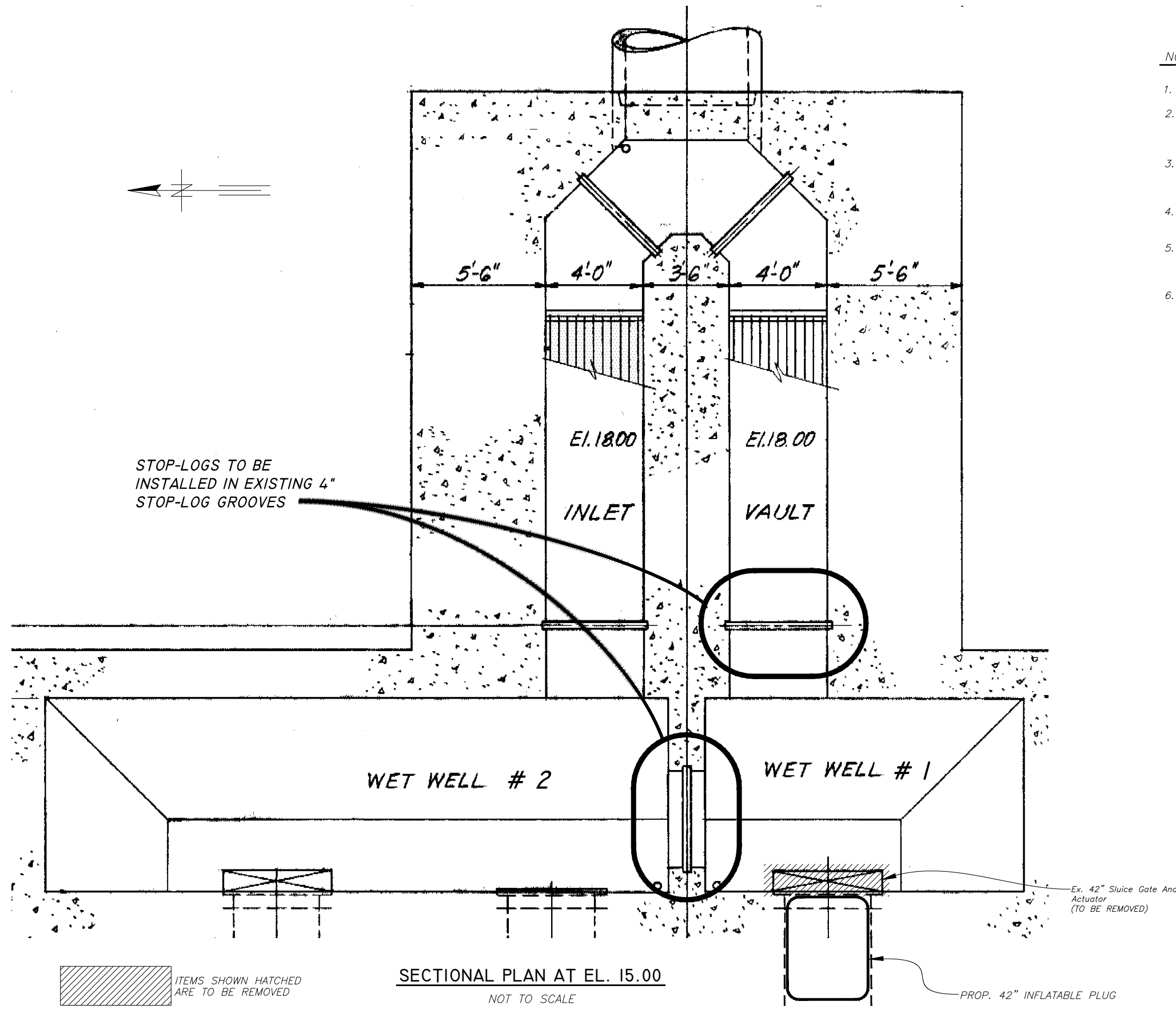
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**CITY of TAMPA**  
WASTEWATER DEPARTMENT

**UNIVERSITY PUMPING STATION  
REHABILITATION  
MISCELLANEOUS PUMP ROOM DETAILS**

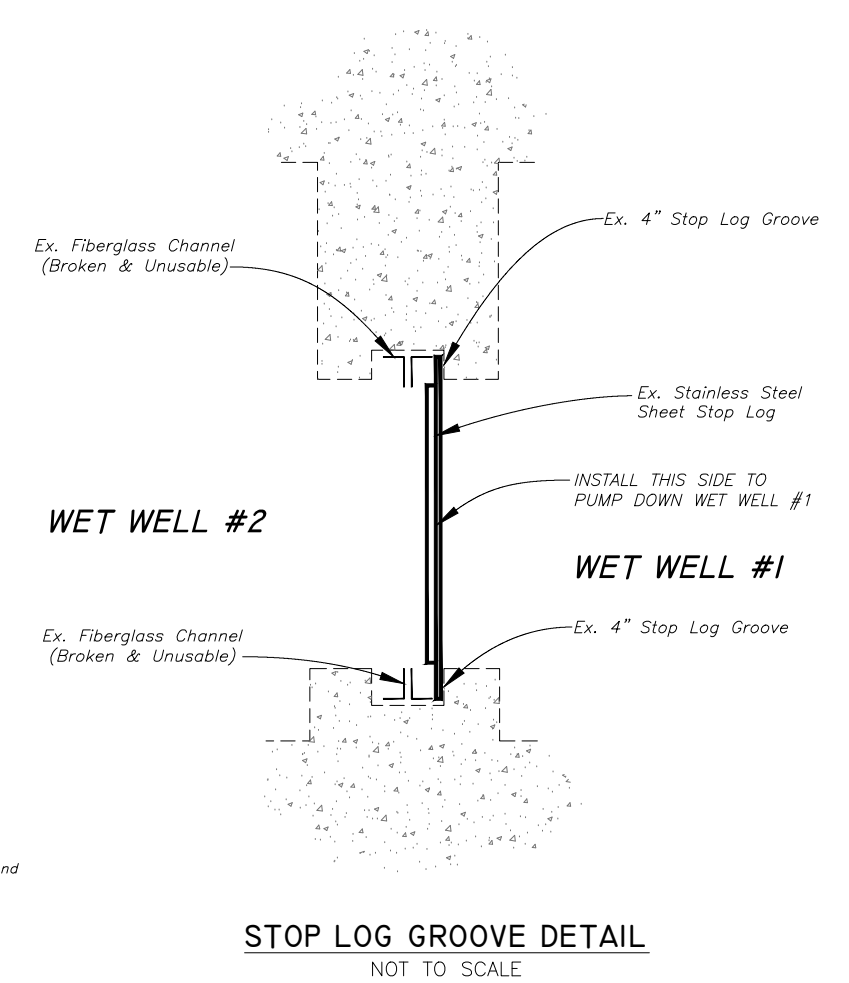
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2016, 11/21/2016, 2:30pm  
 Layout: Nov 21, 2016 - 2:30pm



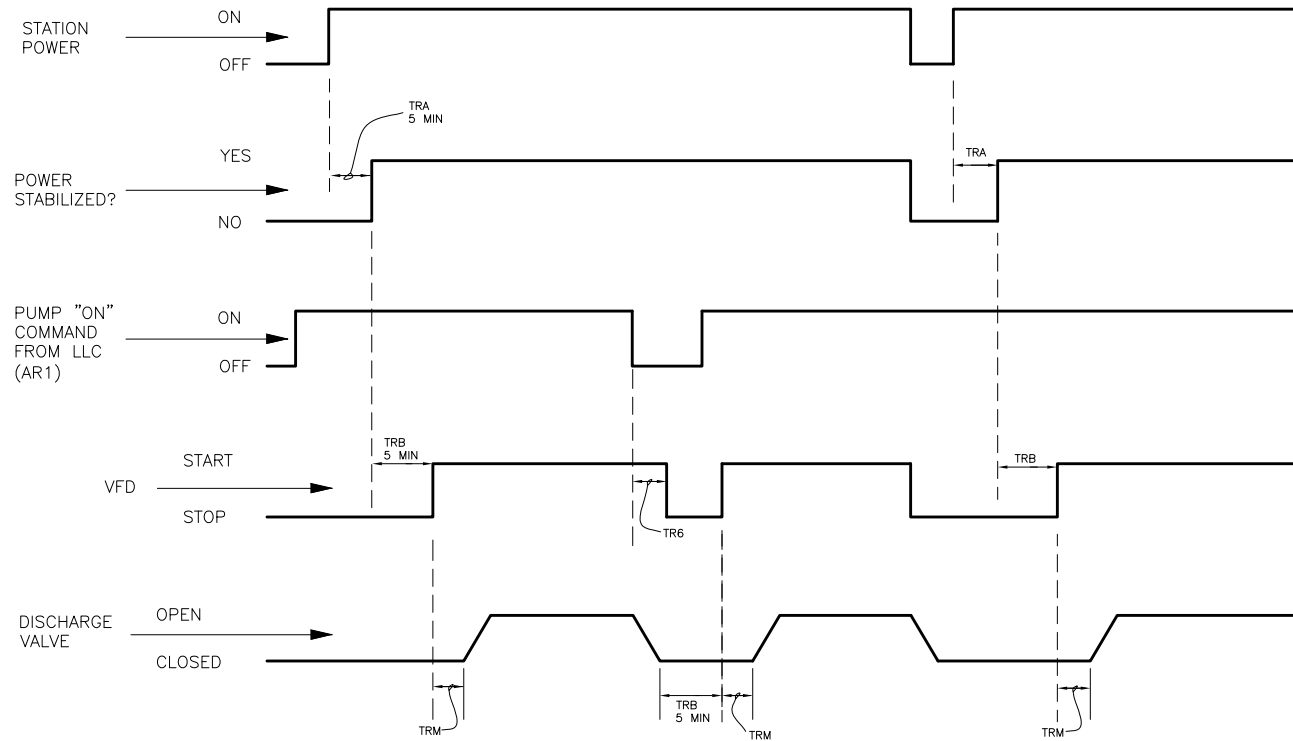
NOTES:

1. CITY WILL FURNISH THE CONTRACTOR WITH TWO STAINLESS STEEL STOP LOGS.
2. CONTRACTOR TO INSTALL STOP LOGS IN THE WET WELL #1 INLET CHANNEL AND IN BETWEEN WET WELLS PRIOR TO REMOVING EXISTING PUMP #1 IN PUMP ROOM AND INSTALLING 24" KNIFE GATE VALVE.
3. AFTER STOP LOGS HAVE BEEN INSTALLED, CONTRACTOR SHALL INSTALL HYDRAULIC SUMP PUMP IN THE ISOLATED WET WELL #1 IN ORDER TO PUMP WET WELL DOWN AND CATCH ANY WASTEWATER BYPASSING THE STOP LOGS.
4. AFTER WET WELL IS PUMPED DOWN, CONTRACTOR SHALL INSTALL, AND MAINTAIN A 42" INFLATABLE PLUG IN THE PUMP #1 INFLUENT PIPE.
5. INFLATABLE PLUG, HYDRAULIC PUMP AND STOP LOGS MAY BE REMOVED AFTER 24" SPOOL PIECE AND KNIFE GATE VALVE ARE SUCCESSFULLY INSTALLED IN THE PUMP ROOM.
6. OSHA STANDARD SAFETY EQUIPMENT SUCH AS SAFETY HARNESSSES, GAS MONITORS, LOWER EXPLOSIVE LIMIT (LEL) DETECTORS, ETC. SHALL BE UTILIZED WHERE THE WORK DICTATES THEIR USE, AND SHALL BE SOLE RESPONSIBILITY OF THE CONTRACTOR.



ITEMS SHOWN HATCHED ARE TO BE REMOVED

JACINTO CARLOS FERRAS, P.E. #49454 DESIGN DIVISION HEAD WASTEWATER DEPARTMENT	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>No.</th> <th>DATE</th> <th>REVISIONS</th> </tr> </thead> <tbody> <tr> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> </tr> <tr> <td>1</td> <td></td> <td></td> </tr> </tbody> </table>	No.	DATE	REVISIONS	3			2			1			DES: J.H. DRN: BB CKD: DATE:	<b>CITY of TAMPA</b> WASTEWATER DEPARTMENT	<b>UNIVERSITY PUMPING STATION</b> <b>PUMP #1 REPLACEMENT</b> <b>WET WELL ISOLATION DETAILS</b>	SHEET <b>10</b>
No.	DATE	REVISIONS															
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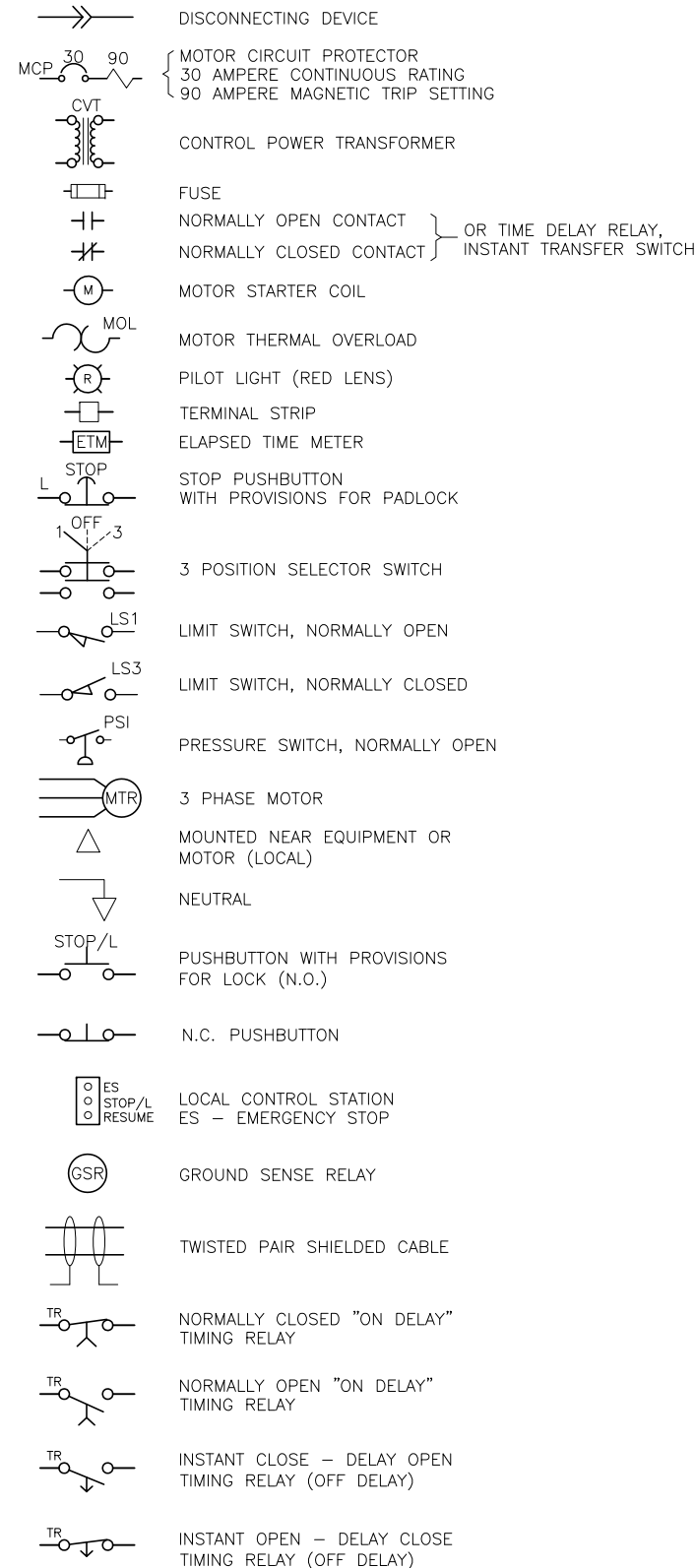


**SEWAGE PUMP No. 1  
(TIMING DIAGRAM)**

**ABBREVIATIONS:**

4C	4 CONDUCTOR	HZ	HERTZ
A	AMPS	IG	ISOLATED GROUND
AF	AMPERE FRAME	KVA	KILOVOLT AMPERES
AM	AMMETER	KW	KILOWATTS
AT	AMPERE TRIP	MAX	MAXIMUM
AFF	ABOVE FINISHED FLOOR	MIN	MINIMUM
AFG	ABOVE FINISHED GRADE	N/A	NOT APPLICABLE
ATL	ACROSS-THE-LINE	PH	PHASE
C	CONDUIT	PM	POWER MONITOR
CLF	CURRENT LIMITING FUSE	RECP	RECEPTACLE
CT	CURRENT TRANSFORMER	RPM	REVOLUTIONS PER MINUTE
CU	COPPER	RTU	REMOTE TERMINAL UNIT
EX	EXISTING	RVSS	REDUCED VOLTAGE SOFT STARTER
ELEC	ELECTRICAL	SPD	SURGE PROTECTION DEVICE
EXP	EXPLOSION PROOF	TYP	TYPICAL
FU	FUSE	V	VOLTS
GFI	GROUND FAULT INTERRUPTER	W	WIRE
GND	GROUNDING CONDUCTOR	WP	WEATHERPROOF
HP	HORSEPOWER		

**LEGEND**



**EXAMPLE OF SECTION CUT AND DETAIL**

**SECTION**

SCALE : 1/4" = 1'-0"

SHEET NUMBER WHERE SECTION IS CUT      SHEET NUMBER WHERE SECTION IS SHOWN

**SECTION (LETTERS USED)**

SHEET NUMBER WHERE SECTION IS CUT      SHEET NUMBER WHERE SECTION IS SHOWN

**DETAIL**

SCALE : 1/4" = 1'-0"

SHEET NUMBER WHERE DETAIL IS SHOWN      SHEET NUMBER WHERE DETAIL IS ENLARGED



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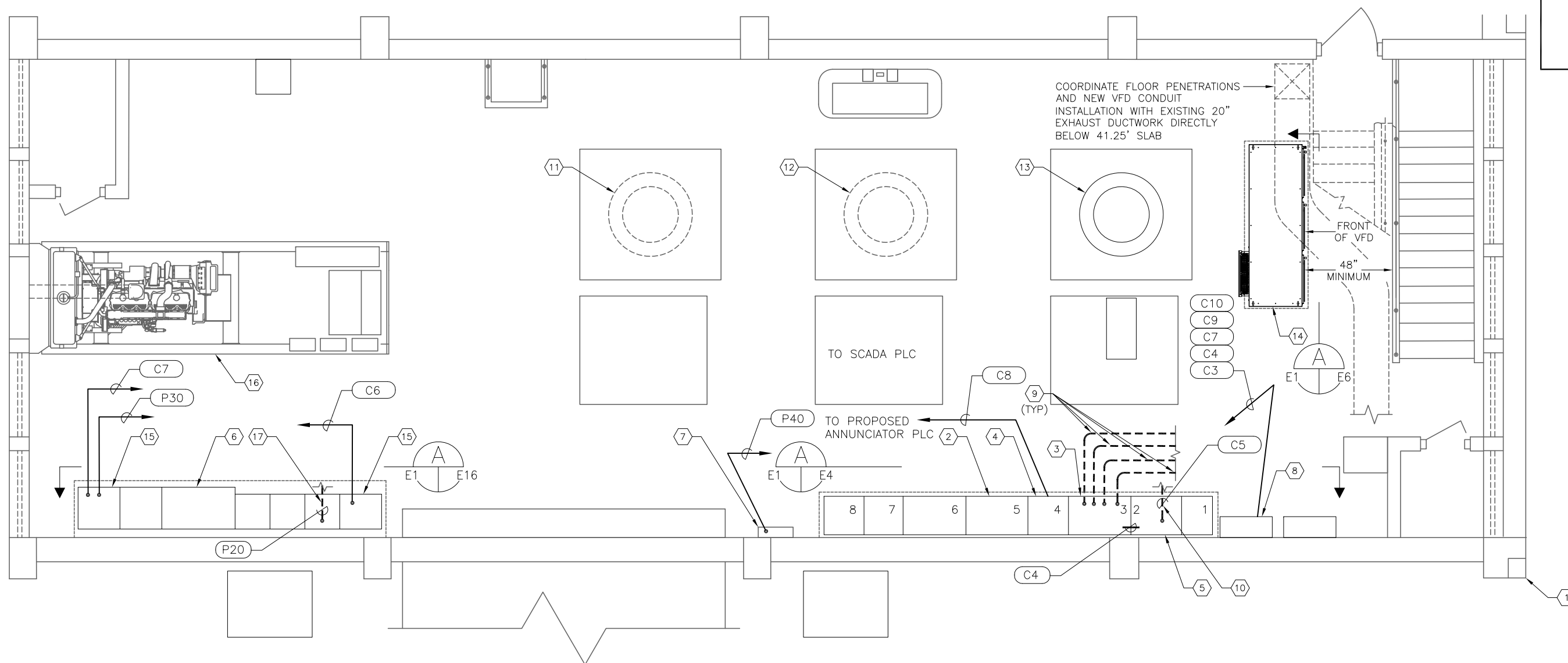
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CKD: TDT  
DATE: 11/21/16

**CITY of TAMPA**  
WASTEWATER DEPARTMENT

**UNIVERSITY P.S.**  
PUMP NO. 1 REPLACEMENT  
TIMING DIAGRAM, LEGEND & ABBREV

W.O. 4511  
SHEET  
**E0**  
OF



**ELECTRICAL POWER PLAN - ELEVATION 41.25'**

SCALE : 3/16" = 1'-0"

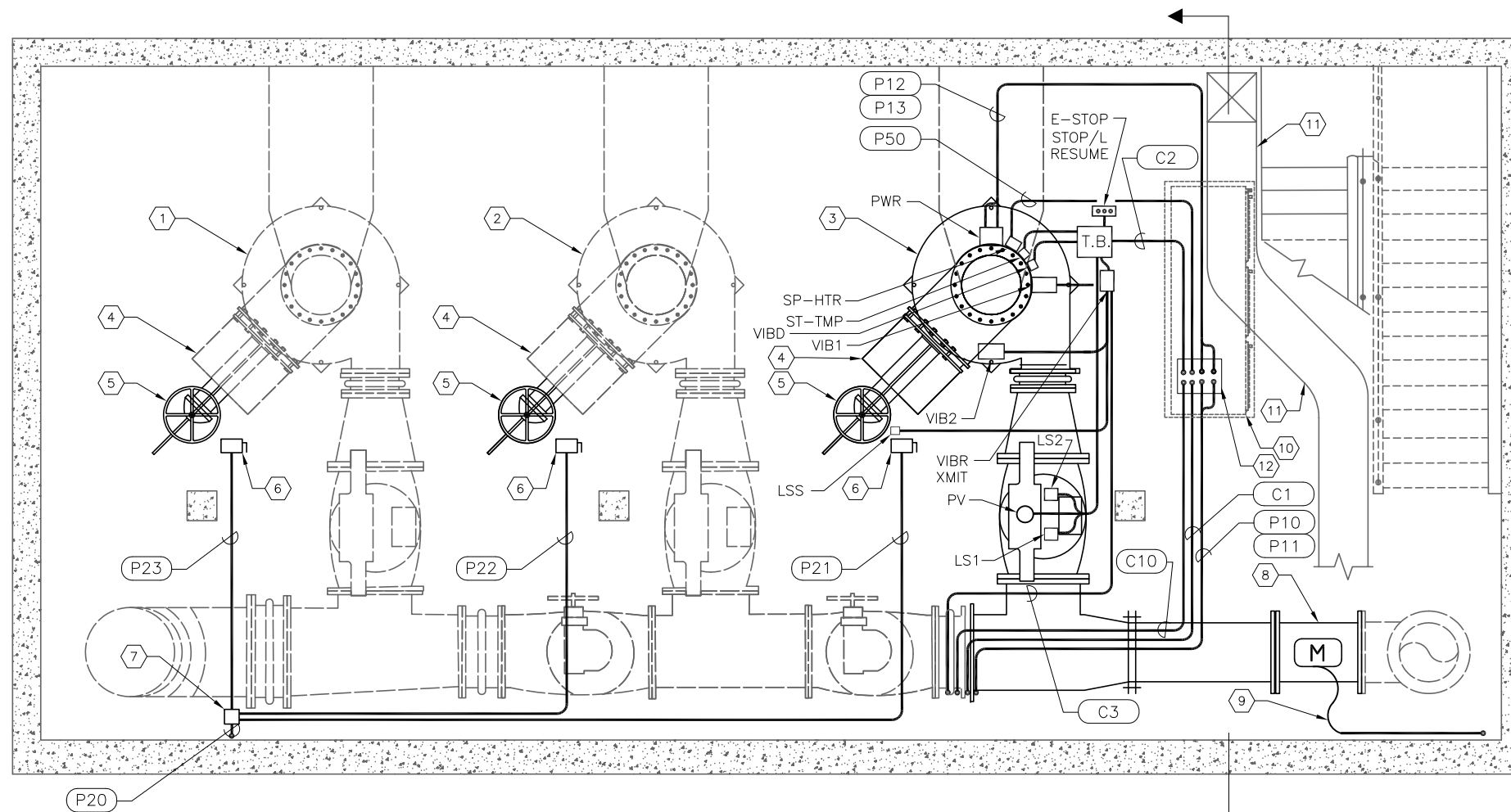
**KEYED NOTES:**

- ① EXISTING PUMP STATION BUILDING.
- ② EXISTING SEWAGE PUMPS CONTROL CENTER. REFER ALSO TO ELEVATION ON SHEET E4.
- ③ EXISTING CUBICLE NO. 3 CONTAINING EXISTING PUMP NO. 1 MOTOR STARTER. EXISTING STARTER TO BE REMOVED. REFER TO SHEETS E4 AND E5 FOR OTHER WORK REQUIRED.
- ④ EXISTING CUBICLE NO. 4 CONTAINING PUMP NO. 1 AND PUMP NO. 2 CONTROLS. (PUMP NO. 1 CONTROLS ABOVE CUBICLE 4A, PUMP NO. 2 CONTROLS BELOW, CUBICLE 4B). REFER TO SHEET E4 FOR WORK REQUIRED.
- ⑤ EXISTING LIQUID LEVEL CONTROL (LLC) PANEL. REFER TO SHEET E4. MODIFICATIONS REQUIRED TO ACCOMMODATE NEW FLOW METER TO BE INSTALLED AT ELEVATION 15.00'. REFER TO SHEET E2 FOR NEW FLOW METER LOCATION.
- ⑥ EXISTING MOTOR CONTROL CENTER, AUTOMATIC TRANSFER SWITCH AND ANNUNCIATOR LINEUP. REFER TO SHEETS E2 AND E16 FOR ELEVATION AND WORK REQUIRED.
- ⑦ EXISTING 120/208V PANEL. CONTRACTOR TO PROVIDE AND INSTALL TWO (2) NEW, 120V, SINGLE-POLE CIRCUIT BREAKERS. ONE CIRCUIT FOR NEW FLOW METER 120V POWER, ONE CIRCUIT FOR NEW ANNUNCIATOR PLC 120V POWER.
- ⑧ EXISTING PLC CONTROL CABINET. CONTRACTOR TO PROVIDE NEW 3/4" CONDUIT WITH ONE (1) 2/C #16 TWISTED SHIELD CABLE (BELDEN 8719) TO NEW FLOW METER TRANSMITTER TO BE INSTALLED IN LIQUID LEVEL CONTROL PANEL. REFER TO NOTE #9 ON SHEET E2. PROVIDE NEW CONDUIT/CONDUCTORS, C3, C4, C7, C9 AND C10.
- ⑨ NEW CONDUIT AND CONDUCTORS TO BE INSTALLED TO NEW PUMP NO. 1 AT ELEVATION 15.00'. REFER TO SHEET E2 FOR CONTINUATION.
- ⑩ EXISTING CONDUIT. CONDUIT CURRENTLY CONTAINS ONE MANUFACTURER SUPPLIED FLOW METER TRANSMITTER CABLE. CONTRACTOR TO INSTALL NEW FLOW METER TRANSMITTER CABLE (FROM FLOW METER IN NOTE #8 ON SHEET E2). IN EXISTING CONDUIT.
- ⑪ EXISTING SEWAGE PUMP NO. 3 (AT ELEVATION 15.00'). NO WORK REQUIRED.
- ⑫ EXISTING SEWAGE PUMP NO. 2 (AT ELEVATION 15.00'). NO WORK REQUIRED.
- ⑬ EXISTING SEWAGE PUMP NO. 1 (AT ELEVATION 41.25') TO BE REMOVED AND REPLACED. REFER ALSO TO CIVIL SHEETS AND SHEET E2.
- ⑭ PROPOSED LOCATION OF NEW 400 HP VFD FOR PUMP NO. 1 (AT ELEVATION 41.25'). REFER TO SHEET E6 FOR ELEVATION.
- ⑮ EXISTING ANNUNCIATOR PANEL TO BE REMOVED. REFER ALSO TO SHEET E16 FOR WORK REQUIRED.
- ⑯ EXISTING GENERATOR. NO WORK REQUIRED.
- ⑰ PROVIDE AND INSTALL NEW 3/4" CONDUIT WITH 3-#12 + 1-#12 GND DOWN TO ELEVATION 15.00' FOR NEW KNIFE GATE VALVE ACTUATORS. REFER ALSO TO SHEET E2.



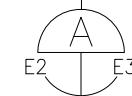
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	3			DRN: JLH			SHEET
	2			CKD: TDT			EI
	1			DATE: 11/21/16			OF



**ELECTRICAL POWER PLAN ELEVATION 15.00'**

SCALE : 3/16" = 1'-0"



REFER TO SHEET E3 FOR ELEVATION REGARDING PUMP MOTOR NO. 1 CONDUCTOR INSTALLATION.

**KEYED NOTES:**

- |   |   |
|---|---|
| <p>1 EXISTING SEWAGE PUMP NO. 3. NO WORK REQUIRED.</p> <p>2 EXISTING SEWAGE PUMP NO. 2. NO WORK REQUIRED.</p> <p>3 NEW SEWAGE PUMP NO. 1 (TO BE INSTALLED AT ELEVATION 15.00'). REFER ALSO TO CIVIL SHEETS.</p> <p>4 EXISTING KNIFE GATE VALVE. REFER ALSO TO CIVIL SHEETS.</p> <p>5 NEW KNIFE GATE VALVE ACTUATOR. REFER ALSO TO CIVIL SHEETS.</p> <p>6 PROVIDE AND INSTALL NEW 600V, 30A, 3-POLE MANUAL SWITCH IN NEMA 4 DIE CAST ZINC ALLOY, SQUARE-D 2510KW2CH OR EQUAL. FIELD LOCATE BASED ON ACTUATOR SELECTED. MOUNT WITH 1-5/8" X 1-5/8" STAINLESS STEEL UNISTRUT. PROVIDE 3/4" WATERTIGHT, NON-METALLIC FLEXIBLE CONDUIT CONNECTION TO ACTUATOR WITH 3-#12 + 1-#12 GND.</p> <p>7 PROVIDE AND INSTALL NEW 6" X 6" X 4" NEMA 4X STAINLESS STEEL JUNCTION BOX AT EL 15.00' FOR ACTUATOR FEEDER CIRCUIT. FIELD LOCATE.</p> | <p>8 NEW 24" ABB METER AND ASSOCIATED FLOW METER ELEMENT.</p> <p>9 EXISTING 3/4" CONDUIT. CONDUIT CONTINUES UP TO JUNCTION BOX AT ELEVATION 26.50'. AN EXISTING CONDUIT IS INSTALLED FROM THE JUNCTION BOX TO THE LIQUID LEVEL CONTROL PANEL. CONTRACTOR TO PROVIDE AND INSTALL NEW FLOW METER SIGNAL CABLE FROM FLOW METER ELEMENT (NOTE #8) TO THE NEW FLOW METER TRANSMITTER TO BE INSTALLED IN THE EXISTING LIQUID LEVEL CONTROL PANEL. REFER ALSO TO SHEET E1.</p> <p>10 PROPOSED LOCATION OF NEW 400 HP VFD FOR PUMP NO. 1 (AT ELEVATION 41.25' ABOVE). REFER TO ALSO TO SHEET E1.</p> <p>11 EXISTING 20" EXHAUST DUCTWORK DIRECTLY BELOW 41.25' SLAB. LOCATION SHOWN IS APPROXIMATE.</p> <p>12 COORDINATE FLOOR PENETRATIONS AND NEW VFD CONDUIT INSTALLATION WITH VFD MANUFACTURER'S CONDUIT ENTRY WINDOW AND EXISTING 20" EXHAUST DUCTWORK DIRECTLY BELOW 41.25' SLAB.</p> |
|---|---|

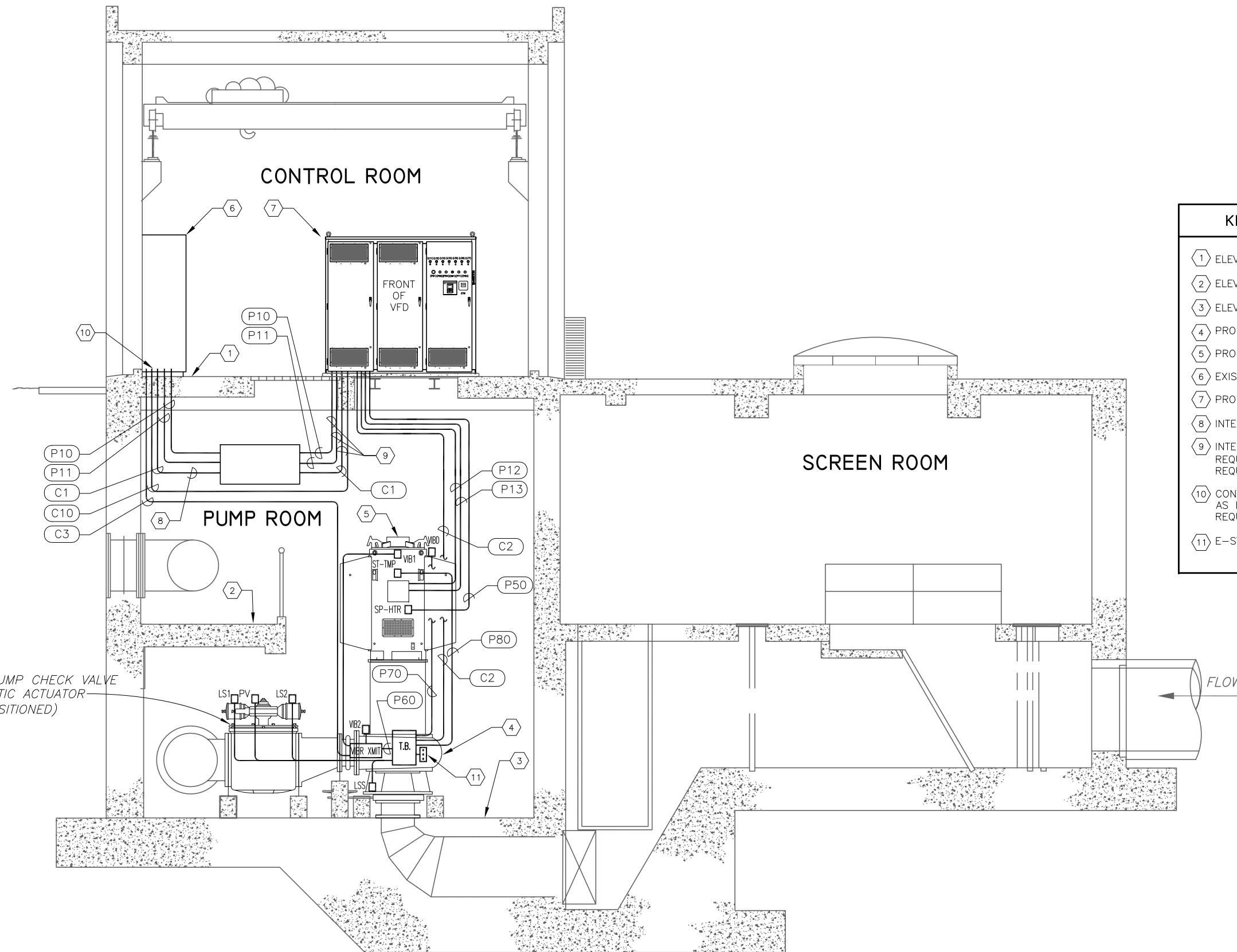
**GENERAL NOTES:**

1. NOT ALL CONDUITS/CONDUCTORS SHOWN FOR CLARITY. REFER ALSO TO SHEETS E1 AND E3.



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	3			DRN: JLH			SHEET
	2			CKD: TDT			E2
	1			DATE: 11/21/16			OF



- KEYED NOTES:**
- 1 ELEVATION 41.25'.
  - 2 ELEVATION 26.50'.
  - 3 ELEVATION 15.00'.
  - 4 PROPOSED SEWAGE PUMP NO. 1.
  - 5 PROPOSED SEWAGE PUMP NO. 1 MOTOR.
  - 6 EXISTING SEWAGE PUMPS CONTROL CENTER.
  - 7 PROPOSED SEWAGE PUMP NO. 1 VFD.
  - 8 INTERCEPT EXISTING 2-1/2" C. AND REDUCE TO 1-1/2" C.
  - 9 INTERCEPT EXISTING CONDUITS AT PULL BOX AND EXTEND AS REQUIRED. PROVIDE NEW 4" CONDUITS FOR VFD FEEDER AS REQUIRED.
  - 10 CONTRACTOR SHALL MAKE MODIFICATIONS TO EXISTING SLAB AS REQUIRED TO ACCOMMODATE ALL NEW CONDUITS REQUIRED FOR NEW VFD INSTALLATION.
  - 11 E-STOP: STOP/L: RESUME

PROP. 30" PUMP CHECK VALVE WITH PNEUMATIC ACTUATOR (TO BE REPOSITIONED)

**ELECTRICAL SECTION**

SCALE : N.T.S.



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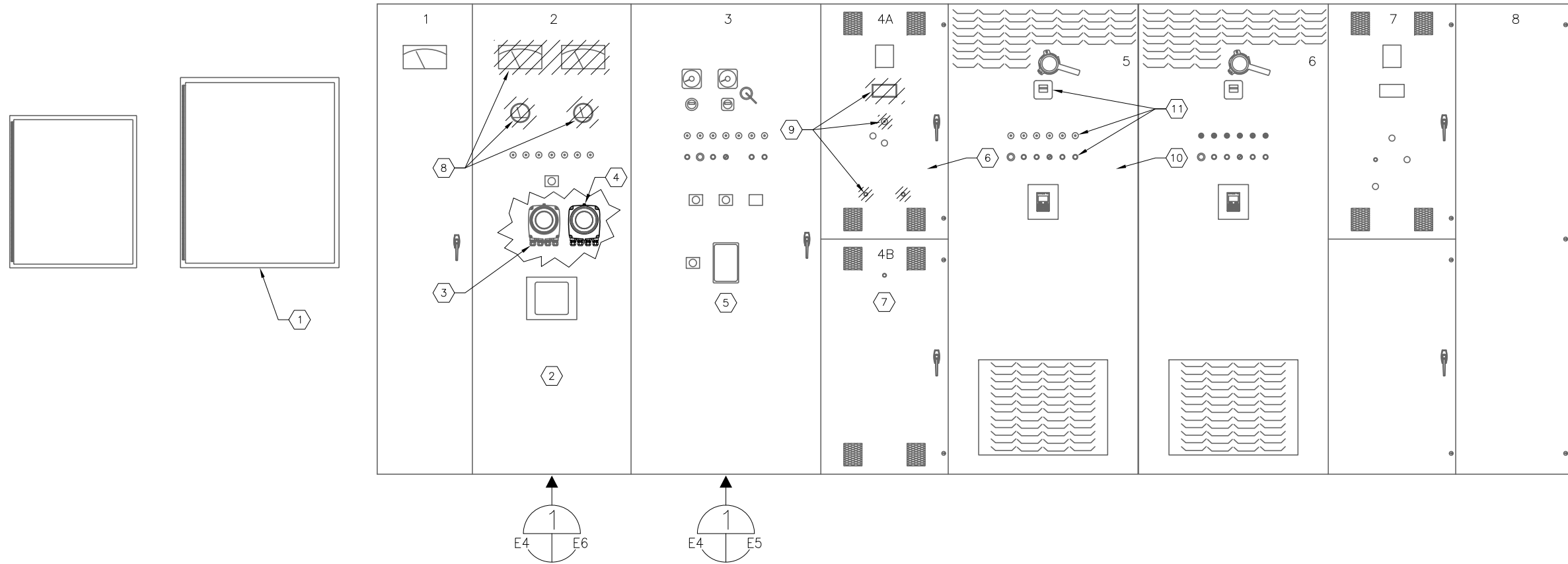
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 CKD: TDT  
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**CITY of TAMPA**  
 WASTEWATER DEPARTMENT

**UNIVERSITY P.S.**  
**PUMP NO. 1 REPLACEMENT**  
**ELECTRICAL POWER SECTION**

W.O. 4511  
 SHEET  
**E3**  
 OF



**SEWAGE PUMPS CONTROL CENTER FRONT ELEVATION**

SCALE : 1/2" = 1'-0"



KEYED NOTES:	
① EXISTING PLC CONTROL CABINET. REFER TO SHEET E1 FOR CONDUIT AND CONDUCTORS REQUIRED.	⑥ EXISTING CUBICLE 4A FOR PUMP NO. 1 CONTROLS. CONTRACTOR SHALL REMOVE ALL INTERIOR COMPONENTS MADE OBSOLETE BY THE INSTALLATION OF THE NEW PUMP NO. 1 VFD. REFER TO CONDUIT AND CABLE SCHEDULE ON SHEET E21. REFER ALSO TO SHEETS E8, E9, E10 AND E11 FOR NEW VFD CONTROLS. PROVIDE AND INSTALL NEW 600V, 20A TERMINAL BLOCKS (ALLEN-BRADLEY 1492-W3) FOR NEW CONDUCTORS TO BE INSTALLED FROM VFD. REFER ALSO TO GENERAL NOTES. NOTE: NEW CONTROLS FOR PUMP NO. 1 SHALL BE MOUNTED IN THE PROPOSED FREE-STANDING VFD CABINET LOCATED TO THE EAST.
② EXISTING LIQUID LEVEL CONTROLS (LLC) CUBICLE. REFER TO DETAIL ON SHEET E6 FOR OTHER WORK REQUIRED.	⑦ EXISTING CUBICLE 4B FOR PUMP NO. 2 CONTROLS. REFER TO SHEETS E13, E14 AND E15 FOR REPLACEMENT OF EXISTING CONTROLS.
③ EXISTING ABB FLOW METER TRANSMITTER LOCATED ON BACKPLATE OF LLC (BEHIND LLC DOOR).	⑧ EXISTING DEVICES TO BE REMOVED AND REPLACED WITH NEW. REFER TO DETAIL ON SHEET E6 FOR WORK REQUIRED.
④ PROVIDE AND INSTALL NEW ABB FLOW METER TRANSMITTER. PROVIDE AND INSTALL 2-#12 + 1-#12 GND TO 120/208V PANELBOARD FOR FLOW METER TRANSMITTER 120V POWER (P40). PROVIDE AND INSTALL 2/C #16 TWISTED SHIELDED (BELDEN 8719) FROM NEW FLOW METER TRANSMITTER TO EXISTING PLC. TRANSMITTER CABLE BY MANUFACTURER.	⑨ REMOVE EXISTING DEVICES AND PROVIDE AND INSTALL 1/4" ALUMINUM PLATE OVER EXISTING CUT-OUTS. PAINT TO MATCH EXISTING SURFACE.
⑤ EXISTING SEWAGE PUMP NO. 1 CUBICLE (SECTION 3). REFER TO SHEET E5 FOR WORK REQUIRED.	⑩ EXISTING SECTION 5 CONTAINING EXISTING PUMP NO. 2 VFD.
	⑪ EXISTING DEVICES TO BE REPLACED. REFER TO SHEETS E13, E14 AND E15 FOR NEW PUSHBUTTONS, PILOT LIGHTS, ETC. REQUIRED.

GENERAL NOTES:
1. ALL DIN-RAIL SHALL BE ALUMINUM.
2. PROVIDE AND INSTALL ALL ASSOCIATED END BARRIERS, TERMINAL JUMPERS AND ACCESSORIES AS REQUIRED FOR TERMINAL BLOCKS.



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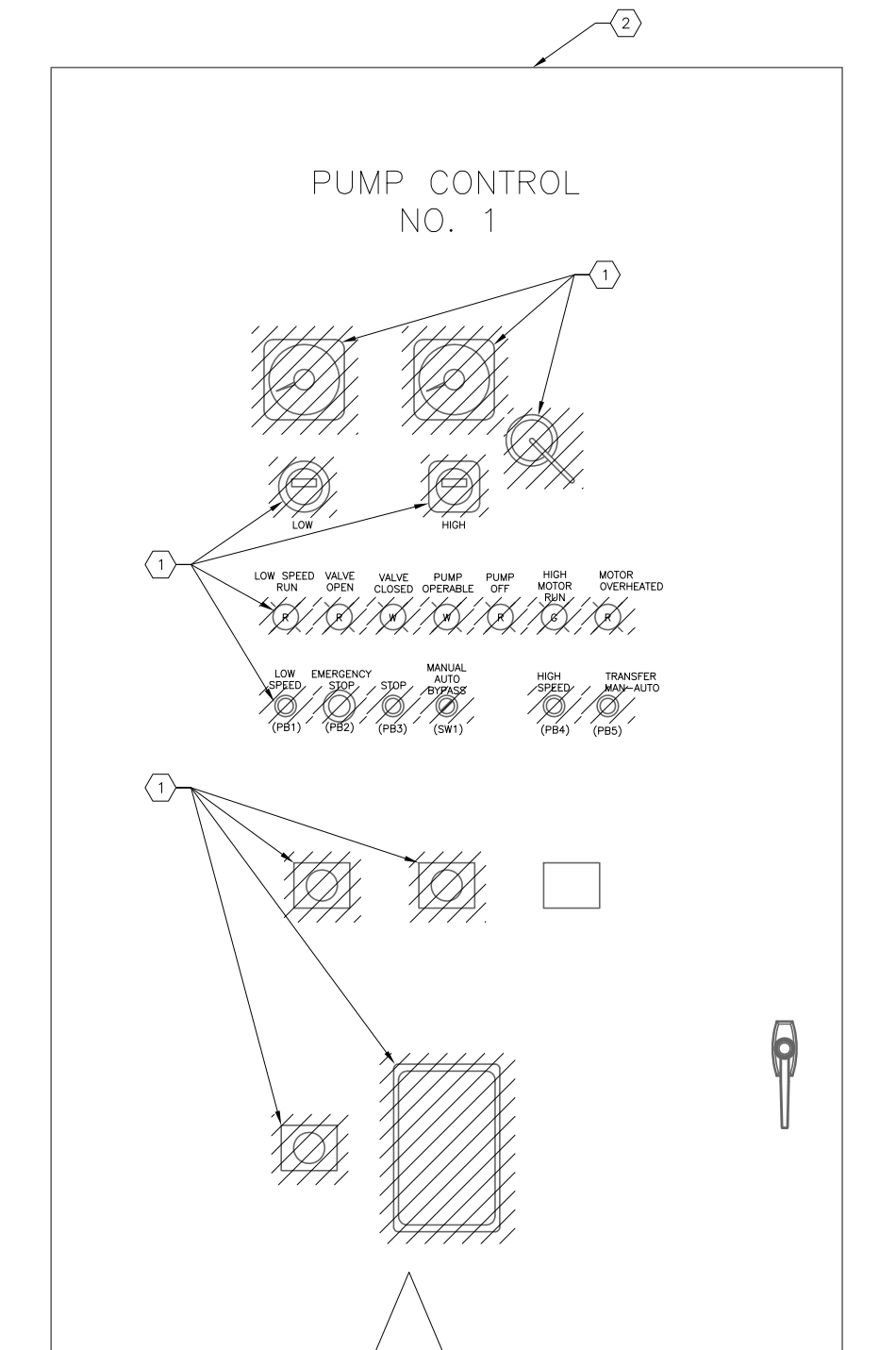
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DRN: JLH  
CKD: TDT  
DATE: 11/21/16

**CITY of TAMPA**  
WASTEWATER DEPARTMENT

**UNIVERSITY P.S.**  
PUMP NO. 1 REPLACEMENT  
CONTROL CENTER FRONT ELEVATION

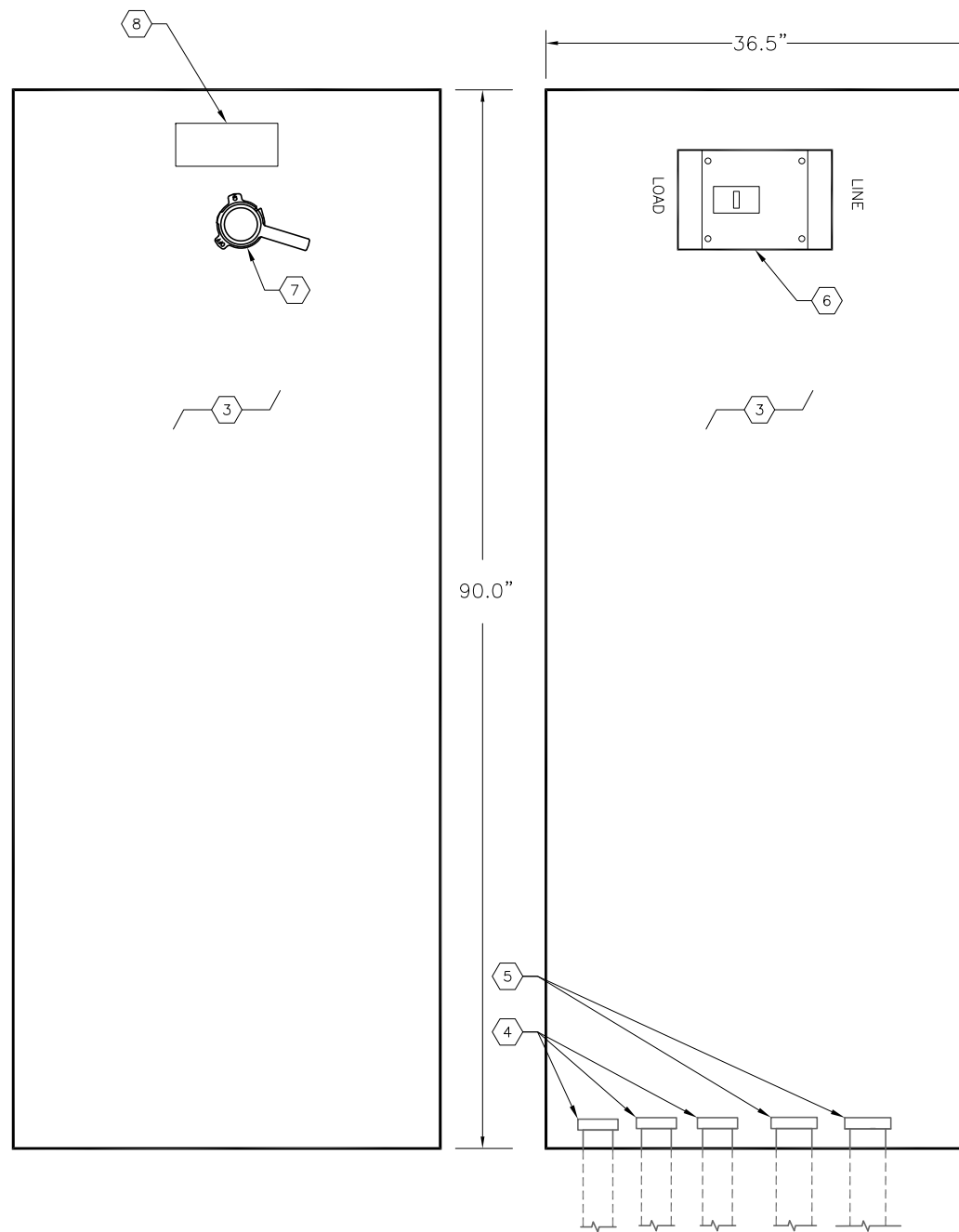
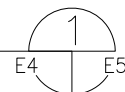
W.O. 4511  
SHEET  
**E4**  
OF





**SEWAGE PUMP No. 1 CONTROLS  
EXISTING FRONT DOOR LAYOUT DETAIL**

SCALE : N.T.S.



**SEWAGE PUMP No. 1  
SECTION 3 PROPOSED  
EXTERIOR LAYOUT**

SCALE : N.T.S.

**SEWAGE PUMP No. 1  
SECTION 3 PROPOSED  
INTERIOR LAYOUT**

SCALE : N.T.S.

**KEYED NOTES:**

- 1 REMOVE ALL EXISTING DOOR MOUNTED OPERATOR DEVICES AND INSTALL PROPOSED DEVICES AS SHOWN. NEATLY COVER EXISTING OPENINGS NOT BEING UTILIZED AND PAINT TO MATCH EXISTING SURFACE. PROVIDE PROPER LEGEND PLATES AS SHOWN. PROPOSED LEGEND PLATES ENGRAVING, LETTERING SIZE, AND MATERIAL SHALL MATCH EXISTING LEGEND PLATES.
- 2 TOP OF EXISTING DOOR.
- 3 ALL EQUIPMENT SHOWN AS LOCATED ON OR IN SECTION 3 IS PROPOSED.
- 4 THREE (3) EXISTING 2-1/2" CONDUITS. CONTRACTOR MAY REUSE EXISTING CONDUITS AS NEEDED.
- 5 CONTRACTOR SHALL MAKE MODIFICATIONS TO EXISTING SLAB AS REQUIRED TO ACCOMMODATE NEW 4" ALUMINUM CONDUITS REQUIRED FOR NEW VFD FEEDERS.
- 6 NEW 600V, 800A, 3-POLE MAIN CIRCUIT BREAKER FOR VFD FEEDER.
- 7 NEW OPERATOR FOR MAIN CIRCUIT BREAKER TO BE INSTALLED ON OUTER DOOR OF SECTION 3. OPERATOR SHALL BE ABLE TO BE LOCKED IN THE 'OFF' POSITION.
- 8 CONTRACTOR SHALL PROVIDE NEW LEGEND PLATE LABELED AS: 'PUMP NO. 1 FEEDER'. PROPOSED LEGEND PLATE ENGRAVING, LETTERING SIZE, AND MATERIAL SHALL MATCH EXISTING LEGEND PLATES.

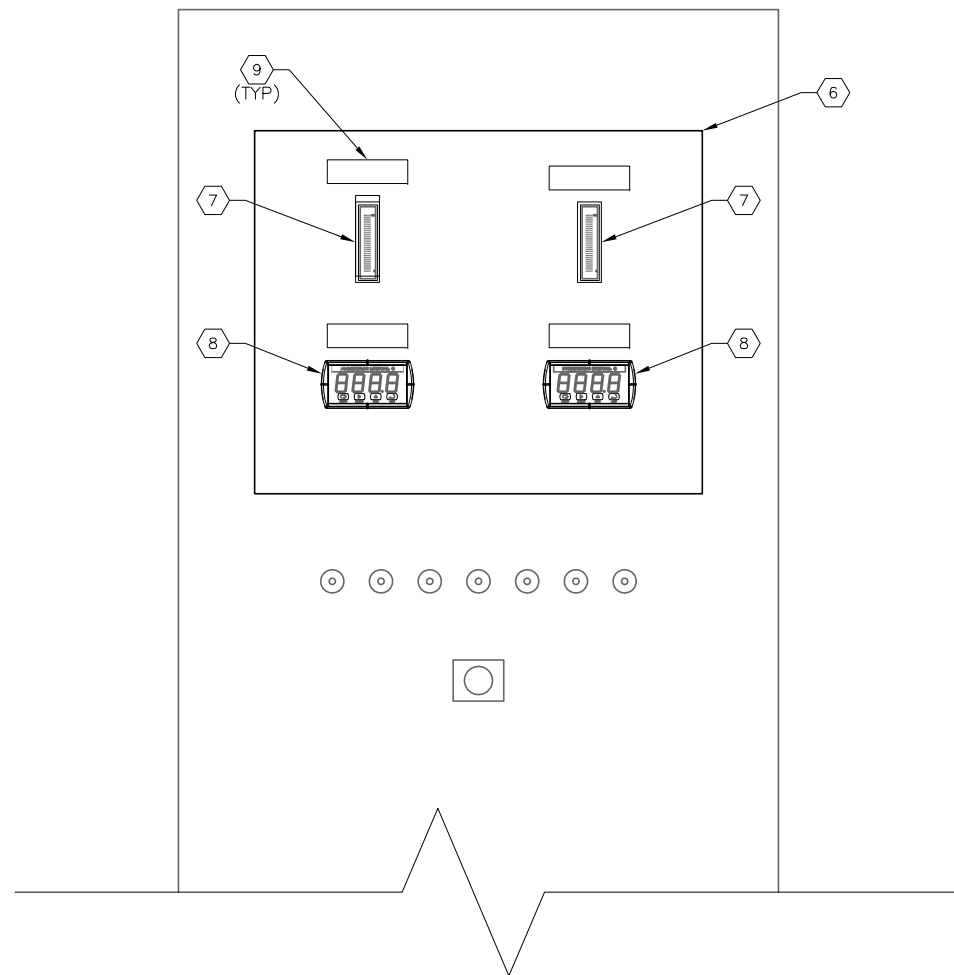
**GENERAL NOTES:**

- 1. ALL EXISTING COMPONENTS LOCATED WITHIN SECTION 3 THAT ARE NO LONGER REQUIRED FOR THE PROPER OPERATION OF PUMP NO. 1 VFD SHALL BE REMOVED.
- 2. LIGHTER LINE WEIGHT ITEMS ARE EXISTING.
- 3. REFER TO SHEET E8, E10 AND E11 FOR NEW PUMP NO. 1 VFD WIRING DIAGRAM.



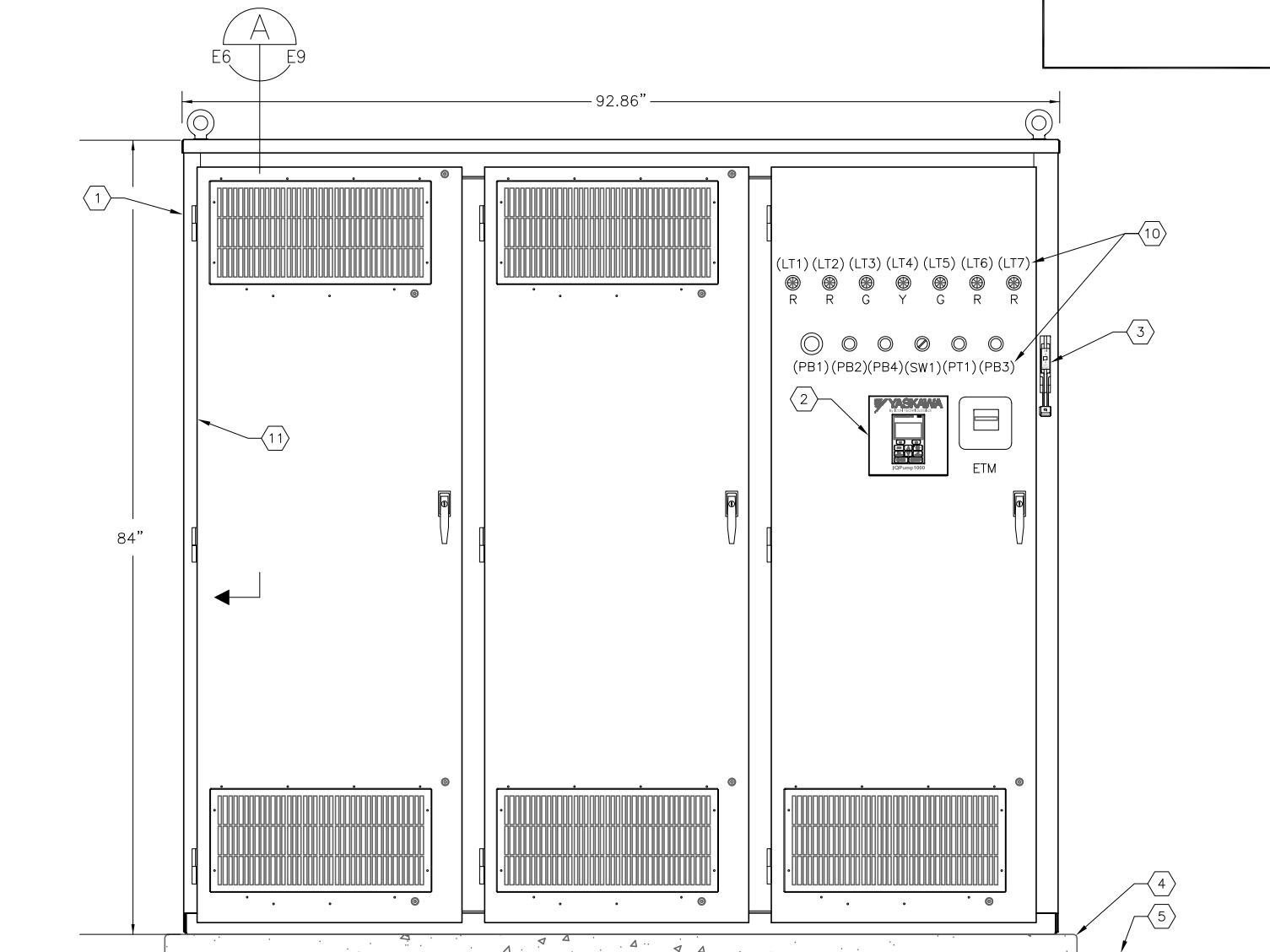
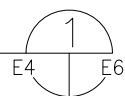
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	3			DRN: JLH			SHEET
	2			CKD: TDT			E5
	1			DATE: 11/21/16			OF



**LIQUID LEVEL CONTROLS (LLC) FRONT ELEVATION**

SCALE : N.T.S.



**VFD FRONT ELEVATION**

SCALE : N.T.S.



**KEYED NOTES:**

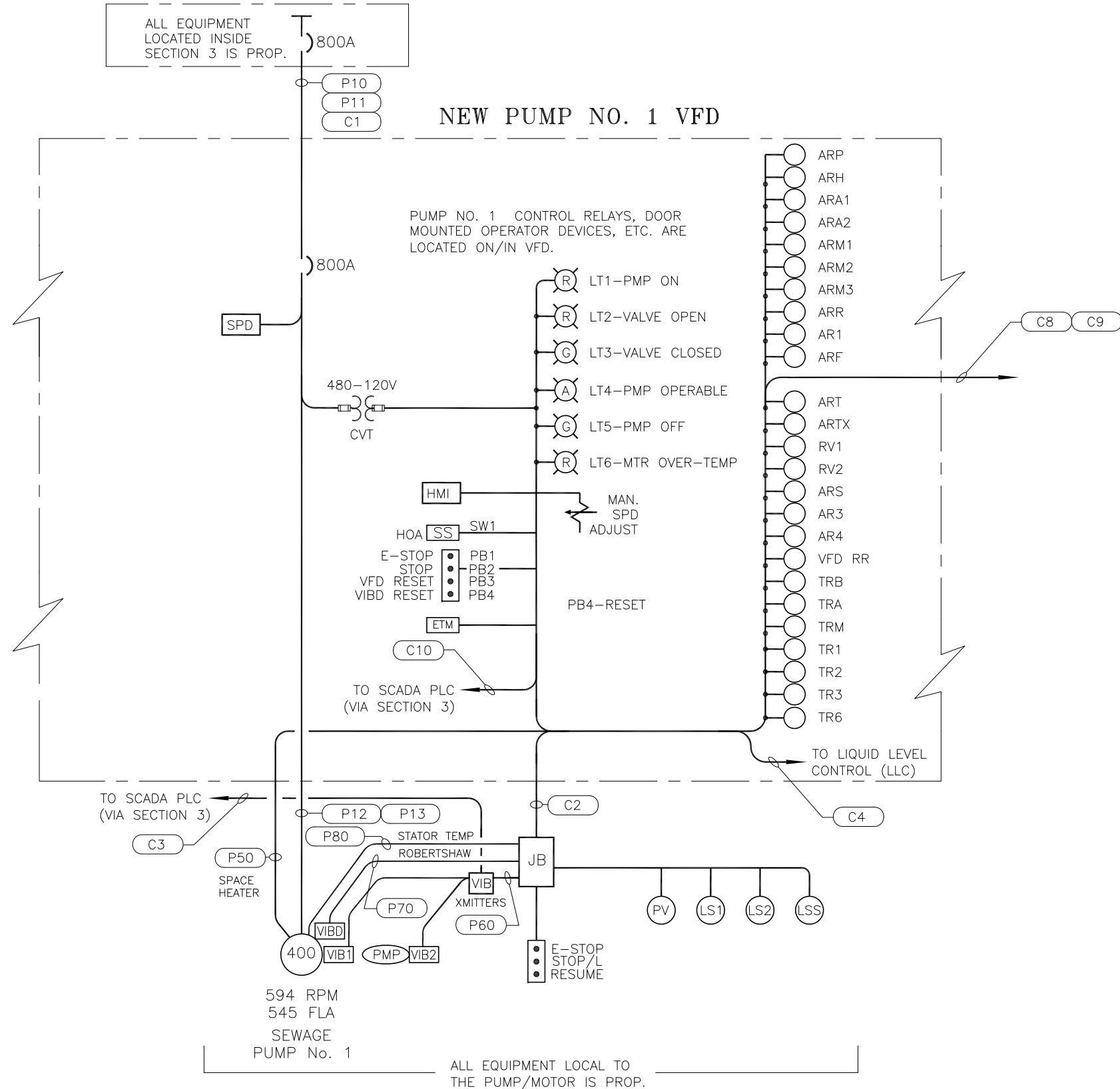
- 1 NEW 400 HP VFD FOR SEWAGE PUMP NO. 1.
- 2 VFD HMI.
- 3 VFD MAIN CIRCUIT BREAKER OPERATOR.
- 4 CONTRACTOR TO PROVIDE AND INSTALL 2" HOUSEKEEPING PAD.
- 5 EXISTING SLAB AT ELEVATION 41.25'.
- 6 AFTER EXISTING DEVICES HAVE BEEN REMOVED (AS INDICATED ON SHEET E4) CONTRACTOR SHALL PROVIDE AND INSTALL 1/4" ALUMINUM PLATE OVER EXISTING CUT-OUTS. PAINT TO MATCH EXISTING SURFACE.
- 7 CONTRACTOR TO PROVIDE AND INSTALL NEW OMEGA HORIZONTAL SCALE BAR GRAPH DISPLAY. OMEGA MODEL # BG-18-4-P7 (110V-50/60 HZ POWER SUPPLY). CONNECT UNIT TO NEW 120V (P40) CIRCUIT PROVIDED FOR NEW FLOW METER.
- 8 CONTRACTOR TO PROVIDE AND INSTALL NEW PRECISION DIGITAL PROCESS METER, MODEL PD765-6X5-10. CONNECT UNIT TO NEW 120V (P40) CIRCUIT PROVIDED FOR NEW FLOW METER.
- 9 PROVIDE AND INSTALL NEW LAMACOID NAMEPLATE (TYPICAL). LETTERING SHALL BE 1/2" MINIMUM AND SHALL MATCH EXISTING VERBIAGE. SECURE NAMEPLATE WITH STAINLESS STEEL SCREWS.
- 10 REFER TO SHEETS E9, E10 AND E11 FOR DEVICE IDENTIFICATIONS.
- 11 REFER TO SHEET E9 FOR VFD NO. 1 CONTROL PANEL DETAIL (CONTROL PANEL LOCATED IN THE INTERIOR OF VFD NO. 1 ON LEFT SIDE WALL OF ENCLOSURE).



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3						SHEET
2						<b>E6</b>
1						OF

EXISTING SECTION 3



ONE LINE DIAGRAM - PUMP No. 1

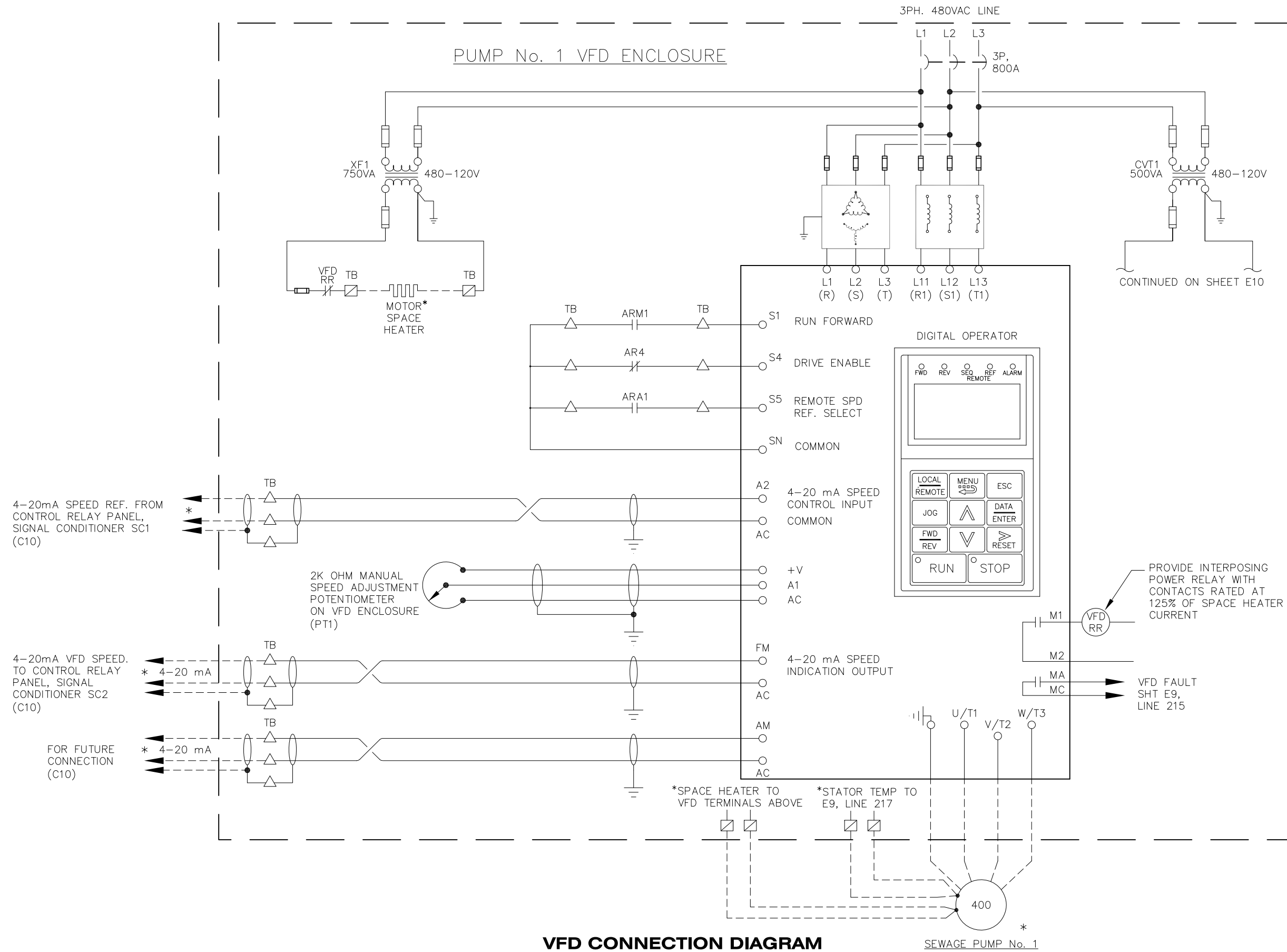
480V - 3PH - 60HZ



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	3			DRN: JLH			SHEET
	2			CKD: TDT			E7
	1			DATE: 11/21/16			OF

PUMP No. 1 VFD ENCLOSURE



CONTINUED ON SHEET E10

- NOTES:**
1.  $\Delta$  - DENOTES FIELD CONNECTION TERMINALS LOCATED IN NEW PUMP No. 1 VFD.
  2. COORDINATE WITH EQUIPMENT MANUFACTURER WIRING DETAILS & SPECIFIC I/O CONNECTION POINTS.
  3. COORDINATE INSTRUMENTATION/CONTROL CONNECTIONS W/ CITY PERSONNEL.
  4. "\*" INDICATES DEVICE IS LOCATED REMOTE FROM VARIABLE FREQUENCY DRIVE ENCLOSURE.
  5. PROVIDE AND INSTALL A YASKAWA iQ1000 VARIABLE FREQUENCY DRIVE WITH THE FOLLOWING RATINGS - 480VAC, 12-PULSE, 590AMP, 491 KVA, INPUT CONVERTER; 545AMP, 412 KVA, OUTPUT INVERTER.
  6. THE DIGITAL OPERATOR SHALL BE MOUNTED ON THE VFD ENCLOSURE FRONT DOOR AS SHOWN ON SHT. E2.
  7.  $\square$  - DENOTES FIELD CONNECTION TERMINALS LOCATED IN THE NEW PUMP No. 1 VFD.

**VFD CONNECTION DIAGRAM**

SEWAGE PUMP No. 1



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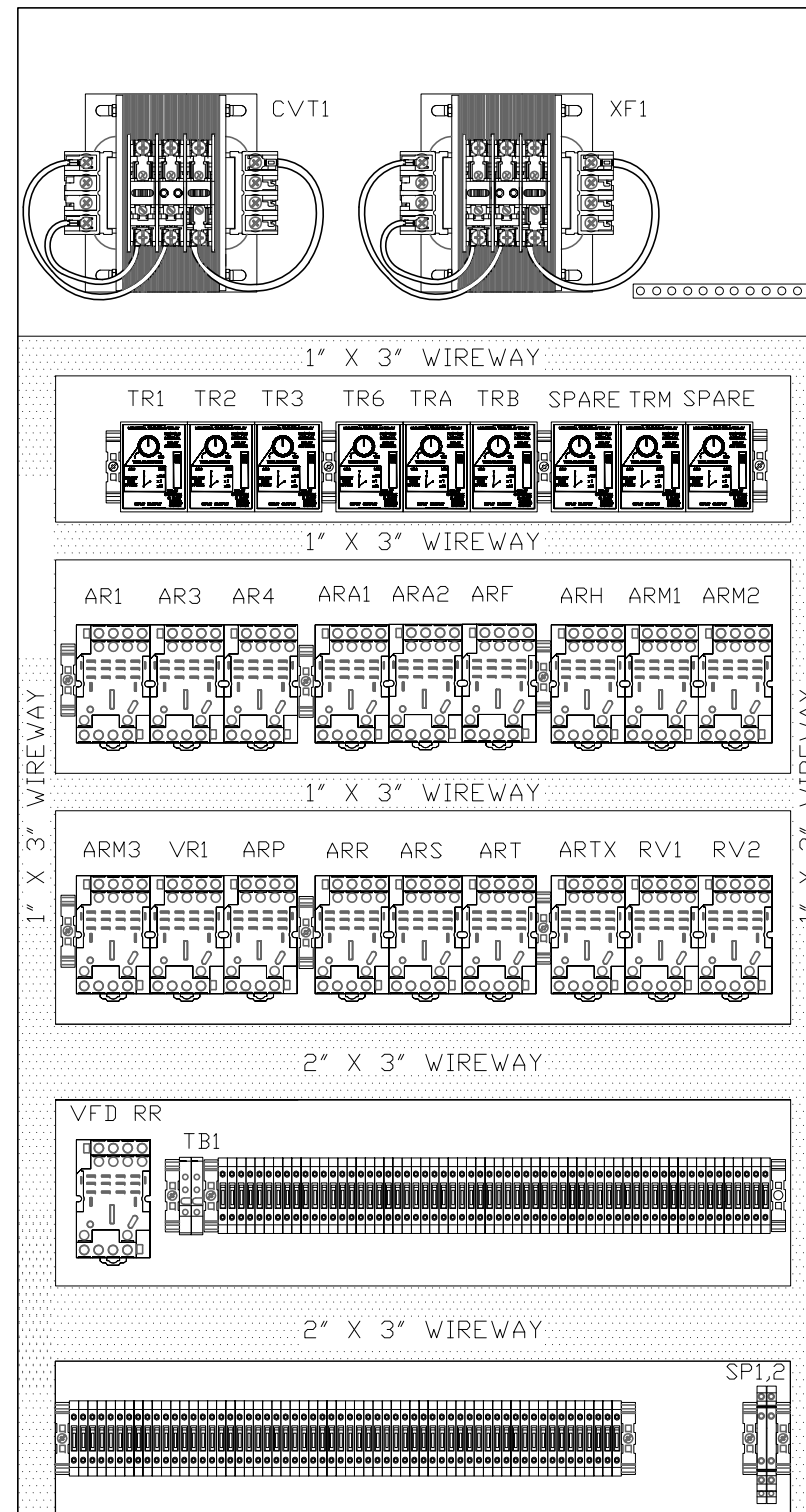
UNIVERSITY P.S.  
PUMP NO. 1 REPLACEMENT  
ELECTRICAL - VFD INTERCONNECTIONS

W.O. 4511  
SHEET  
**E8**  
OF

SYMBOL	DESCRIPTION	MANUFACTURER/MODEL	REMARKS
CVT1	CONTROL VOLTAGE TRANSFORMER	SQUARE D/CLASS 9070-TF500D1	500VA, 120-480V
XF1	CONTROL VOLTAGE TRANSFORMER	SQUARE D/CLASS 9070-TF750D1	750VA, 120-480V
SP1, 2	SURGE SUPPRESSOR	PHOENIX CONTACT 2838186	24V DC SURGE PROTECTION DEVICE
LT1	LEGEND PLATE: MOTOR RUN	SQUARE D/CLASS 9001 SKT-38LRR9	RED LENS INDICATOR LIGHT 120 V, LED TYPE & PRESS TEST
LT2	LEGEND PLATE: VALVE OPEN	SQUARE D/CLASS 9001 SKT-38LRR9	RED LENS INDICATOR LIGHT 120 V, LED TYPE & PRESS TEST
LT3	LEGEND PLATE: VALVE CLOSED	SQUARE D/CLASS 9001 SKT-38LGG9	GREEN LENS INDICATOR LIGHT 120 V, LED TYPE & PRESS TEST
LT4	LEGEND PLATE: PUMP OPERABLE	SQUARE D/CLASS 9001 SKT-38LRY9	YELLOW LENS INDICATOR LIGHT 120 V, LED TYPE & PRESS TEST
LT5	LEGEND PLATE: PUMP OFF	SQUARE D/CLASS 9001 SKT-38LGG9	GREEN LENS INDICATOR LIGHT 120 V, LED TYPE & PRESS TEST
LT6	LEGEND PLATE: MOTOR OVERTEMP	SQUARE D/CLASS 9001 SKT-38LRR9	RED LENS INDICATOR LIGHT 120 V, LED TYPE & PRESS TEST
LT7	LEGEND PLATE: VIBRATION	SQUARE D/CLASS 9001 SKT-38LRR9	RED LENS INDICATOR LIGHT 120 V, LED TYPE & PRESS TEST
PB1	LEGEND PLATE: EMERGENCY STOP	SQUARE D/CLASS 9001 SKR-4RH13	RED MUSHROOM HEAD PUSH BUTTON 1-3/8" DIAMETER
PB2	LEGEND PLATE: STOP	SQUARE D/CLASS 9001 SKR-1R W/ (2) KA2 CONTACTS	RED FLUSH HEAD PUSH BUTTON
PB3	LEGEND PLATE: DRIVE RESET	SQUARE D/CLASS 9001 SKR-1B W/ (2) KA2 CONTACTS	BLACK FLUSH HEAD PUSH BUTTON
PB4	LEGEND PLATE: VIBD RESET	SQUARE D/CLASS 9001 SKR-1B W/ (2) KA2 CONTACTS	BLACK FLUSH HEAD PUSH BUTTON
SW1	LEGEND PLATE: OFF AUTO HAND	SQUARE D/CLASS 9001 SKS43BH2 W/ KA5, KA4 AND KA2 CONTACTS	THREE POSITION SWITCH MAINTAINED WITH AUTO-HAND OVERLAP
PT1	MANUAL SPEED ADJUST	HONEYWELL #73JA2K POT AND BOURNS #H-46-6A DIAL	10-TURN POTENTIOMETER W/TURNS COUNTING DIAL
ETM	ELAPSHED TIME METER	GARASSLIN/INTERMATIC, INC. UWZ SERIES UWZ48	PROVIDE SOCKET BASE
(AR) P, H, A1, A2, M1, M2, M3, M, R, 1, F, T, TX, RV1, RV2, S, 3, 4, VR1 AND VFD RR	CONTROL RELAYS	SQUARE D 120V AC RELAY	PROVIDE 120V AC RELAY BASE SQUARE D RPZF4
(TR) 1, 2, 3 A, B, M	TIMING DELAY "ON DELAY"	ABB TRU3 120V AC TIMER RELAY	PROVIDE ABB NDS-11 TIMER BASE
TR6	TIMING DELAY "OFF DELAY"	ABB TRU3 120V AC TIMER RELAY	PROVIDE ABB NDS-11 TIMER BASE

### PUMP NO. 1 CONTROLS PARTS SCHEDULE

(SCHEMATICS ON SHEETS E10 - E11)



#### GENERAL NOTES:

- SCOPE OF WORK REQUIRES THE REMOVAL OF ALL EXISTING TRANSFORMERS, RELAYS, WIREWAY, ETC. CURRENTLY USED FOR PUMP NO. 1 SPEED CONTROLS. THE EXISTING COMPONENTS FOR THE PUMP NO. 1 SPEED CONTROLS ARE LOCATED IN CUBICLE 4A OF THE PUMP CONTROL CENTER. CONTRACTOR SHALL PROVIDE NEW BACKPANEL AND COMPONENTS AS SHOWN AND FOLLOW THE SCHEMATIC DIAGRAMS ON SHEETS E10 AND E11. THE NEW CONTROL PANEL SHALL BE INSTALLED IN THE PROPOSED VFD CABINET LOCATED TO THE EAST. ALL PILOT DEVICES AND VFM HMI SHALL BE MOUNTED ON THE VFD DOOR AS SHOWN ON SHEET E6.
- PROVIDE TERMINAL BLOCKS, SQUARE D TYPE 3004362 AS REQUIRED.
- PROVIDE TERMINAL JUMPERS, PHOENIX CONTACT 0203519 AS REQUIRED.
- PROVIDE END CLAMPS, PHOENIX CONTACT 0800886 AS REQUIRED.
- PROVIDE TERMINAL END COVERS, PHOENIX CONTACT 3003020 AS REQUIRED.
- PROVIDE PRIMARY FUSES, BUSSMAN FNQR-3 AS REQUIRED.
- PROVIDE SECONDARY FUSES, BUSSMAN FNQ-7 AS REQUIRED.
- ALL DIN RAIL SHALL BE ALUMINUM.
- MOTOR SPACE HEATER RELAY (VFD RR) SHALL BE LOCATED IN THE VFD ENCLOSURE AS SHOWN.

### DETAIL 1, PUMP NO. 1 PROPOSED CONTROLS LAYOUT

SCALE : N.T.S.

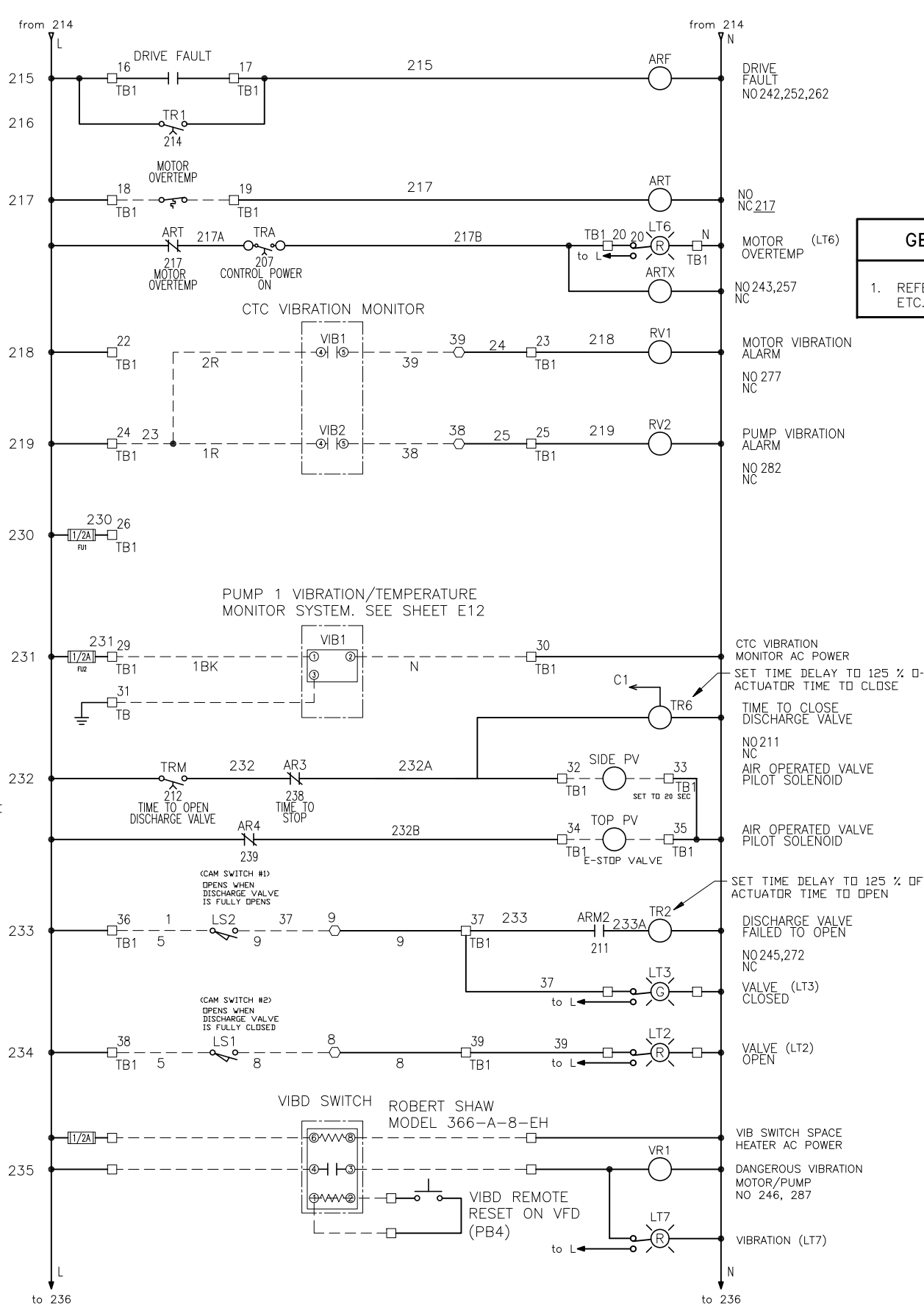
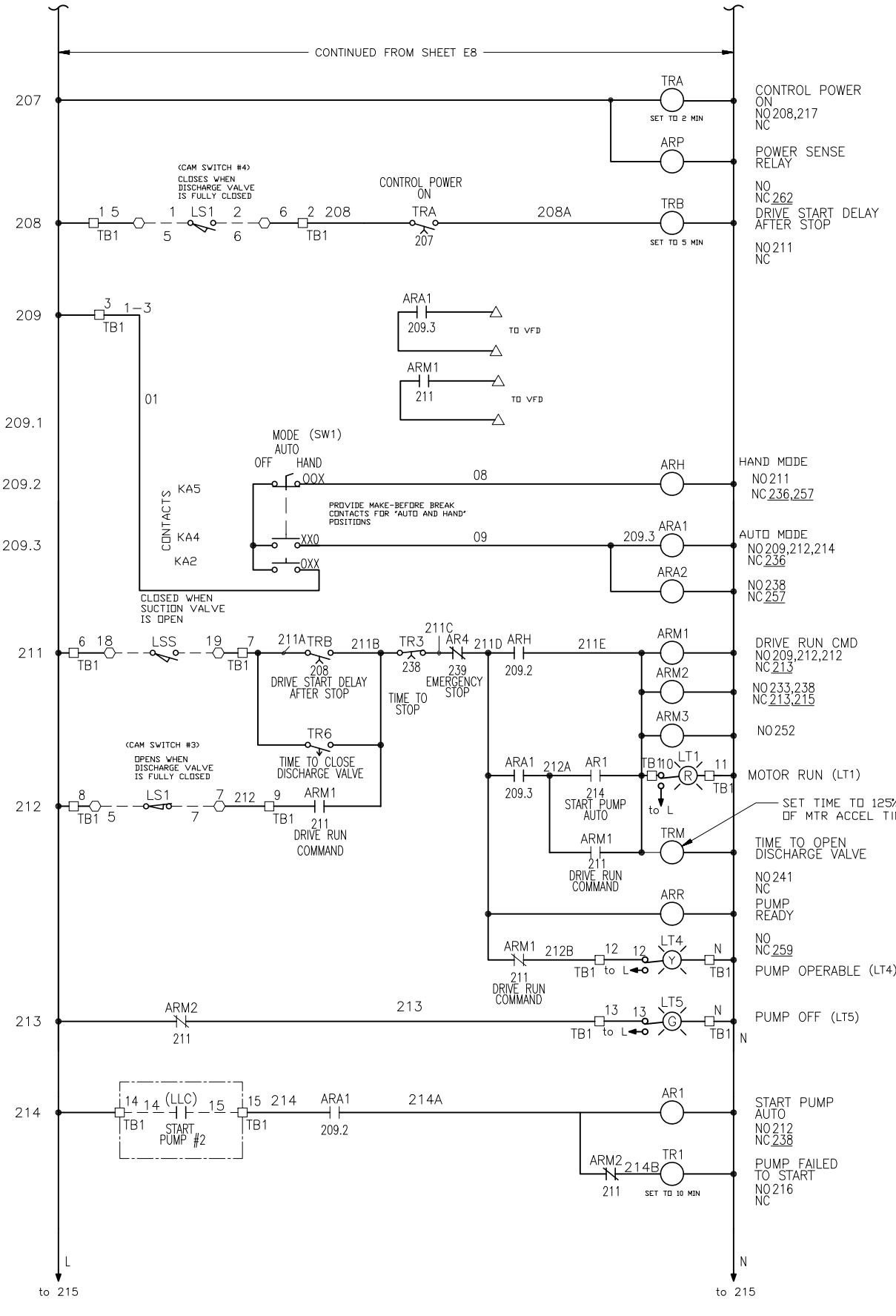


NOTE: CONTROLS SHALL BE PLACED IN THE ORDER AS SHOWN. CONTROL PANEL TO BE INSTALLED IN NEW PUMP NO. 1 VFD



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TIMOTHY THOMAS, P.E. #47079	No.	DATE	REVISIONS	DES: TDT	CITY of TAMPA WASTEWATER DEPARTMENT	UNIVERSITY P.S. PUMP NO. 1 REPLACEMENT PUMP NO. 1 CONTROL PANEL	W.O. 4511
	3			DRN: JLH			SHEET
	2			CKD: TDT			E9
	1			DATE: 11/21/16			OF



**GENERAL NOTES:**  
 1. REFER TO SHEET E9 FOR PILOT LIGHT, SELECTOR SWITCH, ETC. IDENTIFICATIONS.

TIMOTHY THOMAS, P.E. #47079

No.	DATE	REVISIONS
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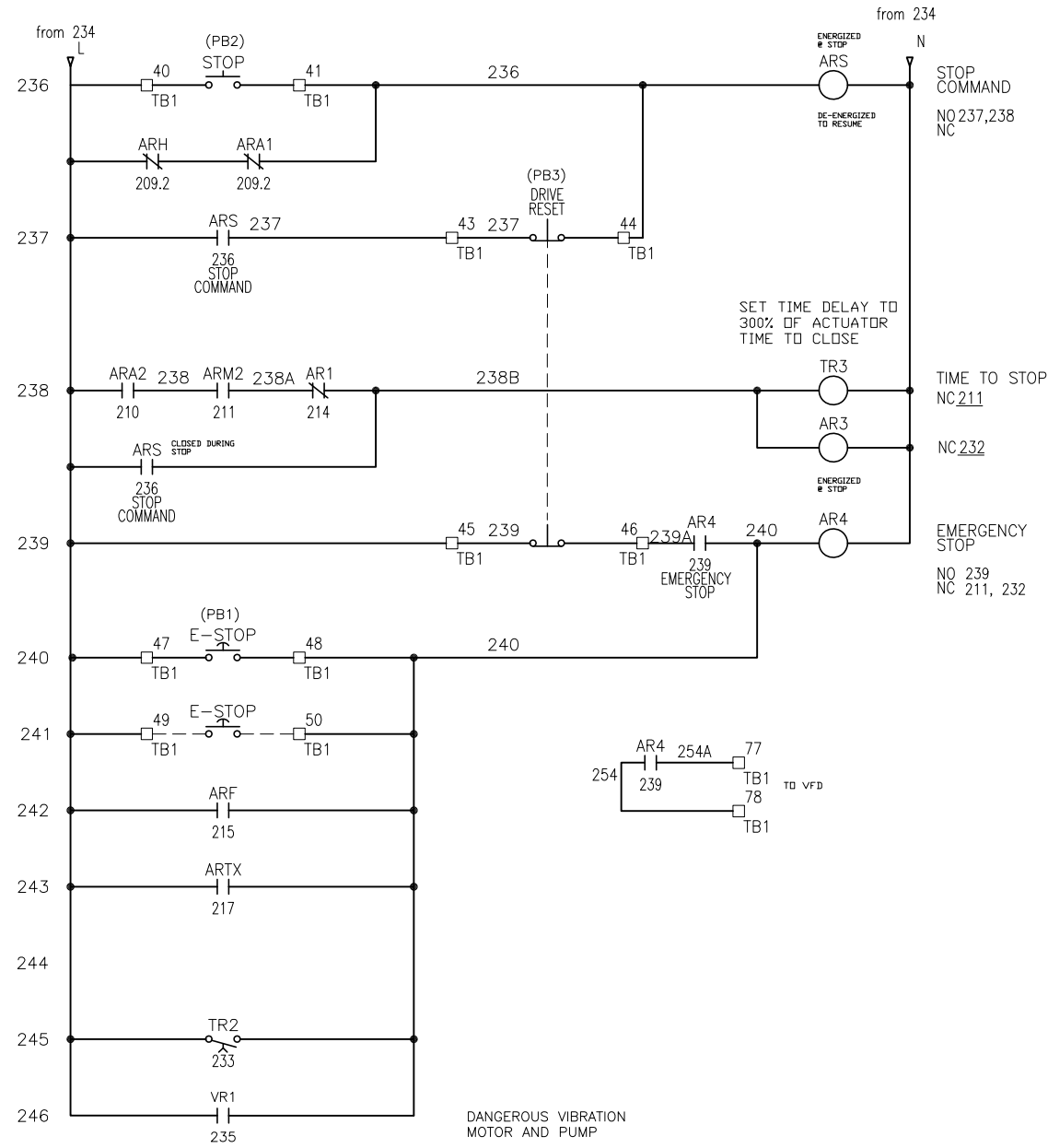
DES: TDT  
 DRN: JLH  
 CKD: TDT  
 DATE: 11/21/16

**CITY of TAMPA**  
 WASTEWATER DEPARTMENT

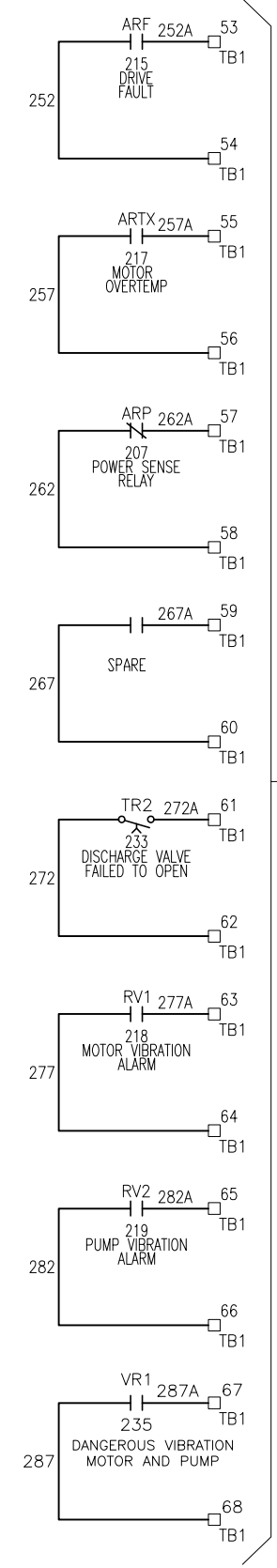
**UNIVERSITY P.S.**  
 PUMP NO. 1 REPLACEMENT  
 PUMP NO. 1 CONTROLS (SHT. 1 OF 3)

W.O. 4511  
 SHEET  
**E10**  
 OF

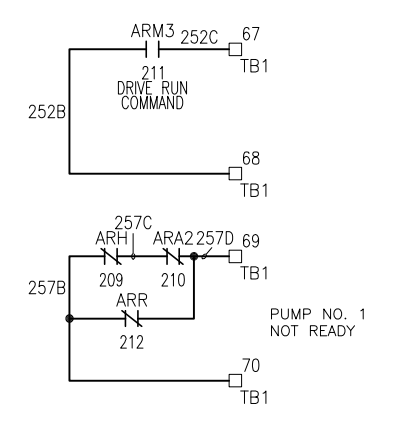




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TO PROPOSED ANNUNCIATOR PLC VIA CONDUIT FROM NEW VFD TO TERMINAL STRIP IN PUMP CONTROL CENTER CUBICLE 4A



VFD-1 4-20ma TB1  
VFD NO. 1 SPEED CONTROL ANALOG  
VFD-2 4-20ma TB1  
VFD NO. 1 SPEED REFERENCE ANALOG  
PUMP NO. 1 NOT READY

TO EXISTING SCADA PLC VIA CONDUIT FROM NEW VFD TO TERMINAL STRIP IN PUMP CONTROL CENTER CUBICLE 4A

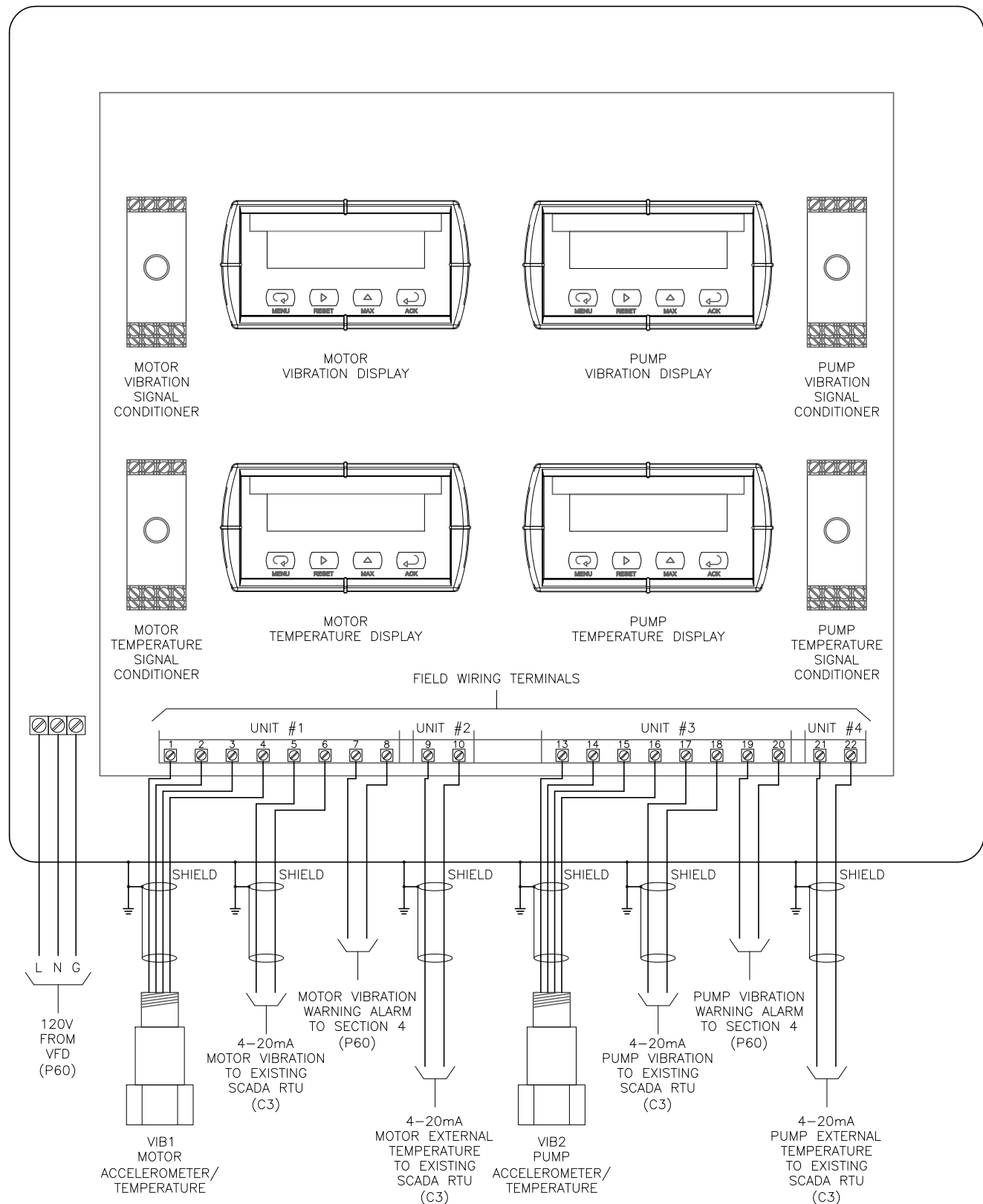
**GENERAL NOTES:**

- REFER TO SHEET E9 FOR PILOT LIGHT, SELECTOR SWITCH, ETC. IDENTIFICATIONS.



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	3			DRN: JLH			SHEET
	2			CKD: TDT			EII
	1			DATE: 11/21/16			OF



FIELD WIRING SCHEDULE				
UNIT No.	TERMINAL No.	TA102 CONDUCTOR	COLOR	REMARKS
UNIT No. 1	1	Ain +	RED	MOTOR VIBRATION INPUT
UNIT No. 1	2	Ain -	BLACK	COMMON
UNIT No. 1	3	Ain	SILVER	GROUND
UNIT No. 1	4	Ain	WHITE	MOTOR TEMPERATURE INPUT
UNIT No. 1	5			MOTOR VIBRATION 4-20mA OUTPUT
UNIT No. 1	6			MOTOR VIBRATION 4-20mA OUTPUT
UNIT No. 1	7			MOTOR VIBRATION ALARM NO CONTACT
UNIT No. 1	8			MOTOR VIBRATION ALARM COMMON
UNIT No. 2	9			MOTOR TEMPERATURE 4-20mA OUTPUT
UNIT No. 2	10			MOTOR TEMPERATURE 4-20mA OUTPUT
UNIT No. 3	13	Ain +	RED	PUMP VIBRATION INPUT
UNIT No. 3	14	Ain -	BLACK	COMMON
UNIT No. 3	15	Ain	SILVER	GROUND
UNIT No. 3	16	Ain	WHITE	PUMP TEMPERATURE INPUT
UNIT No. 3	17			PUMP VIBRATION 4-20mA OUTPUT
UNIT No. 3	18			PUMP VIBRATION 4-20mA OUTPUT
UNIT No. 3	19			PUMP VIBRATION ALARM NO CONTACT
UNIT No. 3	20			PUMP VIBRATION ALARM COMMON
UNIT No. 4	21			PUMP TEMPERATURE 4-20mA OUTPUT
UNIT No. 4	22			PUMP TEMPERATURE 4-20mA OUTPUT

### CTC VIBRATION MONITOR - CTC MODEL # VPR-1002SDO-BB

THE PUMP / MOTOR SUPPLIER SHALL PROVIDE THE SPECIFIED VIBRATION MONITORING EQUIPMENT AND INSTALL THE ACCELEROMETERS/TEMPERATURE SENSORS VIB1 AND VIB2 (CTC MODEL # TA102 EACH) ON THE MACHINERY AS REQUIRED. THE SIGNAL CONDITIONERS AND DISPLAYS SHALL BE INSTALLED IN A COMMON FIBERGLASS ENCLOSURE MOUNTED NEAR THE MACHINERY AND WIRED AS REQUIRED BY THE ELECTRICAL SUBCONTRACTOR.



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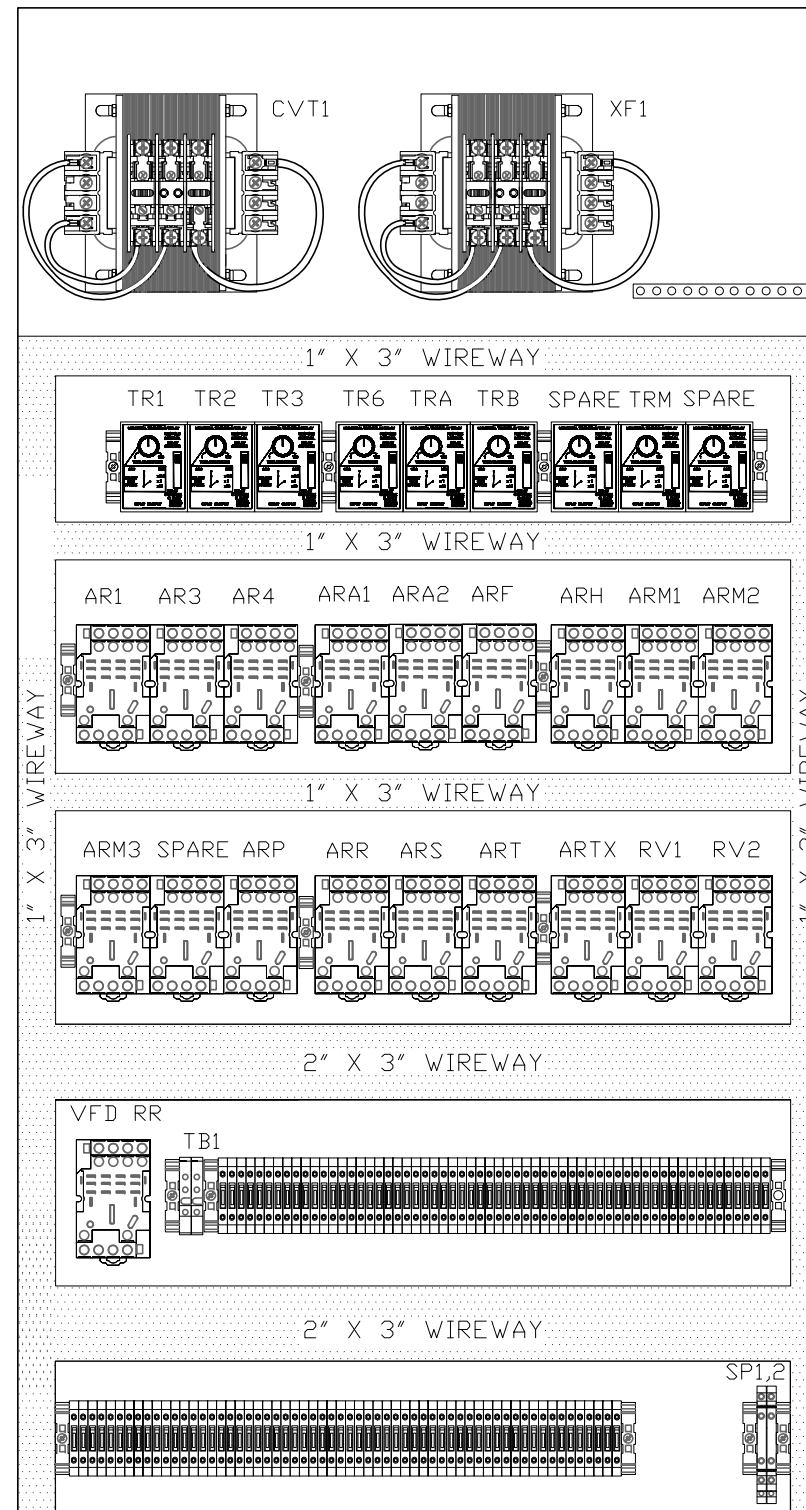
TIMOTHY THOMAS, P.E. #47079	No.	DATE	REVISIONS	DES: TDT DRN: JLH CKD: TDT DATE: 11/21/16	CITY of TAMPA WASTEWATER DEPARTMENT	UNIVERSITY P.S. PUMP NO. 1 REPLACEMENT PUMP NO. 1 CONTROLS (SHT. 3 OF 3)	W.O. 4511
	3						SHEET
	2						E12
	1						OF



SYMBOL	DESCRIPTION	MANUFACTURER/MODEL	REMARKS
CVT1	CONTROL VOLTAGE TRANSFORMER	SQUARE D/CLASS 9070-TF500D1	500VA, 120-480V
XF1	CONTROL VOLTAGE TRANSFORMER	SQUARE D/CLASS 9070-TF750D1	750VA, 120-480V
SP1, 2	SURGE SUPPRESSOR	PHOENIX CONTACT 2838186	24V DC SURGE PROTECTION DEVICE
LT1	LEGEND PLATE: MOTOR RUN	SQUARE D/CLASS 9001 SKT-38LRR9	RED LENS INDICATOR LIGHT 120 V, LED TYPE & PRESS TEST
LT2	LEGEND PLATE: VALVE OPEN	SQUARE D/CLASS 9001 SKT-38LRR9	RED LENS INDICATOR LIGHT 120 V, LED TYPE & PRESS TEST
LT3	LEGEND PLATE: VALVE CLOSED	SQUARE D/CLASS 9001 SKT-38LGG9	GREEN LENS INDICATOR LIGHT 120 V, LED TYPE & PRESS TEST
LT4	LEGEND PLATE: PUMP OPERABLE	SQUARE D/CLASS 9001 SKT-38LRY9	YELLOW LENS INDICATOR LIGHT 120 V, LED TYPE & PRESS TEST
LT5	LEGEND PLATE: PUMP OFF	SQUARE D/CLASS 9001 SKT-38LGG9	GREEN LENS INDICATOR LIGHT 120 V, LED TYPE & PRESS TEST
LT6	LEGEND PLATE: MOTOR OVERTEMP	SQUARE D/CLASS 9001 SKT-38LRR9	RED LENS INDICATOR LIGHT 120 V, LED TYPE & PRESS TEST
PB1	LEGEND PLATE: EMERGENCY STOP	SQUARE D/CLASS 9001 SKR-4RH13	RED MUSHROOM HEAD PUSH BUTTON 1-3/8" DIAMETER
PB2	LEGEND PLATE: STOP	SQUARE D/CLASS 9001 SKR-1R W/ (2) KA2 CONTACTS	RED FLUSH HEAD PUSH BUTTON
PB3	LEGEND PLATE: DRIVE RESET	SQUARE D/CLASS 9001 SKR-1B W/ (2) KA2 CONTACTS	BLACK FLUSH HEAD PUSH BUTTON
SW1	LEGEND PLATE: OFF AUTO HAND	SQUARE D/CLASS 9001 SKS43BH2 W/ KA5, KA4 AND KA2 CONTACTS	THREE POSITION SWITCH MAINTAINED WITH AUTO-HAND OVERLAP
PT1	MANUAL SPEED ADJUST	HONEYWELL #73JA2K POT AND BOURNS #H-46-6A DIAL	10-TURN POTENTIOMETER W/TURNS COUNTING DIAL
ETM	ELAPSED TIME METER	GARASSLIN/INTERMATIC, INC. UWZ SERIES UWZ48	PROVIDE SOCKET BASE
(AR) P, H, A1, A2, M1, M2, M3, M, R, 1, F, T, TX, RV1, RV2, S, 3, 4, AND VFD RR	CONTROL RELAYS	SQUARE D 120V AC RELAY	PROVIDE 120V AC RELAY BASE SQUARE D RPZF4
(TR) 1, 2, 3 A, B, M	TIMING DELAY "ON DELAY"	ABB TRU3 120V AC TIMER RELAY	PROVIDE ABB NDS-11 TIMER BASE
TR6	TIMING DELAY "OFF DELAY"	ABB TRU3 120V AC TIMER RELAY	PROVIDE ABB NDS-11 TIMER BASE

### SECTION 4B, PUMP NO. 2 CONTROLS PARTS SCHEDULE

(SCHEMATICS ON SHEETS E14 - E15)



DETAIL I, PUMP NO. 2  
PROPOSED CONTROLS LAYOUT

NOTE: CONTROLS SHALL BE PLACED IN  
THE ORDER AS SHOWN.

#### GENERAL NOTES:

- SCOPE OF WORK REQUIRES THE REMOVAL OF ALL EXISTING TRANSFORMERS, RELAYS, WIREWAY, ETC. CURRENTLY USED FOR PUMP NO. 2 VFD CONTROLS. THE EXISTING COMPONENTS FOR THE PUMP NO. 2 VFD CONTROLS ARE LOCATED IN CUBICLE 4B OF THE PUMP CONTROL CENTER. CONTRACTOR SHALL PROVIDE NEW BACKPANEL AND COMPONENTS AS SHOWN. ALL CONTROL CONDUCTORS INTERIOR TO THE CUBICLE AND INSTALLED TO THE PUMP NO. 2 VFD (LOCATED IN ADJACENT SECTION 5) SHALL BE NEW. CONDUCTORS CURRENTLY INSTALLED TO FIELD DEVICES (LIMIT SWITCHES, VIBRATION TRANSMITTER POWER/RELAY CONTACTS, E-STOP AT MOTOR, ETC.) SHALL BE REUSED. NEW PILOT LIGHTS, SELECTOR SWITCHES, ETC. SHALL BE PROVIDED AND INSTALLED ON THE FRONT DOOR OF SECTION 5.
- PROVIDE TERMINAL BLOCKS, SQUARE D TYPE 3004362 AS REQUIRED.
- PROVIDE TERMINAL JUMPERS, PHOENIX CONTACT 0203519 AS REQUIRED.
- PROVIDE END CLAMPS, PHOENIX CONTACT 0800886 AS REQUIRED.
- PROVIDE TERMINAL END COVERS, PHOENIX CONTACT 3003020 AS REQUIRED.
- PROVIDE PRIMARY FUSES, BUSSMAN FNQR-3 AS REQUIRED.
- PROVIDE SECONDARY FUSES, BUSSMAN FNQ-7 AS REQUIRED.
- ALL DIN RAIL SHALL BE ALUMINUM.
- MOTOR SPACE HEATER RELAY (VFD RR) SHALL BE LOCATED IN THIS CUBICLE AS SHOWN.

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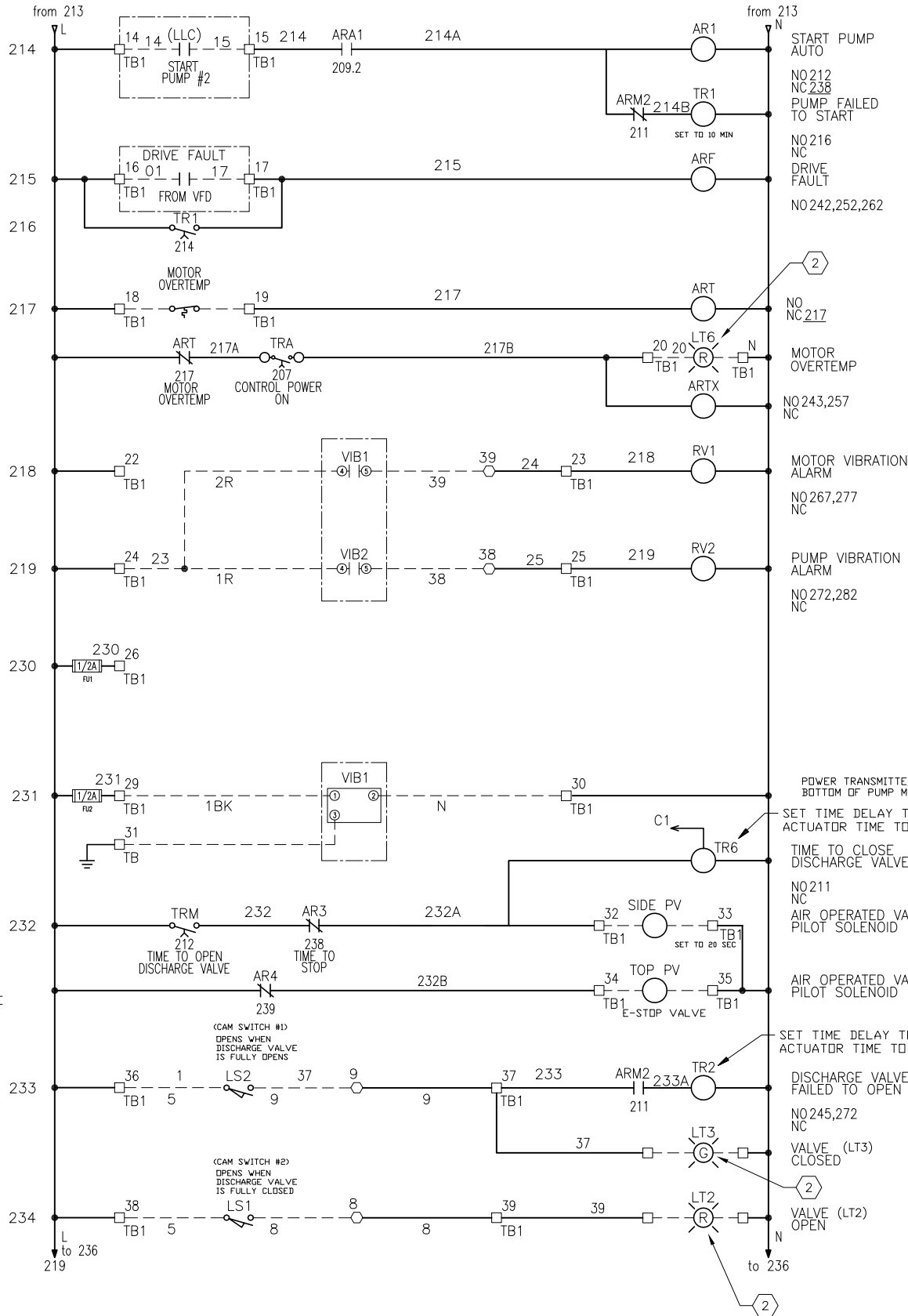
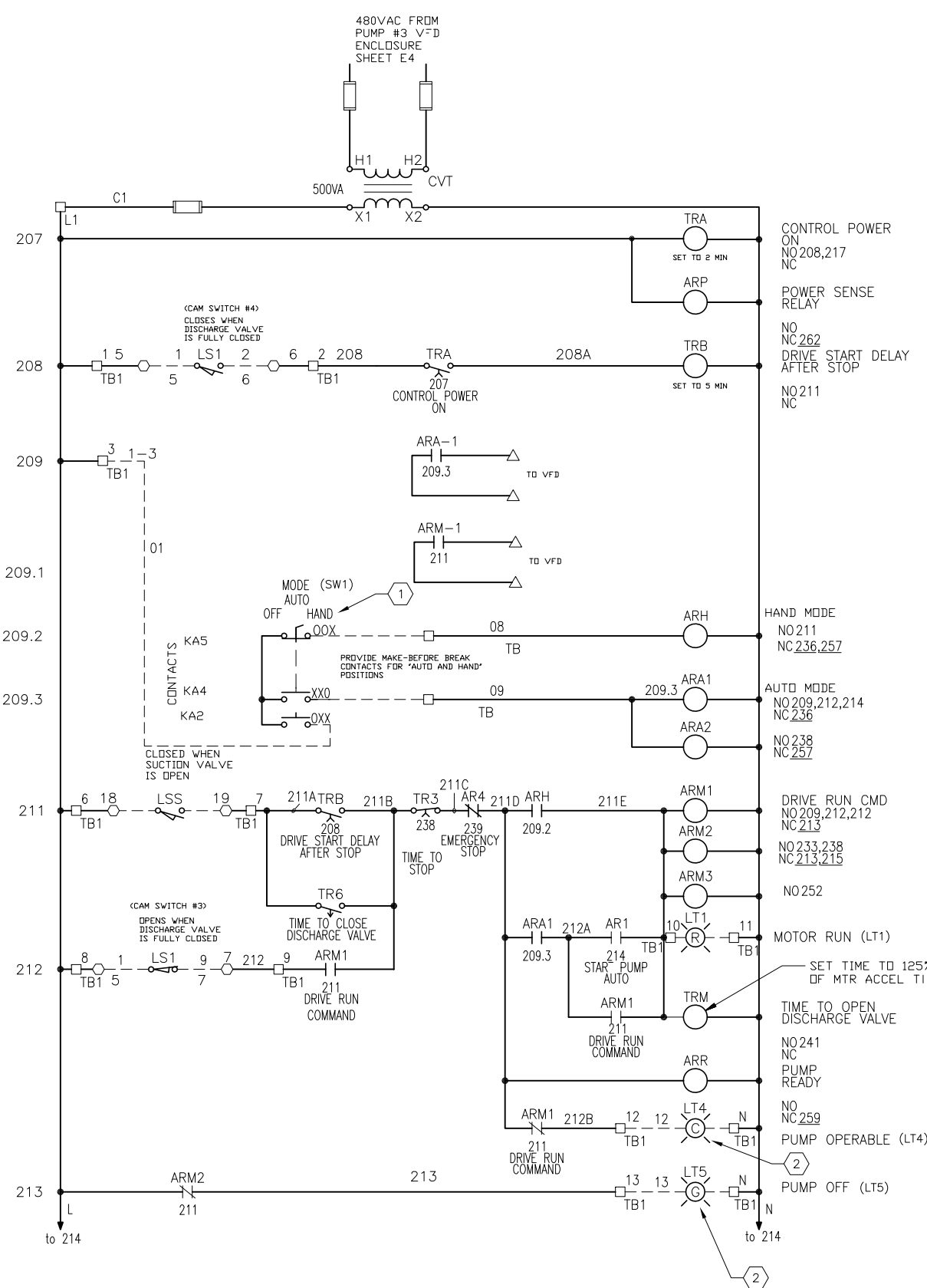
CITY of TAMPA  
WASTEWATER DEPARTMENT

UNIVERSITY P.S.  
PUMP NO. 1 REPLACEMENT  
PUMP NO. 2 CONTROL PANEL

W.O. 4511  
SHEET  
E13  
OF



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**KEYED NOTES:**

1 PROVIDE AND INSTALL NEW SELECTOR SWITCH ON FRONT DOOR OF EXISTING PUMP NO. 2 VFD (SECTION 5). REFER TO E13 FOR PARTS SCHEDULE.

2 PROVIDE AND INSTALL NEW PILOT LIGHTS ON FRONT DOOR OF EXISTING PUMP NO. 2 VFD (SECTION 5). REFER TO E13 FOR PARTS SCHEDULE.

**GENERAL NOTES:**

1. REFER TO SHEET E13 FOR SCOPE OF WORK.

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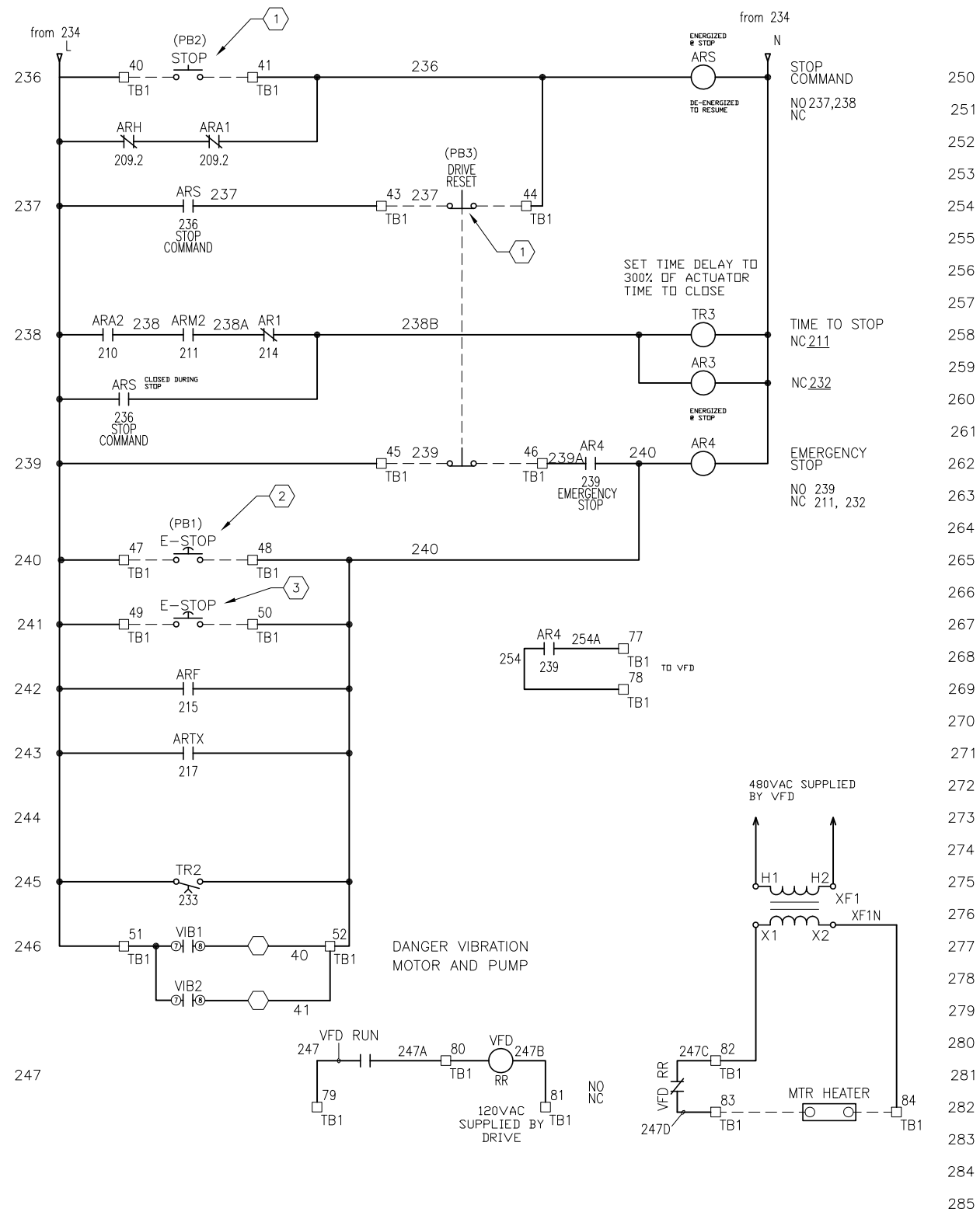
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 DATE: 11/21/16

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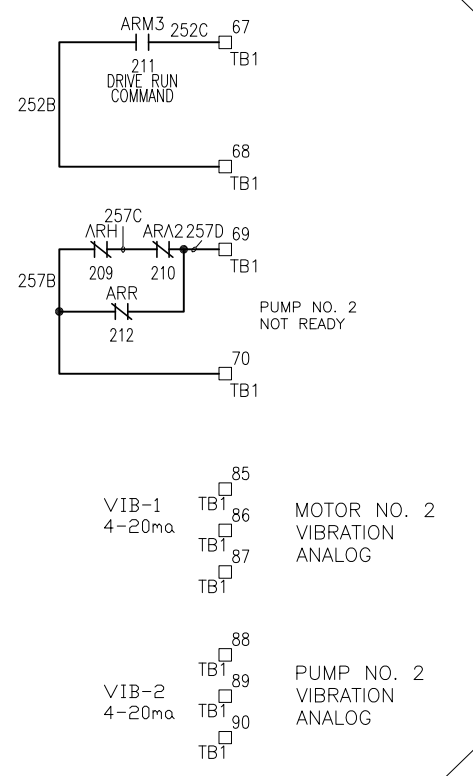
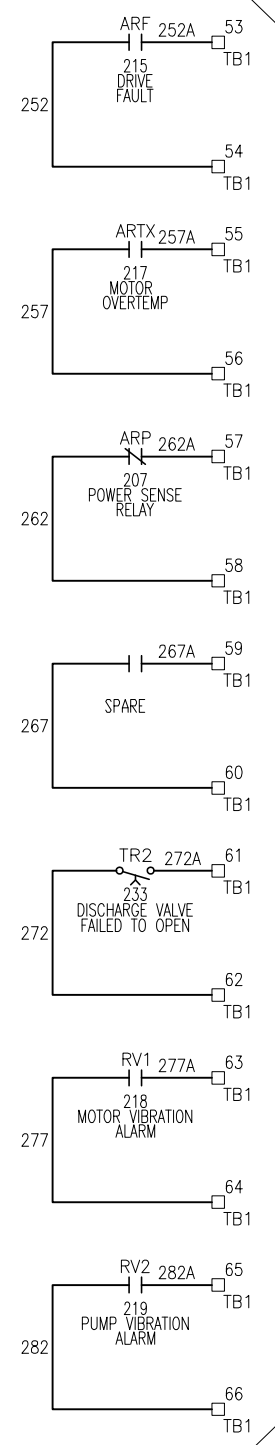
**UNIVERSITY P.S.**  
 PUMP NO. 1 REPLACEMENT  
 PUMP NO. 2 CONTROLS (SHT. 1 OF 2)

W.O. 4511  
 SHEET  
**E14**  
 OF





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**KEYED NOTES:**

① PROVIDE AND INSTALL NEW PUSH BUTTON ON FRONT DOOR OF EXISTING PUMP NO. 2 VFD (SECTION 5). REFER TO E13 FOR PARTS SCHEDULE.

② PROVIDE AND INSTALL NEW MUSHROOM HEAD PUSH BUTTON ON FRONT DOOR OF EXISTING PUMP NO. 2 VFD (SECTION 5). REFER TO E13 FOR PARTS SCHEDULE.

③ EXISTING MUSHROOM HEAD PUSHBUTTON LOCATED AT PUMP NO. 2 MOTOR. PUSHBUTTON TO BE REUSED.

**GENERAL NOTES:**

1. REFER TO SHEET E13 FOR SCOPE OF WORK.

TO EXISTING SCADA PLC

TO EXISTING ANNUNCIATOR PANEL NO. 2



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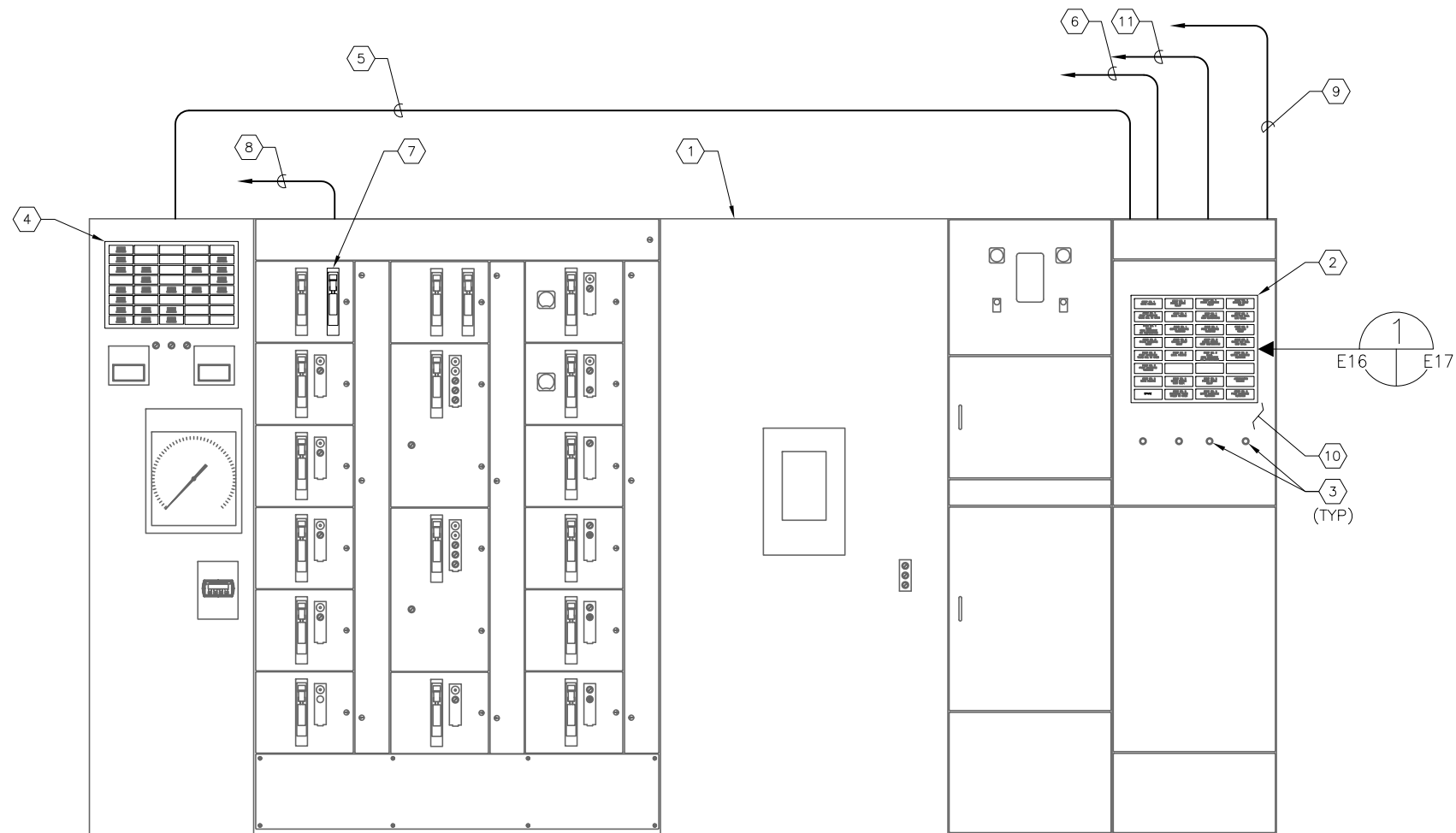
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DRN: JLH  
CKD: TDT  
DATE: 11/21/16

**CITY of TAMPA**  
WASTEWATER DEPARTMENT

**UNIVERSITY P.S.**  
PUMP NO. 1 REPLACEMENT  
PUMP NO. 2 CONTROLS (SHT. 2 OF 2)

W.O. 4511  
SHEET  
**E15**  
OF



**MOTOR CONTROL CENTER FRONT ELEVATION**

SCALE : 1/2" = 1'-0"



**KEYED NOTES:**

- ① EXISTING MOTOR CONTROL CENTER AND AUTOMATIC TRANSFER SWITCH LINEUP.
- ② EXISTING ANNUNCIATOR NO. 1 TO BE REMOVED. CONTRACTOR SHALL PROVIDE AND INSTALL 1/4" ALUMINUM PLATE OVER EXISTING ANNUNCIATOR CUT-OUT. PAINT TO MATCH EXISTING SURFACE. CONTRACTOR TO PROVIDE AND INSTALL NEW MAPLE SYSTEMS HMI, GE PLC, ETC. TO SERVE AS NEW ANNUNCIATOR SYSTEM. REFER TO DETAILS ON SHEET E16.
- ③ CONTRACTOR SHALL REUSE TWO (2) OF THE EXISTING PUSH BUTTONS FOR INPUTS TO ANNUNCIATOR PLC. REFER TO SHEET E17 FOR DETAILS.
- ④ EXISTING ANNUNCIATOR NO. 2 TO BE REMOVED. CONTRACTOR SHALL PROVIDE AND INSTALL 1/4" ALUMINUM PLATE OVER EXISTING ANNUNCIATOR CUT-OUT. PAINT TO MATCH EXISTING SURFACE.
- ⑤ CONTRACTOR TO PROVIDE AND INSTALL 50-#14 + 2-#12 GND IN 1-1/2" CONDUIT TO NEW ANNUNCIATOR PLC (C6). PROVIDE AND INSTALL NEW 600V, 20A TERMINAL BLOCKS (ALLEN-BRADLEY 1492-W3) FOR NEW CONDUCTORS TO BE INSTALLED TO NEW ANNUNCIATOR PLC AND TO TERMINATE EXISTING CONDUCTORS (TO BE REUSED) FROM PUMP CONTROL CENTER. REFER ALSO TO GENERAL NOTES.
- ⑥ PROVIDE AND INSTALL 2-#12 + 1-#12 GND IN 3/4" C. TO 120/208V PANELBOARD FOR ANNUNCIATOR PLC 120V POWER (P30).
- ⑦ CONTRACTOR TO REMOVE EXISTING 480V, 100A, 3-POLE ODOR CONTROL CIRCUIT BREAKER AND INSTALL NEW 480V, 15A, 3-POLE CIRCUIT BREAKER FOR NEW KNIFE GATE VALVE ACTUATORS.
- ⑧ PROVIDE AND INSTALL NEW 3/4" CONDUIT WITH 3-#12 + 1-#12 GND DOWN TO ELEVATION 15.00' FOR NEW KNIFE GATE VALVE ACTUATORS (P20). CONTRACTOR TO FIELD ROUTE AS REQUIRED. REFER ALSO TO SHEET E2.
- ⑨ PROVIDE AND INSTALL NEW 3/4" CONDUIT WITH 2/C-#22 TWISTED SHIELDED CABLE (BELDEN 3106A) TO EXISTING SCADA PLC (C7). REFER ALSO TO SHEET E1.
- ⑩ NEW ANNUNCIATOR PLC SHALL BE INSTALLED BEHIND EXISTING DOOR.
- ⑪ CONTRACTOR TO PROVIDE AND INSTALL 24-#14 + 2-#12 GND IN 1-1/4" CONDUIT TO PUMP CONTROL CENTER CUBICLE 4A (C8).

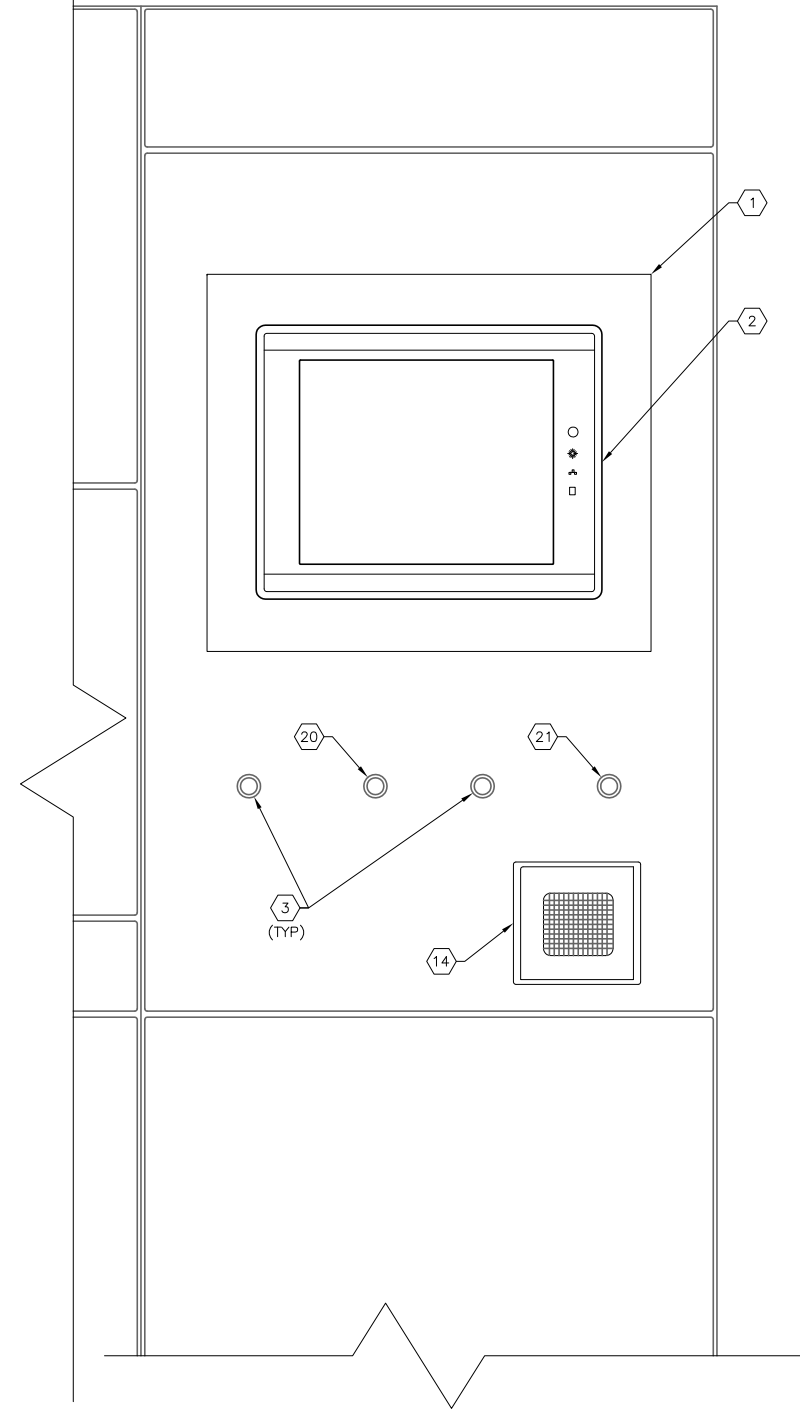
**GENERAL NOTES:**

- 1. ALL DIN-RAIL SHALL BE ALUMINUM.
- 2. PROVIDE AND INSTALL ALL ASSOCIATED END BARRIERS, TERMINAL JUMPERS AND ACCESSORIES AS REQUIRED FOR TERMINAL BLOCKS.



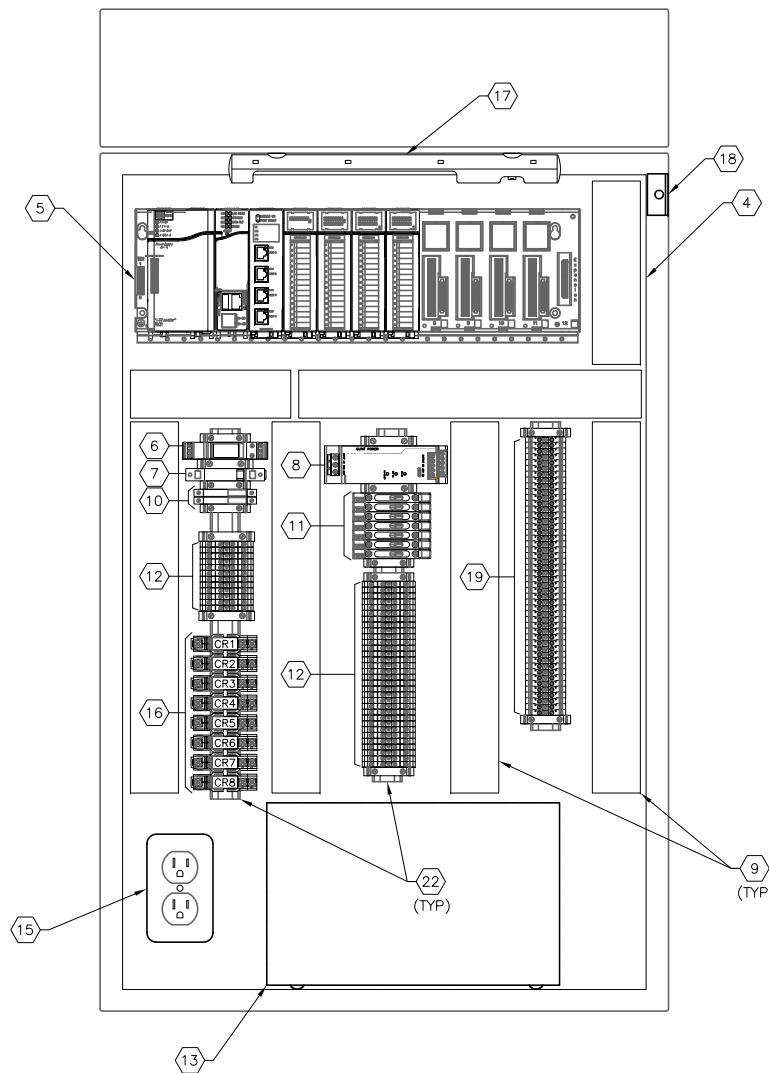
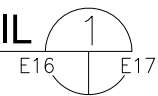
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TIMOTHY THOMAS, P.E. #47079	No.	DATE	REVISIONS	DES: TDT	CITY of TAMPA WASTEWATER DEPARTMENT	UNIVERSITY P.S. PUMP NO. 1 REPLACEMENT MOTOR CONTROL CENTER ELEVATION	W.O. 4511
	3			DRN: JLH			SHEET
	2			CKD: TDT			E16
	1			DATE: 11/21/16			OF



**PROPOSED ANNUNCIATOR EXERIOR DETAIL**

SCALE : N.T.S.



**PROPOSED ANNUNCIATOR INTERIOR DETAIL**

SCALE : N.T.S.

**KEYED NOTES:**

- 1 CONTRACTOR SHALL PROVIDE AND INSTALL 1/4" ALUMINUM PLATE OVER EXISTING ANNUNCIATOR CUT-OUT. PAINT TO MATCH EXISTING SURFACE.
- 2 PROVIDE AND INSTALL HUMAN MACHINE INTERFACE (HMI). MAPLE SYSTEMS HMI5150P. REFER TO SHEET E20 FOR PROPOSED ANNUNCIATOR SCREENS.
- 3 CONTRACTOR SHALL REMOVE EXISTING PUSH BUTTONS CURRENTLY UTILIZED FOR 'TEST' AND 'RESET'. PROVIDE APPROPRIATE PLUG FOR HOLE CREATED AFTER REMOVING EXISTING PUSH BUTTON. PAINT TO MATCH EXISTING SURFACE.
- 4 PROVIDE AND INSTALL NEW ALUMINUM BACKPLATE.
- 5 PROVIDE AND INSTALL PLC RACK. PLC RACK TO CONSIST OF : ONE (1) - GE RX3i CPU : IC695CPE305-ABAG; ONE (1) - SERIAL COMMUNICATION MODULE: GE IC695CMM004; THREE (3) DC INPUT MODULES: GE IC694MDL241; ONE (1) A/C RELAY MODULE: GE IC694MDL916; ONE (1) 120V POWER SUPPLY: GE IC695PSA140; ONE (1) 12-SLOT BACK PLANE: GE IC695CHS012.
- 6 PROVIDE AND INSTALL INCOMING 120V POWER SURGE PROTECTION DEVICES. PHOENIX CONTACT #2858357.
- 7 PROVIDE AND INSTALL 120V CIRCUIT BREAKER. 15 AMPERE SQUARE-D QOU115.
- 8 PROVIDE AND INSTALL 120VAC-24VDC POWER SUPPLY 'PS1' WITH 5 AMPERE OUTPUT. PHOENIX CONTACT #2866750.
- 9 PROVIDE AND INSTALL 2"X3" PANDUIT (OR EQUAL) WIRING SYSTEM WITH COVERS (TYPICAL).
- 10 PROVIDE AND INSTALL 120V, THERMAL CIRCUIT BREAKERS. REFER TO ANNUNCIATOR PLC WIRING DIAGRAM ON SHEET E15 FOR QUANTITIES AND SIZES. ALL THERMAL CIRCUIT BREAKERS SHALL BE PHOENIX CONTACT TCP TYPE.
- 11 PROVIDE AND INSTALL FUSE TERMINAL BLOCKS FOR DC POWER. PHOENIX CONTACT UK 5-HESI.
- 12 PROVIDE AND INSTALL MULTI-LEVEL TERMINAL BLOCKS. PHOENIX CONTACT #3044636.
- 13 PROVIDE AND INSTALL 700VA UPS. APC BR700G.
- 14 PROVIDE AND INSTALL ALARM HORN, WP, FEDERAL SIGNAL MODEL #350WB IN RED WP BACK BOX. HORN TO BE ON PANEL EXTERIOR.
- 15 PROVIDE AND INSTALL DUPLEX SERVICE RECEPTACLE, HUBBELL CRF20I OR EQUAL.
- 16 PROVIDE AND INSTALL SQUARE-D 8501 R SERIES (OR EQUAL) SPDT RELAYS WITH 120V COILS. PROVIDE RELAY BASE AND HOLD DOWN SPRING FOR RELAY.
- 17 PROVIDE AND INSTALL 24V DC LED CABINET LIGHT. HOFFMAN CAT # LED24V15. PROVIDE BRACKET TO MOUNT FIXTURE TO BACKPANEL.
- 18 PROVIDE AND INSTALL REMOTE DOOR SWITCH SWITCH AND ASSOCIATED DOOR SWITCH CABLE FOR 24V DC LED CABINET LIGHT. HOFFMAN CAT # ALFSWD.
- 19 PROVIDE AND INSTALL SURGE PROTECTION DEVICES FOR 24V DC DISCRETE INPUT CIRCUITS. PHOENIX CONTACT #2794699.
- 20 CONTRACTOR SHALL REUSE EXISTING PUSH BUTTON 'ACKNOWLEDGE' FOR INPUTS TO ANNUNCIATOR PLC.
- 21 CONTRACTOR SHALL REUSE EXISTING PUSH BUTTON 'SILENCE' FOR INPUTS TO ANNUNCIATOR PLC.
- 22 ALUMINUM DIN RAIL (TYPICAL).

**GENERAL NOTES :**

- 1. PROVIDE AND INSTALL ALL ASSOCIATED END BARRIERS, TERMINAL JUMPERS AND ACCESSORIES AS REQUIRED FOR TERMINAL BLOCKS, FUSE HOLDERS AND SURGE PROTECTION DEVICES SHOWN AS REQUIRED.



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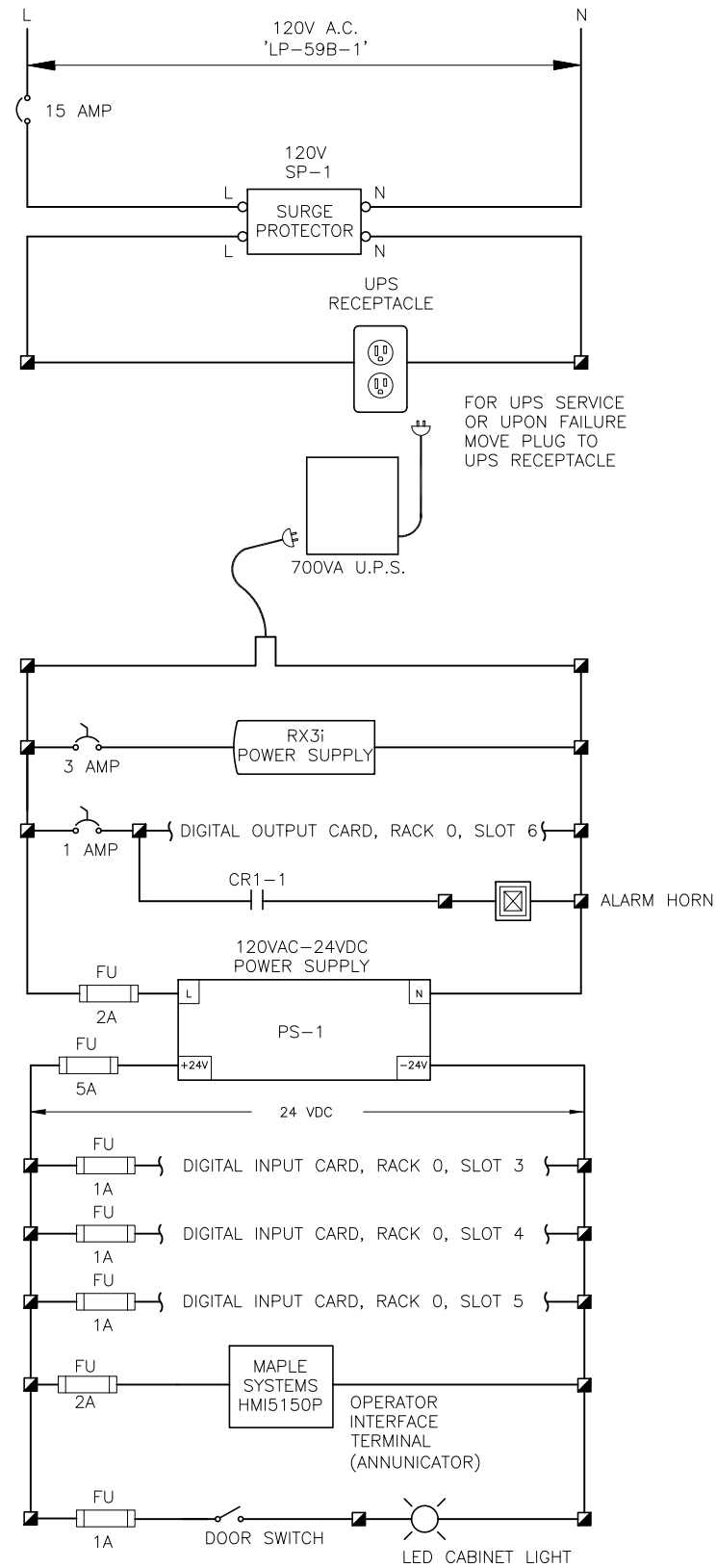
No.	DATE	REVISIONS
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DES: TDT  
DRN: JLH  
CKD: TDT  
DATE: 11/21/16

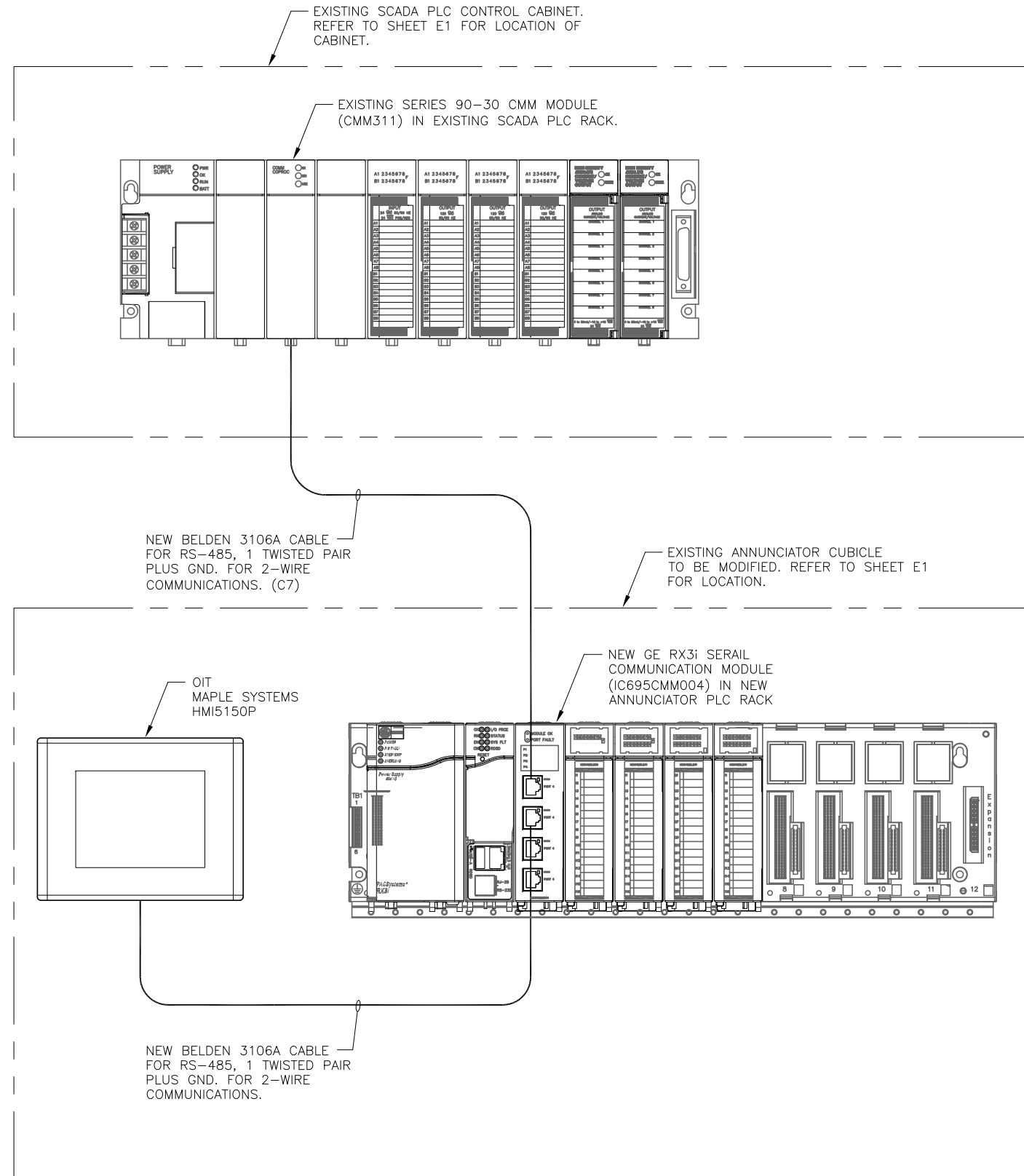
**CITY of TAMPA**  
WASTEWATER DEPARTMENT

**UNIVERSITY P.S.**  
**PUMP NO. 1 REPLACEMENT**  
**ANNUNCIATOR PLC DETAILS**

W.O. 4511  
SHEET  
**E17**  
OF



**ANNUNCIATOR PLC POWER WIRING DIAGRAM**

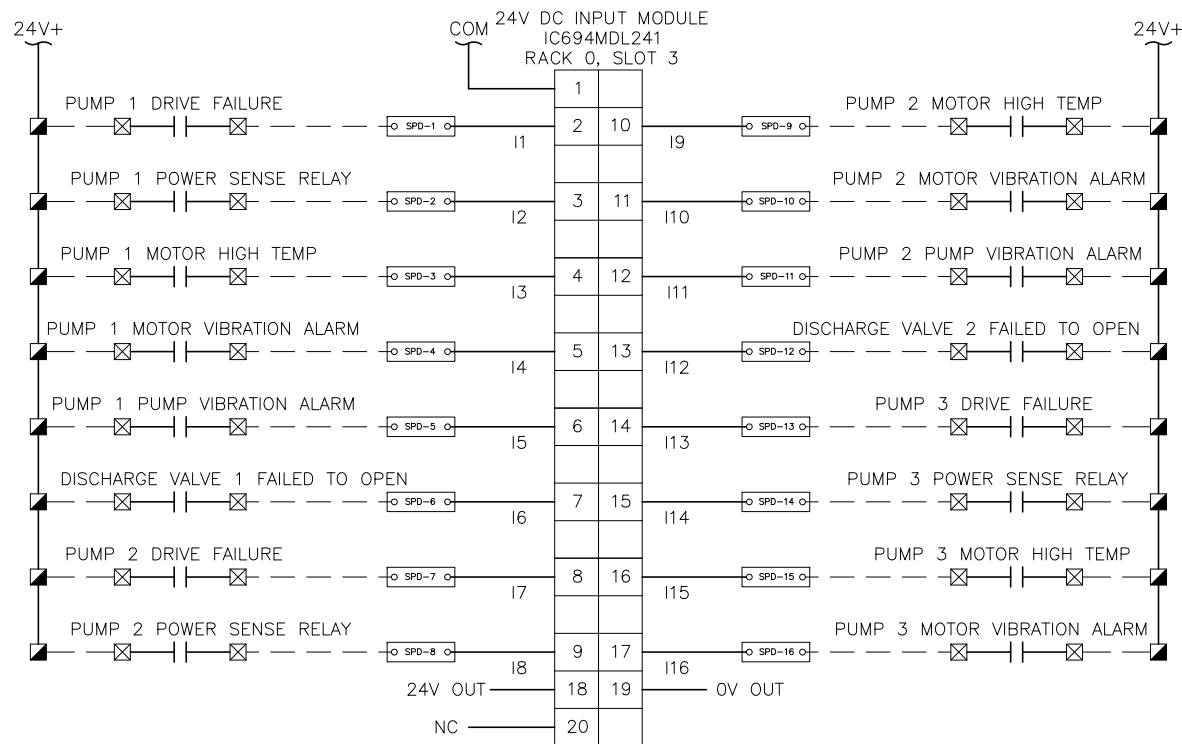


**COMMUNICATIONS RISER DIAGRAM**

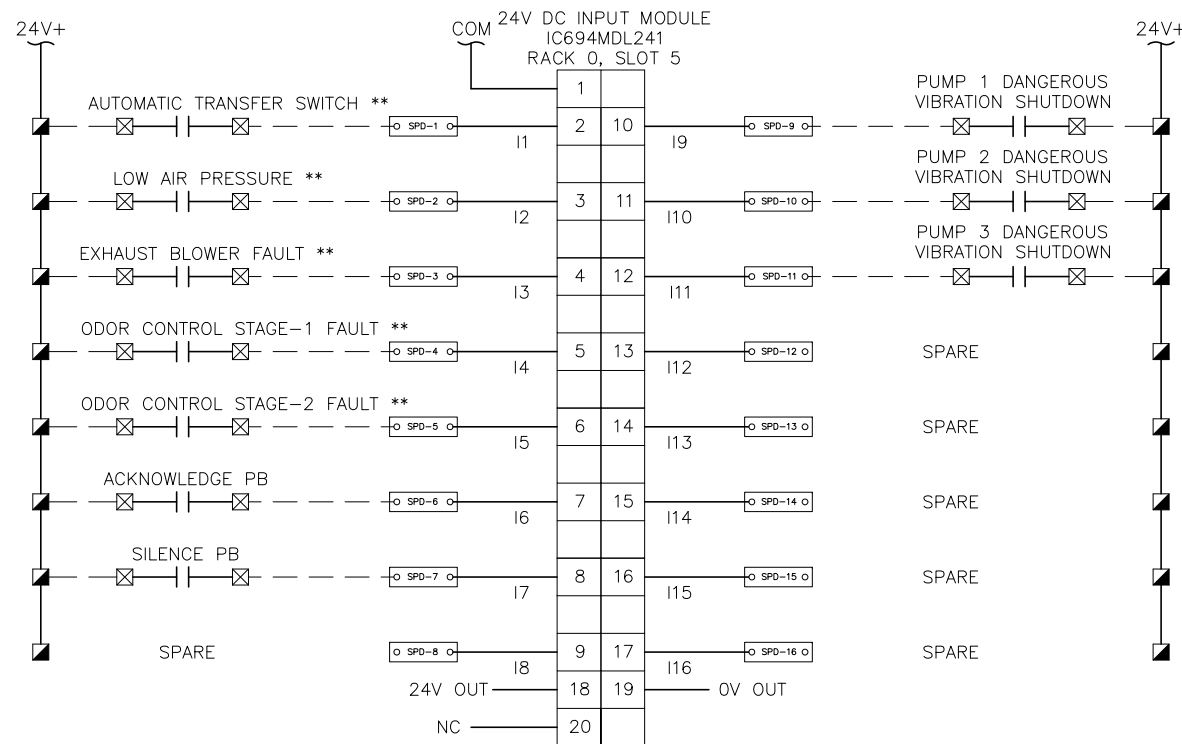


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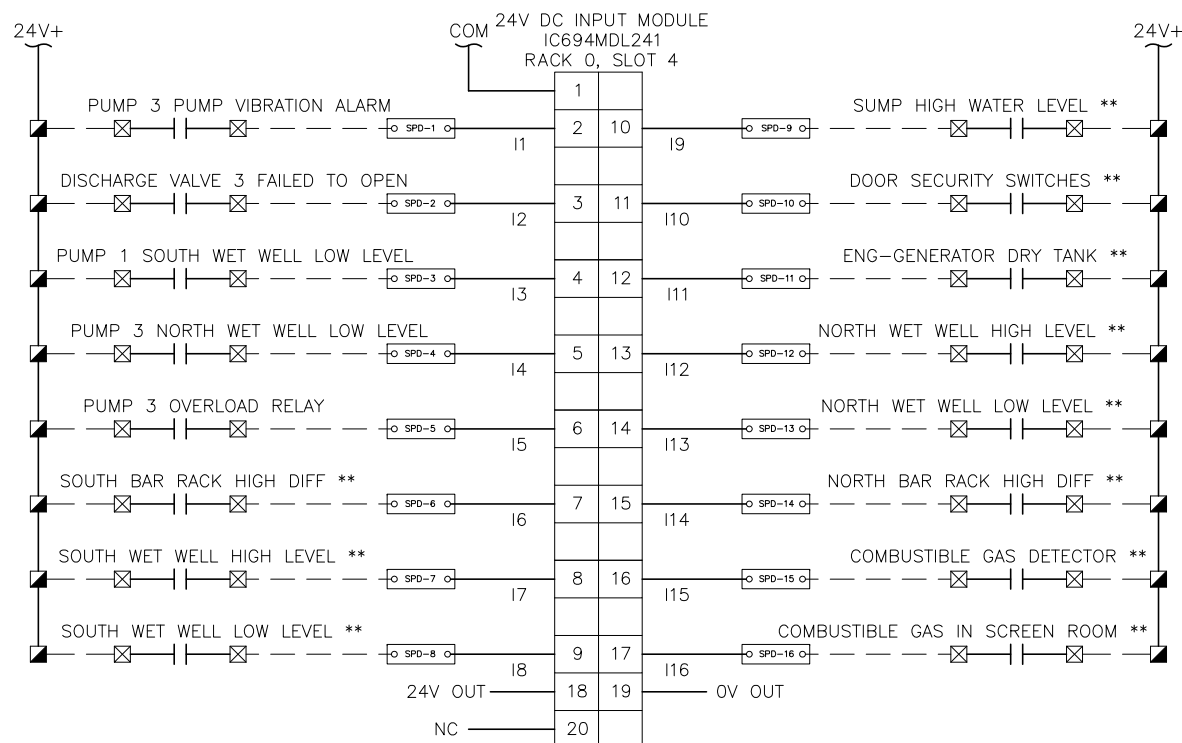
TIMOTHY THOMAS, P.E. #47079	No.	DATE	REVISIONS	DES: TDT	CITY of TAMPA WASTEWATER DEPARTMENT	UNIVERSITY P.S. PUMP NO. 1 REPLACEMENT ANNUNCIATOR PLC WIRING DIAGRAMS	W.O. 4511
	3			DRN: JLH			SHEET
	2			CKD: TDT			<b>E18</b>
	1			DATE: 11/21/16			OF



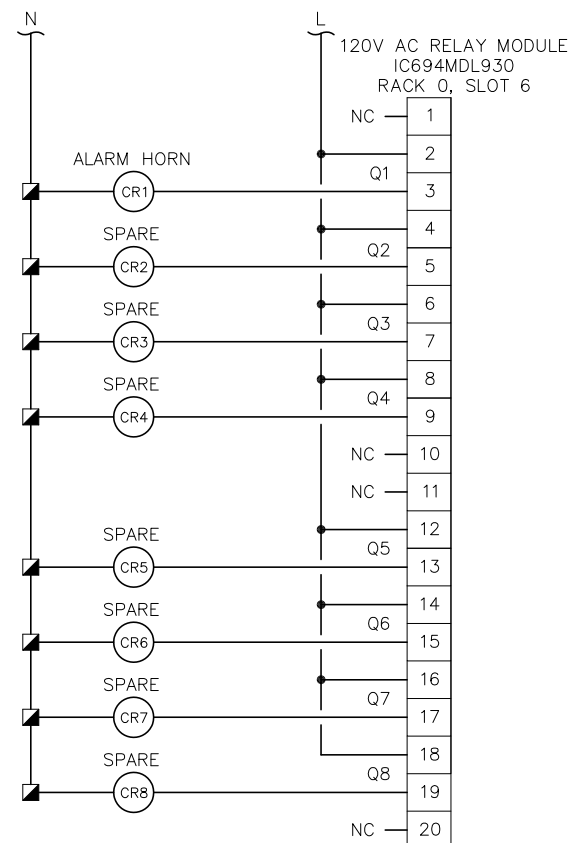
PLC DISCRETE INPUT CARD WIRING DIAGRAM - SLOT 3



PLC DISCRETE INPUT CARD WIRING DIAGRAM - SLOT 5



PLC DISCRETE INPUT CARD WIRING DIAGRAM - SLOT 4



PLC RELAY OUTPUT CARD WIRING DIAGRAM - SLOT 6

**LEGEND**

- DENOTES FIELD WIRING
- ⊠ DENOTES TERMINAL ON FIELD DEVICE
- DENOTES TERMINAL IN ANNUNCIATOR PLC CABINET
- \*\* DENOTES INPUT FROM EXISTING ANNUNCIATOR #2 LOCATED ON SOUTH END OF MOTOR CONTROL CENTER



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WASTEWATER DEPARTMENT

UNIVERSITY P.S.  
PUMP NO. 1 REPLACEMENT  
DISCRETE I/O WIRING DIAGRAMS

W.O. 4511  
SHEET  
**E19**  
OF

NOTE:  
THE EQUIPMENT NECESSARY  
TO PROVIDE THIS  
INFORMATION WILL BE  
PROVIDED IN THE FUTURE.

PUMP #1	PUMP #2	PUMP #3		SWITCHGEAR
STOPPED	RUNNING	STOPPED		MAIN "A" CLOSED
0.0 % SPEED	67.8 % SPEED	0.0 % SPEED		MAIN "B" CLOSED
0.0 KW	97.3 KW	0.0 KW		TIE OPENED
0.0 AMPS	146 AMPS	0.0 AMPS		MAIN "A" AMPS
FAIL TO START	FAIL TO START	FAIL TO START		MAIN "B" AMPS
AFD READY	AFD READY	AFD NOT READY		MAIN "A" KW
W. W. UPSTREAM HIGH WARNING	P#2 FAILED TO START	P#2 STATOR SEAL LEAK		
W. W. UPSTREAM HIGH ALARM	P#2 DISH. VALVE FAIL TO OPEN	P#2 CABLE SEAL LEAK		
W. W. DWNSTREAM LOW WARNING	P#2 DISH. VALVE FAIL TO CLOSE	P#2 BEARING OVERTEMP.		
BUBBLER CNTRL PWR FAIL	P#2 AFD FAIL	P#4 FAILED TO START		
LEL GAS 25%	P#2 MTR STATOR OVERTEMP.	P#4 DISH. VALVE FAIL TO OPEN		
LEL GAS 50%	P#2 STATOR SEAL LEAK	P#4 DISH. VALVE FAIL TO CLOSE		
GAS DETECTOR OK	P#2 CABLE SEAL LEAK	P#4 AFD FAIL		
P#1 FAILED TO START	P#2 BEARING OVERTEMP.	P#4 MTR STATOR OVERTEMP.		
P#1 DISH. VALVE FAIL TO OPEN	P#3 FAILED TO START	P#4 STATOR SEAL LEAK		
P#1 DISH. VALVE FAIL TO CLOSE	P#3 DISH. VALVE FAIL TO OPEN			
P#1 AFD FAIL	P#3 DISH. VALVE FAIL TO CLOSE	WASTEWATER FLOW MGD		
P#1 MTR STATOR OVERTEMP.	P#3 AFD FAIL			
P#1 STATOR SEAL LEAK	P#3 MTR STATOR OVERTEMP.			
<b>ALARMS</b>				

PROPOSED ANNUNCIATOR SAMPLE SCREEN 1

NOTE:  
THE EQUIPMENT NECESSARY  
TO PROVIDE THIS  
INFORMATION WILL BE  
PROVIDED IN THE FUTURE.

PUMP #1	PUMP #2	PUMP #3	PUMP #4	SWITCHGEAR
STOPPED	RUNNING	STOPPED	STOPPED	MAIN "B" KW
0.0 % SPEED	67.8 % SPEED	0.0 % SPEED	0.0 % SPEED	MAIN "A" PF
0.0 KW	97.3 KW	0.0 KW	0.0 KW	MAIN "B" PF
0.0 AMPS	146 AMPS	0.0 AMPS	0.0 AMPS	MAIN "A" KVA
FAIL TO START	FAIL TO START	FAIL TO START	FAIL TO START	MAIN "B" KVA
AFD READY	AFD READY	AFD NOT READY	AFD READY	MCC-65A AMPS
SUMP PUMP LEVEL	SCREEN CONTROL POWER	COMPACTOR RUNNING		
PLANT WATER PRESSURE	SCREEN RUNNING	COMPACTOR FAULT		
HVAC TROUBLE	SCREEN FAULT	COMPACTOR LOW LOAD		
	SCREEN SPRAY WASH FAILURE	COMPACTOR HIGH LOAD		
LIGHTING ATS TROUBLE	SCREEN SPRAY WATER FLOW GPM			
LIGHTING ATS ON BUS "A"				
LIGHTING ATS ON BUS "B"	SCREEN ATS TROUBLE			
	SCREEN ATS ON BUS "A"			
	SCREEN ATS ON BUS "B"			
<b>ALARMS</b>				

PROPOSED ANNUNCIATOR SAMPLE SCREEN 2

- NOTE:
1. THE ANNUNCIATOR HMI IS A MAPLE SYSTEMS # HMI5150P.
  2. SCREEN 1 AND SCREEN 2 SHOWS THE INFORMATION DISPLAYED ON THE SAME HMI AT DIFFERENT TIMES AS CONTROLLED BY OPERATOR TOUCH-SCREEN INPUT.
  3. DISPLAY GRAPHICS AND CHARACTERISTICS SHALL FOLLOW THE STANDARDS SET FORTH AT SULPHUR SPRINGS AND YBOR PUMPING STATIONS.



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	3			DRN: JLH			SHEET
	2			CKD: TDT			<b>E20</b>
	1			DATE: 11/21/16			OF



CONDUIT AND CABLE SCHEDULE					
CONDUIT No.	SIZE	NUMER OF CONDUCTORS/SIZE	FROM	TO	REMARKS
P10	4"	3-500kcmil + 1-2/O GND	PUMP CONTROL CENTER SECTION #3	PUMP NO. 1 VFD	POWER LEADS. PROVIDE NEW CONDUIT/CONDUCTORS (TO EXISTING PULL BOX).
P11	4"	3-500kcmil + 1-2/O GND	PUMP CONTROL CENTER SECTION #3	PUMP NO. 1 VFD	POWER LEADS. PROVIDE NEW CONDUIT/CONDUCTORS (TO EXISTING PULL BOX).
P12	4"	3-500kcmil + 1-2/O GND	PUMP NO. 1 VFD	PUMP MOTOR NO. 1	POWER LEADS. PROVIDE NEW CONDUIT/CONDUCTORS. PROVIDE ALUMINUM CORE, LIQUID TIGHT, FLEXIBLE CONNECTION TO MOTOR.
P13	4"	3-500kcmil + 1-2/O GND	PUMP NO. 1 VFD	PUMP MOTOR NO. 1	POWER LEADS. PROVIDE NEW CONDUIT/CONDUCTORS. PROVIDE ALUMINUM CORE, LIQUID TIGHT, FLEXIBLE CONNECTION TO MOTOR.
P20	3/4"	3-#12 + 1-#12 GND	MOTOR CONTROL CENTER, 1B	NEW JB AT ELEV 15.00'	KNIFE GATE VALVE ACTUATORS - 480V FEEDER. PROVIDE NEW CONDUIT/CONDUCTORS. FIELD ROUTE DOWN TO ELEVATION 15.00'.
P21	3/4"	3-#12 + 1-#12 GND	NEW JB AT ELEV 15.00'	NEW PUMP NO. 1 ACTUATOR	480V FEEDER. PROVIDE NEW CONDUIT/CONDUCTORS.
P22	3/4"	3-#12 + 1-#12 GND	NEW JB AT ELEV 15.00'	NEW PUMP NO. 2 ACTUATOR	480V FEEDER. PROVIDE NEW CONDUIT/CONDUCTORS.
P23	3/4"	3-#12 + 1-#12 GND	NEW JB AT ELEV 15.00'	NEW PUMP NO. 3 ACTUATOR	480V FEEDER. PROVIDE NEW CONDUIT/CONDUCTORS.
P30	3/4"	2-#12 + 1-#12 GND	EXISTING 120/208V PANELBOARD	NEW ANNUNCIATOR PLC	ANNUNCIATOR PLC 120V POWER. PROVIDE NEW CONDUIT/CONDUCTORS.
P40	3/4"	2-#12 + 1-#12 GND	EXISTING 120/208V PANELBOARD	LIQUID LEVEL CONTROLS	NEW FLOW METER TRANSMITTER, BARGRAPH INDICATORS AND DIGITAL PANEL METERS 120V POWER PROVIDE NEW CONDUIT/CONDUCTORS.
P50	3/4"	2-#10 + 1-#10 GND	PUMP NO. 1 VFD	PUMP MOTOR NO. 1	MOTOR SPACE HEATER 120V POWER. PROVIDE NEW CONDUIT/CONDUCTORS. PROVIDE NON-METALLIC, FLEXIBLE CONNECTION TO MOTOR.
P60	3/4"	6-#12 + 1-#12 GND	PUMP NO. 1 VFD	VIBRATION TRANSMITTER	VIBRATION TRANSMITTER 120V POWER AND ALARM RELAY OUTPUTS (VIA TERMINAL BOX AT PUMP MOTOR NO. 1). PROVIDE NEW CONDUIT/CONDUCTORS
P70	3/4"	6-#12 + 1-#12 GND	PUMP NO. 1 VFD	ROBERTSHAW VIBRASWITCH	VIBRASWITCH 120V POWER, RESET AND ALARM RELAY OUTPUT (VIA TERMINAL BOX AT PUMP MOTOR NO. 1). PROVIDE NEW CONDUIT/CONDUCTORS
P80	3/4"	2-#12 + 1-#12 GND	PUMP NO. 1 VFD	MOTOR NO. 1 THERMAL SWITCH	THERMAL SWITCH CONTACT (VIA TERMINAL BOX AT PUMP MOTOR NO. 1). PROVIDE NEW CONDUIT/CONDUCTORS
C1	1-1/2"	36-#14 + 2-#12 GND	PUMP CONTROL CENTER CUBICLE 4A	PUMP NO. 1 VFD	PROVIDE NEW CONDUIT/CONDUCTORS. COUNT INCLUDES SPARES.
C2	2"	50-#12 + 2-#12 GND	PUMP NO. 1 VFD	T.B. AT PUMP MOTOR NO. 1	PROVIDE NEW CONDUIT/CONDUCTORS. COUNT INCLUDES SPARES.
C3	1-1/4"	FOUR - 2/C #16 TW-SH	VIBRATION/TEMPERATURE TRANSMITTER	EXISTING SCADA PLC	FOUR (4): 2/C-#16 (BELDEN 8719 EACH) FOR PUMP AND MOTOR VIBRATION & TEMPERATURE ANALOG SIGNALS VIA NEW TERMINAL BLOCKS IN SECTION 3.
C4	EX.	2-#14 + 1-#14 GND	LIQUID LEVEL CONTROLS (LLC)	PUMP NO. 1 VFD	VFD START AND PUMP READY SIGNALS TO/FROM LLC. PROVIDE NEW CONDUCTORS AND UTILIZE EXISTING RACEWAY FROM LLC TO SECTION 3.
C5	EX.	SUPPLIED BY MANUFACTURER	LIQUID LEVEL CONTROLS (LLC)	NEW FM TRANSMITTER	MANUFACTURER SUPPLIED CABLE TO FLOW METER IN EX CONDUIT. 2/C #16 (BELDEN 8719) FROM TRANSMITTER TO SCADA PLC.
C6	1-1/2"	50-#14 + 2-#12 GND	EXISTING ANNUNCIATOR NO. 2	NEW ANNUNCIATOR PLC	PROVIDE NEW CONDUIT/CONDUCTORS. CONDUCTOR COUNT INCLUDES SPARES.
C7	3/4"	ONE - 2/C #22 TW-SH W/GND	EXISTING SCADA PLC	NEW ANNUNCIATOR PLC	2/C #22 (BELDEN 3106A) FOR NEW ANNUNCIATOR PLC COMMUNICATIONS TO EXISTING SCADA PLC. PROVIDE NEW CONDUIT/CONDUCTORS.
C8	1-1/4"	24-#14 + 2-#12 GND	PUMP CONTROL CENTER CUBICLE 4A	NEW ANNUNCIATOR PLC	PROVIDE NEW CONDUIT/CONDUCTORS. COUNT INCLUDES SPARES.
C9	EX	6-#14 + 1-#14 GND	PUMP CONTROL CENTER CUBICLE 4A	EXISTING SCADA PLC	VFD SIGNALS TO EXISTING SCADA PLC. PROVIDE NEW CONDUCTORS AND UTILIZE EXISTING RACEWAY FROM SECTION 3 TO SCADA PLC.
C10	1"	THREE - 2/C #16 TW-SH	PUMP NO. 1 VFD	EXISTING SCADA PLC	THREE (4): 2/C-#16 (BELDEN 8719 EACH) FOR VFD SPEED CONTROL, SPEED REFERENCE (ONE SPARE) ANALOG SIGNALS VIA NEW TERMINAL BLOCKS IN SECTION 3.



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	3						SHEET
	2						E21
	1						OF