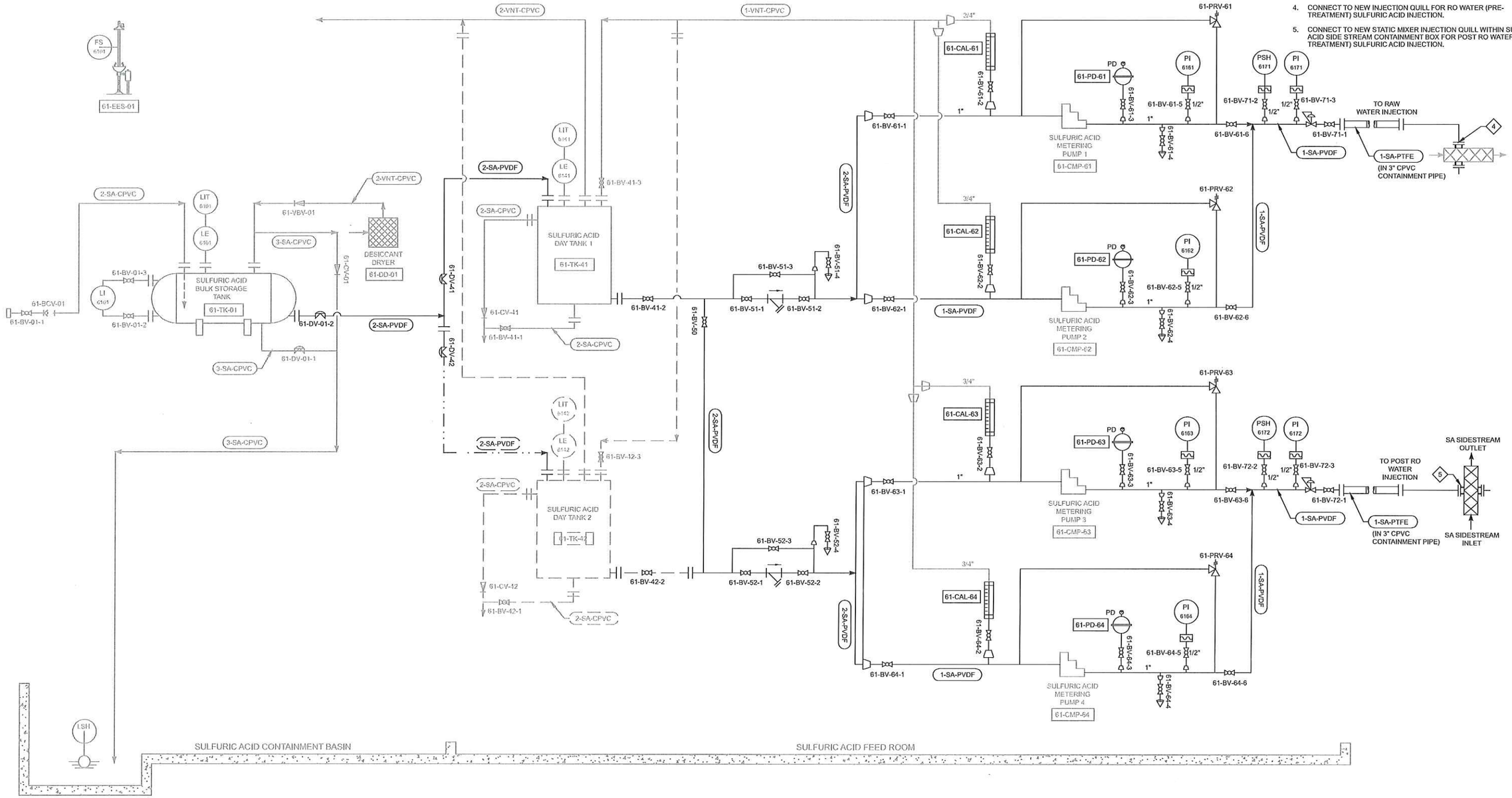
GENERAL NOTES:

1. NEW VALVES TO MATCH EXISTING VALVE SIZE AND TYPE. MATERIAL FOR NEW VALVES SHALL BE PVDF TO MATCH NEW PVDF PIPING.
2. WHERE TRUE-UNION VALVES ARE NOT AVAILABLE, CONTRACTOR TO PROVIDE PVDF UNIONS FITTINGS ON EITHER SIDE OF VALVE, UNLESS OTHERWISE CALLED OUT AS BEING REQUIRED, THREADED PVDF FITTINGS ARE PROHIBITED.
3. NEW STRAINERS TO BE Y-STRAINER TYPE, FLANGED END CONNECTIONS, PVDF BODY, RATED FOR 150 PSI.
4. CONNECT TO NEW INJECTION QUILL FOR RO WATER (PRE-TREATMENT) SULFURIC ACID INJECTION.
5. CONNECT TO NEW STATIC MIXER INJECTION QUILL WITHIN SULFURIC ACID SIDE STREAM CONTAINMENT BOX FOR POST RO WATER (POST-TREATMENT) SULFURIC ACID INJECTION.



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			BID SET

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DATE NOVEMBER 2024

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CITY OF PUNTA GORDA, FLORIDA

SULFURIC ACID FEED SYSTEM IMPROVEMENTS

MECHANICAL

SULFURIC ACID FEED SYSTEM PROCESS FLOW DIAGRAM

VERIFY SCALES
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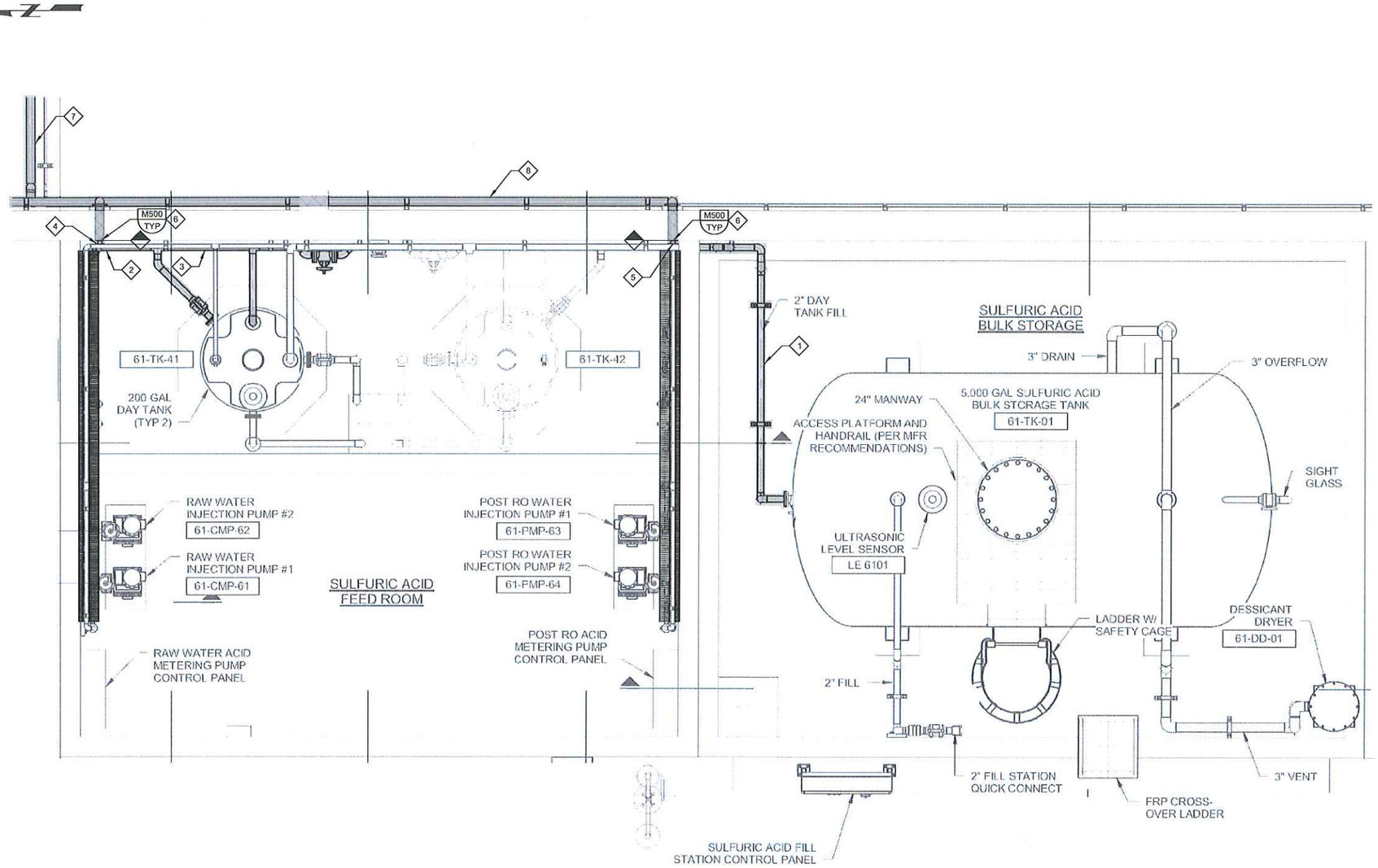
JOB NO. 202885
DRAWING NO. M01
SHEET NO. OF

PROJECT NO. 202885-100000 FILE NAME: 202885_00M01.dgn



J **PLAN**
SCALE: 1/2" = 1'-0"
FILE: 20288500M0101

GENERAL NOTES:

1. WALL PENETRATIONS SHALL BE FILLED WITH ACCEPTABLE FIRESTOPPING MATERIAL. REFER TO SPECIFICATION SECTION 07840 - FIRESTOPPING FOR ADDITIONAL INFORMATION.
2. ALL REPLACEMENT PIPING IS TO BE SUPPORTED USING EXISTING PIPE SUPPORT STRUTS, CHANNELS, AND BRACKETS WITH NEW FASTENERS AND MATERIALS WHEN NECESSARY.
3. SEE SHEET M01 FOR NEW PIPE, FITTINGS, VALVES, AND APPURTENANCES. NEW PIPING TO MATCH EXISTING PIPE ROUTING AND LAYOUT.
4. SHADING INDICATES NEW PIPE TO REPLACE DEMOLISHED PIPING.
5. ALL CPVC ELBOWS USED FOR CONTAINMENT OF PTFE TUBING ARE TO BE LONG-RADIUS TYPE.

(#) KEY NOTES:

1. PROVIDE 2" PVDF SULFURIC ACID TRANSFER PIPING FROM EXISTING BULK STORAGE TANK FLANGE TO EXISTING DAY TANK FLANGE.
2. PROVIDE 2" AND 1" PVDF SULFURIC ACID SUCTION PIPING FROM THE EXISTING DAY TANK TO RAW WATER INJECTION PUMPS #1 AND #2.
3. PROVIDE 2" AND 1" PVDF SULFURIC ACID SUCTION PIPING FROM THE EXISTING DAY TANK TO POST RO WATER INJECTION PUMPS #1 AND #2.
4. PROVIDE 1" PVDF SULFURIC ACID DISCHARGE PIPING FROM RAW WATER INJECTION PUMPS #1 AND #2 TO THE POINT OF TRANSITION.
5. PROVIDE 1" PVDF SULFURIC ACID DISCHARGE PIPING FROM POST RO WATER PUMPS #1 AND #2 TO THE POINT OF TRANSITION.
6. TRANSITION FROM 1" PVDF TO 1" PTFE TUBING IN 3" CPVC CONTAINMENT PIPING AT EXISTING SULFURIC ACID FEED ROOM WALL PENETRATION. REFER TO DETAIL M500 FOR TRANSITION. EXISTING WALL PENETRATION TO BE RE-USED FOR NEW PIPE ROUTING.
7. PROVIDE 1" PTFE TUBING IN 3" CPVC CONTAINMENT PIPING FOR DISCHARGE OF SULFURIC ACID FROM RAW WATER INJECTION PUMPS #1 AND #2 TO THE POINT OF INJECTION (PRE-TREATMENT).
8. PROVIDE 1" PTFE TUBING IN 3" CPVC CONTAINMENT PIPING FOR DISCHARGE OF SULFURIC ACID FROM POST RO WATER INJECTION PUMPS #1 AND #2 TO THE POINT OF INJECTION (POST-TREATMENT).

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CITY OF PUNTA GORDA, FLORIDA
SULFURIC ACID FEED SYSTEM IMPROVEMENTS
MECHANICAL
SULFURIC ACID FEED ROOM MODIFICATIONS PLAN

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JOB NO. 202885
DRAWING NO. M02
SHEET NO. OF

PROJECT NO. 202885-100000 FILE NAME: 202885_00M02.dgn

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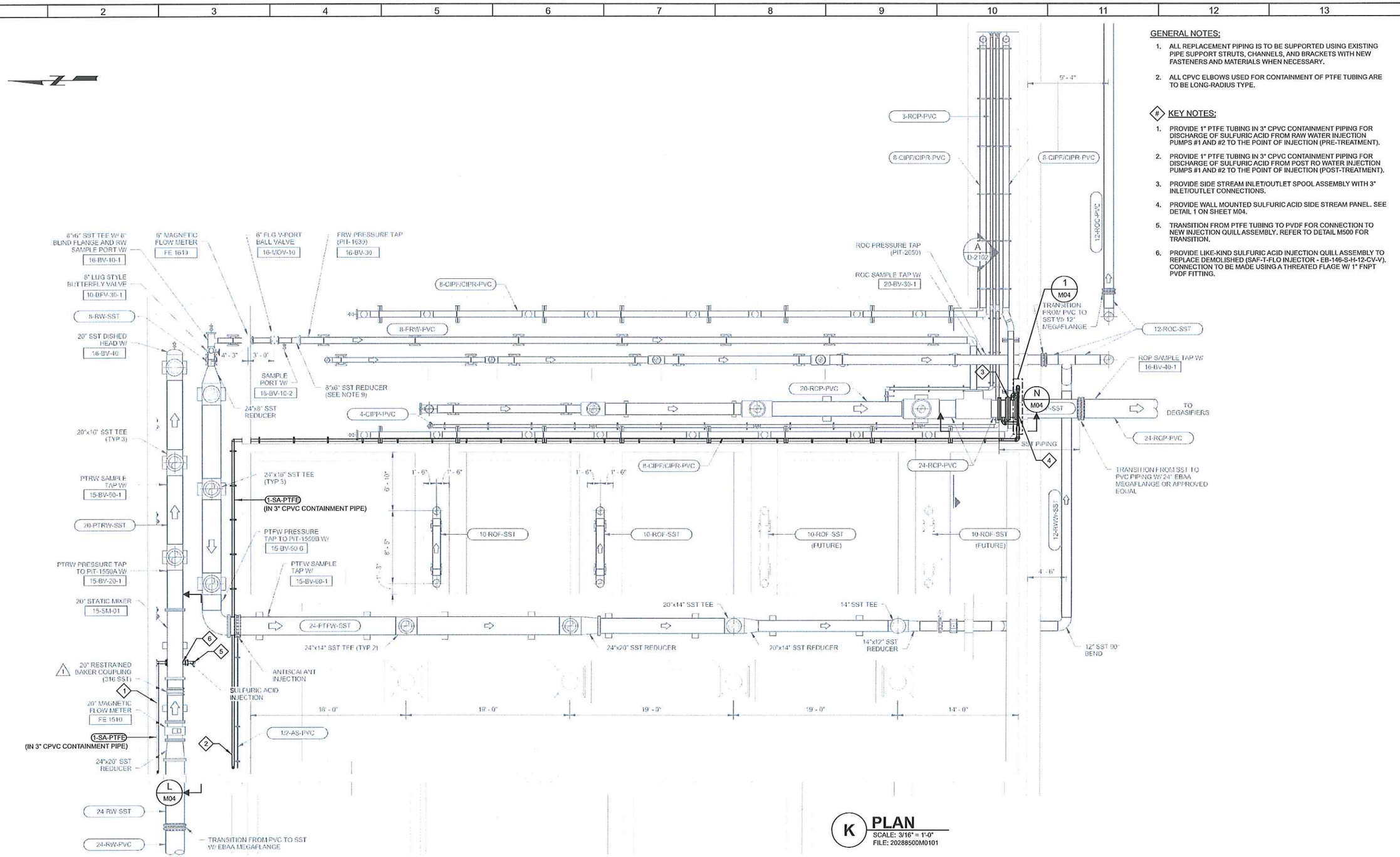
LAST SAVED BY: hvo



GENERAL NOTES:

1. ALL REPLACEMENT PIPING IS TO BE SUPPORTED USING EXISTING PIPE SUPPORT STRUTS, CHANNELS, AND BRACKETS WITH NEW FASTENERS AND MATERIALS WHEN NECESSARY.
2. ALL CPVC ELBOWS USED FOR CONTAINMENT OF PTFE TUBING ARE TO BE LONG-RADIUS TYPE.

KEY NOTES:

1. PROVIDE 1" PTFE TUBING IN 3" CPVC CONTAINMENT PIPING FOR DISCHARGE OF SULFURIC ACID FROM RAW WATER INJECTION PUMPS #1 AND #2 TO THE POINT OF INJECTION (PRE-TREATMENT).
2. PROVIDE 1" PTFE TUBING IN 3" CPVC CONTAINMENT PIPING FOR DISCHARGE OF SULFURIC ACID FROM POST RO WATER INJECTION PUMPS #1 AND #2 TO THE POINT OF INJECTION (POST-TREATMENT).
3. PROVIDE SIDE STREAM INLET/OUTLET SPOOL ASSEMBLY WITH 3" INLET/OUTLET CONNECTIONS.
4. PROVIDE WALL MOUNTED SULFURIC ACID SIDE STREAM PANEL. SEE DETAIL 1 ON SHEET M04.
5. TRANSITION FROM PTFE TUBING TO PVDF FOR CONNECTION TO NEW INJECTION QUILL ASSEMBLY. REFER TO DETAIL M500 FOR TRANSITION.
6. PROVIDE LIKE-KIND SULFURIC ACID INJECTION QUILL ASSEMBLY TO REPLACE DEMOLISHED (SAF-T-FLO INJECTOR - EB-146-S-H-12-CV-V). CONNECTION TO BE MADE USING A THREATED FLAGE W/ 1" FNPT PVDF FITTING.

K PLAN

SCALE: 3/16" = 1'-0"
FILE: 20288500M0101

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CITY OF PUNTA GORDA, FLORIDA
SULFURIC ACID FEED SYSTEM IMPROVEMENTS
MECHANICAL
SULFURIC ACID FEED PIPING MODIFICATIONS PLAN

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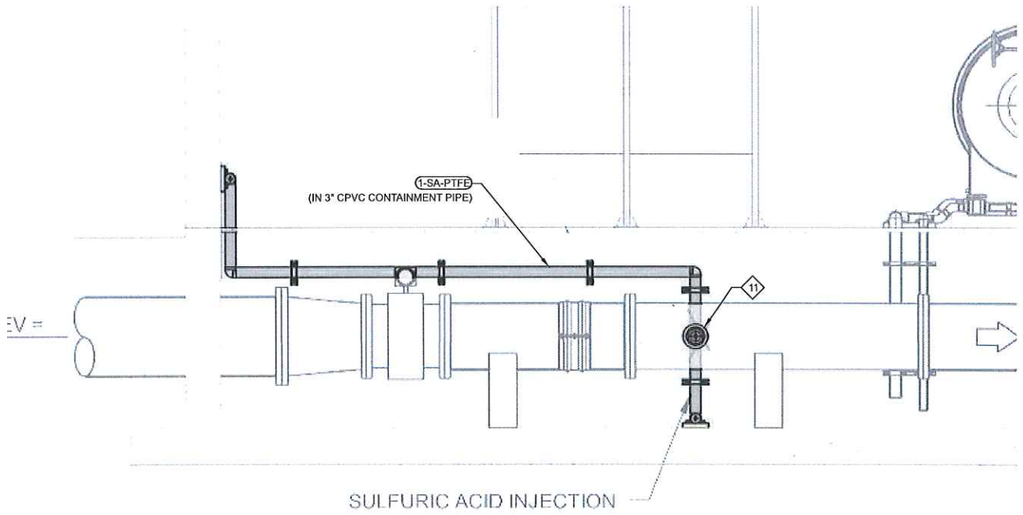
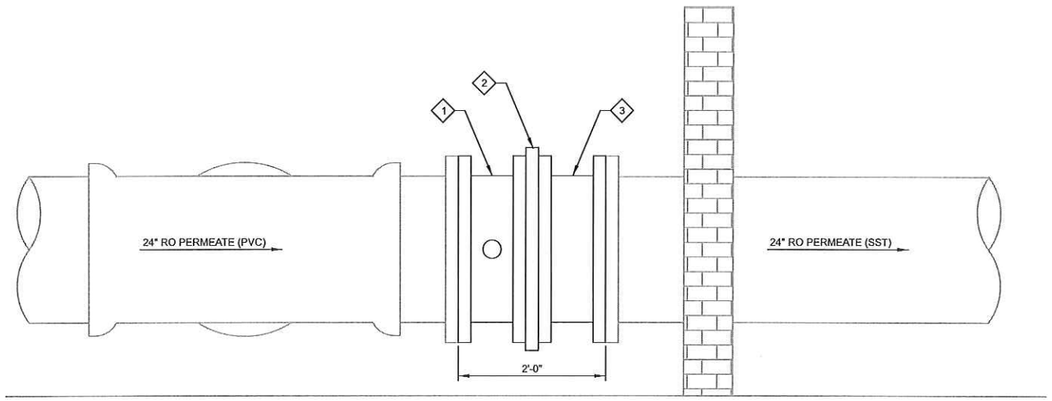
DRAWING NO. M03
SHEET NO. OF

PROJECT NO. 202885-100000 FILE NAME: 202885_00M03.dgn



PRE-TREATMENT SULFURIC ACID INJECTION

L SECTION
M03
SCALE: 1" = 1'-0"
FILE: SULFURIC ACID FEED PIPING DEMOLITION SECTION 2



POST-TREATMENT SULFURIC ACID SIDE STREAM

N SECTION
M03
SCALE: NTS
FILE: -

GENERAL NOTES:

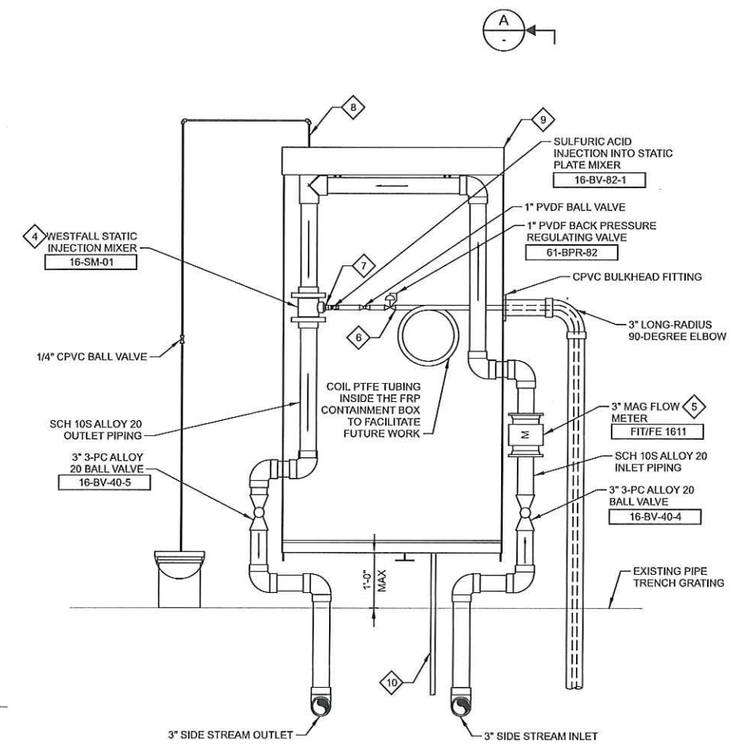
1. DIMENSIONS SHOWN ARE APPROXIMATED BASED ON RECORD DRAWINGS. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS.
2. ALL FITTINGS ON ALLOY 20 PIPING ARE TO BE WELDED OR FLANGED. UNLESS OTHERWISE CALLED OUT AS BEING REQUIRED, THREADED ALLOY 20 FITTINGS ARE PROHIBITED.
3. ALL CPVC ELBOWS USED FOR CONTAINMENT OF PTFE TUBING ARE TO BE LONG-RADIUS TYPE.

KEY NOTES:

1. PROVIDE 24" DIAMETER, 316 STAINLESS STEEL, 150#, FLANGED SPOOL PIECE, WITH 3" FLANGED CONNECTION PORT FOR CONNECTION TO SULFURIC ACID SIDE STREAM INLET. MANUFACTURERS: JIFCO, AEREX INDUSTRIES, OR EQUAL.
2. PROVIDE 24" DIAMETER, 1/2" THICK, 316 STAINLESS STEEL, 150#, CONCENTRIC SHARP-EDGED BEVELED ORIFICE PLATE, WITH SINGLE 18" DIAMETER ORIFICE. MANUFACTURERS: WYATT ENGINEER, OR EQUAL.
3. PROVIDE 24" DIAMETER, 316 STAINLESS STEEL, 150#, FLANGED SPOOL PIECE, WITH 3" FLANGED CONNECTION PORT FOR CONNECTION TO SULFURIC ACID SIDE STREAM OUTLET. MANUFACTURERS: JIFCO, AEREX INDUSTRIES, OR EQUAL.
4. PROVIDE 3" DIAMETER, ALLOY 20 OR HASTELLOY, WESTFALL STATIC INJECTION MIXER, MODEL 2800.
5. PROVIDE 3" DIAMETER, MAGNETIC FLOW METER (0-100 GPM). REFER TO DETAIL NF136 FOR GROUNDING. MANUFACTURERS: ENDRESS+HAUSER, OR EQUAL.

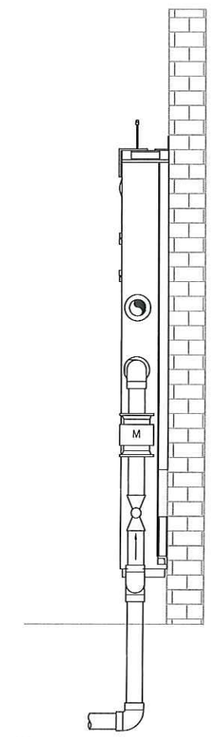
KEY NOTES:

6. TRANSITION FROM PTFE TUBING TO PVDF FOR CONNECTION OF DOWNSTREAM VALVES AND INJECTION QUILL CONNECTION. REFER TO DETAIL M500 FOR TRANSITION.
7. CONNECTION TO STATIC MIXER INJECTION QUILL TO BE MADE USING A 1" TO 1/2" FNPT COMPRESSION PVDF FITTING.
8. TRANSITION FROM ALLOY 20 TEE FITTING TO CPVC FOR 1/4" CPVC MANUAL AIR BLEED PIPING. AIR BLEED DISCHARGE PIPE TO EMPTY INTO A 5-GALLON BUCKET (PROVIDED BY OWNER) WITH A 6" AIR GAP.
9. PROVIDE WALL MOUNTED FRP CONTAINMENT BOX. GLOSS WHITE. CONTAINMENT BOX IS TO BE A MAX. 1'-0" FROM THE FLOOR. MAXIMUM DIMENSIONS FOR FRP CONTAINMENT BOX ARE 5'-0" LENGTH, 4'-0" WIDTH, 10" DEPTH. FRP CONTAINMENT BOX SHALL HAVE A 1/8" MIN. THICKNESS SLIDING OR HINGED TRANSPARENT PTFE SPLASH SHIELD USING FRP SUPPORT BRACKETS OR HINGES. FRP CONTAINMENT BOX TO BE WALL MOUNTED TO MASONRY WALL USING ONE OF THE ANCHORING SYSTEMS DEFINED IN SECTION 05190 - MECHANICAL ANCHORING AND FASTENING TO CONCRETE AND MASONRY.
10. PROVIDE 1" CPVC DRAIN PIPE FOR LEAK DRAINAGE OF FRP CONTAINMENT BOX. DIRECT DRAIN PIPING TO THE CHANNEL BELOW.
11. PROVIDE LIKE-KIND SULFURIC ACID INJECTION QUILL ASSEMBLY TO REPLACE DEMOLISHED (SAF-T-FLO INJECTOR - EB-146-S-H-12-CV-V). CONNECTION TO BE MADE USING A THREATED FLAGE W/ 1" FNPT PVDF FITTING.



POST-TREAMENT SULFURIC ACID PANEL

1 DETAIL
M03
SCALE: 3/4" = 1'-0"
FILE: -



A SECTION
-
SCALE: 3/4" = 1'-0"
FILE: -

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CITY OF PUNTA GORDA, FLORIDA

SULFURIC ACID FEED SYSTEM IMPROVEMENTS

MECHANICAL

SULFURIC ACID FEED PIPING MODIFICATIONS SECTIONS

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SHEET NO. OF

PROJECT NO. 202885-100000 FILE NAME: 202885_00M04.dgn

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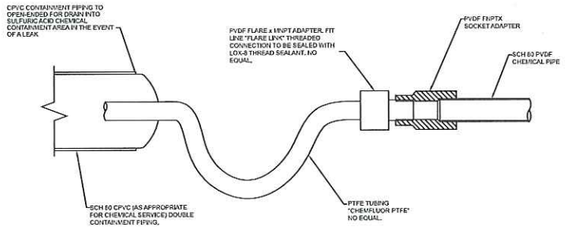
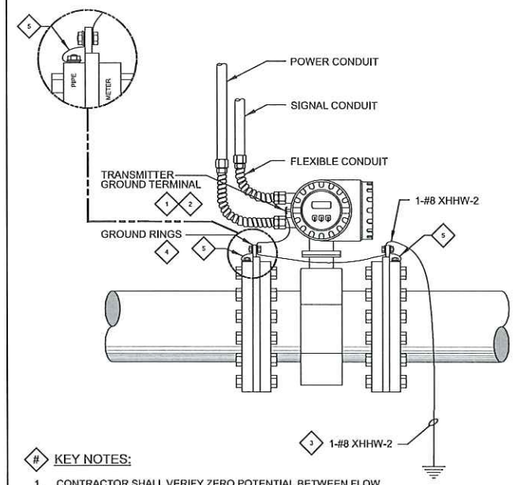


M500 TYP J

DETAIL - TRANSITION TO/FROM DOUBLE CONTAINMENT



 # KEY NOTES:

1. CONTRACTOR SHALL VERIFY ZERO POTENTIAL BETWEEN FLOW TUBE, EARTH GROUND AND TRANSMITTER GROUND TERMINAL.
2. CONNECT TRANSMITTER GROUND TERMINAL TO GROUND RINGS.
3. CONNECT METER BODY TO EARTH GROUND POTENTIAL.
4. EQUALIZE POTENTIAL VIA GROUND RINGS BETWEEN FLUID AND MAGMETER.
5. PROVIDE BONDING JUMPER ON CONDUCTIVE PIPES.

NF136 TYP S

INTEGRAL MAGNETIC FLOWMETER GROUNDING DETAIL

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			100% DESIGN SUBMITTAL NOT FOR CONSTRUCTION

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SULFURIC ACID FEED SYSTEM IMPROVEMENTS

TYPICAL

TYPICAL MECHANICAL DETAILS

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DRAWING NO. TM01
SHEET NO. OF

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Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo_Std_Pen_v0905.pen PlotScale: 1:1
LAST SAVED BY: hvo
PROJECT NO. 202885-100000 FILE NAME: 202885_00TM01.dgn

ELECTRICAL PLAN/LAYOUT

SYMBOL	DESCRIPTION
TTC	TELEPHONE TERMINAL CABINET
	TERMINAL JUNCTION BOX
	ELECTRICAL EQUIPMENT
X	CEILING MOUNTED DOWNLIGHT LUMINAIRE - SEE SCHEDULE FOR TYPE
X	FLUORESCENT LUMINAIRE, SURFACE OR LAY IN TYPE SEE SCHEDULE FOR TYPE
X	LUMINAIRE AND POLE - SEE SCHEDULE FOR TYPE
X	WALL MOUNTED LUMINAIRE - SEE SCHEDULE FOR TYPE
X	FLOOD LIGHTS - AIM IN THE DIRECTION SHOWN SEE SCHEDULE FOR TYPE
X	EXIT LIGHTS - SOLID SECTION IS DIRECTION OF FACE SEE SCHEDULE FOR TYPE
X	EMERGENCY LIGHT WITH BATTERY PACK SEE SCHEDULE FOR TYPE
X Y Z (TYP)	LIGHTING FIXTURE POWER AND SWITCHING LEGEND X=FIXTURE TYPE Y=PANEL-CIRCUIT BRKR Z=SWITCH IF NO Z INDICATED, CONNECT DIRECTLY TO CIRCUIT BREAKER.
[B2]	CONDUIT/CONDUCTOR - REFER TO CIRCUIT SCHEDULE
LPA-2	HOME RUN - PANEL AND CIRCUIT NUMBER SHOWN
	EXPOSED CONDUIT AND CONDUCTORS*
	UNDERGROUND CONDUIT AND CONDUCTORS* NOTE: * ALL UNMARKED CONDUIT RUNS CONSIST OF 2#12, 1#12G IN 3/4"C.
YCX	YARD CONDUIT. REFER TO YARD CONDUIT SCHEDULE
	DIRECT BURIED CONDUIT
	CONDUIT, STUBBED AND CAPPED AS SHOWN
G	GROUND WIRE, 4/O UNLESS OTHERWISE NOTED
	6 FOOT GROUND WIRE PIGTAIL, 4/O UNLESS OTHERWISE NOTED
	GROUND ROD - 5/8" x 20' COPPER CLAD UNLESS OTHERWISE NOTED. COUPLING TWO 10' RODS IS ACCEPTABLE.
	GROUND TEST WELL, SEE DETAIL
S	WALL SWITCH: 2- DOUBLE POLE, 3- THREE WAY, 4- FOUR WAY, P- PILOT LIGHT, K- KEY OPERATED, D- DIMMER, WP- WEATHERPROOF, CRE- CORROSION RESISTANT
	CONVENIENCE RECEPTACLE - 20A DUPLEX UNLESS SPECIFIED OTHERWISE WP- WEATHERPROOF, C- CLOCK HANGER, TL- TWIST LOCK, CRE- CORROSION RESISTANT, GFI-GROUND FAULT INTERRUPTER
	CONVENIENCE RECEPTACLE - 20A QUADROPLEX UNLESS SPECIFIED OTHERWISE
	CONVENIENCE RECEPTACLE - 20A DUPLEX UNLESS SPECIFIED OTHERWISE. LOCATED ABOVE COUNTER TOP GFI-GROUND FAULT INTERRUPTER
	CONVENIENCE RECEPTACLE - 20A DUPLEX UNLESS SPECIFIED OTHERWISE. MOUNTED FLUSH IN FLOOR.
30	RECEPTACLE, SPECIAL PURPOSE - AMPERAGE AS INDICATED.
	TELEPHONE/DATA RECEPTACLE (OUTLET BOX, 18" AFF) W - WALL MOUNTED, 54" AFF
	TELEPHONE/DATA RECEPTACLE MOUNTED FLUSH IN FLOOR
J	JUNCTION BOX NEMA 12 ENCLOSURE UNLESS INDICATED OTHERWISE. 4X = NEMA 4X SS
F	FIRE ALARM PULL STATION
F	FIRE ALARM HORN/STROBE LIGHT
F	FIRE ALARM STROBE LIGHT
FACP	FIRE ALARM CONTROL PANEL
FAAP	FIRE ALARM ANNUNCIATOR PANEL
CAM X	SURVEILLANCE CAMERA X - 90, 180 OR 360 CAMERA
DS	SECURITY SYSTEM DOOR SWITCH

SYMBOL	DESCRIPTION
SD	FIRE ALARM SMOKE DETECTOR EC- MOUNTED TO EXPOSED CEILING H- HARSH ENVIRONMENT RATED
HD	FIRE ALARM HEAT DETECTOR EC- MOUNTED TO EXPOSED CEILING
BD R	BEAM DETECTOR, T=TRANSMITTER, R=RECEIVER
SD D	DUCT SMOKE DETECTOR
RTU	REMOTE TELEMETRY UNIT
CR	SECURITY CARD READER

ABBREVIATIONS

ABBREVIATIONS	DESCRIPTION
A	AMMETER, AMPERE
AC	ALTERNATING CURRENT
AF	AMPERE FRAME
AFD	ADJUSTABLE FREQUENCY DRIVE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AS	AMMETER SWITCH, AMPERE SENSOR
ASU	AIR SUPPLY UNIT
ATS	AUTOMATIC TRANSFER SWITCH
BC	BYPASS CONTACTOR
BRKR	BREAKER
C	CONDUIT, CONTACTOR
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CMS	COMBINATION MOTOR STARTER
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY
CRE	CORROSION RESISTANT
CT	CURRENT TRANSFORMER
DC	DIRECT CURRENT
DIV	DIVISION
DP	DISTRIBUTION PANEL (480V)
EF	EXHAUST FAN
EG	ELECTRICAL GROUND
ETM	ELAPSED TIME METER
EXST	EXISTING
FDR	FEEDER
F, FU	FUSE
FI	FLOW INDICATOR
FLR	FLOOR
FLUOR	FLUORESCENT
FM	FLOW METER
FO	FIBER OPTIC
FS	FLOAT SWITCH, FLOW SWITCH
FT	FLOW TRANSMITTER
FUT	FUTURE
FVNR	FULL VOLTAGE NON-REVERSING STARTER
G	GREEN, GROUND
GEN	GENERATOR
GFI	GROUND FAULT INTERRUPTER
GFR	GROUND FAULT RELAY
GND	GROUND
HH	HANDHOLE
HID	HIGH INTENSITY DISCHARGE
HOA	HAND/OFF/AUTO
HOR	HAND/OFF/REMOTE
HPS	HIGH PRESSURE SODIUM
HVAC	HEATING, VENTILATING & AIR CONDITIONING
IC	INTERRUPTING CAPACITY
I & C	INSTRUMENTATION AND CONTROL
IMH	INSTRUMENTATION MANHOLE
INST	INSTANTANEOUS
IP	INSTRUMENT PANEL (PANELBOARD)
J, J-BOX	JUNCTION BOX
K	KEY INTERLOCK
KK	KIRK KEY INTERLOCK
LA	LIGHTNING ARRESTER
LC	LIGHTING CONTACTOR
LP	LIGHTING PANEL (PANELBOARD)
LR	LOCAL/REMOTE, LATCHING RELAY
LS	LIMIT SWITCH
LT FLEX	LIQUID TIGHT FLEX CONDUIT
LTG	LIGHTING
M	MAGNETIC CONTACTOR COIL OR MOTOR
MA	MILLIAMPS
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MDP	MAIN DISTRIBUTION PANEL
MERC	MERCURY VAPOR
MH	MOTOR HEATER, MANHOLE
MLO	MAIN LUGS ONLY
MPZ	MINI POWER ZONE
MPR	MOTOR PROTECTION RELAY
MS	MOTOR STARTER
MSC	MANUFACTURER SUPPLIED CABLE
MT	MOUNT
MTD	MOTOR TEMPERATURE DETECTOR
N	NEUTRAL
NC	NORMALLY CLOSED
NEMA	NATIONAL ELECTRIC MANUFACTURER'S ASSOCIATION
NO	NORMALLY OPEN
NP	NAMEPLATE
NTS	NOT TO SCALE
OL	OVERLOAD RELAY
OLM	OPTICAL LINK MODULE
P	POLE
PB	PULL BOX
PC	PHOTOCELL
PH	PHASE
PM	PHASE MONITOR, POWER METER
PNL	PANEL
PP	POWER PANEL (480VAC)
PR	PAIR
PS	PRESSURE SWITCH
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE CONDUIT
RCPT	RECEPTACLE
RMS	ROOT MEAN SQUARE
RS	RIGID STEEL CONDUIT
RGS	RIGID GALVANIZED STEEL CONDUIT
RTU	REMOTE TELEMETRY UNIT
SC	SURGE CAPACITOR
SF	SUPPLY FAN
SH	SPACE HEATER
S/N	SOLID NEUTRAL
SPD	SURGE PROTECTION DEVICE
SSRVS	SOLID STATE REDUCED VOLTAGE STARTER
SS	STAINLESS STEEL
SV	SOLENOID VALVE
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYM	SYMMETRICAL
T	THERMOSTAT
TB	TERMINAL BOARD
TDR	TIME DELAY RELAY
TJB	TERMINAL JUNCTION BOX
TS	THERMAL SWITCH
TSP	TWISTED SHIELDED PAIR
TYP	TYPICAL
UPS	UNINTERRUPTIBLE POWER SUPPLY
UVR	UNDER VOLTAGE RELAY
V	VOLTMETER, VOLT
VFD	VARIABLE FREQUENCY DRIVE
VS	VOLTMETER SWITCH
W	WATT
WHD	WATTHOUR DEMAND METER
WP	WEATHERPROOF
XFMR	TRANSFORMER

ONE LINE DIAGRAMS, RISER DIAGRAMS AND SCHEMATICS

SYMBOL	DESCRIPTION
5	MOTOR, SQUIRREL CAGE INDUCTION UNLESS OTHERWISE NOTED - HORSEPOWER INDICATED
	OVERLOAD RELAY HEATER
1	MAGNETIC STARTER WITH NEMA SIZE INDICATED
M	MOTOR CIRCUIT PROTECTOR, MAGNETIC, 3 POLE UNLESS INDICATED OTHERWISE.
400	CIRCUIT BREAKER, THERMAL MAGNETIC TRIP SHOWN, 3 POLE UNLESS INDICATED OTHERWISE.
400 225	FUSED SWITCH, SWITCH AND FUSE CURRENT RATING INDICATED, 3 POLE UNLESS INDICATED OTHERWISE.
100	SWITCH - CURRENT RATING INDICATED, 3 POLE UNLESS INDICATED OTHERWISE.
400 600	DRAWOUT CIRCUIT BREAKER, LOW VOLTAGE 600= FRAME RATING, 400=TRIP SETTING
1200 1200	DRAWOUT CIRCUIT BREAKER, MEDIUM VOLTAGE 1200= FRAME RATING, 1200=TRIP SETTING
600 400	DRAWOUT FUSED SWITCH, LOW OR MEDIUM VOLTAGE 600= FRAME RATING, 400=FUSE RATING
(3)	CURRENT TRANSFORMER, NUMBER OF WINDINGS INDICATED
480-120 /208V 15 KVA, 3Ø K-4 RATED	TRANSFORMER, VOLTAGES, PHASE AND RATING INDICATED AS APPLICABLE
	LIGHTNING ARRESTER
	CAPACITOR OR SURGE CAPACITOR
M	UTILITY METER
G	GENERATOR
X 0-600V	METER SCALE RANGE SHOWN IF REQUIRED A - AMPS, V - VOLTS, PM - PHASE MONITOR, P - POWER METER
	FUSE
SPD	SURGE PROTECTION DEVICE
	GROUND
CPT 120V	CONTROL TRANSFORMER
GFR	GROUND FAULT RELAY WITH C.T.
	PUSH-BUTTON SWITCH, MOMENTARY CONTACT, NORMALLY OPEN
	PUSH-BUTTON SWITCH, MOMENTARY CONTACT, NORMALLY CLOSED
	PUSH BUTTON SWITCH, MAINTAINED CONTACTS WITH MECHANICAL INTERLOCK
	REMOTE DEVICE
A	INDICATING LIGHT - LETTER INDICATES COLOR A - AMBER, B - BLUE, C - CLEAR, G - GREEN, R - RED, W - WHITE
A	PUSH TO TEST AND CONNECT INDICATING LIGHT SCHEMATIC DIAGRAMS ONLY A - AMBER, B - BLUE, C - CLEAR, G - GREEN, R - RED, W - WHITE

SYMBOL	DESCRIPTION
S M	MANUAL MOTOR STARTER SWITCH, NEMA 4X SS UNLESS OTHERWISE NOTED. NUMBER OF POLES AS REQUIRED
PB 4X	PUSH-BUTTON STATION, NEMA 12 ENCLOSURE UNLESS INDICATED OTHERWISE. 4X = NEMA 4X 316 STAINLESS STEEL ENCLOSURE. SEE CONTROL DIAGRAMS FOR TYPE PUSH BUTTON REQUIRED
30 4X	NONFUSED DISCONNECT SWITCH, SIZE INDICATED, 3 POLE UNLESS INDICATED OTHERWISE, NEMA 12 ENCLOSURE, 4X = NEMA 4X 316 STAINLESS STEEL
F 60 40 4X	FUSED DISCONNECT SWITCH, SIZE INDICATED (60 = SWITCH RATING: 40 = FUSE RATING) 3 POLE UNLESS INDICATED OTHERWISE, NEMA 12 ENCLOSURE, 4X = NEMA 4X 316 STAINLESS STEEL
LC 30 4X	LIGHTING CONTACTOR, CURRENT RATING INDICATED, NEMA 12 ENCLOSURE UNLESS INDICATED OTHERWISE. SEE CONTROL DIAGRAM FOR NUMBER OF POLES. 4X = NEMA 4X 316 STAINLESS STEEL
2 4X	MAGNETIC STARTER, NEMA SIZE INDICATED, NEMA 12 ENCLOSURE, UNLESS INDICATED OTHERWISE. SEE CONTROL DIAGRAM. 4X = NEMA 4X 316 STAINLESS STEEL
2 4X	COMBINATION (FUSE OR CIRCUIT BREAKER AS INDICATED). MAGNETIC STARTER, NEMA SIZE INDICATED, NEMA 12 ENCLOSURE UNLESS INDICATED OTHERWISE. SEE CONTROL SCHEMATIC DIAGRAM. 4X = NEMA 4X 316 STAINLESS STEEL
	ELECTRIC RESISTANCE HEATER
ETM	ELAPSED TIME METER
CRX	CONTACT - NORMALLY OPEN WITH COIL INDICATED
CRX	CONTACT - NORMALLY CLOSED WITH COIL INDICATED
CRX	CONTROL RELAY, X=SEQUENTIAL NUMBER
LRX (L)	LATCHING RELAY, X=SEQUENTIAL NUMBER L - LATCH, U - UNLATCH
TDX NOTC	TIME DELAY RELAY, X=SEQUENTIAL NUMBER NOTC=NORMALLY OPEN TIMED CLOSED NOTO=NORMALLY OPEN TIMED OPEN AFTER CLOSE NCTO=NORMALLY CLOSED TIMED OPEN NCTC=NORMALLY CLOSED TIMED CLOSED AFTER OPEN
	TEMPERATURE
	OPENS ON RISING TEMPERATURE, CLOSES ON FALLING TEMPERATURE
	CLOSES ON RISING TEMPERATURE, OPENS ON FALLING TEMPERATURE
H O A XOO OOX	SELECTOR SWITCH: MAINTAINED CONTACT WITH CONTACT POSITION INDICATED, CHART IDENTIFIES OPERATION

	POSITION		
CKT.	HAND	OFF	AUTO
1	X	O	O
2	O	O	X

X - CLOSED CONTACT
O - OPEN CONTACT

GENERAL

SYMBOL	DESCRIPTION
	CONNECTION POINT TO EQUIPMENT SPECIFIED, FURNISHED AND INSTALLED UNDER OTHER SECTIONS. RACEWAY, CONDUCTOR AND CONNECTION IN THIS SECTION.
1"C,2#12,1#12G 1"C,1-25/C TYPE 1	INDICATES RACEWAY AND CIRCUIT CONDUCTORS. FIRST NUMBER IS RACEWAY SIZE. THE FOLLOWING NUMBERS ARE THE CONDUCTOR QUANTITIES, SIZES, AND TYPES.
	DEMOLITION TO BE REMOVED OR DELETED

LINE WEIGHT

NEW

EXISTING

NOTE:
THIS IS A STANDARD LEGEND SHEET. SOME SYMBOLS OR ABBREVIATIONS MAY APPEAR ON THIS SHEET AND NOT BE UTILIZED ON PROJECT.

ADS Engineering
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POMPANO BEACH, FL 33064

REV	DATE	BY	DESCRIPTION
			BID SET

DESIGNED MDG
DRAWN SIDZ
CHECKED ADS
DATE NOVEMBER 2024

ALEKSANDAR D. STOJANOVIC LICENSE No 60289 STATE OF FLORIDA PROFESSIONAL ENGINEER

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CITY OF PUNTA GORDA, FLORIDA

SULFURIC ACID FEED SYSTEM IMPROVEMENTS

ELECTRICAL

LEGEND

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 202885
DRAWING NO. GE01
SHEET NO. OF

GENERAL NOTES AND SPECIFICATIONS:

1. NOT USED.
2. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS AND LABOR TO INSTALL THE ELECTRICAL SYSTEMS AS INDICATED ON THE DRAWINGS. ITEMS NOT SHOWN BUT OBVIOUSLY NECESSARY FOR COMPLETION OF THE WORK SHALL BE INCLUDED.
3. THE INSTALLATION SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE 2020 (NFPA 70), ELECTRICAL SAFETY IN THE WORKPLACE (NFPA 70E), ALL MONROE COUNTY CODES AND LATEST FLORIDA BUILDING CODE.
4. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS TO INCLUDE, BUT ARE NOT LIMITED TO, INSPECTIONS AND APPROVALS AND TO INCLUDE ALL FEES AS PART OF HIS BID IF NOT OTHERWISE NOTED. THE FOLLOWING PERMITS ARE REQUIRED: POWER, LIGHTING, INSTRUMENTATION, LIGHTNING PROTECTION, FIBER OPTIC, LOW VOLTAGE AND ELECTRICAL DEMOLITION.
5. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE ENGINEER AND THE OWNER.
6. THE CONTRACTOR SHALL, BEFORE SUBMITTING HIS BID, VISIT THE SITE OF THE PROJECT AND BECOME FAMILIAR WITH THE EXISTING CONDITIONS. NO ALLOWANCE WILL BE MADE FOR EXISTING CONDITIONS OR FAILURE OF THE CONTRACTOR TO OBSERVE THEM.
7. ALL EQUIPMENT AND MATERIAL SHALL BE NEW AND U.L. LISTED WHERE APPLICABLE.
8. THE CONTRACTOR IS RESPONSIBLE TO TEST ALL SYSTEMS INSTALLED OR MODIFIED UNDER THIS PROJECT AND REPAIR OR REPLACE ALL DEFECTIVE WORK TO THE SATISFACTION OF THE ENGINEER AND OWNER.
9. ALL EQUIPMENT FURNISHED AND INSTALLED BY THE CONTRACTOR SHALL BE GUARANTEED AGAINST DEFECTS IN MATERIAL AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM DATE OF ACCEPTANCE.
10. ALL CONDUCTORS SHALL BE COPPER. NO ALUMINUM ALLOWED UNLESS SPECIFICALLY INDICATED ON DRAWINGS.
11. SHOP DRAWINGS SHALL BE SUBMITTED FOR ALL ELECTRICAL & CONTROL EQUIPMENT AND MATERIAL.
12. ALL CONTROL PANELS SHALL BE CONSTRUCTED BY A UL 508A APPROVED PANEL VENDOR AND SHALL BEAR A UL 508A LABEL ON THE PANEL.
13. THE DRAWINGS ARE NOT INTENDED TO SHOW THE EXACT LOCATION OF CONDUIT RUNS. THESE ARE TO BE COORDINATED WITH THE OTHER TRADES SO THAT CONFLICTS ARE AVOIDED PRIOR TO INSTALLATIONS.
14. ALL LOCATIONS OF EQUIPMENT, PANELS ETC. ARE SHOWN FOR ILLUSTRATION PURPOSES. CONTRACTOR SHALL VERIFY AND COORDINATE EXACT LOCATION AND SIZE WITH ALL SUBCONTRACTORS AND EQUIPMENT SUPPLIERS PRIOR TO ANY INSTALLATION AND THEN INSTALL AS SUCH WITH CORRESPONDING CONDUIT STUB-UPS.
15. SEE OTHER DISCIPLINE DRAWINGS FOR COORDINATION OF ALL DRAWINGS. ANY CONFLICTS SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION AND MOVEMENT OF CONDUITS OR OTHER ELECTRICAL EQUIPMENT SHALL BE ACCOMPLISHED WITHOUT ANY ADDITIONAL COST FOR THE OWNER.
16. LOCATIONS OF MANHOLES, HANDHOLES AND PULL BOXES ARE APPROXIMATE. CONTRACTOR SHALL COORDINATE EXACT LOCATION WITH EXISTING AND NEW PIPING OR CONDUIT AND ADJUST ACCORDINGLY.
17. NOT ALL CONDUITS SHOWN ON RISER AND ONE-LINE DIAGRAMS ARE SHOWN ON BUILDING LAYOUTS. CONTRACTOR SHALL SUPPLY ALL CONDUITS AND CABLES AS SHOWN ON RISER AND ONE-LINE DIAGRAMS.
18. ALL CIRCUITS SHALL BE IDENTIFIED IN JUNCTION BOXES, PULL BOXES, CONTROL PANELS, PANELBOARDS, LIGHTING POLES, CONTROLLERS AND SERVICE POINTS. IDENTIFICATION SHALL MATCH PANELBOARD SCHEDULES.
19. EXPOSED RUNS OF CONDUITS SHALL BE INSTALLED WITH RUNS PARALLEL OR PERPENDICULAR TO WALLS, STRUCTURAL MEMBERS OR INTERSECTIONS OF VERTICAL PLANES AND CEILINGS, WITH RIGHT ANGLE TURNS CONSISTING OF SYMMETRICAL BENDS OR PULL BOXES AS INDICATED ON THE DRAWINGS. BENDS AND OFFSETS SHALL BE AVOIDED WHERE POSSIBLE.
20. INSTRUMENTATION IS LOW VOLTAGE SIGNALS SUCH AS 4-20MA, TELEPHONE COMMUNICATION, FIRE ALARM COMMUNICATION. POWER CONDUIT SHALL ONLY CROSS INSTRUMENTATION CONDUIT PERPENDICULARLY AT RIGHT ANGLES WITH 6" SEPARATION.
21. CONDUCTOR PULLING TENSIONS SHALL NOT EXCEED MANUFACTURER'S RECOMMENDATION. CONTRACTOR SHALL INSTALL PULL BOXES TO MEET MANUFACTURER'S REQUIREMENTS.
22. MINIMUM DISTANCE ALLOWED BETWEEN POWER CONDUITS AND INSTRUMENTATION CONDUITS SHALL BE:

VOLTAGE	DISTANCE
4160V - 15KV TO INST. CONDUIT	3 FT
480V - 600V TO INST CONDUIT	2 FT
120V TO INST. CONDUIT	1 FT

23. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONDUIT AND WIRING INSTALLATION FOR ALL VENDOR PROVIDED EQUIPMENT (PACKAGE SYSTEMS). IF THE SHOP DRAWINGS DIFFER FROM THE DESIGNED FACILITIES, THE CONTRACTOR SHALL REDESIGN THE FACILITIES AND SUBMIT THE REVISED DESIGN FOR THE ENGINEER'S APPROVAL ALONG WITH THE SHOP DRAWINGS. THERE SHALL BE NO ADDITIONAL COST TO THE OWNER FOR THE REDESIGN NOR FOR ANY ADDITIONAL CONDUITS AND WIRING. DURING SUBMITTAL THE CONTRACTOR SHALL VERIFY ALL SUPPLIED BREAKER SIZES FOR ALL PACKAGED SYSTEMS SUCH AS HVAC, EXHAUST FANS, MIXERS, CHEMICAL PUMPS ETC. AND MODIFY ALL BREAKERS IN MCC'S AND PANELBOARDS ACCORDINGLY WITHOUT ANY ADDITIONAL COST TO THE OWNER.
24. ALL EXCAVATIONS FOR CONDUITS, HANDHOLES, MANHOLES AND PULLBOXES NEAR EXISTING PIPING, CONDUIT AND EQUIPMENT SHALL BE HAND EXCAVATED AND COORDINATED WITH THE OWNER.
25. MINIMUM DEPTH FROM TOP OF DUCT BANKS OR CONDUITS TO FINISHED GRADE SHALL BE 24" UNLESS OTHERWISE NOTED.
26. COLORED WARNING TAPE 6" WIDE SHALL BE INSTALLED 8" BELOW FINISHED GRADE DIRECTLY ABOVE ALL UNDERGROUND YARD CONDUITS ACCORDING TO THE FOLLOWING SCHEDULE:
    POWER: RED
    ALL OTHER CONDUITS: GREEN
27. CONTRACTOR SHALL RESTORE SIDEWALKS, ROADWAYS, SOD AND SPRINKLER SYSTEM PIPING TO MATCH EXISTING, AFTER THE COMPLETION OF THE CONDUIT AND PULLBOX INSTALLATION.
28. GROUNDING SHALL BE INSTALLED IN ACCORDANCE WITH NEC 2020, ARTICLE 250. THE GROUNDING SYSTEM TEST SHALL NOT EXCEED A 48 HOUR SPAN DRY RESISTANCE OF 10 OHMS. ADDITIONAL GROUNDING TO MEET THIS REQUIREMENT SHALL BE INSTALLED AT NO EXTRA COST. GROUNDING AND BONDING CONNECTIONS SHALL NOT BE PAINTED. ALL GROUNDING CONNECTIONS SHALL BE EXOTHERMIC UNLESS SPECIFICALLY INDICATED OTHERWISE.
29. AN EQUIPMENT GROUND WIRE SIZED PER NEC SHALL BE PULLED IN ALL ELECTRICAL CONDUITS, POWER AND CONTROL, AS SHOWN ON PLANS.
30. ALL ENCLOSURES, TJB, WIREWAY, PULL BOXES (EXCEPT IN-GROUND PULL BOXES AND MANHOLES) ETC. SHALL CONTAIN A GROUNDING BUS. CONNECT ALL RACEWAY BONDS TO THIS BUS VIA GROUNDING BUSHING AND EXTEND BONDING JUMPER FROM THIS BUS TO THE ENCLOSURE.
31. PRIMARY BUILDING GROUNDING SHALL BE AN EMBEDDED GRID OF MINIMUM #4/0 AWG WIRE INSTALLED IN THE FOUNDATION AND AROUND THE BUILDING PERIMETER TO FORM A COMPLETE LOOP. SECONDARY GROUND CONNECTIONS TO ALL METAL EQUIPMENT, HAND RAILS, STRUCTURAL STEEL, CONCRETE PADS, REBAR ETC. SHALL HAVE A MINIMUM #4 STRANDED COPPER CONDUCTOR BONDED USING APPROVED LUGS OR EXOTHERMIC CONNECTIONS. ALL EQUIPMENT GROUNDING CONDUCTORS PENETRATING CONCRETE SLABS OR FINISHED GRADE SHALL HAVE A 72" CONDUCTOR PIGTAIL AT EACH LOCATION FOR CONNECTION TO EQUIPMENT.
32. ALL CONCRETE ENCASED DUCTBANKS SHALL CARRY A MINIMUM #4/0 AWG BARE COPPER GROUND WIRE, OVER THE ENTIRE LENGTH, WHICH SHALL BE CONNECTED TO THE SITE GROUNDING GRID AND GROUND RODS LOCATED CONNECTING MANHOLES, HANDHOLES OR PULL BOXES.
33. CONTRACTOR SHALL CORE DRILL EXISTING CONCRETE WALLS, FLOORS, MANHOLES, HANDHOLES AND PULL BOXES FOR CONDUIT PENETRATIONS. SEAL PENETRATIONS WITH NON-SHRINK GROUT OR APPROPRIATE FIRE RATED DEVICES WHERE APPLICABLE.
34. ALL CONDUITS PENETRATING RATED FIRE WALLS OR RATED FIRE FLOORS SHALL BE INSTALLED WITH U.L. APPROVED DEVICES TO MAINTAIN THE FIRE RATING OF THE WALL OR FLOOR PENETRATED.
35. PROVIDE CONDUIT DUCT SEAL AT ALL CONDUIT ENDS.
36. ALL SPARE CONDUITS SHALL BE SEALED WITH A CAP AT BOTH ENDS AND A PULL STRING INSTALLED WITH IDENTIFICATION ON BOTH ENDS.
37. ALL RECEPTACLES SHALL BE INSTALLED 18" AFF UNLESS OTHERWISE NOTED. LIGHT SWITCHES SHALL BE MOUNTED 48" AFF UNLESS OTHERWISE NOTED.
38. ALL RECEPTACLES WITHIN 6' OF A SINK SHALL BE GFI.
39. FLEXIBLE CONDUITS SHALL BE USED TO TERMINATE ALL MOTORS AND OTHER VIBRATING EQUIPMENT AND SHALL BE BETWEEN 18" AND 3' IN LENGTH.
40. TYPEWRITTEN PANEL SCHEDULES SHALL BE INSTALLED IN EACH PANELBOARD, AND TYPEWRITTEN TERMINAL BLOCK SCHEDULES IN EACH CONTROL CABINET.
41. ALL SPD'S SHALL BE INTEGRAL TO THE NEW EQUIPMENT SHOWN AND SUPPLIED AS ONE UNIT AND ONE U.L. ENTITY.
42. ALL MATERIAL IN DESIGNATED CORROSIVE AREAS SHALL BE NEMA 4X STAINLESS STEEL OR NON-METALLIC.
43. ALL OUTDOOR LIGHTING FIXTURES SHALL BE OF COPPER FREE CONSTRUCTION.
44. ALL REFERENCES TO SS OR STAINLESS STEEL SHALL BE 316 STAINLESS STEEL.
45. CONTRACTOR SHALL BALANCE PANELBOARD LOADS AT THE END OF THE PROJECT.
46. ALL YARD CONDUITS SHALL BE CONCRETE ENCASED UNLESS NOTED OTHERWISE. REFER TO DRAWING 00GE33 FOR INSTALLATION DETAILS.
47. ALL CONDUIT CONNECTIONS TO NEMA 4X PANELS/ENCLOSURES SHALL USE MYERS HUBS (OR EQUAL) TO MAINTAIN 4X RATING.
48. PROVIDE ARMORED CABLE FOR ALL VFD'S FROM VFD TO MOTOR WHERE INDICATED ON DRAWINGS PER SPECIFICATION 26_05_05. INSTALL ARMORED CABLE PER MANUFACTURER'S INSTRUCTIONS AND SPECIFICATION 26_05_05.
49. CONTRACTOR SHALL PROVIDE FOR A SATISFACTORY NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL) INSPECTION FOR ALTERATIONS TO CONTROL PANELS, ELECTRICAL EQUIPMENT, OR ASSEMBLIES TO MAINTAIN THE ORIGINAL UL RATING.
50. PROVIDE AS-BUILT DRAWINGS AND MANUALS IN ACCORDANCE WITH THE FLORIDA BUILDING CODE 13-413.ABC.2.1 & 13-413.ABC.2.2
51. CONDUCTORS SHALL BE STRANDED COPPER, NO ALUMINUM ALLOWED UNLESS SPECIFICALLY INDICATED ON DRAWINGS. POWER CONDUCTORS SHALL BE XHHW IN WET LOCATIONS OR IN UNDERGROUND RACEWAYS AND SHALL BE THWN/THHN IN DRY LOCATIONS.
52. INSTRUMENTATION AND CONTROL CIRCUITS ORIGINATING FROM CONTROL PANELS CONTAINING A PLC ARE CLASSIFIED AS CLASS 1 POWER-LIMITED CIRCUITS PER NEC ARTICLE 725. CONTROL AND INSTRUMENTATION AND CONTROL CIRCUITS ORIGINATING FROM CONTROL PANELS WITHOUT A PLC OR FROM A MOTOR CONTROL CENTER ARE CLASSIFIED AS CLASS 1 REMOTE CONTROL AND SIGNALING CIRCUITS PER NEC ARTICLE 725.
53. ALL VERTICAL CONDUIT PENETRATIONS FROM CONCRETE SLAB SHALL HAVE A MAINTENANCE PAD TO PREVENT CORROSION.
54. AFFIX NAMEPLATES TO ALL DISCONNECT SWITCHES WITH THE NAME OF THE EQUIPMENT SERVED BY THE DISCONNECT SWITCH IN ACCORDANCE WITH NEC ARTICLE 110.22. NAMEPLATES SHALL BE AS DESCRIBED IN SPECIFICATION 26_05_04.
55. THERE ARE NO CLASSIFIED AREAS PERTAINING TO NEC ARTICLE 500 IN THIS FACILITY.
56. ALL CONDUITS SHALL BE MEGGER TESTED AFTER INSTALLATION AND INSULATION MUST BE IN COMPLIANCE WITH THE INSULATED POWER CABLE ENGINEERS ASSOCIATION MINIMUM VALUES OF INSULATION RESISTANCE. MEGGER TEST RESULTS SHALL BE SUBMITTED TO ENGINEER FOR APPROVAL.

NOTE:

THE EXISTING ELECTRICAL INFORMATION IS OBTAINED FROM "RECORD DRAWINGS" AND OTHER "AS-BUILT DRAWINGS". CONTRACTOR SHALL VERIFY THE INFORMATION PROVIDED IN THESE DRAWINGS AND ADJUST ACCORDINGLY. ANY CONFLICTS SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION BEFORE SUBMITTING HIS BID.

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POMPANO BEACH, FL 33064

REV	DATE	BY	DESCRIPTION
			BID SET

DESIGNED MDG
DRAWN SIDZ
CHECKED ADS
DATE NOVEMBER 2024

ALEKSANDAR D. STOJANOVIC LICENSE No 60269 STATE OF FLORIDA PROFESSIONAL ENGINEER

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CITY OF PUNTA GORDA, FLORIDA

SULFURIC ACID FEED SYSTEM IMPROVEMENTS

ELECTRICAL

NOTES

VERIFY SCALES
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0 1"
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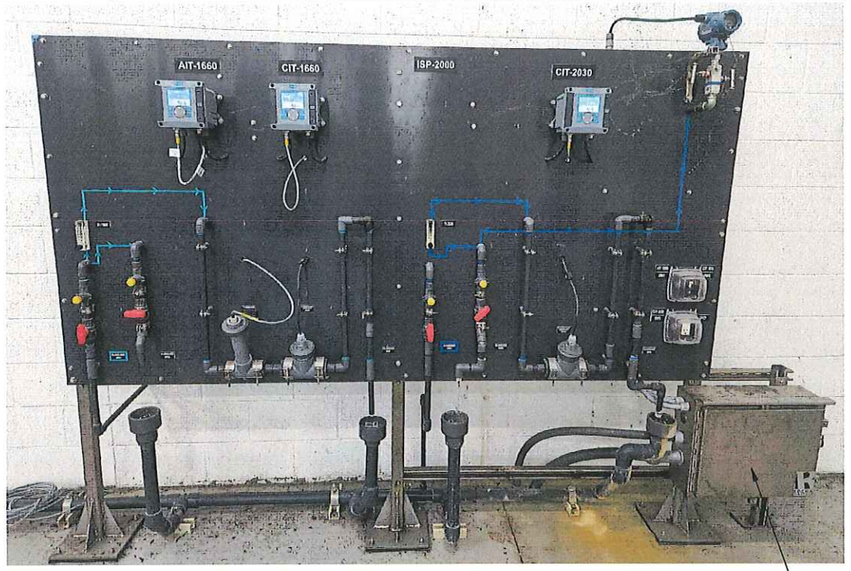
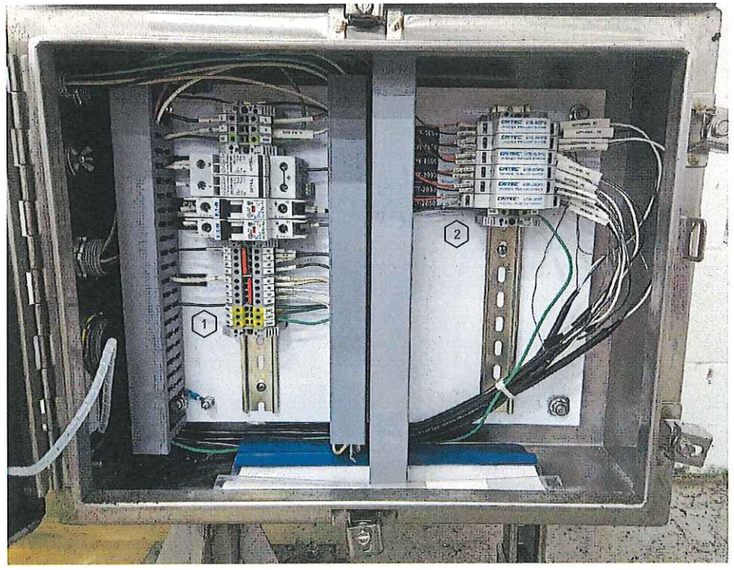
JOB NO. 202885
DRAWING NO. GE02
SHEET NO. OF



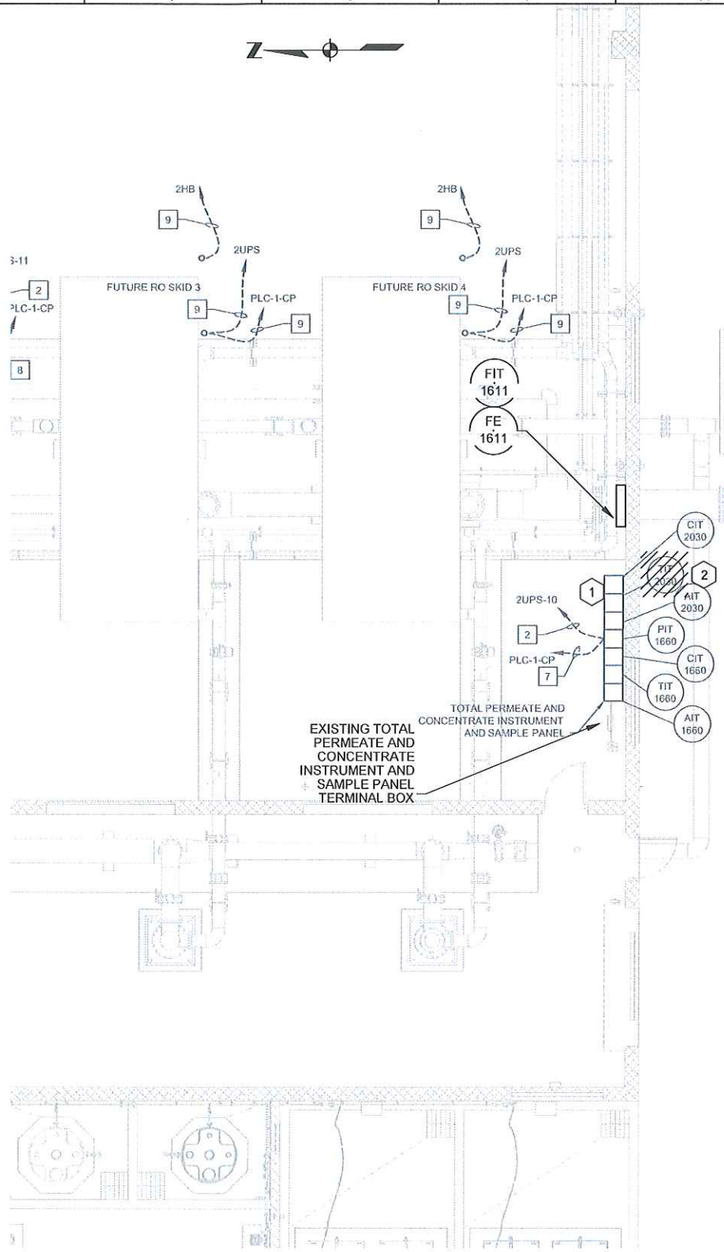
EXISTING TOTAL PERMEATE AND CONCENTRATE INSTRUMENT AND SAMPLE PANEL

NOT TO SCALE



EXISTING TERMINAL BOX INTERIOR VIEW

NOT TO SCALE



SULFURIC ACID FEED MODIFICATION PLAN

0 2' 4' 6' 12'

3/16"=1'-0"

1 1"C (2-2/C#16TSP)
2 1"C (2#12, #12 G)
3 1"C (3#12, #12 G)
4 1"C (8#14)
5 1"C (MANUFACTURERS C
6 1-1/2"C (11-2/C#16TSP)
7 1-1/4"C (7-2/C#16TSP)
8 1"C (6 STRAND MM FIBEF
9 1"C (PULL STRING)
10 1"C(2/C#16TSP) 1

KEYED NOTES

1. CONTRACTOR SHALL RUN NEW CONDUIT AND WIRE [3/4"C, 2#12, 1#12G], FROM FIT-1611 TO THE EXISTING TOTAL PERMEATE AND CONCENTRATE SAMPLE PANEL TERMINAL BOX TO PROVIDE 120VAC POWER FOR FIT. CONTRACTOR SHALL PROVIDE ALL MODIFICATIONS TO THE TERMINAL BOX TO PROVIDE POWER TO FIT-1611 INCLUDING BUT NOT LIMITED TO ADDING ADDITIONAL TERMINALS FOR POWER CONNECTIONS, JUMPERS, ALL NECESSARY WIRING, FOR COMPLETE WORKING SYSTEM IN PLACE. ALL NEW PANEL COMPONENTS SHALL MATCH TO EXISTING.
2. CONTRACTOR SHALL RUN NEW WIRE AND CONDUIT [3/4"C, 1-TYPE B, TW SHLD PR], FROM FIT-1611 TO EXISTING TOTAL PERMEATE AND CONCENTRATE SAMPLE PANEL TERMINAL BOX TO PROVIDE SIGNAL INTERFACE FOR FIT-1611. CONTRACTOR SHALL DISCONNECT AND ABANDON THE EXISTING TIT-2030 CONNECTION IN EXISTING TERMINAL BOX. CONTRACTOR SHALL TERMINATE NEW FIT-1611 WIRES IN THE PLACE OF THE REMOVED TIT-2030. CONTRACTOR SHALL REUSE EXITING SURGE SUPPRESSOR AND EXISTING WIRES GOING FROM TERMINAL PANEL TO PLC-1 CP FOR CONNECTING FIT-1611 TO SCADA SYSTEM.

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			BID SET

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CITY OF PUNTA GORDA, FLORIDA

SULFURIC ACID FEED SYSTEM IMPROVEMENTS

ELECTRICAL
SULFURIC ACID FEED
MODIFICATION PLAN

VERIFY SCALES
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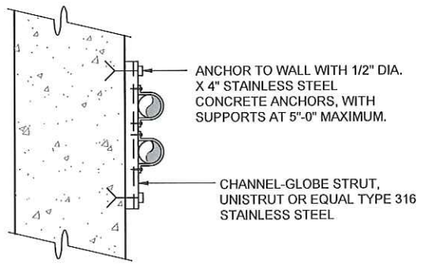
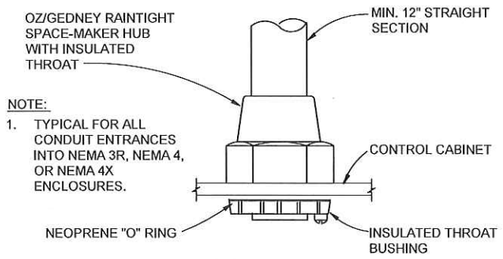
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 202885
DRAWING NO. E01
SHEET NO. OF



CONDUIT SUPPORT

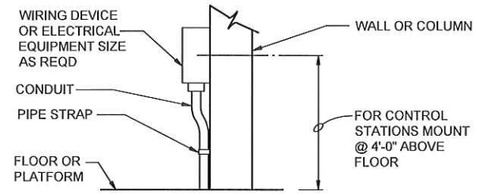
SCALE: NTS



NOTE:
1. TYPICAL FOR ALL CONDUIT ENTRANCES INTO NEMA 3R, NEMA 4, OR NEMA 4X ENCLOSURES.

CONDUIT HUB

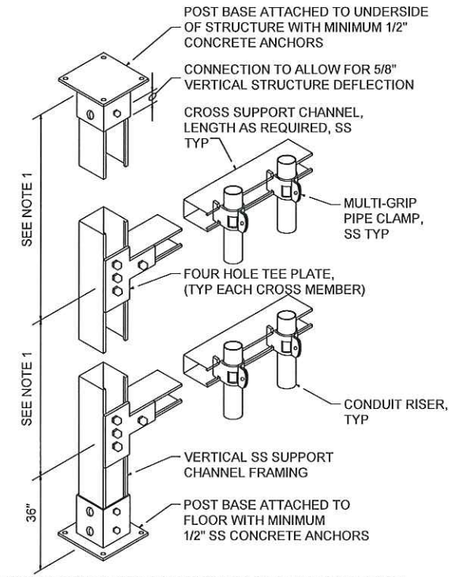
SCALE: NTS



NOTE:
1. ALL MOUNTING HARDWARE SHALL BE STAINLESS STEEL 316. ON CONCRETE WALLS, USE MALLEABLE IRON INSERTS, MOUNT ENCLOSURE ON 1/4" SPACERS OF 1/2" RIGID CONDUIT.

WALL OR COLUMN MOUNTED DEVICE

SCALE: NTS



NOTES:
1. LENGTH AS REQUIRED TO LIMIT UNSUPPORTED CONDUIT LENGTH TO MAXIMUM VALUES ALLOWED BY NEC.
2. ALL MATERIALS AND FASTENING HARDWARE SHALL BE TYPE 316 STAINLESS STEEL (SS).

VERTICAL CONDUIT SUPPORT

SCALE: NTS

REV	DATE	BY	DESCRIPTION
			BID SET

DESIGNED: MDG
DRAWN: SIDZ
CHECKED: ADS
DATE: NOVEMBER 2024

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CITY OF PUNTA GORDA, FLORIDA

SULFURIC ACID FEED SYSTEM IMPROVEMENTS

ELECTRICAL

DETAILS SHEET NO.1

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SHEET NO. OF

INSTRUMENT IDENTIFICATION

EXAMPLE SYMBOLS

UP	UNIT PROCESS NUMBER
F	FIRST LETTER(S)
IT	SUCCEEDING LETTER(S)
BB	CLARIFYING ABBREVIATIONS
LLL	LOOP NUMBER
UU	UNIT NUMBER

GENERAL INSTRUMENT OR FUNCTIONAL SYMBOLS


FIELD MOUNTED


REAR-OF-PANEL MOUNTED (OPERATOR INACCESSIBLE)


PANEL MOUNTED (OPERATOR ACCESSIBLE)


MCC MOUNTED


COMPUTER FUNCTION


PLC FUNCTION


SHARED DISPLAY, SHARED CONTROL

INSTRUMENT IDENTIFICATION LETTERS TABLE

LETTER	FIRST-LETTER: PROCESS OR INITIATING VARIABLE	FIRST-LETTER: MODIFIER	SUCCEEDING-LETTERS: READOUT OR PASSIVE FUNCTION	SUCCEEDING-LETTERS: OUTPUT FUNCTION	SUCCEEDING-LETTERS: MODIFIER
A	ANALYSIS (+)		ALARM		
B	BURNER, COMBUSTION		USER'S CHOICE (*)	USER'S CHOICE (*)	USER'S CHOICE (*)
C	USER'S CHOICE(*)			CONTROL	
D	DENSITY (S.G)	DIFFERENTIAL			
E	VOLTAGE		PRIMARY ELEMENT, SENSOR		
F	FLOW RATE	RATIO (FRACTION)			
G	USER'S CHOICE(*)		GLASS, GAUGE VIEWING DEVICE	GATE	
H	HAND (MANUAL)				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW
M	MOISTURE	MOMENTARY			MIDDLE, INTERMEDIATE
N	TORQUE		USER'S CHOICE (*)	USER'S CHOICE (*)	USER'S CHOICE (*)
O	USER'S CHOICE(*)		ORIFICE, RESTRICTION		
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RUN		RECORD OR PRINT		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION, MECHANICAL ANALYSIS			VALVE, DAMPER, LOUVER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED (+)	X AXIS	UNCLASSIFIED (+)	UNCLASSIFIED (+)	UNCLASSIFIED (+)
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION	Z AXIS		DRIVE, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

TABLE BASED ON THE INSTRUMENTATION, SYSTEMS, AND AUTOMATION SOCIETY (ISA) STANDARD.

(+) WHEN USED, EXPLANATION IS SHOWN ADJACENT TO INSTRUMENT SYMBOL. SEE ABBREVIATIONS AND LETTER SYMBOLS.

(*) WHEN USED, DEFINE THE MEANING HERE FOR THE PROJECT

EXAMPLES

ON EVENT LIGHT

ON AND OFF EVENT LIGHTS (TWO LIGHTS TOTAL)

OPENED AND CLOSED POSITION LIGHTS

OPENED AND CLOSED POSITION SWITCHES

ON-OFF HAND SWITCH. MAINTAINED CONTACT SWITCH (CONTROLLED DEVICE WILL RESTART ON RETURN OF POWER AFTER POWER FAILURE).

STOP-START HAND SWITCH MOMENTARY CONTACT SWITCHES (CONTROLLED DEVICE WILL NOT RESTART ON RETURN OF POWER AFTER POWER FAILURE).

ELECTRIC ACTUATOR WITH INTEGRAL OPEN-STOP-CLOSE MOMENTARY CONTACT CONTROL SWITCH

LOCK-OUT-SWITCH


DENOTES EQUIPMENT SPECIFIED UNDER OTHER SECTION OF THIS CONTRACT


DENOTES EXISTING EQUIPMENT OR EQUIPMENT PROVIDED BY OTHERS UNDER A SEPARATE CONTRACT

OTHER DEVICES

SSX	SURGE SUPPRESSOR TYPE X
ISX	INTRINSIC SAFETY BARRIER TYPE X
UPS	UNINTERRUPTABLE POWER SUPPLY
	"X" = IDENTIFIED IN SECTION 13411
FOPP	FIBER OPTIC PATCH PANEL
FOMC	FIBER OPTIC MEDIA CONVERTER

TRANSDUCERS

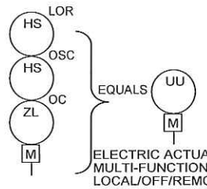
A	ANALOG	I	CURRENT
D	DIGITAL	P	PNEUMATIC
E	VOLTAGE	PF	PULSE FREQUENCY
F	FREQUENCY	PD	PULSE DURATION
H	HYDRAULIC	R	RESISTANCE

EXAMPLE:

CURRENT TO PNEUMATIC TRANSDUCER (BACK OF PANEL, IN A FLOW LOOP)

DIGITAL SYSTEM INTERFACES

▲	ANALOG INPUT	WHERE X=
▼	ANALOG OUTPUT	A = ALARM
▲X	DISCRETE INPUT	H = MAINTAINED
▼X	DISCRETE OUTPUT	M = MOMENTARY
		S = STATUS



ELECTRIC ACTUATOR WITH MULTI-VARIABLE, MULTI-FUNCTION OPERATOR STATION, INCLUDING LOCAL/OFF/REMOTE HANDSWITCH, OPEN/STOP/CLOSE PUSHBUTTON AND OPEN CLOSED STATUS LIGHTS

LINE LEGEND

PROCESS (CLOSED CONDUIT, DASHED LINE INDICATES ALTERNATE FLOW STREAM)

PROCESS (OPEN CHANNEL)

ELECTRICAL SIGNAL

PNEUMATIC SIGNAL

FILLED SYSTEM SIGNAL

HYDRAULIC SYSTEM SIGNAL

DATA LINK

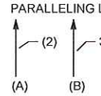
—PWR— POWER

—MSC— MANUFACTURER SUPPLIED CABLE

SIMILAR PROCESS OR FACILITY BOUNDARY

PACKAGE SYSTEM EQUIPMENT

PARALLELING LINES



(A) TOTAL OF 2 SIGNALS

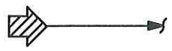
(B) 3 TYPICAL SETS OF 2 SIGNALS EACH. TOTAL OF 6 SIGNALS.

CONNECTING LINES

NON-CONNECTING LINES

INTERFACE SYMBOLS

LINE CONTENTS IN OR OUT OF DRAWING


INTERFACE TO OR FROM PROCESS EXTERNAL TO PROJECT

SELF CONTAINED VALVE & EQUIPMENT TAG NUMBERS

W = UNIT PROCESS NUMBER

D:

ARV	= AIR RELEASE VALVE
AVRV	= AIR AND VACUUM RELEASE VALVE
E	= EJECTOR
GTE	= GATE
M	= MECHANICAL EQUIPMENT
MXR	= MIXER
PMP	= PUMP
T	= TANK

X = LOOP NUMBER

Y = UNIT NUMBER

GENERAL NOTES

1. COMPONENTS AND PANELS SHOWN WITH A ASTERISK (**) ARE PART OF A PACKAGE SYSTEM; SEE EQUIPMENT SPECIFICATIONS. FOR MULTIPLE PACKAGES ON SAME DRAWING, USE * , * 2, *3, ETC.
2. COMPONENTS SHOWN WITH A DIAMOND (◆) ARE PART OF DIVISION 40 INSTRUMENTATION AND CONTROLS
3. THIS IS A STANDARD LEGEND. THEREFORE, NOT ALL OF THIS INFORMATION MAY BE USED ON THIS PROJECT.

ABBREVIATIONS & LETTER SYMBOLS

AC	ALTERNATING CURRENT
ACK	ACKNOWLEDGE
AI	ANALOG INPUT
AO	ANALOG OUTPUT
AS	ADJUSTABLE SPEED
BFP	BACK FLOW PREVENTER
BW	BACKWASH
CK	CLOSE COMMAND
CL_2 etc.	CHLORINE (TYPICAL: USE STANDARD CHEMICAL ELEMENT ABBREVIATION)
CTRL	CONTROL
COND	CONDUCTIVITY
CPX	CONTROL PANEL NO. X
CPOL	CATIONIC POLYMER
CR	CHLORINE RESIDUAL
CS	CONSTANT SPEED
CTU	CENTRAL TELEMETRY UNIT
D	DRAIN
DCU	DISTRIBUTED CONTROL UNIT
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
DC	DIRECT CURRENT
ETM	ELPASET TIME METER
FA	FAIL ALARM
FB	FIBER
FC	FAIL CLOSED
FCL	FREE CHLORINE
FCL_2	FREE CHLORINE RESIDUAL
HMI	HUMAN MACHINE INTERFACE
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
IP	IN PLC REMOTE
IR	IN REMOTE
ISR	INTRINSICALLY SAFE RELAY
LCP	LOCAL CONTROL PANEL
LR	LOCAL-REMOTE
M	MODULATE
MC	MOTOR CONTROLLER
MCC	MOTOR CONTROL CENTER
MCC-X	MOTOR CONTROL CENTER NO. X
MOV	MOTOR OPERATED VALVE
MSC	MANUFACTURER SUPPLIED CABLE
MTD	MOTOR TEMPERATURE DETECTOR
MTS	MANUAL TRANSFER SWITCH
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OC	OPEN-CLOSE(D)
OCK	OPEN & CLOSE COMMANDS
OCM	OPTICAL COMMUNICATION MODULE
OCR	OPEN-CLOSE-REMOTE
OIU	OPERATOR INTERFACE UNIT
OK	OPEN COMMAND
OO	ON-OFF
OOA	ON-OFF-AUTO
ORP	OXIDATION REDUCTION POTENTIAL
OSC	OPEN-STOP-CLOSE
pH	HYDROGEN ION CONCENTRATION
PLC	PROGRAMMABLE LOGIC CONTROLLER
RIO	REMOTE I/O UNIT
RTU	REMOTE TERMINAL UNIT
RK	RUN COMMAND
SP	SET POINT
SS	START-STOP
TCL	TOTAL CHLORINE
TCL_2	TOTAL CHLORINE RESIDUAL
TOC	TOTAL ORGANIC CARBON
TOD	TOTAL OXYGEN DEMAND
TURB	TURBIDITY
USP	UPSTREAM SETPOINT
VFD	VARIABLE FREQUENCY DRIVE
VIB	VIBRATION
ZK	ON STATUS
YS	POSITION ADJUST
ZR	ZERO DIFFERENCE

Δ	DIFFERENCE		
Σ	SUM		
X	MULTIPLY		
÷	DIVIDE		
f(x)	CHARACTERIZED		
X^n	RAISE TO THE Nth POWER		
√‾	SQUARE ROOT		
AVG	AVERAGE		
1:1	REPEAT OR BOOST		
>	SELECT HIGHEST SIGNAL		
<	SELECT LOWEST SIGNAL		
}	BIAS		
%	GAIN OR ATTENUATE		

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SULFURIC ACID FEED SYSTEM IMPROVEMENTS

INSTRUMENTATION

INSTRUMENTATION LEGEND SHEET NO.1

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VALVE SYMBOLS

- GATE
- KNIFE GATE
- BUTTERFLY
- GLOBE
- BALL
- VEE- BALL
- PLUG
- SEAT PORT ECCENTRIC PLUG
- DIAPHRAGM
- PINCH
- NEEDLE
- SWING CHECK
- BALL CHECK
- ROTARY
- 4-WAY SOLENOID VALVE
- PRESSURE RELIEF
- AIR AND/OR VACUUM RELEASE
- REGULATED SIDE PRESSURE CONTROL
- PRESSURE REGULATING (CLAY-TYPE)
- MULTI-PORT VALVES (GATE VALVE SHOWN. FOR OTHER VALVE TYPES, APPROPRIATE VALVE SYMBOL SHOWN.) SEAT PORTS ARE IMPLIED BY INDICATED FLOW PATTERN.
- ANGLE GATE
- TELESCOPE
- SAMPLE
- MUD
- BACKFLOW PREVENTER

GATE SYMBOLS

- SLUICE
- BUTTERFLY
- FABRICATED SLIDE
- FLAP
- STOP LOG
- SHEAR

ACTUATOR SYMBOLS

- PNEUMATIC WITH POSITIONER
- PNEUMATIC WITH SOLENOID
- ELECTRIC
- ELECTRIC WITH POSITIONER
- HYDRAULIC
- PNEUMATIC WITH VOLUME BOOSTER
- SOLENOID
- MANUAL
- ELECTROHYDRAULIC
- HYDRAULIC

NOTE:
ON LOSS OF PRIMARY POWER (PNEUMATIC, ELECTRICAL OR HYDRAULIC)

XX: FO =FAIL OPEN; FC =FAIL CLOSED; FLP=FAIL TO LAST POSITION; NO = NORMALLY OPEN; NC = NORMALLY CLOSED; O/C=OPEN/CLOSE; MOD=MODULATING

PRIMARY ELEMENT SYMBOLS

- PARSHALL FLUME
- WEIR
- ORIFICE PLATE
- FLOW TUBE (VENTURI)
- PITOT-STATIC
- VORTEX METER
- ULTRASONIC FLOWMETER
- FLOW SWITCH
- ELECTROMAGNETIC FLOWMETER
- PROPELLER OR TURBINE METER
- THERMAL FLOWMETER
- LEVEL (ULTRASONIC)
- LEVEL (RADAR)
- LEVEL SWITCH (FLOAT)
- DENSITY METER
- GENERIC
- ROTAMETER
- CORIOLIS FLOWMETER

MISCELLANEOUS SYMBOLS

- DIAPHRAGM SEAL
- BLIND FLANGE
- AIR GAP
- VENT TO ATMOSPHERE
- AERATOR
- PLUG
- RECEPTACLE
- SELF CONTAINED AIR SUPPLY
- COMPOSITE SAMPLER (DIPPER TYPE)
- COMPOSITE SAMPLER (SUCTION TYPE)
- TV CAMERA
- INTERLOCK, SEE CONTROL DIAGRAMS
- PURGE SET X : W = WATER A = AIR
- SEE
- AIR SET XX= SUPPLY PRESSURE IN PSIG.
- FILTER/ REGULATOR/ GAUGE SET
- FLEXIBLE CONNECTOR
- PULSATION DAMPENER
- AIR FILTER
- DRIP TRAP
- FLAME TRAP
- STRAINER
- HORN
- CHLORINE INJECTOR
- 120 VOLT, 60 HZ POWER
- 480 VOLT, 3-PHASE, 60 HZ POWER
- ANNULAR DIAPHRAGM SEAL
- RUPTURE DISK (PRESSURE)
- RUPTURE DISK (VACUUM)
- PIG INSERT POINT
- PIG CATCH POINT
- MIXER
- ELECTRIC MOTOR SINGLE SPEED
- ELECTRIC MOTOR ADJUSTABLE SPEED
- TV MONITOR
- LOGIC ELEMENT: IF A AND NOT B THEN C
- LOGIC ELEMENT: IF A OR B THEN C
- FLUSHING CONNECTION
- HOSE ADAPTOR
- SEAL WATER SET
- SIGHT GLASS
- PANEL CONTINUED ON SAME OR OTHER DRAWING
- PANEL OUTLINE
- PANEL NAME
- SKIMMING MECHANISM
- SCREW
- SCREW CONVEYOR
- PIPE CAP
- CALIBRATION COLUMN
- EXPANSION COUPLING
- SIMPLEX BASKET

PUMP AND COMPRESSOR SYMBOLS

NOTE: XX: AS ADJUSTABLE SPEED; CS-1 CONSTANT SPEED (SINGLE SPEED); CS-2 CONSTANT SPEED (TWO SPEED)

- CENTRIFUGAL PUMP (DRY PIT)
- CENTRIFUGAL WET PIT PUMP OR TURBINE PUMP
- RECIPROCATING OR METERING PUMP (POSITIVE DISPLACEMENT)
- DIAPHRAGM PUMP
- GEAR PUMP OR BLOWER (POSITIVE DISPLACEMENT)
- PISTON PUMP
- PROGRESSIVE CAVITY PUMP
- COMPRESSOR (CENTRIFUGAL)
- COMPRESSOR (PISTON)
- BLOWER OR FAN (CENTRIFUGAL)
- EJECTOR
- ENERGY RECOVERY DEVICE
- SUBMERSIBLE SUMP PUMP
- VACUUM PUMP
- ROTARY PUMP
- SCREW PUMP
- VERTICAL PUMP

FLOW STREAM IDENTIFICATION

- AH — AMMONIUM SULFATE
- ALP — AIR, LOW PRESSURE
- BWW — BACKWASH WASTE
- CCR — CLEANING CONCENTRATE RETURN
- CF — CLEANING FEED
- CFR — CLEANING FEED RETURN
- CFI — CARTRIDGE FILTER INFLUENT
- CF/W — SPENT CLEANING SOLUTION
- CPR — CLEANING PERMEATE RETURN
- D — DRAIN, SANITARY
- DMP — DEGASIFIED MEMBRANE PERMEATE
- DR — DRAIN, PROCESS
- FS — FIRE SPRINKLER
- FW — FINISHED WATER
- HW — TEMPERED POTABLE WATER
- MC — MEMBRANE CONCENTRATE
- MF — MEMBRANE FEED
- MF/B — MEMBRANE FEED BYPASS
- MF/W — MEMBRANE FEED WASTE
- MP — MEMBRANE PERMEATE
- NA — SODIUM HYDROXIDE
- OF — OVERFLOW
- PMS — PERMEATE MAKEUP SUPPLY
- PP — POLYPHOSPHATE
- RWB — RAW WATER - BISCAYNE
- SA — SAMPLE
- SH — SODIUM HYPOCHLORITE
- SI — SCALE INHIBITOR
- SPD — SUMP PUMP DISCHARGE
- SSI — SAND STRAINER INFLUENT
- SU — SULFURIC ACID
- V — VENT
- W1 — POTABLE WATER
- W2 — BACKFLOW PREVENTED POTABLE WATER

- CARTRIDGE FILTER
- STATIC MIXER
- AIR VENT
- FLAP GATE
- HEATER INLINE
- QUICK CONNECT COUPLING
- HEAT ELEMENT
- EYEWASH SHOWER
- CHEMICAL INJECTION ASSEMBLY
- BLADDER TANK

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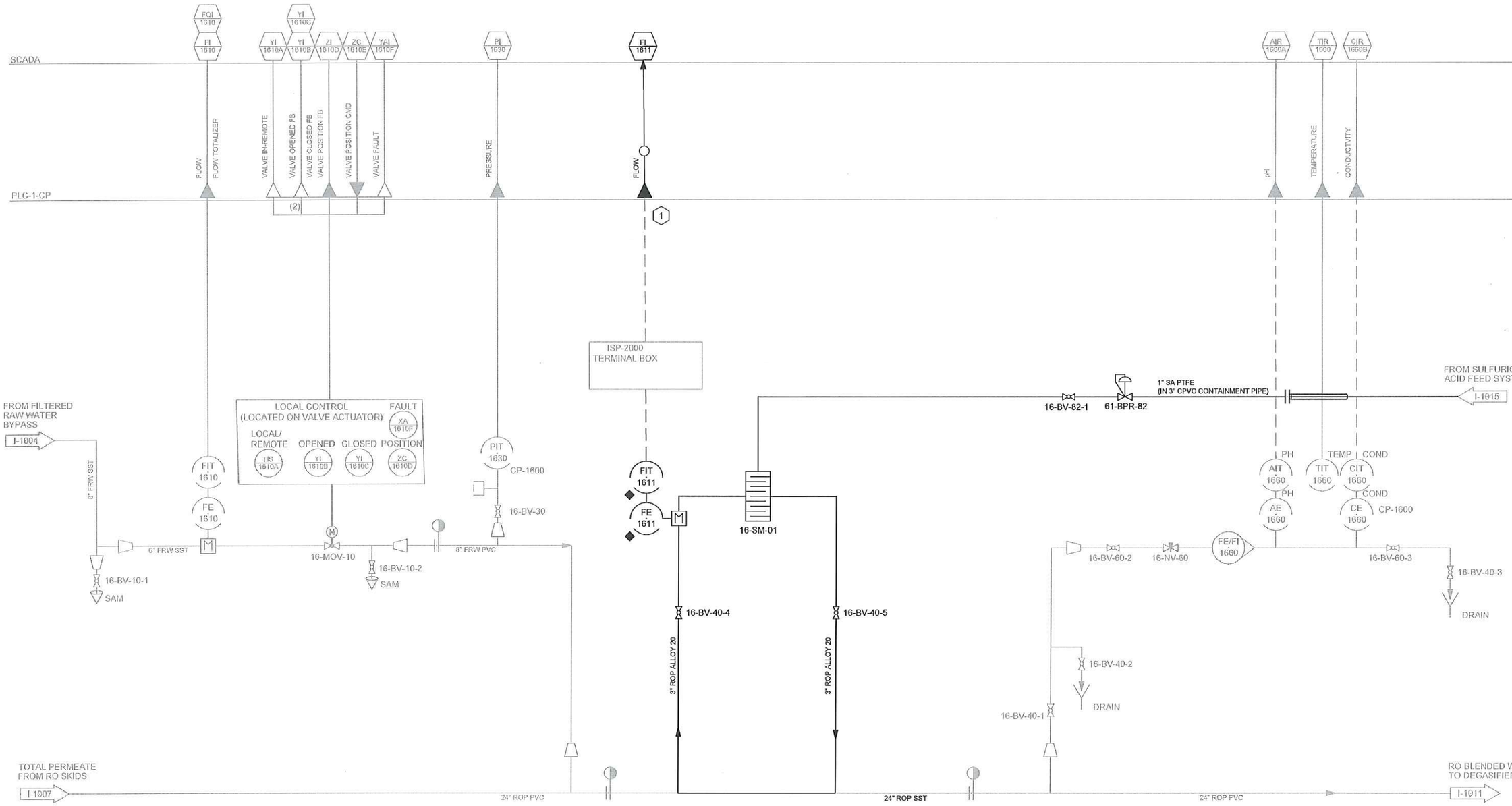

KEYED NOTES

1. CONTRACTOR SHALL REUSE EXITING ANALOG INPUT FROM TIT-2030 FOR FIT-1611 FLOW METER

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SULFURIC ACID FEED SYSTEM IMPROVEMENTS

INSTRUMENTATION

SULFURIC ACID FEED P&ID

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