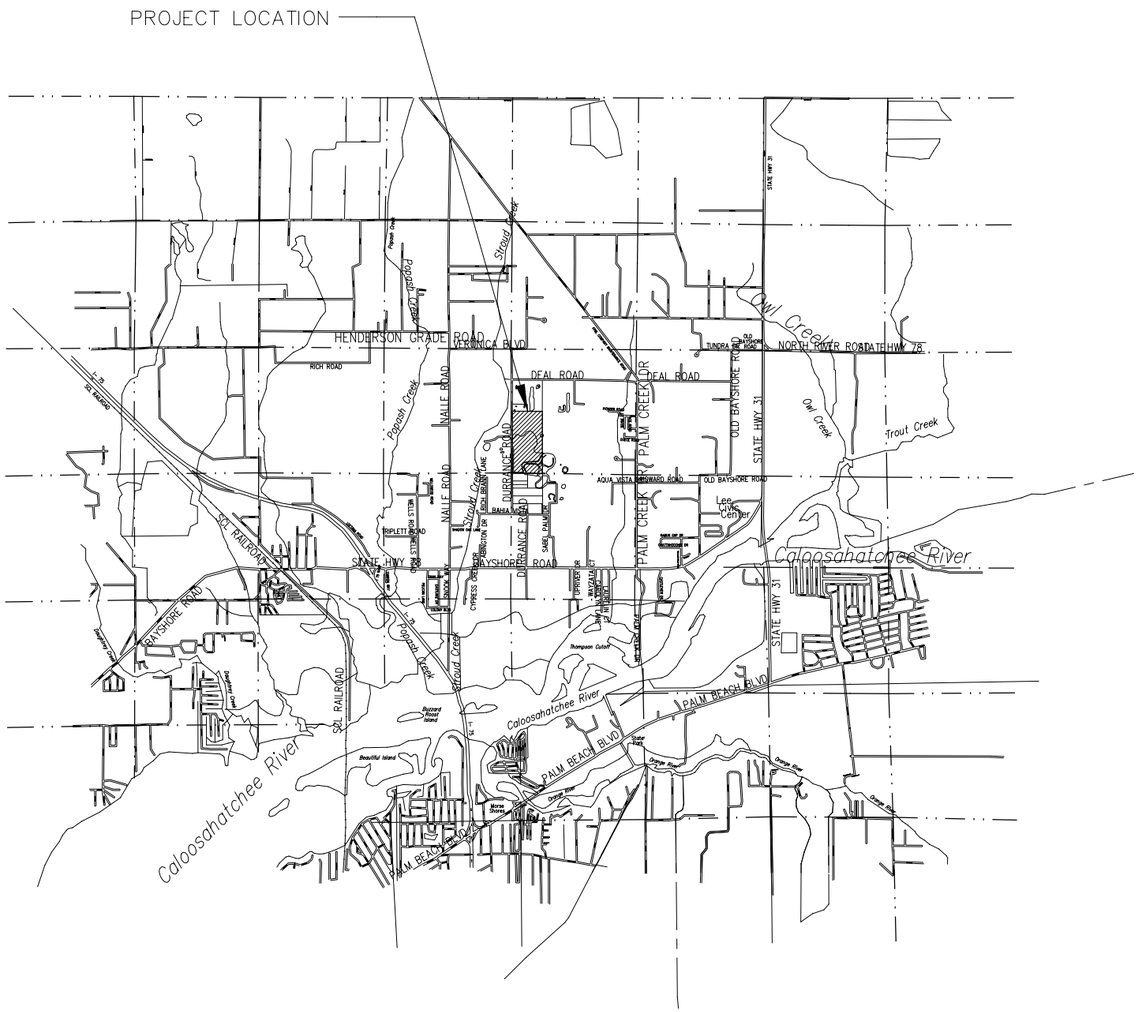
Lee County
Southwest Florida

LEE COUNTY UTILITIES

NORTH LEE COUNTY WATER TREATMENT PLANT RO CONCENTRATE ACID FEED SYSTEM

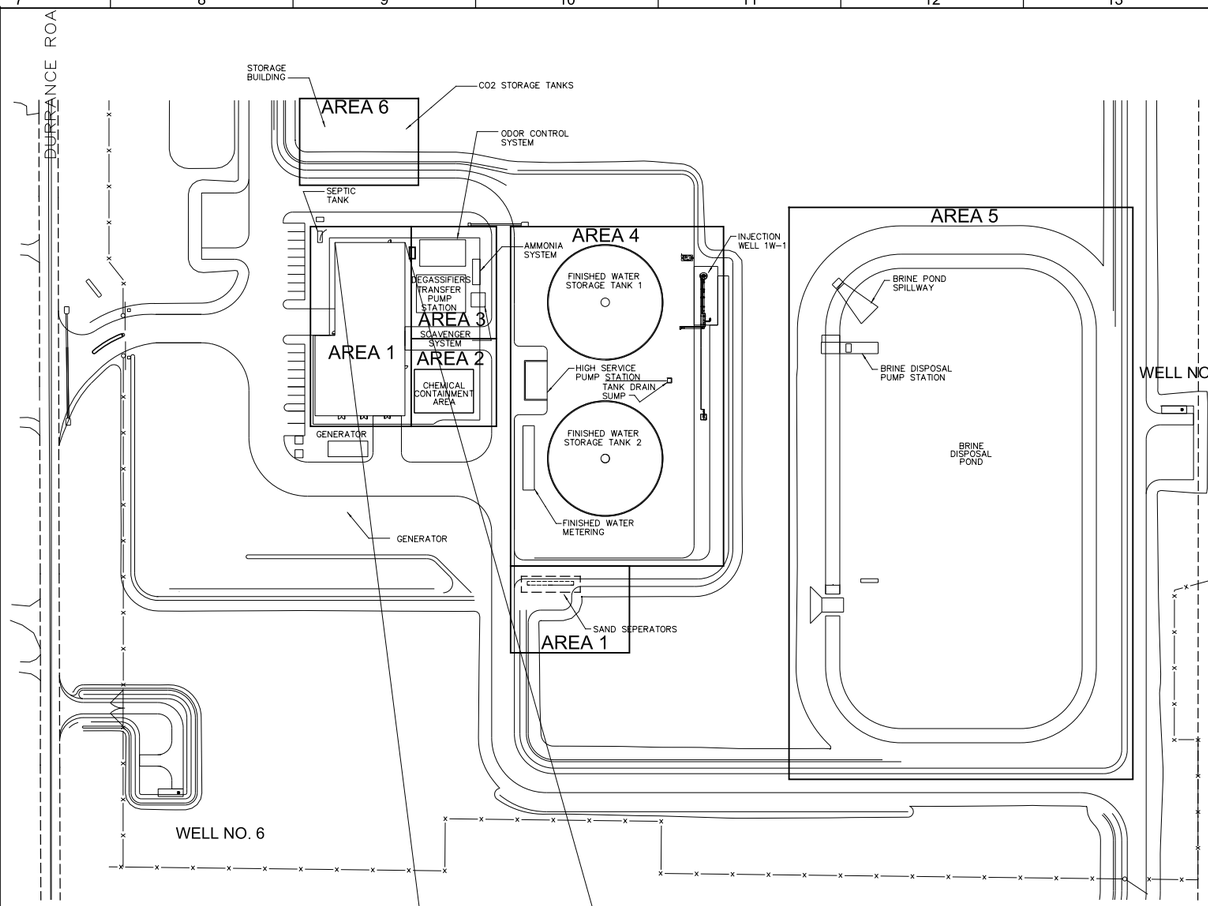
DECEMBER 2016

carollo
Certificate No. 8571



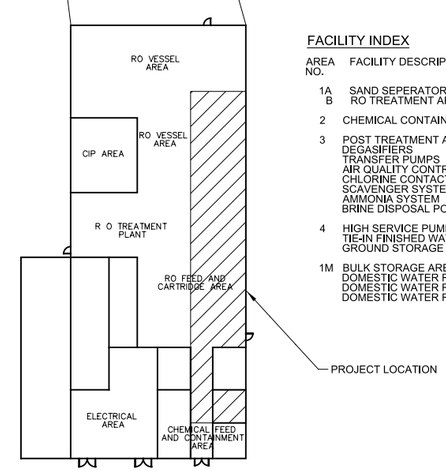
LOCATION MAP

SCALE: NTS



BUILDING AREA INDEX

SCALE: 1" = 80'



ENLARGED PLAN AREA 1

FACILITY INDEX

AREA NO.	FACILITY DESCRIPTION
1A	SAND SEPERATOR AREA
B	RO TREATMENT AREA
2	CHEMICAL CONTAINMENT AREA
3	POST TREATMENT AREA INCLUDES: DEGASIFIERS TRANSFER PUMPS AIR QUALITY CONTROL SYSTEM (ODOR) CHLORINE CONTACT BASIN SCAVENGER SYSTEM\ AMMONIA SYSTEM BRINE DISPOSAL POND SPILLWAY
4	HIGH SERVICE PUMPS STATION TIE-IN FINISHED WATER PIPE GROUND STORAGE TANKS
1M	BULK STORAGE AREA DOMESTIC WATER RISER 2 DOMESTIC WATER RISER 3 DOMESTIC WATER RISER 1 (NOT USED)

FACILITY INDEX

AREA NO.	FACILITY DESCRIPTION
5	DEEP INJECTION WELL DUAL ZONE MONITORING WELLS BRINE POND BRINE POND SPILLWAY BRINE POND PUMPING STATION
6	STORAGE BUILDING CARBON DIOXIDE STORAGE TANKS

REV	DATE	BY	DESCRIPTION

DESIGNED ECC
DRAWN DVP
CHECKED TFS/JSN
DATE DECEMBER 2016

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RO CONCENTRATE ACID FEED SYSTEM

GENERAL

LOCATION MAP AND BUILDING AREA INDEX

VERIFY SCALES
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JOB NO. 10180C.10
DRAWING NO. G-02

PROJECT NO. 10180C.10 FILE NAME: 10180C1000G02.dgn

Plot Date: 07-DEC-2016 7:21:30 AM
User: svcPW
PlotScale: 2:1
DesignScript: Carollo_Std_Pen_v0905.pen
ColorTable: gshade.ctb
Model: Layout1
LAST SAVED BY: dperry

DWG NO.	DESCRIPTION
	GENERAL
G-01	COVER SHEET
G-02	LOCATION MAP AND BUILDING AREA INDEX
G-03	LIST OF DRAWINGS
G-05	STANDARD ABBREVIATIONS
G-06	STANDARD SYMBOLS
G-07	PIPING SHCEDULE AND GENERAL MECHANICAL NOTES
G-10	DESIGN CRITERIA 3 OF 7
G-15	PROCESS FLOW DIAGRAM
	MECHANICAL / PROCESS
GP-1	EQUIPMENT SCHEDULES 1
GP-2	EQUIPMENT SCHEDULES 2
GP-4	EQUIPMENT SCHEDULES 4
1P-2	PROCESS BUILDING - CHEMICAL ROOM PLANS
1P-3	PROCESS BUILDING - CARTRIDGE FILTERS AND FIRST STAGE FEED PUMPS
1P-5	PROCESS BUILDING - MEMBRANE TRAINS
1P-13	PROCESS BUILDING SECTIONS 6 - PROCESS TRENCH
2P-12	SULFURIC ACID FEED ROOM ENLARGED PLAN AND SECTION
	ELECTRICAL
GE-01	ELECTRICAL SYMBOLS 1
GE-02	ELECTRICAL SYMBOLS 2 AND GENERAL NOTES
GE-03	ELECTRICAL SYMBOLS 3
GE-04	ELECTRICAL ABBREVIATIONS AND GENERAL NOTES
GE-15	POWER PANELS PP-1, PP-2, PP-4, PP-5 AND PP-SB ONE LINE DIAGRAMS AND CONDUIT DEVELOPMENT
GE-19	RISER DIAGRAMS 4
GE-21	PANELBOARD SCHEDULES 1
GE-23	PANELBOARD SCHEDULES 3
2E-02	CHEMICAL FEED ROOM EQUIPMENT AND INSTRUMENTATION LOCATION
	INSTRUMENTATION
I-01	INSTRUMENTATION LEGEND
I-03	MEMBRANE FEED SYSTEM
I-12	SULFURIC ACID SYSTEM
I-17	SCAVENGER SYSTEM
ID-3	PANEL LAYOUTS 1
IL-15	INSTRUMENTATION LOOP DIAGRAMS SHEET 15
IL-16	INSTRUMENTATION LOOP DIAGRAMS SHEET 16
N-1	INSTRUMENTATION SYMBOLS
N-MC-1	PROCESS PIPING AND INSTRUMENTATION DIAGRAM - MEMBRANE CONCENTRATE
N-SA-03	PROCESS PIPING AND INSTRUMENTATION DIAGRAM - SULFURIC ACID DAY TANK
N-SA-04	PROCESS PIPING AND INSTRUMENTATION DIAGRAM - SULFURIC ACID METERING PUMPS
N-SA-05	PROCESS PIPING AND INSTRUMENTATION DIAGRAM - SULFURIC ACID METERING PUMPS
N-SA-06	PROCESS PIPING AND INSTRUMENTATION DIAGRAM - SULFURIC ACID METERING PUMPS

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LIST OF DRAWINGS

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JOB NO. 10180C.10
DRAWING NO. G-03

Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo_Std_Pen_v0905.pen PlotScale: 2:1 User: svcPW Plot Date: 06-DEC-2016 1:24:22 PM LAST SAVED BY: dperry

	ABBREV	DESCRIPTION
A	AA	AERATION AIR
	AB	ANCHOR BOLT
	ABC	AGGREGATE BASE COURSE
	AC	ASPHALTIC CONCRETE/AIR COOLING CAP
	ACB	AIR CIRCUIT BREAKER
	ACC	AIR COOLED CONDENSER
	ACP	ASBESTOS CEMENT PIPE OR ACOUSTIC CEILING PANELS
	ACU	AIR CONDITIONING UNIT
	AD	ACCESS DOOR/AIR DAMPENER
	ADA	AMERICANS WITH DISABILITIES ACT
	ADJ	ADJUSTABLE
	AFF	ABOVE FINISHED FLOOR
	AHR	ANCHOR
	AI	ANALOG INPUT
	AIC	AIR COMPRESSOR
	AID	AIR DRYER
	ALM	ALARM
	ALTN	ALTERNATE
	AL	ALUMINUM
	AO	ANALOG OUTPUT
	AP	ACCESS PANEL
	APPROX	APPROXIMATE
	ARCH	ARCHITECTURAL
	ARV	AIR RELEASE VALVE
	ATC	ACOUSTICAL TILE CEILING
	AWP	ACOUSTIC WALL PANEL
	AUTO	AUTOMATIC
	AUX	AUXILIARY
	AV	ANGLE VALVE
	AVG	AVERAGE
	@	AT
B	BCV	BALL CHECK VALVE
	BCW	BARE COPPER WIRE
	BD	BOARD OR BALANCING DAMPER
	BDD	BACKDRAFT DAMPER
	BF	BLIND FLANGE/BACKFLOW PREVENTER
	BFV	BUTTERFLY VALVE
	BL	BLEACH
	BLDG	BUILDING
	BLK	BLOCK
	BLKG	BLOCKING
	BLO	BLOWER
	BM	BEAM
	BRG	BEARING
	BRKR	BREAKER
	BS	BOTTOM SLUDGE
	BSC	BAR SCREEN
	BSCIP	BELL & SPIGOT CAST IRON PIPE
	BSP	BLACK STEEL PIPE
	BTU	BRITISH THERMAL UNITS
	BV	BALL VALVE
	BYP	BYPASS
C	C	CONDUIT OR ALUMINUM OR STEEL AMERICAN STANDARD
	C TO C	CENTER TO CENTER
	CA	CONCRETE ANCHOR
	CB	CATCH BASIN
	CCP	CONCRETE CYLINDER PIPE
	CD	CEILING DIFFUSER
	CFM	CUBIC FOOT PER MINUTE
	CHAN	CHANNEL
	CHS	CHLORINE RESIDUAL SENSOR
	CHL	CHLORINE
	CHR	CHLORINE RESIDUAL
	CIP	CAST IRON PIPE
	CIRC	CIRCUMFERENTIAL
	CISP	CAST IRON SOIL PIPE
	CJ	CONSTRUCTION JOINT
	CL OR C L	CENTER LINE OR CLOSE(D)
	CLD	CHLORINE LEAK DETECTOR
	CLG	CEILING
	CLP	CONTROL PANEL
	CLR	CLEAR
	CLS	CHLORINE SOLUTION
	CLSM	CONTROLLED LOW STRENGTH MATERIAL
	CLV	CHLORINE VACUUM
	CMLSP	CEMENT MORTAR LINED STEEL PIPE
	CMP	CORRUGATED METAL PIPE
	CMU	CONCRETE MASONRY UNIT
	CND	CONDUIT
	CO	CLEANOUT OR CONDUIT ONLY
	COL	COLUMN
	COMP	COMPACTED
	COMPA	COMPRESSED AIR
	CONC	CONCRETE
	CONN	CONNECTION
	CONSTR	CONSTRUCTION
	CONT	CONTINUE (D) (OUS) OR CONTROL
	CPLG	COUPLING
	CPT	CONTROL POWER TRANSFORMER
	CR	CONDENSATE RETURN
	CRN	CRANE
	CRPT	CARPET TILE
	CT	CERAMIC TILE
	CTD	CENTERED
	CTSK	COUNTERSUNK
	CU	CUBIC
	CUP	COPPER PIPE
	CW	COLD WATER
D	D	DROP
	DBL	DOUBLE
	DCS	DECHLORINATION SOLUTION OR DISTRIBUTED CONTROL SYSTEM OR DILUTED CAUSTIC SOLUTION
	DEG	DEGREE
	DET	DETAIL
	DG	DIGESTER GAS
	DGR	DEGRITTED RETURN
	DGS	DIGESTED SLUDGE
	DI	DISCRETE INPUT
	DIA OR Ø	DIAMETER
	DIAG	DIAGONAL
	DIG	DIGESTER
	DIM	DIMENSION
	DIP	DUCTILE IRON PIPE
	DIPBS	DUCTILE IRON PIPE, BELL & SPIGOT
	DIPMJ	DUCTILE IRON PIPE, MECHANICAL JOINT
	DIST	DISTRIBUTION
	DJ	DOUBLE JOINT
	DMJT	DISMANTLING JOINT
	DMPR	DAMPER
	DN	DOWN
	DO	ENGINE DIESEL OIL OR DISCRETE OUTPUT
	DR	DRAIN OR DRIVE
	DS	DOWN SPOUT
	DSL	DIGESTED SLUDGE
	DV	DIAPHRAGM VALVE
	DW	DEWATERING PUMP DISCHARGE
	DWG	DRAWING
	DZMW	DUAL ZONE MONITORING WELL
E	E	EAST OR BURIED ELECTRICAL
	EA	EACH
	ECC	ECCENTRIC
	ED	EQUIPMENT DRAIN
	EDB	ELECTRICAL DUCT BANK
	EE	ENGINE EXHAUST
	EF	EACH FACE OR EXHAUST FAN
	EFL	EFFLUENT
	EFU	EXHAUST FAN UNIT
	EGR	ENGINE GENERATOR ROOM
	EJW	ENGINE JACKET WATER
	EL	ELEVATION
	ELL	ELBOW
	ELEC	ELECTRIC (AL)
	EMBED	EMBEDMENT
	EMH	ELECTRICAL MANHOLE
	ENGR	ENGINEER
	EO	EMERGENCY OVERFLOW
	EOP	EDGE OF PAVEMENT
	EP	EXPLOSION PROOF
	EQL	EQUAL
	EQPT	EQUIPMENT
	ES	EMERGENCY STOP
	EW	EACH WAY
	EWC	ELECTRIC WATER COOLER
	EWH	ELECTRIC WATER HEATER
	EWS	EMERGENCY EYEWASH STATION
	EXIST	EXISTING
	EXP	EXPANSION
	EXPO	EXPOSED
	EXT	EXTERIOR
F	FA	FLAME ARRESTOR OR FOUL AIR
	FACP	FIRE ALARM CONTROL PANEL
	FAE	FOUL AIR EXHAUST
	FB	ALUMINUM OR STEEL FLAT BAR
	FC	FLEXIBLE CONNECTION OR FLEXIBLE COUPLING
	FCA	FLANGE COUPLING ADAPTER
	FCL	FAILS CLOSED OR FERRIC CHLORIDE
	FCS	FERRIC CHLORIDE SOLUTION
	FCTF	FACTORY FINISH
	FCV	FLAPPER CHECK VALVE
	FD	FLOOR DRAIN/FEEDER/FIRE DAMPENER
	FDN	FOUNDATION
	FE	FLOW ELEMENT
	FEC	FIRE EXTINGUISHER CABINET
	FEXT	FIRE EXTINGUISHER
	FF	FAR FACE OR FACTORY FINISH
	FG	FINISH GRADE
	FHY	FIRE HYDRANT
	FI	FLOW INDICATOR
	FIG	FIGURE
	FILP	FAILS IN LAST POSITION
	FIN FL	FINISH FLOOR
	FIT	FLOW INDICATOR/ TRANSMITTER
	FL	FLOOR
	FLEX	FLEXIBLE
	FLG	FLANGE
	FLGA	FLANGE ADAPTER
	FLL	FLOW LINE
	FLT	FILTRATE
	FO	FAILS OPEN OR FUEL OIL
	FOR	FUEL OIL RETURN
	FOS	FUEL OIL SUPPLY
	FPR	FIRE ALARM CABLE PAIR
	FR	FORWARD-REVERSE
	FRP	FIBERGLASS REINFORCED PLASTIC
	FS	FAST-SLOW
	FSH	FLUSH SHELL
	FSLOS	FAST-SLOW LOCKOUT STOP
	FSP	FABRICATED STEEL PIPE
	FST	FAST OR FORWARD-STOP
	FSST	FAST-SLOW-STOP
	FT	FOOT
	FTC	FAIL TO CLOSE
	FTG	FOOTING
	FTO	FAIL TO OPEN
	FW	FILTERED WATER / FINISHED WATER
G	G	GRIT PIPING
	GA	GAGE OR GAUGE
	GALV	GALVANIZE (D)
	GB	GRAB BAR
	GEN	GENERATOR
	GFI	GROUND FAULT INTERRUPTOR
	GL	GLASS
	GLB	GLUE LAMINATED BEAM
	GLCIP	GLASS LINED CAST IRON PIPE
	GLV	GLOBE VALVE
	GND	GROUND
	GR	GRADE
	GSP	GALVANIZED STEEL PIPE
	GTV	GATE VALVE
	GWB	GYPSUM WALLBOARD
	GYP	GYPSUM
H	H1E	HOOK ONE END
	H2E	HOOK TWO ENDS
	HA	HAND-AUTO
	HB	HOSE BIBB
	HCS	HYPOCHLORITE SOLUTION
	HDS	HEATED DIGESTED SLUDGE
	HDW	HARDWARE
	HLA	HIGH LEVEL ALARM
	HM	HOLLOW METAL
	HOA	HAND-OFF-AUTO
	HORIZ	HORIZONTAL
	HPA	HIGH PRESSURE AIR
	HPS	HIGH PRESSURE SODIUM
	HPT	HIGH POINT
	HPU	HEAT PUMP UNIT
	HR	HOSE RACK
	HSS	STEEL HOLLOW STRUCTURAL SECTION
	HTR	HEATER
	HW	HEATED DOMESTIC WATER OR HOT WATER
	HWR	HOT WATER RETURN
	HWS	HOT WATER SUPPLY OR HIGH WATER SURFACE
I	I	ALUMINUM ASSOCIATION STANDARD I - BEAM
	IA	INSTRUMENT AIR
	IC	INSTRUMENTATION CONDUIT
	ID	INTERIOR DIAMETER
	IN OR "	INCH
	INCLR	INTERCOOLER
	INF	INFLUENT
	INJ	INJECTOR
	INSTR	INSTRUMENT (ATION)
	INSUL	INSULATE (D) (ING) (TION)
	INTEG	INTEGRAL
	INTR	INTERIOR
	INVT	INVERT
	IPB	INSTRUMENTATION PULL BOX
	IPD	INFLUENT PUMP DISCHARGE
	IPR	INFLUENT PUMP RECYCLE
	ISB	INFLUENT SEWER BYPASS
	I/O	INPUT/OUTPUT MODULE
	IW	INJECTION WELL
J	J	JOIST
	JAN	JANITOR
	JB	JUNCTION BOX
	JT	JOINT
L	L	ALUMINUM OR STEEL ANGLE OR LEFT
	LA	LIGHTNING ARRESTER
	LAB	LABORATORY
	LAV	LAVATORY
	LC	LOCK CLOSE
	LCP	LOCAL CONTROL PANEL
	LF	LINEAR FEET
	LIM SW	LIMIT SWITCH
	LLA	LOW LEVEL ALARM
	LLCO	LOW LEVEL CUT OFF
	LLH	LONG LEG HORIZONTAL
	LLV	LONG LEG VERTICAL
	LO	LOCK OUT
	LOP	LOCK OPEN
	LOR	LOCAL-OFF-REMOTE
	LOS	LOCKOUT-STOP
	LP	LOW POINT OR LIQUID PROPANE
	LPA	LOW PRESSURE AIR
	LR	LONG RADIUS
	LRA	LOCAL-REMOTE-AUTO
	LS	LIMIT SWITCH
	LSA	LEVEL SENSOR, AIR (BUBBLER)
	LTG	LIGHTNING
	LUBO	LUBE OIL
	LV	LOUVER
	LWS	LOW WATER SURFACE
	L/L	LEAD/LAG
	L/L/LL	LEAD/LAG/LAG-LAG
	L/R	LOCAL-REMOTE
M	MATL	MATERIAL
	MAX	MAXIMUM
	MBH	THOUSAND BTU - HOURS
	MCC	MOTOR CONTROL CENTER
	MCP	MOTOR CIRCUIT PROTECTOR
	MECH	MECHANICAL
	ME	MECHANICAL EQUIPMENT
	MFRS	MANUFACTURER'S
	MH	MANHOLE, SANITARY
	MIN	MINIMUM
	MISC	MISCELLANEOUS
	MJ	MECHANICAL JOINT
	MJDIP	MECHANICAL JOINT DUCTILE IRON PIPE
	MK	MARK
	ML	MIXED LIQUOR
	MON	MONUMENT
	MSL	MEAN SEA LEVEL
	MTD	MOUNTED
	MV	MOTORIZED VALVE
	MWS	MAXIMUM WATER SURFACE
	MX	MIXER
N	N	NORTH
	NA	NOT APPLICABLE
	NAT GR	NATURAL GRADE
	NC	NORMALLY CLOSED
	NCHO	NORMALLY CLOSED HELD OPEN
	NDV	NEEDLE VALVE
	NF	NEAR FACE
	NG	NATURAL GAS
	NL	NIGHT LIGHT
	NO	NORMALLY OPEN
	NO OR #	NUMBER
	NOHC	NORMALLY OPEN HELD CLOSED
	NOM	NOMINAL
	NP	NATIONAL PIPE THREAD
	NPS	ALUMINUM PIPE
	NTS	NOT TO SCALE
	NV	NEEDLE VALVE
O	OC	ON CENTER
	OCL	OPEN-CLOSE
	OD	OUTSIDE DIAMETER
	OIS	OPERATOR INTERFACE STATION
	OP	OPEN
	OPNG	OPENING
	OPP	OPPOSITE
	OPR	OPERATE(OR)
	OSC	OPEN-STOP-CLOSE
	OTF	OUTFALL
	OVFL	OVERFLOW
	OVLD	OVERLOAD
P	P	PUMP
	PA	PAGING SYSTEM
	PB	PULL BOX
	PCV	PLUG CONCENTRIC VALVE
	PD	PLANT DRAIN
	PE	PLANT EFFLUENT
	PEF	PRIMARY EFFLUENT
	PERP	PERPENDICULAR
	PEV	PLUG ECCENTRIC VALVE
	PG	PRESSURE GAUGE
	PH	PHASE
	PHW	PLANT HOT WATER
	PI	POINT OF INTERSECTION
	PIN	PRIMARY INFLUENT
	PIV	PINCH VALVE
	PL	ALUMINUM OR STEEL PLATE OR PROPERTY LINE
	PLC	PROGRAMMABLE LOGIC CONTROLLER
	PLCS	PLACES
	PLE	PLAIN END
	PLYWD	PLYWOOD
	PNL	PANEL
	POL	POLYMER
	POLS	POLYMER SOLUTION
	PR	PAIR OR INSTRUMENT CABLE PAIR
	PRC	PLANT RECYCLE
	PREFAB	PREFABRICATED
	PRI	PRIMARY
	PRPNE	PROPANE GAS
	PRV	PRESSURE REDUCING VALVE
	PS	PRIMARY SLUDGE
	PSC	PRIMARY SCUM
	PSI	POUND PER SQUARE INCH
	PV	PLUG VALVE
	PVC	POLYVINYL CHLORIDE
	PVCP	RIGID POLYVINYL CHLORIDE PIPE
	PVMT	PAVEMENT
R	R	RIGHT, PLANT RECYCLE FLOW OR RISE
	RAD	RADIUS
	RAS	RETURN ACTIVATED SLUDGE
	RB	STEEL ROUND BAR
	RCP	REINFORCED CONCRETE PIPE
	RCPT	RECEPTACLE
	RD	ROOF DRAIN OR ALUMINUM ROD
	RDCR	REDUCER
	RDR	ROLL-UP-DOOR
	RDY	READY
	RECT	RECTANGULAR
	REF	REFERENCE
	REINF	REINFORCE (D)(ING)(MENT)
	REJ	RUBBER EXPANSION JOINT
	REQD	REQUIRED
	REV	REVISION OR REVERSE ACTING
	RFCA	RESTRAINED FLANGE COUPLING ADAPTOR
	RG	RETURN GRILLE
	RIO	REMOTE I/O (INPUT/OUTPUT)
	RM	ROOM
	RMT	REMOTE
	RO	REVERSE OSMOSIS
	RP	RADIUS POINT
	RS	RAW SEWAGE
	RT	ALUMINUM RECTANGULAR TUBE
	RTM	RUNNING TIME METER
	R/W	RIGHT-OF-WAY
S	S	SOUTH OR ALUMINUM OR STEEL AMERIACAN STANDARD S - SHAPE
	SA	SAMPLE PIPING OR SERVICE AIR
	SC	SCUM
	SCHED	SCHEDULE
	SCS	SCRUBBER CHLORINE SOLUTION
	SCV	SWING CHECK VALVE
	SD	STORM DRAIN
	SE	SECONDARY EFFLUENT
	SEC	SECONDARY
	SECT	SECTION
	SEL	SELECT
	SF	SUPPLY FAN
	SGL	SINGLE
	SH	SHEET
	SHW	SECONDARY HOT WATER
	SIL	SILENCE
	SIM	SIMILAR
	SLG	SLUDGE OR SLUICE GATE
	SLO	SLOW
	SLOS	START-LOCKOUT-STOP
	SLP	SLOPE
	SN	SUPERNATANT
	SOLV	SOLENOID VALVE
	SOV	SULFUR OXIDE VACUUM
	SP	STOP
	SPEC	SPECIFICATION
	SPLP	SAMPLER PUMP
	SQ	SQUARE OR ALUMINUM SQUARE BAR
	SR	STOP-RESET/SUPPLY REGISTER
	SRG	SPLIT RANGE
	SS	SERVICE SINK OR START-STOP
	SSC	SECONDARY SCUM
	SSL	SECONDARY SLUDGE
	SST	STAINLESS STEEL
	SSTT	SOLID STATE TRIP
	SSW	SANITARY SEWER
	ST	STEAM OR START
	STA	STATION
	STD	STANDARD
	STL	STEEL
	STOR	STORAGE
	STR	STRAINER
	STRL	STRUCTURAL
	SUSP	SUSPENDED
	SW	SOFTENED WATER
	SWGR	SWITCHGEAR
	SWR	SEAL WATER
	SYMM	SYMMETRICAL
	S/W	SIDEWALK
T	T	TANK/ALUMINUM OR STEEL T - SHAPE
	TBG	TUBING
	TD	THERMAL DISPERSION
	TDR	TOWEL DISPENSER/ RECEPTACLE
	TE	THICKENER EFFLUENT
	TEL	TELEPHONE SERVICE OR TELEPHONE
	TEMP	TEMPERATURE OR TEMPORARY
	TFR	TRANSFORMER
	TH	TOILET PAPER HOLDER
	THERMO	THERMOSTAT
	THK	THICK
	THO	THICKENER OVERFLOW
	THRU	THROUGH
	TJB	TELEPHONE JUNCTION BOX
	TOC	TOP OF CONCRETE
	TOS	TOP OF STEEL
	TOW	TOP OF WEIR
	TPS	THICKENED PRIMARY SLUDGE
	TS	THICKENED SLUDGE
	TWAS	THICKENED WASTE ACTIVATED SLUDGE
	TYP	TYPICAL
	T&B	TOP AND BOTTOM
	T&G	TONGUE AND GROOVE
U	UNO	UNLESS NOTED OTHERWISE
	UPS	UNINTERRUPTIBLE POWER SUPPLY
	UR	URINAL
V	V OR VLV	VALVE
	VAC	VACUUM
	VAV	VARIABLE AIR VOLUME
	VB	VALVE BOX
	VC	VICTAULIC COUPLER
	VCP	VITRIFIED CLAY PIPE
	VERT	VERTICAL
	VFD	VARIABLE FREQUENCY DRIVE
	VN	VENT
	VOL	VOLUME
	VP	VENT PIPE
	VTR	VENT THROUGH ROOF
W	W	WEST OR STEEL WIDE FLANGE BEAM
	WAS	WASTE ACTIVATED SLUDGE
	WC	WATER CLOSET
	WD	WOOD
	WF	WIDE FLANGE (BEAM)
	WH	WATER HEATER
	WO	WASTE OIL
	WP	WORKING POINT OR WEATHERPROOF
	WS	WATER SURFACE
	WWF	WELDED WIRE FABRIC
	W/	WITH
	W/O	WITHOUT
X	XFMR	TRANSFORMER
Y	YD	YARD
#	1W	POTABLE WATER
	2W	NON-POTABLE WATER
	2W/HW	HEATED 2W
	3W	PLANT EFFLUENT
	4WV	FOUR WAY VALVE

REV	DATE	BY	DESCRIPTION

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RO CONCENTRATE ACID FEED SYSTEM

GENERAL

STANDARD ABBREVIATIONS

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User: svcPW
PlotScale: 2:1
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MECHANICAL SYMBOLS

- AIR OR CHEMICAL DIFFUSER
- QUICK DISCONNECT HIGH PRESSURE AIR OR FLUSHING
- BATCHMETER
- AIR VENT
- BACK FLOW PREVENTER
- BLOWER
- CALIBRATION COLUMN
- COMPRESSOR/TURBINE
- COMPRESSOR: RECIPROCATING
- DIAPHRAGM SEAL
- DRAIN
- EJECTOR OR EDUCTOR
- ELECTRIC MOTOR
- EQUIPMENT DRAIN
- FAN: EXHAUST/SUPPLY
- FILTER
- FIRE HYDRANT
- FLAME ARRESTER
- FLAME ARRESTER WITH THERMALLY OPERATED VALVE
- FLOOR DRAIN
- GAUGE: PRESSURE
- GAUGE: DIFFERENTIAL PRESSURE
- GRINDER
- MIXER
- OIL OR MOISTURE TRAP
- PRIMARY LEVEL ELEMENT: BUBBLER
- PRIMARY LEVEL ELEMENT: FLOAT SWITCH
- PRIMARY LEVEL ELEMENT: PROBE
- PRIMARY LEVEL ELEMENT: RADAR
- PRIMARY FLOW ELEMENT: FLUME
- CHEMICAL INJECTION: POINT
- PRIMARY FLOW ELEMENT: X = C - CORIOLOS, X = M - MAGNETIC, X = P - PROPELLER, X = PT - PITOT TUBE, X = R - ROTAMETER, X = T - TURBINE, X = TH - THERMAL, X = U - ULTRASONIC, X = D - DENSITY
- PRIMARY FLOW ELEMENT: ORIFICE PLATE
- PRIMARY FLOW ELEMENT: VENTURI TUBE
- PRIMARY FLOW ELEMENT: WEIR
- PULSATION DAMPENER
- PUMP: CENTRIFUGAL
- PUMP: DIAPHRAGM
- PUMP: METERING
- PUMP: PLUNGER
- PUMP: PROGRESSIVE CAVITY
- PUMP: RECIPROCATING
- PUMP: ROTARY
- PUMP: SCREW
- PUMP: SUBMERSIBLE
- PUMP: VERTICAL LIFT
- REDUCER: CONCENTRIC
- REDUCER: ECCENTRIC
- ROTARY CHEMICAL FEEDER
- RUPTURE DISK
- SAMPLE PORT
- SIGHT GLASS
- SLIDE GATE
- SLUICE GATE
- STRAINER: WYE TYPE
- STRAINER: WYE TYPE WITH BLOWOFF
- THERMOMETER
- VALVE: ANGLE
- CHEMICAL BULK STORAGE TANK
- CHEMICAL METERING PUMP
- VALVE: AIR RELIEF
- VALVE: BALL
- VALVE: BALL CHECK
- VALVE: BUTTERFLY
- VALVE: CONE
- VALVE: DIAPHRAGM
- VALVE: FLAPPER CHECK
- VALVE: FOUR WAY
- VALVE: GATE
- VALVE: GLOBE
- VALVE: HOSE
- VALVE: NEEDLE
- VALVE: PINCH
- VALVE: PLUG CONCENTRIC
- VALVE: PLUG ECCENTRIC
- VALVE: PRESSURE RELIEF PRESSURE-REDUCING REGULATOR
- VALVE: SWING CHECK
- VALVE: TELESCOPING
- VALVE: THREE WAY AIR OPERATED
- VALVE: THREE WAY MOTOR OPERATED
- VALVE: THREE WAY SOLENOID OPERATED
- VALVE: VACUUM
- BACKPRESSURE REGULATOR SELF-CONTAINED
- BACKPRESSURE REGULATOR W/EXTERNAL PRESSURE TAP
- PRESSURE-REDUCING REGULATOR: SELF CONTAINED
- PRESSURE-REDUCING REGULATOR W/EXTERNAL PRESSURE TAP
- TURBINE ASSISTED INTERSTAGE BOOST PUMP
- SAND SEPERATOR
- VALVE: DISCRETE CONTROL ACTUATOR
- VALVE: MODULATING CONTROL ACTUATOR
- VALVE: PNEUMATIC CONTROL ACTUATOR

PIPE JOINT COUPLER SYMBOLS

TYPE OF JOINT OR COUPLER	THREE LINE PIPE
FLANGED JOINT	
MECHANICAL JOINT	
RESTRAINED MECHANICAL JOINT	R
WELDED JOINT	
PUSH-ON JOINT	
RESTRAINED PUSH-ON JOINT	R
SCREWED JOINT	
CONCRETE OR CLAY PIPE JOINT	
GROOVED COUPLING	
FLANGED COUPLING ADAPTER	
RESTRAINED FLANGED COUPLING ADAPTER	R
FLEXIBLE COUPLING	
RESTRAINED FLEXIBLE COUPLING FOR STEEL PIPE	
RESTRAINED FLEXIBLE COUPLING FOR FLANGED PIPE	
DISMANTLING JOINT	
EXPANSION JOINT	
BOLTED SPLIT SLEEVE COUPLING	

LINEWORK

CIVIL DRAWINGS

- NEW STRUCTURES
- EXISTING STRUCTURES
- NEW PIPING (TRIPLE LINES)
- NEW PIPING (SINGLE LINE)
- EXISTING PIPING (TRIPLE LINES)
- EXISTING PIPING (SINGLE LINE)
- HIDDEN LINE
- HIDDEN LINE (EXISTING)
- CENTER, MONUMENT, OR SURVEY LINE
- GUARDRAIL
- EXISTING CONTOURS (308)
- NEW CONTOURS (308)
- NEW FENCE
- EXISTING FENCE
- REMOVE (CROSS HATCHING: FENCE SHOWN AS EXAMPLE) (PP)
- POWER POLE & LINE (E)
- PROPERTY LINE OR RIGHT OF WAY
- SLOPE (TOP, TOE)
- RAILROAD
- CITY LIMITS
- FUTURE ROAD
- EXISTING ROAD
- CURB & GUTTER (OR)

STRUCTURAL DRAWINGS

- NEW STRUCTURES
- EXISTING STRUCTURES
- NEW PIPING UNDER SLAB (TRIPLE LINES)
- NEW PIPING UNDER SLAB (SINGLE LINE)
- EXISTING PIPING UNDER SLAB (TRIPLE LINES)
- EXISTING PIPING UNDER SLAB (SINGLE LINE)
- HIDDEN LINE
- EXISTING HIDDEN LINE
- NEW CENTERLINE
- EXISTING CENTERLINE
- GUARDRAIL
- EXISTING TO BE REMOVED
- STRUCTURAL OPENING
- REINFORCING BARS
- SLOPE LINE

MECHANICAL AND HVAC DRAWINGS

- NEW OR EXISTING STRUCTURES
- NEW OR EXISTING STRUCTURES HIDDEN
- NEW PIPING (TRIPLE LINES)
- NEW PIPING HIDDEN (TRIPLE LINES)
- NEW PIPING (SINGLE LINE)
- NEW PIPING HIDDEN (SINGLE LINE)
- EXISTING PIPING (TRIPLE LINES)
- EXISTING PIPING HIDDEN (TRIPLE LINES)
- EXISTING PIPING (SINGLE LINE)
- EXISTING PIPING HIDDEN (SINGLE LINE)
- NEW EQUIPMENT OR PIPING CENTERLINE
- EXISTING EQUIPMENT OR PIPING CENTERLINE
- NEW EQUIPMENT
- NEW EQUIPMENT HIDDEN
- EXISTING EQUIPMENT
- NEW FITTING
- EXISTING TO BE REMOVED
- NEW PIPING CALL-OUT (X-#)
- EXISTING PIPING CALL-OUT (X-#)
- NEW EQUIPMENT CALL-OUT (X-#)

BUILDING MATERIALS LEGEND

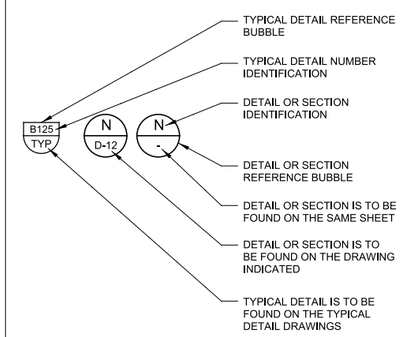
VIEW IN SECTION

MATERIAL	EXISTING	REMOVE	NEW
CLASS "A", "B", AND "D" CONCRETE			
CLASS "C" CONCRETE			
STEEL			
CAST IRON OR FIBERGLASS			
ALUMINUM			
BRICK OR BLOCK			
WOOD CROSS GRAIN, FINISH			
STRUCTURAL WOOD			
BRONZE, BRASS, OR COPPER			
ABC			
RUBBER			
SOIL			

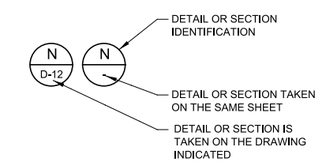
VIEW IN PLAN (NEW SHOWN - EXISTING SCREENED)

- FINISH WOOD GRAIN
- TREAD PLATE
- GRATING (SPAN)
- PAVEMENT

DRAWING CROSS REFERENCE



AT CROSS REFERENCE



AT TITLE

REV	DATE	BY	DESCRIPTION

DESIGNED ECC
DRAWN DVP
CHECKED TFS/JSN
DATE DECEMBER 2016

carollo

Lee County Southwest Florida

LEE COUNTY UTILITIES
NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM
GENERAL
STANDARD SYMBOLS

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

JOB NO. 10180C.10
DRAWING NO. G-06

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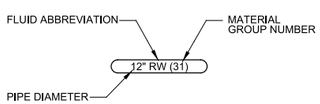
GENERAL
Architectural Units
PROJECT NO. 10180C.10
FILE NAME: 10180C1000G06.dgn

FLUID ABBREVIATION	FUNCTION THIS LIST INCLUDES SOME LINES NOT USED IN THIS PROJECT	PIPING MATERIALS (SEE SCH AT RIGHT) EXPOSED PIPING 2" DIA AND SMALLER	EXPOSED PIPING 2 1/2" DIA AND LARGER	BURIED PIPING 2" DIA AND SMALLER	BURIED PIPING 2 1/2" DIA AND LARGER	FIELD TEST REQUIREMENTS MINIMUM TEST PRESSURE PSI	TEST METHOD (SEE NOTE 1)
A	AERATION	1,16,18	5,11,16,18	1,16,18	5,11,16,18	25	AM
AM	ANHYDROUS AMMONIA	10, 16, 33	10	10	10	NOTE 4	HH
BD	BLOW DOWN	--	16, 26	--	16, 26	50	HH
BP	BYPASS	--	15,31,8	--	8	150	HH
BW	FILTER BACKWASH	--	8	--	8	150	HH
CD	CHEMICAL DRAIN AND VENT	13,17,23	13,17,23	13,17,23	13,17,23	--	NOTE 2
CI	CORROSION INHIBITOR (NOTE 8)	16,33	16	16,33	16	150	HH
CL	CHLORINE SOLUTION (NOTE 8)	16,30	16,30	16,30	16,30	150	HH
CO2	CARBON DIOXIDE	15	--	15	--	350	AM
CS	CAUSTIC SODA (NOTE 6, 8)	16	16	16	16	150	HH
DR	DRAIN	12,16,17	12,16,17	12,16,17	12,16,17	--	GR
EE	ENGINE EXHAUST	14*	14*	14	14	--	--
EWR	ENGINE COOLING WATER RETURN	1*	1*	1	1	125	HH
EWS	ENGINE COOLING WATER SUPPLY	1*	1*	1	1	125	HH
FA	FOUL AIR	--	18	--	18	10	AM
FE	FINAL EFFLUENT	--	8	--	8	50	HH
FM	FORCE MAIN	--	8,26	--	8,26	125	HH
FOR	FUEL OIL RETURN	9	9	9	9	125	AM
FOS	FUEL OIL SUPPLY	9	9	9	9	125	AM
FSP	FIRE PROTECTION SPRINKLER SYSTEM	NOTE 10	NOTE 10	NOTE 10	NOTE 10	125	HH
FW	FILTERED WATER / FINISHED WATER	15	15	--	--	125	HH
HF	HYDROFLUOSILIC ACID (NOTE 8)	30	30	30	30	150	HH
HR	HEATING WATER RETURN	1*	1*	1*	1*	125	HH
HS	HEATING WATER SUPPLY	1*	1*	1*	1*	125	HH
HWR	DOMESTIC HOT WATER RETURN	24*	2*	24*	2*	125	HH
HWS	DOMESTIC HOT WATER SUPPLY	24*	2*	24*	2*	125	HH
IA	INSTRUMENT AIR	24	2	24	2	125	AM
LO	LUBE OIL	9	9	9	9	125	AM
LPG	LIQUEFIED PETROLEUM GAS	3	3	3	3	NOTE 2	AM
LSP	LANDSCAPING SPRINKLER SYSTEM	2,16	2,16	2,16	2,16	125	HH
MC	MEMBRANE CONCENTRATE	15	15	31	31	NOTE 3	HH
MCC	MEMBRANE CLEANING CONCENTRATE RETURN	16	16	16	16	150	HH
MCP	MEMBRANE CLEANING PERMEATE RETURN	16	16	16	16	150	HH
MCS	MEMBRANE CLEANING SUPPLY	16	16	16	16	150	HH
MCW	MEMBRANE CLEANING WASTE	16	16	16	16	150	HH
MF	MEMBRANE FEED	15	15	31	31	NOTE 3	HH
MP	MEMBRANE PERMEATE	16	16, 34	31	31	125	HH
OF	OVERFLOW	6,16,30,32	8	6,16,30,32	8	--	GR
OG	OFF GAS	18	18	18	18	125	AM
PA	PLANT AIR (NOTE 9)	2, 14	2, 14	7	11	300	AM
PD	PLANT DRAIN	2	8,12	2	8,12,22,28	--	GR
PI	PLANT INFLUENT	--	21,26	--	21,26	--	--
PO	PLANT OVERFLOW	2	8	2	8,28	--	GR
PW	POTABLE WATER	2,24	2	2,24,37	2,11,19	150	HH
RW	RAW WATER	15	15	31	31	180	HH
RWL	RAINWATER LEADER	4,12	4,12	12	12	NOTE 2	--
S	SCUM	--	30	--	30	50	HH
SA	SAMPLE LINE	16,18,24	--	16,18,24	--	150	HH
SAD	SAMPLE DRAIN	1,16,18,24	--	1,16,18,24	--	--	GR
SC	SPARE CHEMICAL	16	16	16	16	150	HH
SCV	SCAVENGER SYSTEM DISCHARGE	16	16	--	31	150	HH
SD	SANITARY DRAIN AND VENT	4,12,13,17	12,13,17	12,13,17	12,13,17	--	GR
SDR	STORM DRAIN	-- --	8	--	22,28	--	GR
SCI	SCALE INHIBITOR (NOTE 8)	6,16,30,32	--	6,16,30,32	--	150	HH
SOA	SULFURIC ACID (NOTE 7, 8)	30	30	30	30	150	AM
SPD	SUMP PUMP DISCHARGE	2	26	2	26	50	LH
SS	SANITARY SEWER	--	12	--	12,21	NOTE 2	--
SUW	SOFTENED UTILITY WATER	16,24	16,24	16,37	16,37	125	HH
UW	UTILITY WATER (NON-POTABLE WATER)	2,24,16	2,11,16	2,24,16	2,11,19,16	125	HH
VE	VENT	6,12,16,30,32	--	6,12,16,30,32	--	NOTE 2	--

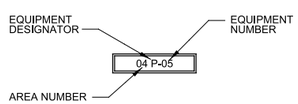
PIPING IDENTIFICATION

SEE PIPING SCHEDULE



EQUIPMENT IDENTIFICATION

SEE EQUIPMENT SCHEDULE / SPECIFICATIONS



PIPING MATERIAL SCH

GROUP NO	PIPE	FITTINGS (NOTE 5)
1	STEEL, ASTM A53, SCH 40, BLACK WELDED.	2 1/2" AND SMALLER, MALLEABLE IRON, ANSI B16.3, THREADED, BANDED, BLACK, 150 PSI OR STEEL, ANSI B16.9, BUTT-WELDED, 3" AND LARGER, CAST IRON, ANSI B16.1, 125 PSI FLGD OR MECH CPLG.
2	STEEL, ASTM A53, SCH 40, BLACK WELDED, GALVANIZED	2 1/2" AND SMALLER, MALLEABLE IRON, ANSI B16.3, THREADED, BANDED, GALVANIZED 150 PSI. 3" AND LARGER, CAST IRON, ANSI B16.1, 125 PSI FLGD OR MECH CPLG.
3	STEEL, ASTM A106 OR A53, SCH 80, SEAMLESS, BLACK.	FORGED STEEL, ANSI B16.11, SOCKET WELDED OR THREADED, BLACK, 2000 PSI, OR STEEL, ANSI B16.9, BUTT-WELDED, SCH 80.
4	SAME AS GROUP NO. 1	CAST IRON, ANSI B16.12, THREADED, DRAINAGE PATTERN.
5	WELDED STEEL, AWWA C200, UNLINED.	WELDED STEEL, FABRICATED, AWWA C200, UNLINED.
6	STEEL, ASTM A106, OR A53, SCH 40, SEAMLESS, BLACK.	STEEL, ANSI B16.9, BUTT-WELDED. CAST IRON, ANSI B16.1, 125 PSI, FLGD. FORGED STEEL, SOCKET WELDED, ANSI B16.11, 2000 PSI OR STEEL, ANSI B16.5, 150 PSI FLGD.
7	SAME AS GROUP NO. 2.	MALLEABLE IRON, ANSI B16.3, THREADED, BANDED, GALVANIZED, 300 PSI.
8	WELDED STEEL, AWWA C200.	WELDED STEEL, AWWA C200, FABRICATED.
9	SAME AS GROUP NO. 1.	2 1/2" AND SMALLER, MALLEABLE IRON, ANSI B16.3, THREADED, BANDED, BLACK, 150 PSI. 3" AND LARGER, STEEL, ANSI B16.9, BUTT-WELDED
10	SAME AS GROUP NO. 3.	1-1/4" AND SMALLER, FORGED STEEL, ANSI B16.11, THREADED OR SOCKET WELDED, BLACK, 3000 PSI, WITH FLGD AMMONIA UNIONS, 1-1/2" AND LARGER, STEEL, ANSI B16.9, BUTT-WELDED OR FLGD, SCH 80
11	DUCTILE IRON, ANSI A21.51, (AWWA C151) 50 PSI, BELL AND SPIGOT, MECH JTS, MECH CPLG, OR 125 PSI FLGD (TYPICAL SERVICE - WATER LINES) REF TO SPECS	DUCTILE IRON , ANSI A21.10, OR AWWA C110, BELL AND SPIGOT, MECH CPLG, FLGD OR MECH JTS, 250 PSI, (PRESSURE RATING) 12" AND SMALLER, 150 PSI, (PRESSURE RATING) 14" AND LARGER, WITH 125 PSI ANSI B16.1 FLANGES. FLANGES BOLTS AND NUTS TO BE 316 S.S: MECH JTS BOLTS AND NUTS TO BE COR-TEN. REF. TO SPECS
12	CAST IRON SOIL, ANSI/ASTM A-74, SERVICE WEIGHT, BELL AND SPIGOT OR HUBLESS. AT THE OPTION OF THE CONTRACTOR, DUCTILE IRON (GROUP NO. 11) MAY BE SUBSTITUTED	CAST IRON SOIL, ANSI/ASTM A-74, SERVICE WEIGHT, BELL AND SPIGOT OR HUBLESS. AT THE OPTION OF THE CONTRACTOR, DUCTILE IRON (GROUP NO 11) MAY BE SUBSTITUTED.
13	CORROSION RESISTANT (HIGH SILICON CONTENT) CAST IRON, SERVICE WEIGHT, BELL AND SPIGOT OR HUBLESS.	CORROSION RESISTANT (HIGH SILICON CONTENT) CAST IRON, SERVICE WEIGHT, BELL AND SPIGOT OR HUBLESS.
14	STAINLESS STEEL, TYPE 316, ASTM A312, SCH 40S.	STAINLESS STEEL, TYPE 316 ANSI B16.3, SCREWED, 150 PSI. ANSI B16.9, BUTT-WELDED, SCH 40S, 150 PSI FLGD OR BACKING FLGD, OR GROOVED.
15	STAINLESS STEEL, TYPE 316L, ASTM A312, SCH 10S, ELECTROPOLISHED	STAINLESS STEEL, TYPE 316L ANSI B16.9 BUTT-WELDED SCH 150 PSI FLGD OR BACKING FLGD, OR GROOVED
16	POLYVINYL CHLORIDE, SCH 80, NORMAL IMPACT. ASTM D1785	POLYVINYL CHLORIDE, SCH 80, NORMAL IMPACT, SOCKET SOLVENT WELD JTS, ASTM D2467.
17	POLYPROPYLENE, ASTM D2146, SCH 40, WITH HEAT FUSED JTS.	POLYPROPYLENE, SCH 40, DRAINAGE TYPE WITH HEAT FUSED SOCKET JTS.
18	FIBERGLASS REINFORCED PLASTIC, ASTM D2996, FILAMENT-WOUND, SOCKET AND SPIGOT ENDS, ADHESIVE BONDED.	FIBERGLASS REINFORCED PLASTIC, FILAMENT-WOUND, SOCKET ENDS, ADHESIVE BONDED, OR FIBERGLASS FLGD.
19	POLYVINYL CHLORIDE PRESSURE PIPE ASTM D2241 WITH BELL AND SPIGOT JTS.	CAST IRON, 150 PSI, FOR POLYVINYL CHLORIDE PIPE, AWWA C110 CEMENT MORTAR LINED, AWWA C104.
20	VITRIFIED CLAY, PERFORATED, ASTM C 700, EXTRA STRENGTH, FLEXIBLE COMPRESSION JTS FOR BELL AND SPIGOT PIPE OR PLAIN END WITH MECH COMPRESSION JTS	VITRIFIED CLAY, ASTM C700, FLEXIBLE JTS FOR BELL AND SPIGOT PIPE OR PLAIN END WITH MECH COMPRESSION JTS.
21	VITRIFIED CLAY, ASTM C700, EXTRA STRENGTH, FLEXIBLE COMPRESSION JTS FOR BELL AND SPIGOT PIPE OR PLAIN END WITH MECH COMPRESSION JTS	VITRIFIED CLAY, ASTM C700, FLEXIBLE JTS FOR BELL AND SPIGOT PIPE OR PLAIN END WITH MECH COMPRESSION JTS.
22	REINFORCED CONCRETE, ASTM C76, T&G JTS. (TYPICAL SERVICE-CULVERTS)	SAME AS GROUP NO. 8
23	TEMPERED GLASS. (ARMORED, WHERE BURIED). ANSI/ASTM C599	TEMPERED GLASS DRAINAGE TYPE WITH COMPRESSION CPLG AND TEFLON JTS. ANSI/ASTM C599 (ARMORED WHERE BURIED)
24	COPPER, ASTM B88, TYPE K, SOFT TEMPERED WHERE BURIED, HARD TEMPERED WHERE EXPOSED.	WROUGHT COPPER OR CAST BRONZE, ANSI B16.22, SOLDER JOINT, 150 PSI,OR COMPRESSION FITTINGS. (FOR OXYGEN PIPING USE SILVER SOLDER. FOR COMPRESSED AIR PIPING USE 95-5 TIN-ANTIMONY SOLDER)
25	STEEL, ASTM A106 OR A53, SCH 40, SEAMLESS, BLACK, SARAN OR POLYPROPYLENE-LINED	STEEL, ANSI B16.5, 150 PSI FLGD, SARAN OR POLYPROPYLENE-LINED.
26	SAME AS GROUP NO. 11 (TYPICAL SERVICE - SLUDGE AND SEWAGE LINES)	SAME AS GROUP NO. 11.
27	POLYVINYL CHLORIDE GRAVITY SEWER PIPE, ASTM D3034, BELL AND SPIGOT.	POLYVINYL CHLORIDE, ANSI/ASTM D3034, BELL AND/OR SPIGOT.
28	REINFORCED CONCRETE, AWWA C302, CLASS- SEE DRAWINGS. (TYPICAL SERVICE - PRESSURE PIPELINES)	SAME AS GROUP NO. 8.
29	SAME AS GROUP NO. 1.	2" AND SMALLER, MALLEABLE IRON, ANSI B16.3, THREADED, BANDED, BLACK, 150 PSI. 2- 1/2" AND LARGER, STEEL ANSI B16.9, BUTT-WELDED.
30	CHLORINATED POLYVINYL CHLORIDE	CPVC, SCHED.80, SOCKED SOLVENT WELD JOINTS

PIPING MATERIAL SCH CONTINUED

GROUP NO	PIPE	FITTINGS (NOTE 5)
31	HIGH DENSITY POLYETHYLENE (HDPE) ASTM D3350 - SDR AS SPECIFIED	HDPE THERMAL BUTT-FUSED; FLANGE CONNECTIONS AT ALL VALVES AND TRANSITIONS. ASTM-2657
32	POLYVINYLIDENE FLUORIDE (PVDF) LINED STEEL PIPE, ASTM F1545, ASTM A53 OR A106, SCHED. 40	ASTM B16.1, 125 PSI FLANGED
33	STAINLESS STEEL TUBING, TYPE 316L, Rb 80, ASTM A632	316 SS COMPRESSION FITTINGS
34	POLYVINYL CHLORIDE, C900/C905, MIN SDR 18	NOTE 10
35	WELDED STEEL AWWA C200, MORTAR LINED PER AWWA C205	STEEL, AWWA C208 MORTAR LINED PER AWWA 205. BEVELED END FLANGES, 150 PSI.
36	DUCTILE IRON, MORTAR LINED, AWWA C150, PC150	DUCTILE IRON, MORTAR LINED, AWWA C110, CL150

PIPE SCHEDULE NOTES:

1. REFER TO SPEC SECTION 40_05_00.09 FOR TEST METHODS AND LEAKAGE ALLOWANCE.
2. TEST IN ACCORDANCE WITH APPLICABLE PLUMBING CODE.
3. TEST ALL GROUP NO. 15 PIPING TO PRESSURE OF 350 PSI; ALL OTHER PIPING SHALL BE TESTED AT 150 PSI.
4. TEST ALL GAS PIPING WITH GROUP NO. 10 AND 33 TO PRESSURE OF 300 PSI. ALL CARRIER WATER PIPING WITH GROUP NO. 10 OR 16 TO 150 PSI.
5. WHERE SCHEDULED, TWO BACKING FLANGES SHALL NOT BE USED WHERE VALVES ARE LOCATED.
6. CONTRACTOR TO REPLACE EXISTING CAUSTIC SODA PIPING (GROUP NO. 6, 33) WITH SCHD 80 PVC (GROUP NO. 16).
7. CONTRACTOR TO REPLACE EXISTING SULFURIC ACID PIPING (GROUP NO. 15, 32) WITH SCHD 80 CPVC (GROUP NO. 30).
8. NEW CHEMICAL PIPING TO BE DOUBLE CONTAINED OUTSIDE OF CONTAIMENT AREAS. REFER TO SECTION 15265 FOR DESCRIPTION OF SYSTEM.
9. NEW INSTRUMENT AIR HEADERS TO BE TYPE 316 STAINLESS STEEL PIPE.
10. FOR INDOOR AND ABOVE GRADE PIPE FURNISH CLASS150 FABRICATED FITTINGS; FOR BURIED PIPING FURNISH EPOXY COATED DUCTILE IRON, AWWA C110, CLASS 150.
11. ALL BURIED STEEL WATER PIPE (AWWA C200) SHALL BE MORTAR COATED PER AWWA C205.

GENERAL MECHANICAL NOTES:

1. GENERAL MECHANICAL NOTES APPLY TO ALL MECHANICAL DRAWINGS AND PIPING.
2. NOT ALL THE REQUIRED PIPE SUPPORTS ARE SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL PROVIDE ALL THE PIPE SUPPORTS SHOWN ON THE DRAWINGS AND ADDITIONAL PIPE SUPPORTS AS REQUIRED PER SPECIFICATIONS.
3. NOT ALL THE REQUIRED FITTINGS ARE SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL PROVIDE ALL THE FITTINGS SHOWN ON THE DRAWINGS AND ADDITIONAL FITTINGS AS REQUIRED FOR PIPING ARRANGEMENTS SHOWN ON THE DRAWINGS AND PER EQUIPMENT FURNISHED.
4. SUCTION AND DISCHARGE PIPING OF PUMPS SHALL BE INSTALLED AND SUPPORTED IN SUCH A MANNER SO THAT THEY SHALL NOT IMPART STRAIN ON PUMPS.
5. WARNING SIGNS SHALL BE PROVIDED PER SPECIFICATIONS ON FRONT AND BACK OF ALL REMOTELY CONTROLLED EQUIPMENT.
6. ALL PIPING JOINTS SHALL BE PER PIPE SCHEDULE AND IN ACCORDANCE WITH THE SPECIFICATIONS, UNLESS OTHERWISE NOTED ON THE DRAWINGS.
7. FIELD VERIFY LOCATIONS. SIZES, AND CONNECTION MATERIALS OF ALL EXISTING PIPING AND EQUIPMENT BEFORE FABRICATING NEW PIPE OR RETRO FIT FOR NEW EQUIPMENT.
8. ALL FLEXIBLE COUPLINGS SHALL BE RESTRAINED PER APPLICABLE TYPICAL DETAIL P112, UNLESS NOTED OTHERWISE.
9. PRESSURE GAUGES, PRESSURE SWITCHES, MAGNETIC METERS, MASS FLOW METERS, LEVEL SENSOR, ANALYZERS, ELECTRIC MOTOR VALVE OPERATORS SHOWN ON THE MECHANICAL DRAWINGS - SEE ELECTRICAL AND INSTRUMENTATION FOR DETAILS.
10. MOUNT ALL VALVES AND MANUAL VALVE OPERATOR IN AN ACCESSIBLE LOCATION WITH UNOBSTRUCTED VALVE OPERATOR POSITION FOR EASE OF OPERATION, LESS THAN 6'-0" ABOVE FINISHED FLOOR.
11. FOR PROCESS PIPING WHERE PIPE MATERIAL IS STAINLESS STEEL, STRAP, BRACKET, "U"-BOLT, LOCKWASHERS, AND ANCHORS FOR PIPE SUPPORT TO BE STAINLESS STEEL TYPE 316, FOR CHEMICAL PIPING, WHERE PIPE MATERIAL IS STAINLESS STEEL OR HASTELLOY C-2000, SUPPORT SYSTEM TO BE FRP WITH NON-METALLIC APPURTENANCES, UNLESS OTHERWISE NOTED ON THE DRAWINGS.
12. ALL PIPE PENETRATION THROUGH FIRE RATED WALLS OR FLOORS SHALL REQUIRE FIRESTOPPING. SEE SPECIFICATION FOR DETAILS.

REV	DATE	BY	DESCRIPTION

DESIGNED ECC
DRAWN DVP
CHECKED TFS/JSN
DATE DECEMBER 2016

carollo®

Lee County Southwest Florida

LEE COUNTY UTILITIES

NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM

GENERAL

PIPE SCHEDULE AND
GENERAL MECHANICAL NOTES

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

JOB NO. 10180C.10
DRAWING NO. G-07

CORROSION INHIBITOR (CI) CRITERIA
(LIQUID SOLUTION, 4%, 0.34 LBS CI/GALLON)

DESCRIPTION	UNITS	MIN	AVG	MAX
LOCATION: CHLORINE CONTACT BASIN				
PROCESS FLOW RATE	MGD	2.91	11.64	11.64
CHEMICAL DOSE	MG/L	2.63	2.63	2.63
CHEMICAL USAGE	LB/DAY	64	255	255
CHEMICAL FEED RATE	GPD	190	759	759
BULK/DAY STORAGE TANK				
STORAGE TANKS	NO.		2	
TANK CAPACITY, EACH	GAL		350	
STORAGE CAPACITY, TOTAL	GAL		700	
STORAGE TIME, TOTAL	HOURS	89	22	22
DELIVERY LOAD (50 LB. BAGS)	NO. BAGS		160	
DELIVERY LOAD (TOTAL)	LBS		8,000	
TIME BETWEEN DELIVERY	DAYS	125	31	31
METERING PUMPS				
PUMP TYPE:			MOTOR DRIVEN DIAPHRAGM	
MOTOR:			AC W/ INTEGRAL VFD DRIVE	
RATED PUMP CAPACITY	GPH		38.0	
MAXIMUM MOTOR SPEED	STROKES/MIN		87	
MINIMUM MOTOR SPEED	STROKES/MIN		17	
MOTOR SPEED TURNDOWN	RATIO		5:1	
STROKE SETPOINT (SP)	% STROKE		100	
TOTAL TURNDOWN	RATIO		10:1	
MAX. CAPACITY AT STROKE SP	GPH		38.0	
MIN. CAPACITY AT STROKE SP	GPH		3.8	
CONNECTION SIZE	IN.		1	
STANDBY PUMPS	NO.	1	1	1
METERING PUMPS IN SERVICE	NO.	1	1	1
CHEMICAL FEED RATE (TOTAL)	GPH	7.9	31.6	31.6
CHEMICAL FEED RATE (EACH)	GPH	7.9	31.6	31.6
PUMP SPEED REQUIRED	%	21	83	83

NOTES:

1. MOTOR SPEED AUTOMATICALLY ADJUSTED; STROKE MANUALLY ADJUSTED TO MODIFY METERING PUMP RANGE AND MAINTAIN DOSAGE SET POINT.
2. CORROSION INHIBITOR (CALGON 71920 - TRIPOLYPHOSPHATE) FROM AN NSF STANDARD 60 CERTIFIED SUPPLIER.

SULFURIC ACID (SOA) CRITERIA
(LIQUID SOLUTION, 93.5%, 14.33 LBS/GALLON)

DESCRIPTION	UNITS	MIN	AVG	MAX
LOCATION: MEMBRANE CONCENTRATE				
CONCENTRATE FLOW	MGD	0.62	2.50	3.33
SULFURIC ACID DOSE	MG/L	322	322	322
CHEMICAL USAGE	LB/DAY	1,678	6,713	8,941
CHEMICAL FEED RATE	GPD	117	468	624
BULK STORAGE TANKS				
BULK STORAGE CAPACITY	GAL		7,296	
STORAGE TIME	DAYS	62	16	12
TIME BETWEEN DELIVERY	DAYS	28	7	5
DAY TANKS				
DAY TANK ACTIVE VOLUME	GAL		175	
STORAGE TIME	HRS	36	9	7
METERING PUMPS				
NUMBER	NO.		2	
PUMP TYPE			MOTOR DRIVEN DIAPHRAGM	
RATED PUMP CAPACITY	GPH		35.9	
RATED PUMP PRESSURE	PSI		145	
CHEMICAL FEED TUBING DIAMETER	INCH		3/4	

SODIUM HYPOCHLORITE (CL) CRITERIA
(LIQUID SOLUTION, 10.5%, 1.01 LBS SH/GALLON)

DESCRIPTION	UNITS	MIN	AVG	MAX
LOCATION: DEGASIFICATION TOWERS				
PROCESS FLOW RATE	MGD	2.91	11.64	11.64
CHEMICAL DOSE	MG/L	5.4	10.7	12.5
CHEMICAL USAGE	LB/DAY	121	1,039	1213
CHEMICAL FEED RATE	GPD	121	1,033	1207
LOCATION: ODOR SCRUBBER 2				
CHEMICAL USAGE	LB/DAY	84	334	334
AVERAGE FEED RATE	GPD	83	332	332
BULK STORAGE TANKS				
BULK STORAGE TANKS	NO.		3	
STORAGE CAPACITY, EACH	GAL		9,174	
STORAGE CAPACITY, TOTAL	GAL		27,522	
STORAGE TIME, TOTAL	DAYS	135	20	18
DELIVERY TRUCK FULL LOAD	GAL		5,050	
TIME BETWEEN DELIVERY	DAYS	25	4	3
DAY TANKS				
DAY TANKS	NO.		2	
DAY TANK ACTIVE VOL., EACH	GAL		642	
DAY TANK ACTIVE VOL., TOTAL	GAL		1,284	
STORAGE TIME, TOTAL	HOURS	151.2	22.6	20.0
DAY TANK DIAMETER	FEET		4.5	
ACTIVE STORAGE VOL. HEIGHT	FEET		6.8	
TOTAL DAY TANK HEIGHT	FEET		8.0	
DAY TANK SIZE, EACH	GAL		750	
METERING PUMPS (DEGASIFIERS)				
PUMP TYPE:			MOTOR DRIVEN DIAPHRAGM	
MOTOR:			AC W/ INTEGRAL VFD DRIVE	
RATED PUMP CAPACITY	GPH		85.6	
MAX. MOTOR SPEED	STROKES/MIN		173	
MIN. MOTOR SPEED	STROKES/MIN		17	
MOTOR SPEED TURNDOWN	RATIO		10:1	
STROKE SETPOINT (SP)	% STROKE		33	
TOTAL TURNDOWN	RATIO		30:1	
MAX. CAPACITY AT STROKE SP	GPH		28.2	
MIN. CAPACITY AT STROKE SP	GPH		0.93	
CONNECTION SIZE	IN.		1-1/2	
STANDBY PUMPS	NO.	1	1	1
METERING PUMPS IN SERVICE	NO.	1	2	2
CHEMICAL FEED RATE (TOTAL)	GPH	5.0	43.0	50.3
CHEMICAL FEED RATE (EACH)	GPH	5.0	21.5	25.1
PUMP SPEED REQUIRED	%	20	77	90

NOTES:

1. MOTOR SPEED AND STROKE LENGTH BOTH MANUALLY AND AUTOMATICALLY ADJUSTED TO MODIFY METERING PUMP RANGE AND MAINTAIN DOSAGE SET POINT. SPEED WILL AUTOMATICALLY ADJUST BASED UPON CHLORINE ANALYZER FEEDBACK (10% TRIM).
2. SODIUM HYPOCHLORITE FROM AN NSF STANDARD 60 CERTIFIED SUPPLIER.

REV	DATE	BY	DESCRIPTION

DESIGNED ECC
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DATE DECEMBER 2016

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Lee County Southwest Florida

LEE COUNTY UTILITIES
NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM
GENERAL
DESIGN CRITERIA 3 OF 7

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

JOB NO. 10180C.10
DRAWING NO. G-10

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Model: Layout1
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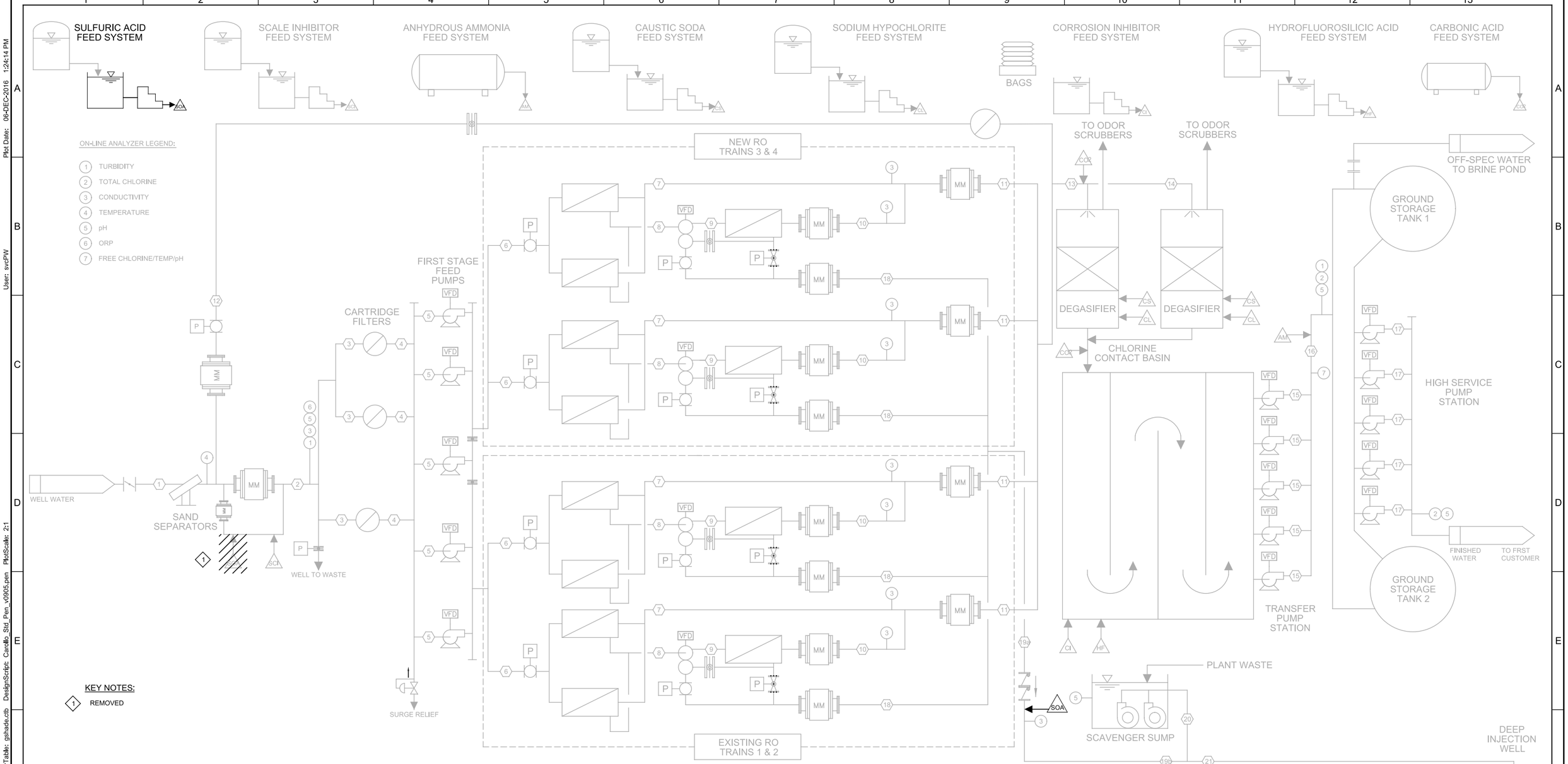

Line Number		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19a	19b	20	21
Parameter/Stream		Sand Separators Inlet	RO Process Feed	Cartridge Filter Influent	Cartridge Filter Effluent	1st Stage Feed Pump Suction	1st Stage Feed Water	1st Stage Permeate	1st Stage Concentrate	2nd Stage Feed Water	2nd Stage Permeate	Total Permeate	Permeate Blend Water	Degasifier Feed Water	Individual Degasifier Feed	Transfer Pump Discharge	Ground Storage Feed	High Service Pump Discharge	Train Concentrate	Total Concentrate (Inside Bldg)	Total Concentrate (Outside Bldg)	Scavenger Sump Effluent(1)	Injection Well Flow(2)
Nominal Pipe Diameter (in.)		30	24	14	14	14	10	8	8	8	6	10	6	24	18	12	30	18	6	8	12	4	16
80% Recovery	Flow Rate (gpm)	9,820	8,680	2,893	2,893	2,170	2,170	1,177	993	993	556	1,733	1,140	8,072	4,036	2,018	8,072	3,885	434	1,732	1,732	400	1,732
	Velocity (fps)	6.84	6.42	6.37	6.37	4.78	8.16	7.56	5.84	5.84	6.18	6.52	11.52	6.40	5.31	5.21	3.38	4.51	4.80	10.20	6.68	12.38	2.53
75% Recovery	Flow Rate (gpm)	10,384	9,244	3,081	3,081	2,311	2,311	1,177	1,134	1,134	556	1,733	1,140	8,072	4,036	2,018	8,072	3,885	578	2,312	2,312	400	2,312
	Velocity (fps)	7.23	6.84	6.78	6.78	5.09	8.70	7.56	6.68	6.68	6.18	6.52	11.52	6.40	5.31	5.21	3.38	4.51	6.42	13.61	8.92	12.38	3.39

Notes:(1) Intermittent flow.(2) During brief intermittent scavenger sump flow the total injection well flow increases to 2,132 gpm at 80% recovery and 2,712 gpm at 75% recovery.

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carollo

Lee County Southwest Florida

LEE COUNTY UTILITIES

NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM

GENERAL

PROCESS FLOW DIAGRAM

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

JOB NO. 10180C.10

DRAWING NO. G-15

PROJECT NO. 10180C.10 FILE NAME: 10180C1000G15.dgn

GENERAL
Architectural Units

Plot Date: 06-DEC-2016 1:24:14 PM
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ColorTable: gshade.ctb
Model: Layout1
LAST SAVED BY: dperry

PUMP SCHEDULE

TAG NUMBER	TYPE	MIN DRIVER SIZE (HP)	MIN FLOW (GPM)	MAX FLOW (GPM)	MIN TDH (FT H20)	MAX TDH (FT H20)	SERVICE	LOCATION	REMARKS
03-P-01	VERTICAL TURBINE	250	2170	2309	177	347	MF	FIRST STAGE FEED	TO REPLACE EXISITING FIRST STAGE FEED PUMP
03-P-02	VERTICAL TURBINE	250	2170	2309	177	347	MF	FIRST STAGE FEED	TO REPLACE EXISITING FIRST STAGE FEED PUMP
03-P-03	VERTICAL TURBINE	250	2170	2309	177	347	MF	FIRST STAGE FEED	TO REPLACE EXISITING FIRST STAGE FEED PUMP
03-P-04	VERTICAL TURBINE	250	2170	2309	177	347	MF	FIRST STAGE FEED	
03-P-05	VERTICAL TURBINE	250	2170	2309	177	347	MF	FIRST STAGE FEED	
03-P-06	TURBINE ASSISTED MOTORIZED BOOSTER PUMP	60	1012	1134	140	265	MC	RO INTERSTAGE TRAIN 1	TO REPLACE EXISTING INTERSTAGE BOOST PUMP
03-P-07	TURBINE ASSISTED MOTORIZED BOOSTER PUMP	60	1012	1134	140	265	MC	RO INTERSTAGE TRAIN 2	TO REPLACE EXISTING INTERSTAGE BOOST PUMP
03-P-08	TURBINE ASSISTED MOTORIZED BOOSTER PUMP	60	1012	1134	140	265	MC	RO INTERSTAGE TRAIN 3	
03-P-09	TURBINE ASSISTED MOTORIZED BOOSTER PUMP	60	1012	1134	140	265	MC	RO INTERSTAGE TRAIN 4	
04-P-01	MAGNETIC DRIVE	20	100	450	60	140	CS/CL	ODOR CONTROL 1ST STAGE	TO REPLACING EXISTING FYBROC PUMP
04-P-02	MAGNETIC DRIVE	20	100	450	60	140	CS/CL	ODOR CONTROL 1ST STAGE	TO REPLACING EXISTING FYBROC PUMP
04-P-03	MAGNETIC DRIVE	20	100	450	60	140	CS/CL	ODOR CONTROL 2ND STAGE	TO REPLACING EXISTING FYBROC PUMP
04-P-04	MAGNETIC DRIVE	20	100	450	60	140	CS/CL	ODOR CONTROL 2ND STAGE	TO REPLACING EXISTING FYBROC PUMP
04-P-05	MAGNETIC DRIVE	20	100	450	60	140	CS/CL	ODOR CONTROL 1ST STAGE	
04-P-06	MAGNETIC DRIVE	20	100	450	60	140	CS/CL	ODOR CONTROL 1ST STAGE	
05-P-01	VERTICAL TURBINE	40	505	2021	10.6	34.2	FW	CHLORINE CONTACT BASIN	FURNISH AND INSTALL NEW VFD TO EXISTING PUMP
05-P-02	VERTICAL TURBINE	40	505	2021	10.6	34.2	FW	CHLORINE CONTACT BASIN	FURNISH AND INSTALL NEW VFD TO EXISTING PUMP
05-P-03	VERTICAL TURBINE	40	505	2021	10.6	34.2	FW	CHLORINE CONTACT BASIN	FURNISH AND INSTALL NEW VFD TO EXISTING PUMP
05-P-04	VERTICAL TURBINE	40	505	2021	10.6	34.2	FW	CHLORINE CONTACT BASIN	
05-P-05	VERTICAL TURBINE	40	505	2021	10.6	34.2	FW	CHLORINE CONTACT BASIN	
06-P-01	VERTICAL TURBINE	250	3507	4601	83	184	FW	HIGH SERVICE PUMP STATION	
06-P-02	VERTICAL TURBINE	250	3507	4601	83	184	FW	HIGH SERVICE PUMP STATION	
06-P-03	VERTICAL TURBINE	250	3507	4601	83	184	FW	HIGH SERVICE PUMP STATION	
06-P-04	VERTICAL TURBINE	250	3507	4601	83	184	FW	HIGH SERVICE PUMP STATION	
06-P-05	VERTICAL TURBINE	250	3507	4601	83	184	FW	HIGH SERVICE PUMP STATION	
07-P-01	SUBMERSIBLE	56	560	950	125	154	MC	BRINE DISPOSAL POND	
07-P-02	SUBMERSIBLE	56	560	950	125	154	MC	BRINE DISPOSAL POND	
07-P-03	SUBMERSIBLE						SA	MONITORING WELL	
07-P-04	SUBMERSIBLE						SA	MONITORING WELL	
07-P-05	SUBMERSIBLE	1	-	75	-	20	DR	SUMP	
08-P-01	DRUM PUMP	1.35	-	-	-	-	MCS	CLEANING SYSTEM	
08-P-02	HORIZONTAL END SUCTION PUMP	1	-	100	-	15	MCS	CLEANING SYSTEM	
08-P-03	HORIZONTAL END SUCTION PUMP	50	-	880	-	135	MCS	CLEANING SYSTEM	
08-P-04	HORIZONTAL END SUCTION PUMP	50	-	880	-	135	MCS	CLEANING SYSTEM	
18-P-01	END SUCTION CENTRIFUGAL	10	N/A	120	N/A	150	CO2	CHLORINE CONTACT BASIN	CO2 SYSTEM SUPPLIER VENDOR PACKAGE
18-P-02	END SUCTION CENTRIFUGAL	10	N/A	120	N/A	150	CO2	CHLORINE CONTACT BASIN	CO2 SYSTEM SUPPLIER VENDOR PACKAGE
18-P-03	END SUCTION CENTRIFUGAL	20	N/A	250	N/A	150	CO2	CHLORINE CONTACT BASIN	CO2 SYSTEM SUPPLIER VENDOR PACKAGE
18-P-04	END SUCTION CENTRIFUGAL	20	N/A	250	N/A	150	CO2	CHLORINE CONTACT BASIN	CO2 SYSTEM SUPPLIER VENDOR PACKAGE
18-P-05	END SUCTION CENTRIFUGAL	20	N/A	250	N/A	150	CO2	CHLORINE CONTACT BASIN	CO2 SYSTEM SUPPLIER VENDOR PACKAGE
18-P-06	END SUCTION CENTRIFUGAL	10	N/A	120	N/A	150	CO2	CHLORINE CONTACT BASIN	CO2 SYSTEM SUPPLIER VENDOR PACKAGE
16-P-01	SUBMERSIBLE PUMP	40.2	400	450	163	125	SCV	SCAVENGER SYSTEM	
16-P-02	SUBMERSIBLE PUMP	40.2	400	450	163	125	SCV	SCAVENGER SYSTEM	

NOTES:

1. CL = CHLORINE SOLUTION; CO2 = CARBON DIOXIDE; CS = CAUSTIC SODA SOLUTION; DR = DRAIN; FW = FILTERED WATER / FINISHED WATER; MC = MEMBRANE CONCENTRATE; MCS = MEMBRANE CLEANING SUPPLY; MF = MEMBRANE FEED; SA = SAMPLE; SCV = SCAVENGER SYSTEM DISCHARGE.

CHEMICAL PUMP SCHEDULE

TAG NUMBER	TYPE	MAX DRIVER HP	MIN FLOW (GPM)(2)	MAX FLOW (GPM)(2)	MAX PRESS. (PSIG)	SERVICE	LOCATION	REMARKS
09-P-01	MAGNETIC DRIVE	1.5	N/A	42	14	SOA	SULFURIC ACID STORAGE AREA	REPLACE EXISTING AIR DIAPHRAGM PUMP
09-P-02	MAGNETIC DRIVE	1.5	N/A	42	14	SOA	SULFURIC ACID STORAGE AREA	REPLACE EXISTING AIR DIAPHRAGM PUMP
09-FD-01	MECHANICALLY ACTUATED DIAPHRAGM	0.33	0.36	35.9	145	SOA	SULFURIC ACID FEED SYSTEM	INSTALL NEW PUMP ON NEW PUMP SKID
09-FD-02	MECHANICALLY ACTUATED DIAPHRAGM	0.33	0.36	35.9	145	SOA	SULFURIC ACID FEED SYSTEM	INSTALL NEW PUMP ON NEW PUMP SKID
10-P-01	MAGNETIC DRIVE	1.5	N/A	50	10	SCI	SCALE INHIBITOR STORAGE AREA	
10-P-02	MAGNETIC DRIVE	1.5	N/A	50	10	SCI	SCALE INHIBITOR STORAGE AREA	
10-FD-01	SOLENOID ACTUATED DIAPHRAGM	N/A	0.018	1.8	145	SCI	SCALE INHIBITOR FEED SYSTEM	INSTALL NEW PUMP ON NEW PUMP SKID
10-FD-02	SOLENOID ACTUATED DIAPHRAGM	N/A	0.018	1.8	145	SCI	SCALE INHIBITOR FEED SYSTEM	INSTALL NEW PUMP ON NEW PUMP SKID
10-FD-03	SOLENOID ACTUATED DIAPHRAGM	N/A	0.018	1.8	145	SCI	SCALE INHIBITOR FEED SYSTEM	INSTALL NEW PUMP ON NEW PUMP SKID
11-P-01	MAGNETIC DRIVE	5.0	N/A	86	27	CL	SODIUM HYPOCHLORITE STORAGE AREA	REPLACE EXISTING AIR DIAPHRAGM PUMP
11-P-02	MAGNETIC DRIVE	5.0	N/A	86	27	CL	SODIUM HYPOCHLORITE STORAGE AREA	REPLACE EXISTING AIR DIAPHRAGM PUMP
11-FD-01	MECHANICALLY ACTUATED DIAPHRAGM	0.50	0.60	60.2	145	CL	SODIUM HYPOCHLORITE FEED SYSTEM	INSTALL NEW PUMP ON NEW PUMP SKID
11-FD-02	MECHANICALLY ACTUATED DIAPHRAGM	0.50	0.60	60.2	145	CL	SODIUM HYPOCHLORITE FEED SYSTEM	INSTALL EXISTING PUMP ON NEW PUMP SKID
11-FD-03	MECHANICALLY ACTUATED DIAPHRAGM	0.50	0.86	85.6	145	CL	SODIUM HYPOCHLORITE FEED SYSTEM	INSTALL NEW PUMP ON NEW PUMP SKID
11-FD-04	MECHANICALLY ACTUATED DIAPHRAGM	0.50	0.86	85.6	145	CL	SODIUM HYPOCHLORITE FEED SYSTEM	INSTALL NEW PUMP ON NEW PUMP SKID
11-FD-05	MECHANICALLY ACTUATED DIAPHRAGM	0.50	0.86	85.6	145	CL	SODIUM HYPOCHLORITE FEED SYSTEM	INSTALL EXISTING PUMP ON NEW PUMP SKID
12-P-01	MAGNETIC DRIVE	3.0	N/A	56	18	CS	CAUSTIC SODA STORAGE AREA	REPLACE EXISTING AIR DIAPHRAGM PUMP
12-P-02	MAGNETIC DRIVE	3.0	N/A	56	18	CS	CAUSTIC SODA STORAGE AREA	REPLACE EXISTING AIR DIAPHRAGM PUMP
12-FD-01	MECHANICALLY ACTUATED DIAPHRAGM	0.125	0.111	11.1	145	CS	CAUSTIC SODA FEED SYSTEM	INSTALL EXISTING PUMP ON NEW PUMP SKID
12-FD-02	MECHANICALLY ACTUATED DIAPHRAGM	0.125	0.053	5.3	145	CS	CAUSTIC SODA FEED SYSTEM	INSTALL NEW PUMP ON NEW PUMP SKID
12-FD-03	MECHANICALLY ACTUATED DIAPHRAGM	0.125	0.111	11.1	145	CS	CAUSTIC SODA FEED SYSTEM	INSTALL NEW PUMP ON NEW PUMP SKID
12-FD-04	MECHANICALLY ACTUATED DIAPHRAGM	0.125	0.111	11.1	145	CS	CAUSTIC SODA FEED SYSTEM	INSTALL NEW PUMP ON NEW PUMP SKID
12-FD-05	MECHANICALLY ACTUATED DIAPHRAGM	0.125	0.111	11.1	145	CS	CAUSTIC SODA FEED SYSTEM	INSTALL EXISTING PUMP ON NEW PUMP SKID
13-FD-01	SOLENOID ACTUATED DIAPHRAGM	N/A	0.018	1.8	145	HF	FLUORIDE FEED SYSTEM	INSTALL NEW PUMP ON NEW PUMP SKID
13-FD-02	SOLENOID ACTUATED DIAPHRAGM	N/A	0.018	1.8	145	HF	FLUORIDE FEED SYSTEM	INSTALL NEW PUMP ON NEW PUMP SKID
14-FD-01	MECHANICALLY ACTUATED DIAPHRAGM	0.24	0.38	38	100	CI	CORROSION INHIBITOR FEED SYSTEM	INSTALL NEW PUMP ON NEW PUMP SKID
14-FD-02	MECHANICALLY ACTUATED DIAPHRAGM	0.24	0.38	38	100	CI	CORROSION INHIBITOR FEED SYSTEM	INSTALL NEW PUMP ON NEW PUMP SKID

NOTES:
1. CL = CHLORINE SOLUTION; CI = CORROSION INHIBITOR; CS = CAUSTIC SODA; HF = HYDROFLUOROSILICIC ACID; SCI = SCALE INHIBITOR; SOA = SULFURIC ACID
2. FLOW RATE VALUES FOR MECHANICALLY ACTUATED DIAPHRAGM AND SOLENOID ACTUATED DIAPHRAGM CHEMICAL FEED PUMPS ARE IN UNITS OF GALLONS PER HOUR (GPH).

REV	DATE	BY	DESCRIPTION

DESIGNED ECC
DRAWN DVP
CHECKED TFS/JSN
DATE DECEMBER 2016

carollo

Lee County Southwest Florida

LEE COUNTY UTILITIES
NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM
MECHANICAL
EQUIPMENT SCHEDULES 1

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

JOB NO. 10180C.10
DRAWING NO. GP-1

Plot Date: 06-DEC-2016 1:22:28 PM
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ColorTable: gshade.ctb
Model: Layout1
LAST SAVED BY: dperry
GENERAL
Architectural Units
PROJECT NO. 10180C.10
FILE NAME: 10180C1000GP-1.dgn

FLOW METER SCHEDULE

TAG NUMBER	SIZE (INCHES)	PROCESS FLOW RANGE	INSTRUMENT CALIBRATION RANGE	SERVICE	END CONNECTIONS	TYPE	LOCATION	REMARKS
FE-124	4	0 - 1,150 GPM	0-12,000 GPM	RW	FLANGE	MAGNETIC	CHEMICAL FEED AREA	SALVAGE EXISTING METER AND RELOCATE IN NEW PIPING
FIT-127	16	0 - 9,250 GPM	0-10,000 GPM	RW	FLANGE	MAGNETIC	CHEMICAL FEED AREA	SALVAGE EXISTING METER AND RELOCATE IN NEW PIPING
FE-133	3	0 - 100 GPM	0-100 GPM	RW	FLANGE	MAGNETIC	CHEMICAL FEED AREA	
FE-208	8	0 - 1,736 GPM	0-1,800 GPM	MP	FLANGE	MAGNETIC	TRAIN 1 TOTAL PERMEATE	
FE-216	6	0 - 580 GPM	0-600 GPM	MP	FLANGE	MAGNETIC	TRAIN 1 STAGE 2 PERMEATE	SALVAGE EXISTING METER AND RELOCATE IN NEW PIPING
FE-217	4	0 - 580 GPM	0-600 GPM	MC	FLANGE	MAGNETIC	TRAIN 1 CONCENTRATE	SALVAGE EXISTING METER AND RELOCATE IN NEW PIPING
FE-228	8	0 - 1,736 GPM	0-1,800 GPM	MP	FLANGE	MAGNETIC	TRAIN 2TOTAL PERMEATE	
FE-236	6	0 - 580 GPM	0-600 GPM	MP	FLANGE	MAGNETIC	TRAIN 2 STAGE 2 PERMEATE	SALVAGE EXISTING METER AND RELOCATE IN NEW PIPING
FE-237	4	0 - 580 GPM	0-600 GPM	MC	FLANGE	MAGNETIC	TRAIN 2 CONCENTRATE	SALVAGE EXISTING METER AND RELOCATE IN NEW PIPING
FE-248	8	0 - 1,736 GPM	0-1,800 GPM	MP	FLANGE	MAGNETIC	TRAIN 3 TOTAL PERMEATE	
FE-256	6	0 - 580 GPM	0-600 GPM	MP	FLANGE	MAGNETIC	TRAIN 3 STAGE 2 PERMEATE	
FE-257	4	0 - 580 GPM	0-600 GPM	MC	FLANGE	MAGNETIC	TRAIN 3 CONCENTRATE	
FE-268	8	0 - 1,736 GPM	0-1,800 GPM	MP	FLANGE	MAGNETIC	TRAIN 4 TOTAL PERMEATE	
FE-276	6	0 - 580 GPM	0-600 GPM	MP	FLANGE	MAGNETIC	TRAIN 4 STAGE 2 PERMEATE	
FE-277	4	0 - 580 GPM	0-600 GPM	MC	FLANGE	MAGNETIC	TRAIN 4 CONCENTRATE	
FE-400	18	0 - 4,036 GPM	0 - 4,200 GPM	MP	STRAP ON	ULTRASONIC	DEGASIFIER	
FE-401	18	0 - 4,036 GPM	0 - 4,200 GPM	MP	STRAP ON	ULTRASONIC	DEGASIFIER	
FE-430	30	0 - 10,500	0 - 10,500	FW	FLANGE	MAGNETIC	HIGH SERVICE PUMP STATION	
FI-430	24	0 - 10,500	0 - 10,500	FW	FLANGE	PROPELLER	HIGH SERVICE PUMP STATION	
04-ME-16	1/2	0 - 4 GPM	0 - 4 GPM	UW	FNPT	ROTAMETER	ODOR CONTROL SYSTEM	
04-ME-18	1/2	0 - 4 GPM	0 - 4 GPM	UW	FNPT	ROTAMETER	ODOR CONTROL SYSTEM	
04-ME-20	1/2	0 - 4 GPM	0 - 4 GPM	UW	FNPT	ROTAMETER	ODOR CONTROL SYSTEM	
FE-312	1/2	0 - 10.6 GPH	0-11 GPH	SOA	FLANGE	MASS	SULFURIC ACID FEED SYSTEM	REMOVE EXISTING FLOW METER
FE-323	1/2	0 - 25.1 GPH	0 - 90 GPH	CL	FLANGE	MASS	SODIUM HYPOCHLORITE FEED SYSTEM	
FE-324	1/2	0 - 25.1 GPH	0 - 90 GPH	CL	FLANGE	MASS	SODIUM HYPOCHLORITE FEED SYSTEM	
FE-325	1/2	0 - 60.3 GPH	0 - 90 GPH	CL	FLANGE	MASS	SODIUM HYPOCHLORITE FEED SYSTEM	
14-FT-01	1-1/2	0 - 99,999.9 GAL	0 - 99,999.9 GAL	UW	FLANGE	TOTALIZER	CORROSION INHIBITOR FEED SYSTEM	
FE-640	1/2	0 - 31.6 GPH	0 - 40 GPH	CI	FLANGE	MASS	CORROSION INHIBITOR FEED SYSTEM	
15-ME-01	1/2	0 - 100 LBS/DAY	0 - 100 LBS/DAY	AM	COMPRESSION	AMMONIATOR	AMMONIA FEED SYSTEM	
15-ME-02	1/2	0 - 100 LBS/DAY	0 - 100 LBS/DAY	AM	COMPRESSION	AMMONIATOR	AMMONIA FEED SYSTEM	
15-FI-01	1-1/2	0-25 GPM	0-25 GPM	SUW	FNPT	ROTAMETER	SOFTENED UTILITY WATER SYSTEM	
FE-151	2	0-25 GPM	0-25 GPM	SUW	FLANGE	MAGNETIC	SOFTENED UTILITY WATER SYSTEM	
FE-152	1/2	0 - 100 LBS/DAY	0 - 100 LBS/DAY	AM	COMPRESSION	MASS	AMMONIA FEED SYSTEM	
FE-810	1/2	0 - 120 LBS/HR	0 - 150 LBS/HR	CO2	FLANGE	MASS	CO2 FEED SYSTEM	
FE-820	1/2	0 - 250 LBS/HR	0 - 300 LBS/HR	CO2	FLANGE	MASS	CO2 FEED SYSTEM	
FE-830	1/2	0 - 250 LBS/HR	0 - 300 LBS/HR	CO2	FLANGE	MASS	CO2 FEED SYSTEM	
FE-664	1/2	0 - 1.5 GPH	0 - 2 GPH	HF	FLANGE	MAGNETIC	FLUORIDE FEED SYSTEM	
FE-343	1/2	0 - 2.5 GPH	0 - 4 GPH	SCI	FLANGE	MASS	SCALE INHIBITOR SYSTEM	
FE-364	1/2	0 - 6 GPH	0 - 12 GPH	CS	FLANGE	MASS	CAUSTIC SODA	
FE-365	1/2	0 - 6 GPH	0 - 12 GPH	CS	FLANGE	MASS	CAUSTIC SODA	
FE-515	16	0 - 2,712 GPM	0 - 3,500 GPM	MC	FLANGE	MAGNETIC	CONCENTRATE INJECTION WELL	
FE-516	2	0 - 100 GPM	0 - 100 GPM	SA	FLANGE	MAGNETIC	DZMW / WELLHEAD CONTAINMENT SUMP	
FE-517	2	0 - 100 GPM	0 - 100 GPM	SA	FLANGE	MAGNETIC	DZMW / WELLHEAD CONTAINMENT SUMP	
08-MT-01	3	0 - 99,999.9 GAL	0 - 99,999.9 GAL	UW	FLANGE	TOTALIZER	CLEANING SYSTEM	
FE-546	8	0 - 1,100 GPM	0 - 1,100 GPM	MCS	FLANGE	MAGNETIC	CLEANING SYSTEM	
FE-700	6	0 - 1,200 GPM	0 - 1,200 GPM	PW	FLANGE	PROPELLER	UTILITY WATER SYSTEM	

NOTES:
1. SERVICE DESIGNATION: AM = AMMONIA, CI = CORROSION INHIBITOR, CL = CHLORINE SOLUTION, CO2 = CARBON DIOXIDE, CS = CAUSTIC SODA, FW = FILTERED WATER / FINISHED WATER , HF = HYDROFLUOROSILICIC ACID, MC= MEMBRANE CONCENTRATE, MCS = MEMBRANE CLEANING SUPPLY, MP = MEMBRANE PERMEATE, PW = POTABLE WATER, RW = RAW WATER, SA = SAMPLE, SCI = SCALE INHIBITOR, SOA = SULFURIC ACID, SUW = SOFTENED UTILITY WATER, UW = UTILITY WATER

CHECK VALVES

TAG NUMBER	TYPE	SIZE (INCHES)	MATERIAL	SERVICE	VALVE END	CLASS	LOCATION	REMARKS
02-V-46	SWING	10	SST	MF	WAFER	150	FIRST STAGE FEED PUMPS	
02-V-49	SWING	10	SST	MF	WAFER	150	FIRST STAGE FEED PUMPS	
02-V-52	SWING	10	SST	MF	WAFER	150	FIRST STAGE FEED PUMPS	
02-V-55	SWING	10	SST	MF	WAFER	150	FIRST STAGE FEED PUMPS	
02-V-58	SWING	10	SST	MF	WAFER	150	FIRST STAGE FEED PUMPS	
03-V-09	FLAPPER	10	SST	MP	LUG	150	MEMBRANE TRAIN 1	
03-V-23	FLAPPER	6	SST	MC	LUG	150	MEMBRANE TRAIN 1	
03-V-33	FLAPPER	10	SST	MP	LUG	150	MEMBRANE TRAIN 2	
03-V-46	FLAPPER	6	SST	MC	LUG	150	MEMBRANE TRAIN 2	
03-V-59	FLAPPER	10	SST	MP	LUG	150	MEMBRANE TRAIN 3	
03-V-73	FLAPPER	6	SST	MC	LUG	150	MEMBRANE TRAIN 3	
03-V-83	FLAPPER	10	SST	MP	LUG	150	MEMBRANE TRAIN 4	
03-V-96	FLAPPER	6	SST	MC	LUG	150	MEMBRANE TRAIN 4	
03-V-15	FLAPPER	16	SST	MP	LUG	150	MEMBRANE AREA	
03-V-18	FLAPPER	8	SST	BP	LUG	150	MEMBRANE AREA	
05-V-01	CENTER GUIDE	12	CI	FW	FLANGE	150	CLEARWELL TRANSFER PUMP	
05-V-03	CENTER GUIDE	12	CI	FW	FLANGE	150	CLEARWELL TRANSFER PUMP	
05-V-05	CENTER GUIDE	12	CI	FW	FLANGE	150	CLEARWELL TRANSFER PUMP	
05-V-07	CENTER GUIDE	12	CI	FW	FLANGE	150	CLEARWELL TRANSFER PUMP	
05-V-09	CENTER GUIDE	12	CI	FW	FLANGE	150	CLEARWELL TRANSFER PUMP	
06-V-13	SLANTING DISC	18	CI	FW	FLANGE	150	HIGH SERVICE PUMP STATION	
06-V-14	SLANTING DISC	18	CI	FW	FLANGE	150	HIGH SERVICE PUMP STATION	
06-V-15	SLANTING DISC	18	CI	FW	FLANGE	150	HIGH SERVICE PUMP STATION	
06-V-16	SLANTING DISC	18	CI	FW	FLANGE	150	HIGH SERVICE PUMP STATION	
06-V-17	SLANTING DISC	18	CI	FW	FLANGE	150	HIGH SERVICE PUMP STATION	
04-V-34	SWING	6	CI	CS/CL	FLANGE		ODOR SCRUBBER 1	
04-V-36	SWING	6	CI	CS/CL	FLANGE		ODOR SCRUBBER 1	
04-V-44	SWING	6	CI	CS/CL	FLANGE		ODOR SCRUBBER 2	
04-V-46	SWING	6	CI	CS/CL	FLANGE		ODOR SCRUBBER 2	
04-V-54	SWING	6	CI	CS/CL	FLANGE		ODOR SCRUBBER 3	
04-V-56	SWING	6	CI	CS/CL	FLANGE		ODOR SCRUBBER 3	
07-V-10	CENTER GUIDE	8	CI	SPD	FLANGE	150	CONCENTRATE SYSTEM	
07-V-12	CENTER GUIDE	8	CI	SPD	FLANGE	150	CONCENTRATE SYSTEM	
08-V-11	SWING	6	PVC	MCS	FLANGE	150	CLEANING SYSTEM	
08-V-13	SWING	6	PVC	MCS	FLANGE	150	CLEANING SYSTEM	

NOTES:
1. MATERIAL DESIGNATIONS: CI = CAST IRON, PVC = POLYVINYL CHLORIDE, SST = STAINLESS STEEL
2. SERVICE DESIGNATIONS: BP = BYPASS, CL = CHLORINE SOLUTION, CS = CAUSTIC SODA, FW = FILTERED WATER / FINISHED WATER, MCS = MEMBRANE CLEANING SUPPLY, MC = MEMBRANE CONCENTRATE, MF = MEMBRANE FEED, MP = MEMBRANE PERMEATE, SPD = SANITARY PROCESS DRAIN

REV	DATE	BY	DESCRIPTION

DESIGNED ECC
DRAWN DVP
CHECKED TFS/JSN
DATE DECEMBER 2016

carollo

Lee County Southwest Florida

LEE COUNTY UTILITIES
NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM
MECHANICAL
EQUIPMENT SCHEDULES 2

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

JOB NO. 10180C.10
DRAWING NO. GP-2

Plot Date: 06-DEC-2016 1:22:35 PM
User: svcPW
PlotScale: 2:1
DesignScript: Carollo_Std_Pen_v0905.pen
ColorTable: gshade.ctb
Model: Layout1
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GENERAL
Architectural Units
PROJECT NO. 10180C.10
FILE NAME: 10180C1000GP-2.dgn

PRESSURE GAUGES/TRANSMITTERS/SWITCHES

ID NO.	RANGE (PSIG)	SERVICE	TYPE	DIAPHRAGM REQUIRED	MOUNT DETAIL	LOCATION	REMARKS
PIT-122A	0 - 200 PSI	RW	-	YES	PANEL	SAND SEPARATORS	RELOCATE ON NEW PANEL
DPIT 122	0 - 50 PSI	RW	-	NO	PANEL	SAND SEPARATORS	RELOCATE ON NEW PANEL
PIT 126	0 - 200 PSI	RW	-	YES	PANEL	CHEMICAL FEED AREA	RELOCATE OUTSIDE OF PIPE TRENCH
PIT 126B	0 - 200 PSI	RW		YES	PANEL	CHEMICAL FEED AREA	
PI 132A	0 - 200 PSI	RW	LIQUID	YES	PIPE	CARTRIDGE FILTERS	INSTALL DIAPHRAM SEAL, REPLACE 1/2-INCH GAUGE PIPING
PI 132B	0 - 200 PSI	RW	LIQUID	YES	PIPE	CARTRIDGE FILTERS	INSTALL DIAPHRAM SEAL, REPLACE 1/2-INCH GAUGE PIPING
PI 132C	0 - 200 PSI	RW	LIQUID	YES	PIPE	CARTRIDGE FILTERS	INSTALL DIAPHRAM SEAL, REPLACE 1/2-INCH GAUGE PIPING
PI 132D	0 - 200 PSI	FW	LIQUID	YES	PIPE	CARTRIDGE FILTERS	INSTALL DIAPHRAM SEAL, REPLACE 1/2-INCH GAUGE PIPING
PI 132E	0 - 200 PSI	FW	LIQUID	YES	PIPE	CARTRIDGE FILTERS	INSTALL DIAPHRAM SEAL, REPLACE 1/2-INCH GAUGE PIPING
PI 132F	0 - 200 PSI	FW	LIQUID	YES	PIPE	CARTRIDGE FILTERS	INSTALL DIAPHRAM SEAL, REPLACE 1/2-INCH GAUGE PIPING
DPIT 132	0 - 25 PSI	RW	-	NO	PIPE	CARTRIDGE FILTERS	
PI 140	0 - 200 PSI	RW	LIQUID	YES	PIPE	RAW WATER SAMPLE PANEL	
PI 150	0 - 100 PSI	SUW	LIQUID	YES	PIPE	STORAGE BUILDING	
PI 151A	0 - 100 PSI	SUW	LIQUID	YES	PIPE	STORAGE BUILDING	
PI 151B	0 - 100 PSI	SUW	LIQUID	YES	PIPE	STORAGE BUILDING	
PIT 151	0 - 100 PSI	SUW	-	YES	PIPE	AMMONIA BUILDING	
PSL 160	30 PSI	FW	-	YES	PIPE	FIRST STAGE FEED PUMPS	REPLACE EXISTING
PI 160A	0 - 160 PSI	FW	LIQUID	YES	PIPE	FIRST STAGE FEED PUMPS	REPLACE EXISTING
PSH 160	200 PSI	FW	-	YES	PIPE	FIRST STAGE FEED PUMPS	REPLACE EXISTING
PI 160B	0 - 250 PSI	FW	LIQUID	YES	PIPE	FIRST STAGE FEED PUMPS	REPLACE EXISTING
PSL 162	30 PSI	FW	-	YES	PIPE	FIRST STAGE FEED PUMPS	REPLACE EXISTING
PI 162A	0 - 160 PSI	FW	LIQUID	YES	PIPE	FIRST STAGE FEED PUMPS	REPLACE EXISTING
PSH 162	200 PSI	FW	-	YES	PIPE	FIRST STAGE FEED PUMPS	REPLACE EXISTING
PI 162B	0 - 250 PSI	FW	LIQUID	YES	PIPE	FIRST STAGE FEED PUMPS	REPLACE EXISTING
PSL 164	30 PSI	FW	-	YES	PIPE	FIRST STAGE FEED PUMPS	REPLACE EXISTING
PI 164A	0 - 160 PSI	FW	LIQUID	YES	PIPE	FIRST STAGE FEED PUMPS	REPLACE EXISTING
PSH 164	200 PSI	FW	-	YES	PIPE	FIRST STAGE FEED PUMPS	REPLACE EXISTING
PI 164B	0 - 250 PSI	FW	LIQUID	YES	PIPE	FIRST STAGE FEED PUMPS	REPLACE EXISTING
PSL 166	30 PSI	FW	-	YES	PIPE	FIRST STAGE FEED PUMPS	
PI 166A	0 - 160 PSI	FW	LIQUID	YES	PIPE	FIRST STAGE FEED PUMPS	
PSH 166	200 PSI	FW	-	YES	PIPE	FIRST STAGE FEED PUMPS	
PI 166B	0 - 250 PSI	FW	LIQUID	YES	PIPE	FIRST STAGE FEED PUMPS	
PSL 168	30 PSI	FW	-	YES	PIPE	FIRST STAGE FEED PUMPS	
PI 168A	0 - 160 PSI	FW	LIQUID	YES	PIPE	FIRST STAGE FEED PUMPS	
PSH 168	200 PSI	FW	-	YES	PIPE	FIRST STAGE FEED PUMPS	
PI 168B	0 - 250 PSI	FW	LIQUID	YES	PIPE	FIRST STAGE FEED PUMPS	
PIT 170A	0 - 200 PSI	MF	-	YES	PANEL	FIRST STAGE FEED PUMPS	RELOCATE OUTSIDE OF PIPE TRENCH, INSTALL DIAPHRAGM SEAL
PIT 170B	0 - 200 PSI	MF	-	YES	PANEL	FIRST STAGE FEED PUMPS	RELOCATE OUTSIDE OF PIPE TRENCH, INSTALL DIAPHRAGM SEAL
PIT 171A	0 - 200 PSI	MF	-	YES	PANEL	FIRST STAGE FEED PUMPS	
PIT 171B	0 - 200 PSI	MF	-	YES	PANEL	FIRST STAGE FEED PUMPS	
PI 200	0 - 300 PSI	MF, MC	LIQUID	YES	PANEL	MEMBRANE TRAIN 1	REPLACE EXISTING
PIT 200	0 - 250 PSI	MF	-	YES	PANEL	MEMBRANE TRAIN 1	REPLACE EXISTING
PIT 201	0 - 250 PSI	MC	-	YES	PANEL	MEMBRANE TRAIN 1	REPLACE EXISTING
PIT 211	0 - 300 PSI	MC	-	YES	PANEL	MEMBRANE TRAIN 1	REPLACE EXISTING
PI 204	0 - 50 PSI	MP	LIQUID	NO	PANEL	MEMBRANE TRAIN 1	REPLACE EXISTING
PSH 204	35 PSI	MP	-	NO	PANEL	MEMBRANE TRAIN 1	REPLACE EXISTING
PSH 203	260 PSI	MC	-	YES	PANEL	MEMBRANE TRAIN 1	REPLACE EXISTING
PSL 203	80 PSI	MC	-	YES	PANEL	MEMBRANE TRAIN 1	REPLACE EXISTING
PIT 207	0 - 300 PSI	MC	-	YES	PANEL	MEMBRANE TRAIN 1	REPLACE EXISTING
PI 220	0 - 300 PSI	MF, MC	LIQUID	YES	PANEL	MEMBRANE TRAIN 2	REPLACE EXISTING
PIT 220	0 - 250 PSI	MF	-	YES	PANEL	MEMBRANE TRAIN 2	REPLACE EXISTING
PIT 221	0 - 250 PSI	MC	-	YES	PANEL	MEMBRANE TRAIN 2	REPLACE EXISTING
PIT 231	0 - 300 PSI	MC	-	YES	PANEL	MEMBRANE TRAIN 2	REPLACE EXISTING
PI 224	0 - 50 PSI	MP	LIQUID	NO	PANEL	MEMBRANE TRAIN 2	REPLACE EXISTING
PSH 224	35 PSI	MP	-	NO	PANEL	MEMBRANE TRAIN 2	REPLACE EXISTING
PSH 223	260 PSI	MC	-	YES	PANEL	MEMBRANE TRAIN 2	REPLACE EXISTING
PSL 223	80 PSI	MC	-	YES	PANEL	MEMBRANE TRAIN 2	REPLACE EXISTING
PIT 227	0 - 300 PSI	MC	-	YES	PANEL	MEMBRANE TRAIN 2	REPLACE EXISTING
PI 240	0 - 300 PSI	MF, MC	LIQUID	YES	PANEL	MEMBRANE TRAIN 3	
PIT 240	0 - 250 PSI	MF	-	YES	PANEL	MEMBRANE TRAIN 3	
PIT 241	0 - 250 PSI	MC	-	YES	PANEL	MEMBRANE TRAIN 3	
PIT 251	0 - 300 PSI	MC		YES	PANEL	MEMBRANE TRAIN 3	
PI 244	0 - 50 PSI	MP	LIQUID	NO	PANEL	MEMBRANE TRAIN 3	
PSH 244	35 PSI	MP	-	NO	PANEL	MEMBRANE TRAIN 3	
PSH 243	260 PSI	MC	-	YES	PANEL	MEMBRANE TRAIN 3	
PSL 243	80 PSI	MC	-	YES	PANEL	MEMBRANE TRAIN 3	
PIT 247	0 - 300 PSI	MC	-	YES	PANEL	MEMBRANE TRAIN 3	
PI 260	0 - 300 PSI	MF, MC	LIQUID	YES	PANEL	MEMBRANE TRAIN 4	
PIT 260	0 - 250 PSI	MF		YES	PANEL	MEMBRANE TRAIN 4	
PIT 261	0 - 250 PSI	MC	-	YES	PANEL	MEMBRANE TRAIN 4	
PIT 271	0 - 300 PSI	MC	-	YES	PANEL	MEMBRANE TRAIN 4	
PI 264	0 - 50 PSI	MP	LIQUID	NO	PANEL	MEMBRANE TRAIN 4	
PSH 264	35 PSI	MP	-	NO	PANEL	MEMBRANE TRAIN 4	
PSH 263	260 PSI	MC	-	YES	PANEL	MEMBRANE TRAIN 4	
PSL 263	80 PSI	MC	-	YES	PANEL	MEMBRANE TRAIN 4	
PIT 267	0 - 300 PSI	MC	-	YES	PANEL	MEMBRANE TRAIN 4	
PI 134A	0 - 100 PSI	BP	LIQUID	YES	PIPE	RAW WATER BLEND CARTRIDGE FILTER	
PI 134A	0 - 100 PSI	BP	LIQUID	YES	PIPE	RAW WATER BLEND CARTRIDGE FILTER	
DPIT 134	0 - 25 PSI	BP	-	NO	PIPE	RAW WATER BLEND CARTRIDGE FILTER	
DPI 400	0 - 5 IN H20	OG	AIR	NO	PANEL	DEGASIFIER 1	
DPI 401	0 - 5 IN H20	OG	AIR	NO	PANEL	DEGASIFIER 2	
PSH 408	36 PSI INC.	FW		YES	PIPE	CLEARWELL TRANSFER PUMP	
PI 408	0 - 160	FW	LIQUID	YES	PIPE	CLEARWELL TRANSFER PUMP	
PSH 407	36 PSI INC.	FW		YES	PIPE	CLEARWELL TRANSFER PUMP	
PI 407	0 - 160	FW	LIQUID	YES	PIPE	CLEARWELL TRANSFER PUMP	
PSH 413	36 PSI INC.	FW		YES	PIPE	CLEARWELL TRANSFER PUMP	
PI 413	0 - 160	FW	LIQUID	YES	PIPE	CLEARWELL TRANSFER PUMP	
PSH 414	36 PSI INC.	FW		YES	PIPE	CLEARWELL TRANSFER PUMP	
PI 414	0 - 160	FW	LIQUID	YES	PIPE	CLEARWELL TRANSFER PUMP	
PSH 415	36 PSI INC.	FW		YES	PIPE	CLEARWELL TRANSFER PUMP	
PI 415	0 - 160	FW	LIQUID	YES	PIPE	CLEARWELL TRANSFER PUMP	
PIT 412	0-50 PSI	FW	LIQUID	NO	PIPE	FIELD POST TREATMENT PANEL	
PSL 420	2.5 PSI	FW	LIQUID	YES	PIPE	HIGH SERVICE PUMP STATION	
PI 420A	0 - 30 PSI	FW	LIQUID	NO	PIPE	HIGH SERVICE PUMP STATION	
PSH 420	12 PSI INC.	FW	LIQUID	YES	PIPE	HIGH SERVICE PUMP STATION	
PI 420B	0 - 200 PSI	FW	LIQUID	YES	PIPE	HIGH SERVICE PUMP STATION	
PSL 424	2.5 PSI	FW	LIQUID	YES	PIPE	HIGH SERVICE PUMP STATION	
PI 424A	0 - 30 PSI	FW	LIQUID	NO	PIPE	HIGH SERVICE PUMP STATION	
PSH 424	12 PSI INC.	FW	LIQUID	YES	PIPE	HIGH SERVICE PUMP STATION	
PI 424B	0 - 200 PSI	FW	LIQUID	YES	PIPE	HIGH SERVICE PUMP STATION	
PSL 428	2.5 PSI	FW	LIQUID	YES	PIPE	HIGH SERVICE PUMP STATION	
PI 428A	0 - 30 PSI	FW	LIQUID	NO	PIPE	HIGH SERVICE PUMP STATION	
PSH 428	12 PSI INC.	FW	LIQUID	YES	PIPE	HIGH SERVICE PUMP STATION	
PI 428B	0 - 200 PSI	FW	LIQUID	YES	PIPE	HIGH SERVICE PUMP STATION	
PSL 432	2.5 PSI	FW	LIQUID	YES	PIPE	HIGH SERVICE PUMP STATION	
PI 432A	0 - 30 PSI	FW	LIQUID	NO	PIPE	HIGH SERVICE PUMP STATION	
PSH 432	12 PSI INC.	FW	LIQUID	YES	PIPE	HIGH SERVICE PUMP STATION	
PI 432B	0 - 200 PSI	FW	LIQUID	YES	PIPE	HIGH SERVICE PUMP STATION	
PSL 436	2.5 PSI	FW	LIQUID	YES	PIPE	HIGH SERVICE PUMP STATION	
PI 436A	0 - 30 PSI	FW	LIQUID	NO	PIPE	HIGH SERVICE PUMP STATION	
PSH 436	12 PSI INC.	FW	LIQUID	YES	PIPE	HIGH SERVICE PUMP STATION	

PRESSURE GAUGES/TRANSMITTERS/SWITCHES

ID NO.	RANGE (PSIG)	SERVICE	TYPE	DIAPHRAGM REQUIRED	MOUNT DETAIL	LOCATION	REMARKS
PI 436B	0 - 200 PSI	FW	LIQUID	YES	PIPE	HIGH SERVICE PUMP STATION	
PIT 431 A	0 - 200	FW		YES	PIPE	HIGH SERVICE PUMP STATION	
PIT 431B	0 - 200	FW		YES	PIPE	HIGH SERVICE PUMP STATION	
DPI 501	0 - 6 IN H2O	OG	AIR	NO	PIPE	ODOR SCRUBBER 1	
DPI 505	0 - 6 IN H2O	OG	AIR	NO	PIPE	ODOR SCRUBBER 2	
DPI 509	0 - 6 IN H2O	OG	AIR	NO	PIPE	ODOR SCRUBBER 3	
PSL 504A		CS/CL	LIQUID	YES	PIPE	ODOR CONTROL SYSTEM	
PI 504A	-30 - 30 PSI	CS/CL	LIQUID	YES	PIPE	ODOR CONTROL SYSTEM	
PSH 504B		CS/CL	LIQUID	YES	PIPE	ODOR CONTROL SYSTEM	
PI 504B	0 - 60 PSI	CS/CL	LIQUID	YES	PIPE	ODOR CONTROL SYSTEM	
PSL 508 A		CS/CL	LIQUID	YES	PIPE	ODOR CONTROL SYSTEM	
PI 508A	-30 - 30 PSI	CS/CL	LIQUID	YES	PIPE	ODOR CONTROL SYSTEM	
PSH 508B		CS/CL	LIQUID	YES	PIPE	ODOR CONTROL SYSTEM	
PI 508B	0 - 60 PSI	CS/CL	LIQUID	YES	PIPE	ODOR CONTROL SYSTEM	
PSL 512A		CS/CL	LIQUID	YES	PIPE	ODOR CONTROL SYSTEM	
PI 512A	-30 - 30 PSI	CS/CL	LIQUID	YES	PIPE	ODOR CONTROL SYSTEM	
PSH 512A		CS/CL	LIQUID	YES	PIPE	ODOR CONTROL SYSTEM	
PI 512A	0 - 60 PSI	CS/CL	LIQUID	YES	PIPE	ODOR CONTROL SYSTEM	
PI 312	0 - 160 PSI	SOA	LIQUID	YES	PIPE	SULFURIC ACID FEED SYSTEM	REPLACE EXISTING WITH SKID MOUNTED INSTRUMENT
PI 313	0 - 160 PSI	SOA	LIQUID	YES	PIPE	SULFURIC ACID FEED SYSTEM	REPLACE EXISTING WITH SKID MOUNTED INSTRUMENT
PI 319	0 - 160 PSI	CL	LIQUID	YES	PIPE	SODIUM HYPOCHLORITE FEED SYSTEM	
PI 320	0 - 160 PSI	CL	LIQUID	YES	PIPE	SODIUM HYPOCHLORITE FEED SYSTEM	
PI 321	0 - 160 PSI	CL	LIQUID	YES	PIPE	SODIUM HYPOCHLORITE FEED SYSTEM	
PI 322	0 - 160 PSI	CL	LIQUID	YES	PIPE	SODIUM HYPOCHLORITE FEED SYSTEM	
PI 323	0 - 160 PSI	CL	LIQUID	YES	PIPE	SODIUM HYPOCHLORITE FEED SYSTEM	
PI 324	0 - 160 PSI	CL	LIQUID	YES	PIPE	SODIUM HYPOCHLORITE FEED SYSTEM	
PI 325	0 - 160 PSI	CL	LIQUID	YES	PIPE	SODIUM HYPOCHLORITE FEED SYSTEM	
PI 343	0 - 160 PSI	SCI	LIQUID	YES	PIPE	SCALE INHIBITOR FEED SYSTEM	
PI 344	0 - 160 PSI	SCI	LIQUID	YES	PIPE	SCALE INHIBITOR FEED SYSTEM	
PI 345	0 - 160 PSI	SCI	LIQUID	YES	PIPE	SCALE INHIBITOR FEED SYSTEM	
PI 360	0 - 160 PSI	CS	LIQUID	YES	PIPE	CAUSTIC SODA FEED SYSTEM	
PI 361	0 - 160 PSI	CS	LIQUID	YES	PIPE	CAUSTIC SODA FEED SYSTEM	
PI 362	0 - 160 PSI	CS	LIQUID	YES	PIPE	CAUSTIC SODA FEED SYSTEM	
PI 363	0 - 160 PSI	CS	LIQUID	YES	PIPE	CAUSTIC SODA FEED SYSTEM	
PI 364	0 - 160 PSI	CS	LIQUID	YES	PIPE	CAUSTIC SODA FEED SYSTEM	
PI 365	0 - 160 PSI	CS	LIQUID	YES	PIPE	CAUSTIC SODA FEED SYSTEM	
PI 366	0 - 160 PSI	CS	LIQUID	YES	PIPE	CAUSTIC SODA FEED SYSTEM	
PI 637	0 - 160 PSI	CI	LIQUID	YES	PIPE	CORROSION INHIBITOR FEED SYSTEM	
PI 638	0 - 160 PSI	CI	LIQUID	YES	PIPE	CORROSION INHIBITOR FEED SYSTEM	
PI 642	0 - 400 PSI	AM	GAS	NO	PIPE	AMMONIA FEED SYSTEM	
PSL 643	25 PSIG	AM	GAS	NO	PIPE	AMMONIA FEED SYSTEM	
PI 643	0 - 100 PSI	AM	GAS	NO	PIPE	AMMONIA FEED SYSTEM	
PI 646	0-30 IN HG	AM	GAS	NO	PIPE	AMMONIA FEED SYSTEM	
PI 648	0-30 IN HG	AM	GAS	NO	PIPE	AMMONIA FEED SYSTEM	
PSL 648	0-30 IN HG	AM	GAS	NO	PANEL	AMMONIA FEED SYSTEM	
PSH 648	0-30 IN HG	AM	GAS	NO	PANEL	AMMONIA FEED SYSTEM	
PI 652	0-30 IN HG	AM	GAS	NO	PIPE	AMMONIA FEED SYSTEM	
PSL 652	0-30 IN HG	AM	GAS	NO	PANEL	AMMONIA FEED SYSTEM	
PSH 652	0-30 IN HG	AM	GAS	NO	PANEL	AMMONIA FEED SYSTEM	
PI 654	0 - 100 PSI	AM	LIQUID	NO	PIPE	AMMONIA FEED SYSTEM	
PI 670	0 - 160 PSI	HF	LIQUID	YES	PIPE	FLUORIDE FEED SYSTEM	
PI 671	0 - 160 PSI	HF	LIQUID	YES	PIPE	FLUORIDE FEED SYSTEM	
PI 801A	0 - 600 PSI	CO2	AIR	NO	PIPE	CO2 STORAGE TANKS	
PSL 801	235 PSI	CO2	AIR	NO	PIPE	CO2 STORAGE TANKS	
PSH 801	325 PSI	CO2	AIR	NO	PIPE	CO2 STORAGE TANKS	
PI 801B	0 - 400 PSI	CO2	AIR	NO	PIPE	CO2 STORAGE TANKS	
PI 802A	0 - 600 PSI	CO2	AIR	NO	PIPE	CO2 STORAGE TANKS	
PSL 802	235 PSI	CO2	AIR	NO	PIPE	CO2 STORAGE TANKS	
PSH 802	325 PSI	CO2	AIR	NO	PIPE	CO2 STORAGE TANKS	
PI 801B	0 - 400 PSI	CO2	AIR	NO	PIPE	CO2 STORAGE TANKS	
PIT 801	0 - 400 PSI	CO2	AIR	NO	PIPE	CO2 STORAGE TANKS	
PI 810	0 - 400 PSI	CO2	AIR	NO	PANEL	CO2 FEED SYSTEM (CHLORINE CONTACT BASIN)	
PI 811	0 - 200 PSI	CO2	AIR	NO	PANEL	CO2 FEED SYSTEM (CHLORINE CONTACT BASIN)	
PI 812	0 - 30 PSI	CO2	LIQUID	NO	PIPE	CO2 FEED SYSTEM (CHLORINE CONTACT BASIN)	
PI 813	0 - 160 PSI	CO2	LIQUID	NO	PIPE	CO2 FEED SYSTEM (CHLORINE CONTACT BASIN)	
PI 814	0 - 160 PSI	CO2	LIQUID	NO	PANEL	CO2 FEED SYSTEM (CHLORINE CONTACT BASIN)	
PI 815	0 - 160 PSI	CO2	LIQUID	NO	PANEL	CO2 FEED SYSTEM (CHLORINE CONTACT BASIN)	
PI 820	0 - 400 PSI	CO2	AIR	NO	PANEL	CO2 FEED SYSTEM (PRE-DEGASIFIER)	
PI 821	0 - 200 PSI	CO2	AIR	NO	PANEL	CO2 FEED SYSTEM (PRE-DEGASIFIER)	
PI 822	0 - 30 PSI	CO2	LIQUID	NO	PIPE	CO2 FEED SYSTEM (PRE-DEGASIFIER)	
PI 823	0 - 160 PSI	CO2	LIQUID	NO	PIPE	CO2 FEED SYSTEM (PRE-DEGASIFIER)	
PI 824	0 - 160 PSI	CO2	LIQUID	NO	PANEL	CO2 FEED SYSTEM (PRE-DEGASIFIER)	
PI 825	0 - 160 PSI	CO2	LIQUID	NO	PANEL	CO2 FEED SYSTEM (PRE-DEGASIFIER)	
PI 830	0 - 400 PSI	CO2	AIR	NO	PANEL	CO2 FEED SYSTEM (STANDBY)	
PI 831	0 - 200 PSI	CO2	AIR	NO	PANEL	CO2 FEED SYSTEM (STANDBY)	
PI 832	0 - 30 PSI	CO2	LIQUID	NO	PIPE	CO2 FEED SYSTEM (STANDBY)	
PI 833	0 - 160 PSI	CO2	LIQUID	NO	PIPE	CO2 FEED SYSTEM (STANDBY)	
PI 834	0 - 160 PSI	CO2	LIQUID	NO	PANEL	CO2 FEED SYSTEM (STANDBY)	
PI 835	0 - 160 PSI	CO2	LIQUID	NO	PANEL	CO2 FEED SYSTEM (STANDBY)	
PI 590	0 - 200 PSI	PA	AIR	NO	PIPE	AIR COMPRESSOR SYSTEM	
PIT 590	0 - 200 PSI	PA	AIR	NO	PIPE	AIR COMPRESSOR SYSTEM	
PIT 596	0 - 200 PSI	PA	AIR	NO	PIPE	AIR COMPRESSOR SYSTEM	
DPIT 510	0 - 60 IN H2O	PA	AIR	YES	PIPE	CONCENTRATE SYSTEM SURGE TANK	
PIT 510	0 - 275 PSI	PA	AIR	YES	PIPE	CONCENTRATE SYSTEM SURGE TANK	
PIT 514	0 - 100 PSI	PA	AIR	YES	PIPE	CONCENTRATE SYSTEM	
PIT 512	0 - 100 PSI	MC	LIQUID	YES	PIPE	CONCENTRATE SYSTEM	
PIT 513	0 - 100 PSI	MC	LIQUID	YES	PIPE	CONCENTRATE SYSTEM	
PSH 524	15 PSI	MCS		YES	PIPE	CLEANING SYSTEM	
PI 524	0 - 60 PSI	MCS	LIQUID	YES	PIPE	CLEANING SYSTEM	
PSL 536	0 PSI	MCS		YES	PIPE	CLEANING SYSTEM	
PSH 536	75 PSI	MCS		YES	PIPE	CLEANING SYSTEM	
PI 536B	0 - 200 PSI	MCS	LIQUID	YES	PIPE	CLEANING SYSTEM	
PSL 538	0 PSI	MCS		YES	PIPE	CLEANING SYSTEM	
PSH 538	75 PSI	MCS		YES	PIPE	CLEANING SYSTEM	
PI 538B	0 - 200 PSI	MCS	LIQUID	YES	PIPE	CLEANING SYSTEM	
DPIT 544	0 - 15 PSI	MCS			PIPE	CLEANING SYSTEM	
PI 544B	0 - 200 PSI	MCS	LIQUID	YES	PANEL	CLEANING SYSTEM	RELOCATE OUT OF PIPE TRENCH
PSH 548	75 PSI	MCS		YES	PANEL	CLEANING SYSTEM	RELOCATE OUT OF PIPE TRENCH
PSH 557	100 PSI	SCV	LIQUID	YES	PIPE	SCAVENGER SYSTEM	
PI 557	0 - 100 PSIG	SCV	LIQUID	YES	PIPE	SCAVENGER SYSTEM	
PSH 558	100 PSI	SCV	LIQUID	YES	PIPE	SCAVENGER SYSTEM	
PI 558	0 - 100 PSIG	SCV	LIQUID	YES	PIPE	SCAVENGER SYSTEM	

NOTES:
1. INSTALL PRESSURE INSTRUMENTS PER THE TYPICAL DETAILS PROVIDED IN THE INSTRUMENTATION DWGS.
2. SERVICE DESIGNATIONS: AM = ANYHYDROUS AMMONIA; BP = BYPASS; CI = CORROSION INHIBITOR; CL = CHLORINE SOLUTION; CS = CAUSTIC SODA; FW = FILTERED / FINISHED WATER;
HF = HYDROFLUOSILICIC ACID; MC = MEMBRANE CONCENTRATE; MCS = MEMBRANE CLEANING SUPPLY; MF = MEMBRANE FEED; MP = MEMBRANE PERMEATE; OG = OFF GAS;
PA = PLANT AIR; RW = RAW WATER; SA = SAMPLE LINE; SCV = SCAVENGER SYSTEM DISCHARGE; SCI = SCALE INHIBITOR; SOA = SULFURIC ACID; SUW = SOFTENED UTILITY WATER;
UW = UTILITY WATER (NON-POTABLE)

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Lee County Southwest Florida

LEE COUNTY UTILITIES
NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM
MECHANICAL
EQUIPMENT SCHEDULES 4

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
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JOB NO. 10180C.10
DRAWING NO. GP-4

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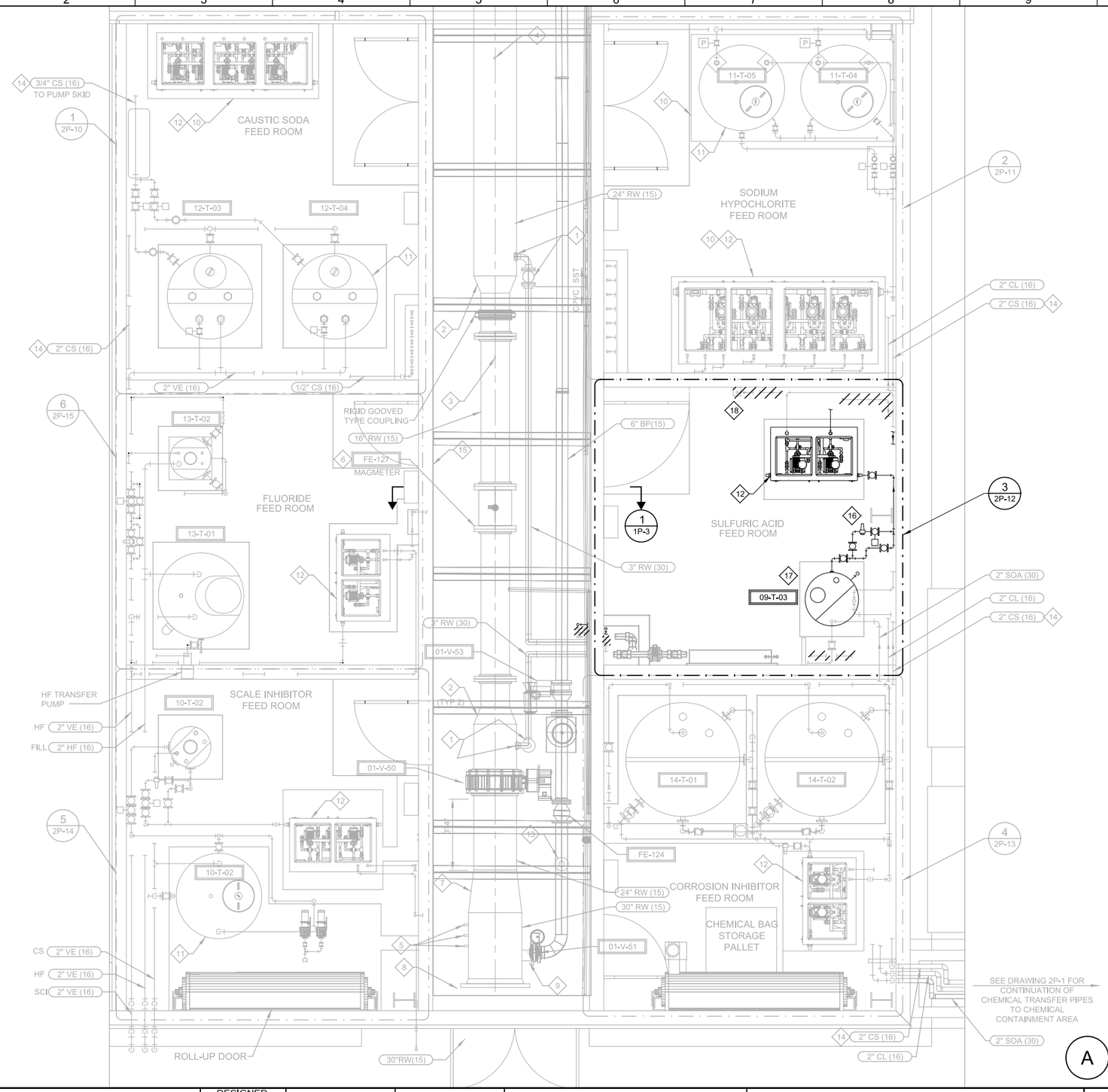

GENERAL NOTES

1. REFER TO GENERAL MECHANICAL NOTES FOR ADDITIONAL INFORMATION AND REQUIREMENTS. SEE DRAWING G-07.
2. FOR CONTINUATION OF PIPING OUTSIDE OF STRUCTURE, SEE CIVIL DRAWINGS.
3. SEE INSTRUMENTATION AND ELECTRICAL SHEETS FOR INSTRUMENTATION LOCATION.
4. CHEMICAL INJECTION PIPING TO BE ROUTED IN PROCESS TRENCH TO INJECTION POINTS PER DETAIL 2/1P-3.
5. ALL NEW CHEMICAL INJECTION LINES WITHIN CONTAINMENT AREA AND PROCESS TRENCH TO BE 1/2" DIA.
6. PROVIDE PNEUMATICALLY ACTUATED QUARTER-TURN ISOLATION VALVE WITH MANUAL BYPASS IN ALL CHEMICAL INJECTION LINES. ISOLATION VALVE TO BE LOCATED WITHIN CHEMICAL FEED ROOM.
7. FIELD ROUTE ALL SAMPLE WATER LINES TO SAMPLE PANEL.
8. FIELD ROUTE INSTRUMENT AIR TO PNEUMATICALLY ACTIVATED VALVES.

KEY NOTES

1. FURNISH AND INSTALL 3" SST WELDED OUTLET, 3" SST PIPE, 3" SST BALL VALVE, 3" 90° SST ELBOW, 3" SST WELDNECK FLANGE, PIPE LENGTH AS REQUIRED. FOR PIPE MATERIAL TRANSITION PROVIDE 3" CPVC VAN-STONE STYLE FLANGE. INSTALL THE SOUTH VAN-STONE STYLE FLANGE IN THE VERTICAL SECTION OF THE PIPE.
2. FURNISH AND INSTALL NEW 24" X 16" CONCENTRIC REDUCER. REDUCER CONTRACTION ANGLE SHALL BE A MINIMUM OF 45°.
3. FURNISH AND INSTALL FLANGED CONNECTIONS FOR FUTURE ORIFICE PLATE. PROVIDE AND INSTALL A BLANK SPACER FOR FUTURE ORIFICE PLATE INSTALLATION.
4. FURNISH AND INSTALL 3/4" 150# NPT THREADED HALF COUPLING. TAP FOR RAW WATER SAMPLE PANEL SUPPLY PIPE.
5. FURNISH AND INSTALL 1/2" 150# NPT THREADED HALF COUPLING. TAP IN RAW WATER PIPE FOR PRESSURE AND TEMPERATURE. RELOCATE EXISTING TRANSMITTERS OUT OF PROCESS TRENCH.
6. SALVAGE EXISTING MAGNETIC FLOW METER FOR REUSE IN NEW PIPING.
7. FURNISH AND INSTALL 30" X 24" CONCENTRIC REDUCER.
8. CONTRACTOR TO CONNECT TO EXISTING SST PIPE BACKING FLANGE CONNECTION.
9. FURNISH AND INSTALL NEW 6" SST OUTLET WITH 6" SST WELD NECK FLANGE ALIGN AND CONNECT WITH EXISTING VALVE.
10. CONTRACTOR TO PROVIDE NEW CONCRETE PAD OF APPROPRIATE SIZE FOR NEW PUMP SKID/DAY TANKS.
11. FURNISH AND INSTALL NEW TANK PER REQUIREMENTS OF SECTION 13208.
12. **FURNISH AND INSTALL NEW METERING PUMP SKID PER REQUIREMENTS OF SECTION 43_33_20.01.**
13. PROVIDE 3" SST WELDED OUTLET WITH BLIND FLANGE FOR FUTURE PILOT TESTING.
14. REPLACE ALL EXISTING CAUSTIC SODA PIPING WITH SCHEDULE 80 PVC.
15. REMOVE EXISTING SCI MASS FLOW METER AND RETURN TO OWNER.
16. HAYWARD 3/4" SIMPLEX BASKET STRAINER. STRAINER SHALL BE OF CPVC WITH FPM SEALS AND CPVC BASKET SCREEN (1/32" PERFORATIONS). MANUFACTURER SHALL CONFIRM CHEMICAL COMPATABILITY WITH 93% SULFURIC ACID.
17. PROVIDE NEW SULFURIC ACID DAY TANK TO MATCH EXISTING SIZE PER SPECIFICATION 43_41_43. TANK SHALL BE CONSTRUCTED OF SPECIAL SULFURIC ACID RESIN TO RESIST OPTICAL DEGRADATION. EXISTING LINES SHALL BE CONNECTED TO NEW TANK.
18. REMOVE EXISTING MASS FLOW METER AND EXISTING SULFURIC ACID FEED PIPING FOR RO FEED (PRETREATMENT), BLENDED PERMEATE, AND SCAVENGER PIT.

A CHEMICAL FEED AREA - PLAN

SCALE: 3/8" = 1'-0"
FILE: 8367A40_6P-M-102

REV	DATE	BY	DESCRIPTION

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DATE DECEMBER 2016

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Lee County Southwest Florida

LEE COUNTY UTILITIES
NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM
MECHANICAL
PROCESS BUILDING - CHEMICAL ROOM PLANS

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
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JOB NO. 10180C.10
DRAWING NO. 1P-2

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Model: Layout1
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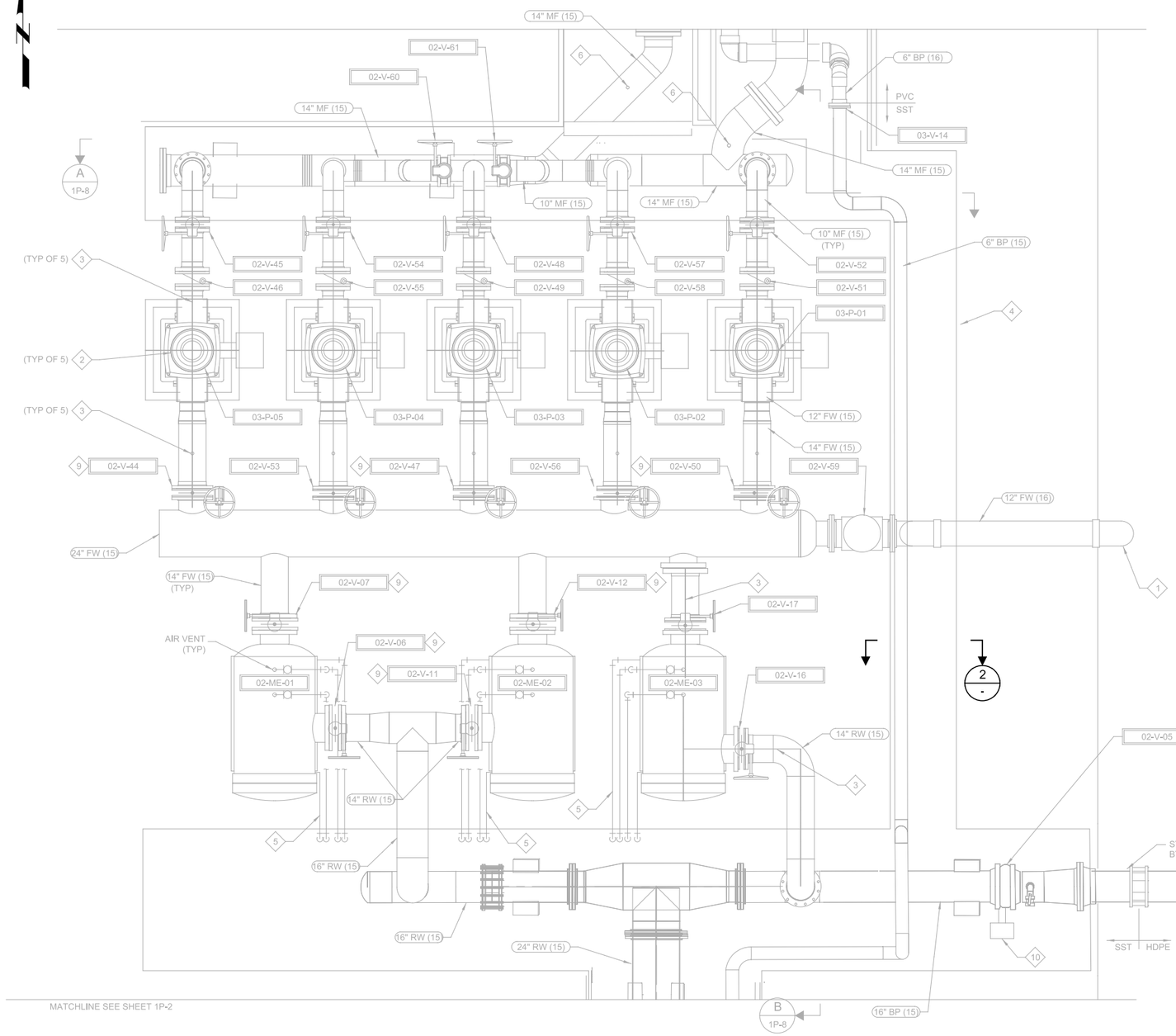
GENERAL
Architectural Units
PROJECT NO. 10180C.10
FILE NAME: 10180C10001P-2.dgn

GENERAL NOTES

1. REFER TO GENERAL MECHANICAL NOTES FOR ADDITIONAL INFORMATION AND REQUIREMENTS. SEE DRAWING G-07.
2. SEE INSTRUMENTATION AND ELECTRICAL SHEETS FOR INSTRUMENTATION LOCATION.
3. 100 YEAR STORM EVENT AT ELEVATION 21.64. PROCESS AREA FINISHED FLOOR AT 24.00. ALL PUMPS TO BE PLACED AT ELEVATION 24.50 OR HIGHER.
4. REFER TO INSTRUMENTATION SHEETS FOR LOCATIONS OF PRESSURE GAUGES. SEE EQUIPMENT SCHEDULE RANGE AND MOUNTING DETAILS FOR INDIVIDUAL GAUGES.

KEY NOTES

1. PROVIDE 36-INCH AIR GAP AT SURGE RELIEF DISCHARGE.
2. PROVIDE NEW 250 HP RO FEED PUMPS IN EXISTING PUMP CANS. FURNISH PUMPS WITH 3/4" NPT HIGH POINT VENT ON PUMP DISCHARGE ASSEMBLY TO PROVIDE VENTING OF CAN.
3. PRESSURE INSTRUMENT. REFER TO EQUIPMENT SCHEDULE FOR RANGE AND MOUNTING DETAIL.
4. FIELD ROUTE 1/2" DIAMETER CHEMICAL INJECTION LINES IN PROCESS TRENCH. WHERE POSSIBLE, INJECTION LINES TO BE SECURED VERTICALLY TO SIDE OF FRP CHANNEL SUPPORT. ALTERNATIVELY, INJECTION LINES MAY BE SECURED VERTICALLY TO SIDE OF TRENCH WALL.
5. ROUTE CARTRIDGE FILTER HOUSING DRAINS AND AIR VENT DISCHARGE PIPING TO PROCESS TRENCH. MAINTAIN 6" AIR GAP.
6. FURNISH AND INSTALL 1/2" 150# APT THREADED HALF COUPLING. TAP FOR PRESSURE TRANSMITTER. LOCATE PRESSURE TRANSMITTER OUT OF PROCESS TRENCH.
7. MOUNT 1/2" CHEMICAL INJECTION PIPES ON FRP CHANNEL SUPPORT. CENTER LINES OF INJECTION PIPES TO BE AT 2-1/2" APART ALONG SUPPORT. CHANNEL SUPPORT TO BE "STRUT TECH SERIES UVF202N" OR EQUAL.
8. REPLACE EXISTING MOTORIZED ACTUATOR WITH PNEUMATIC ACTUATOR.
9. REPLACE MANUAL VALVE ACTUATOR ON EXISTING 14-INCH BUTTERFLY VALVES. REPLACEMENT ACTUATORS TO BE DEZURIK MODEL GS-6A-HD12.
10. REPLACE EXISTING MOTORIZED VALVE ACTUATOR WITH PNEUMATIC ACTUATOR.
11. MOUNT 3/4" CHEMICAL INJECTION PIPE ON FRP CHANNEL SUPPORT. CENTER LINES OF INJECTION PIPES TO BE AT LEAST 2 1/2" APART ALONG SUPPORT.
12. REMOVE EXISTING SULFURIC ACID LINES.



A CARTRIDGE FILTERS AND FIRST STAGE FEED PUMPS - PLAN
SCALE: 3/8" = 1'-0"
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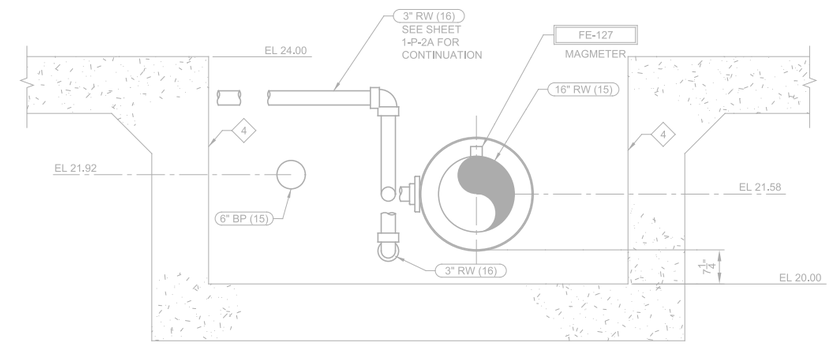

1 1P-2 PROCESS TRENCH - SECTION
SCALE: 3/4" = 1'-0"
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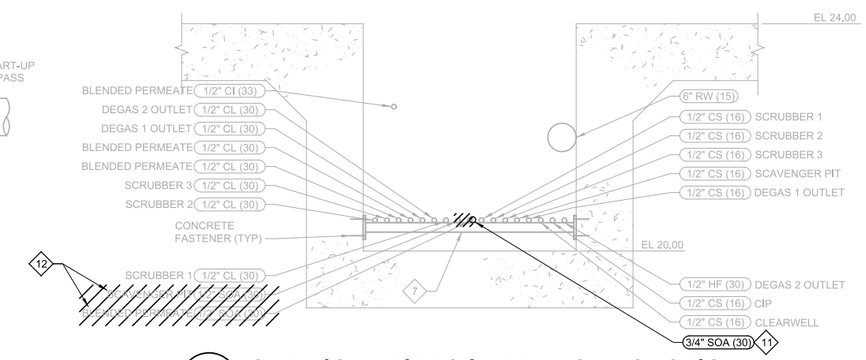

2 - CHEMICAL PIPES IN TRENCH - SECTION
SCALE: 1" = 1'-0"
FILE: -

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LEE COUNTY UTILITIES
NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM
MECHANICAL
PROCESS BUILDING - CARTRIDGE FILTERS AND FIRST STAGE FEED PUMPS

VERIFY SCALES
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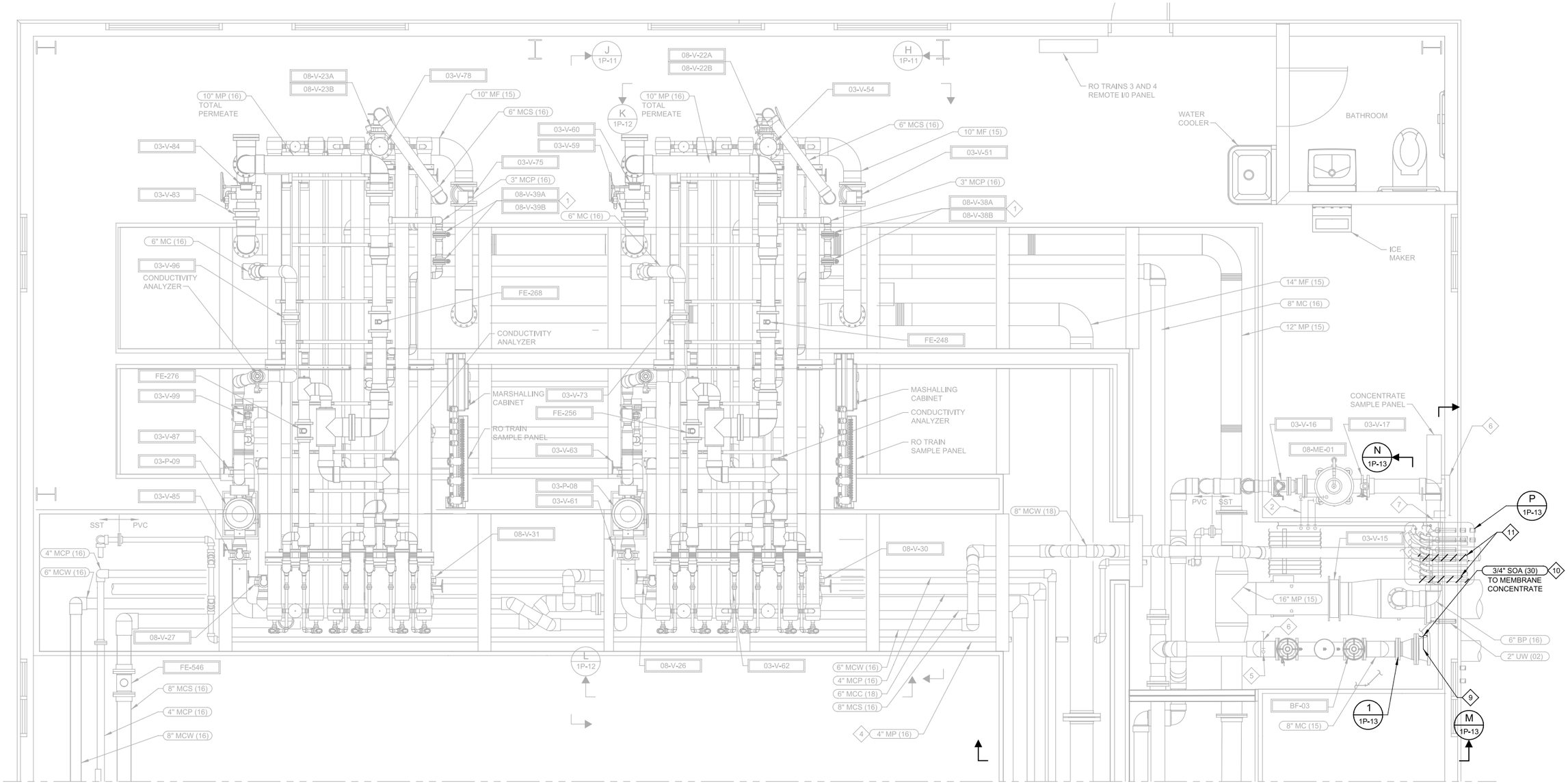

GENERAL NOTES

1. REFER TO GENERAL MECHANICAL NOTES FOR ADDITIONAL INFORMATION AND REQUIREMENTS. SEE DRAWING G-07.
2. SEE INSTRUMENTATION AND ELECTRICAL SHEETS FOR INSTRUMENTATION LOCATION.
3. 100 YEAR STORM EVENT AT ELEVATION 21.64. PROCESS AREA FINISHED FLOOR AT 24.00. ALL PUMPS TO BE PLACED AT ELEVATION 24.50 OR HIGHER.
4. REFER TO INSTRUMENTATION SHEETS FOR LOCATIONS OF PRESSURE GAUGES. SEE EQUIPMENT SCHEDULE RANGE AND MOUNTING DETAILS FOR INDIVIDUAL GAUGES.

KEY NOTES

1. PROVIDE MINIMUM 6" AIR GAP AT CONNECTION OF NEW 3" MEMBRANE CLEANING PERMEATE PIPE TO CIP SYSTEM.
2. ROUTE CARTRIDGE FILTER HOUSING DRAINS AND AIR VENT DISCHARGE PIPING TO TRENCH. PROVIDE FLEXIBLE CONNECTION WITH QUICK DISCONNECT COUPLINGS IN AIR VENT DISCHARGE PIPING AT TOP OF HOUSING. MAINTAIN 6" AIR GAP FOR ALL DRAINS AT PROCESS TRENCH.
3. FIELD ROUTE 1/2" CHEMICAL INJECTION LINES IN PROCESS TRENCH. WHERE POSSIBLE, INJECTION LINES TO BE SECURED VERTICALLY TO SIDE OF FRP CHANNEL. ALTERNATIVELY, INJECTION LINES MAY BE SECURED VERTICALLY TO SIDE OF TRENCH WALL, NOT ALL PIPES SHOWN FOR CLARITY.
4. FIELD-ROUTE 4" MEMBRANE PERMEATE CIP FILL LINE IN PROCESS TRENCH.
5. PROVIDE 3/4" 150# NPT THREADED HALF COUPLING. TAP FOR RO CONCENTRATE SAMPLE PANEL SUPPLY PIPE.
6. FIELD-ROUTE PIPING TO RO CONCENTRATE SAMPLE PANEL.
7. FIELD-ROUTE SAMPLE PANEL DRAIN PIPING TO PROCESS TRENCH DRAIN TO ELIMINATE SPLASHING CONCENTRATE WATER ON PIPING IN TRENCH. MAINTAIN 6" AIR GAP AT DRAIN.
8. ROUTE BOTH CHEMICAL SERVICE TUBING LINES THROUGH DOUBLE CONTAINMENT SHEATH AT WALL PENETRATION. LINES TO BE ROUTED INDIVIDUALLY IN SEPARATE DOUBLE CONTAINMENT SHEATHS OUTSIDE OF BUILDING TO INJECTION POINT.
9. CONNECT TO EXISTING INJECTION QUILL.
10. REFER TO DETAIL 2 ON 1P-3 AND DETAIL 1 ON 1P-13. 3/4" CPVC PIPING TERMINATES INSIDE TRENCH WITH A 3/4" BALL VALVE AND MATERIAL CHANGE TO 3/4" PTFE TUBING. PTFE TUBING ROUTED TO INJECTION QUILL. MATCH EXISTING AND PROVIDE SPLASH GUARD.
11. REMOVE EXISTING SULFURIC ACID LINES.

A MEMBRANE TRAINS AREA NORTH - PLAN

SCALE: 3/8" = 1'-0"
FILE:

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LEE COUNTY UTILITIES
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RO CONCENTRATE ACID FEED SYSTEM
MECHANICAL
PROCESS BUILDING - MEMBRANE TRAINS

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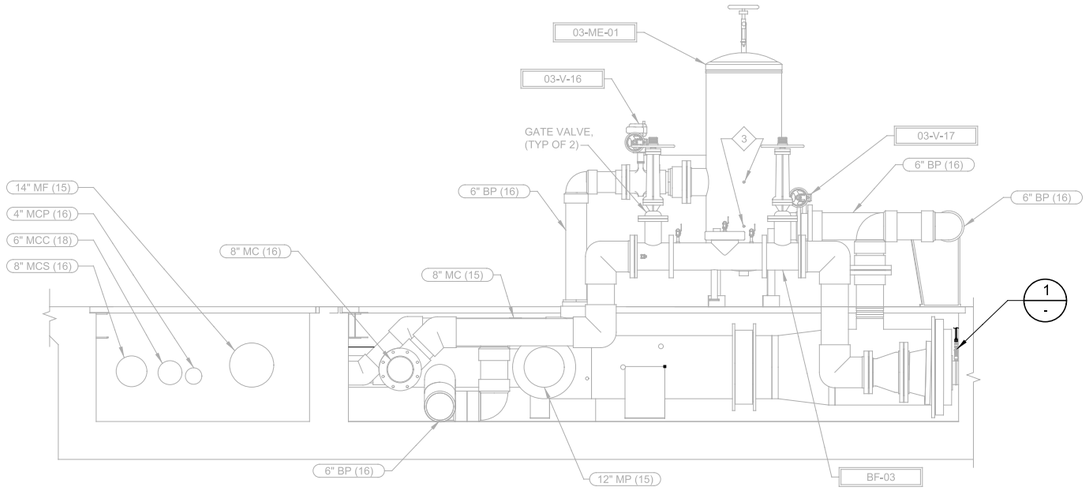
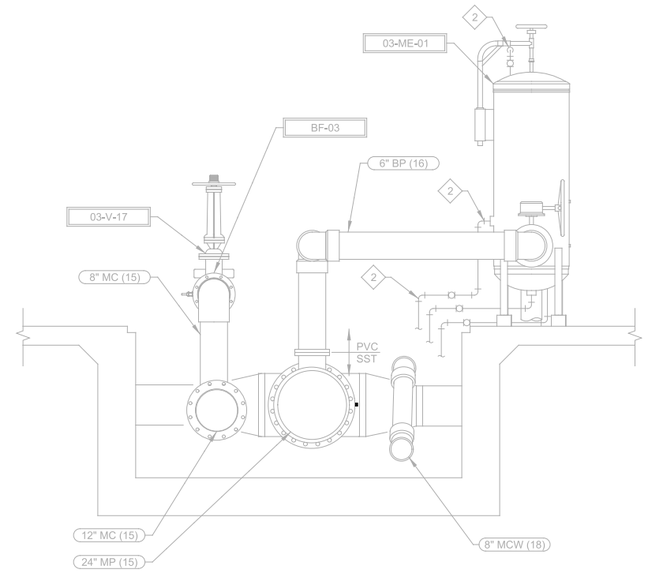


M — PROCESS BUILDING - SECTION

1P-5

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



N — PROCESS BUILDING - SECTION

1P-5

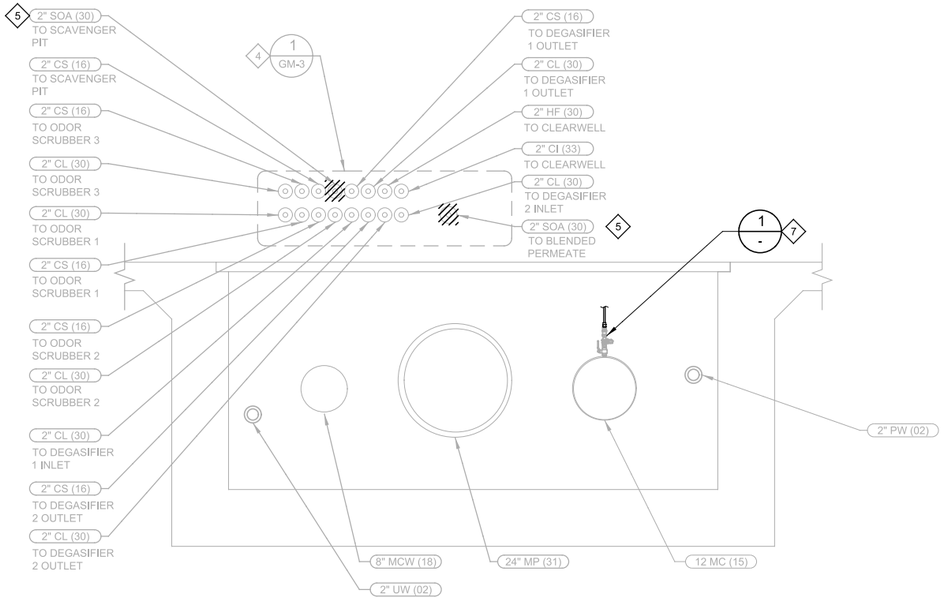
SCALE: 1/2" = 1'-0"
FILE: -

GENERAL NOTES

1. REFER TO GENERAL MECHANICAL NOTES FOR ADDITIONAL INFORMATION AND REQUIREMENTS. SEE DRAWING G-07.
2. SEE INSTRUMENTATION AND ELECTRICAL SHEETS FOR INSTRUMENTATION LOCATION.
3. 100 YEAR STORM EVENT AT ELEVATION 21.64. PROCESS AREA FINISHED FLOOR AT 24.00. ALL PUMPS TO BE PLACED AT ELEVATION 24.50 OR HIGHER.
4. REFER TO INSTRUMENTATION SHEETS FOR LOCATIONS OF PRESSURE GAUGES. SEE EQUIPMENT SCHEDULE RANGE AND MOUNTING DETAILS FOR INDIVIDUAL GAUGES.

KEY NOTES

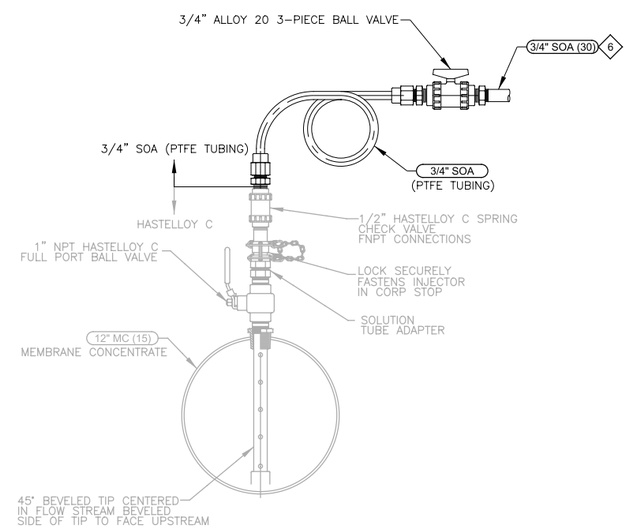
1. FIELD ROUTE 4" MEMBRANE PERMEATE CIP FILL LINE IN PROCESS TRENCH.
2. ROUTE CARTRIDGE FILTER HOUSING DRAINS AND AIR VENT DISCHARGE PIPING TO PROCESS TRENCH. PROVIDE FLEXIBLE CONNECTION WITH QUICK DISCONNECT COUPLINGS IN AIR VENT DISCHARGE PIPING AT TOP OF HOUSING. MAINTAIN 6" AIR GAP FOR ALL DRAINS AT PROCESS TRENCH.
3. DIFFERENTIAL PRESSURE TRANSMITTER. REFER TO INSTRUMENTATION DRAWINGS.
4. TRANSITION FROM SINGLE TO DOUBLE CONTAINMENT AT TERMINATION OF PROCESS TRENCH INSIDE BUILDING.
5. REMOVE EXISTING SULFURIC ACID LINE.
6. 3/4" CPVC PIPING TERMINATES TO BALL VALVE AND TRANSITIONS TO 3/4" PTFE TUBING TO MATCH EXISTING.
7. EXISTING INJECTION QUILL INSTALLED IN A SST NIPPLE WELDED TO 12" SST MC (15) LINE.



P — PROCESS BUILDING - TRENCH SECTION

1P-5

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



1 — SULFURIC ACID INJECTOR DETAIL 7

1P-5

SCALE: N.T.S.
FILE: -

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Lee County Southwest Florida

LEE COUNTY UTILITIES

NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM

MECHANICAL

PROCESS BUILDING SECTIONS 6 - PROCESS TRENCH

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

JOB NO. 10180C.10
DRAWING NO. 1P-13

Plot Date: 06-DEC-2016 1:23:28 PM
User: svcPW
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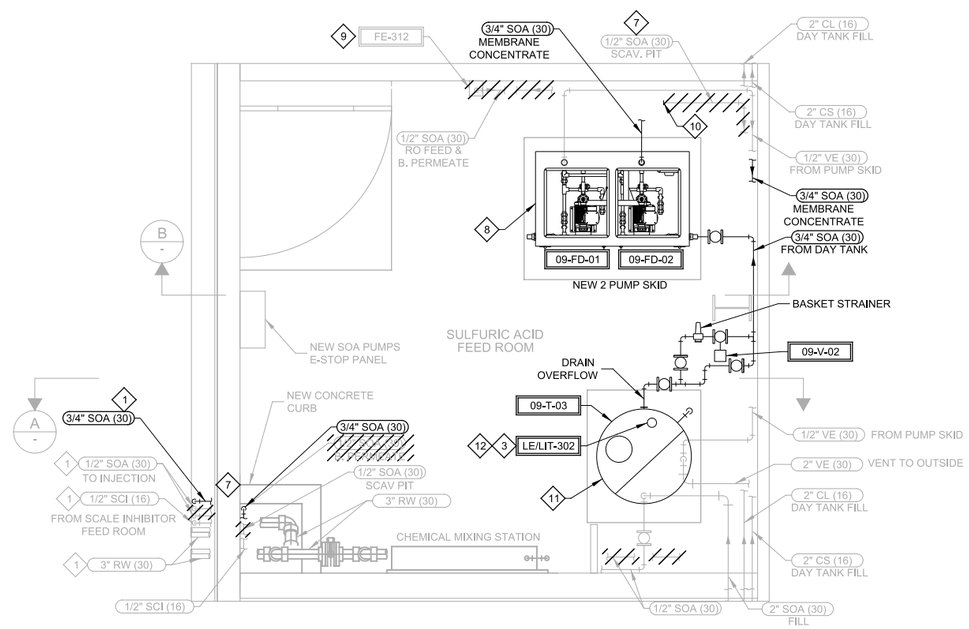


3 / 1P-2 SULFURIC ACID FEED ROOM-ENLARGED PLAN

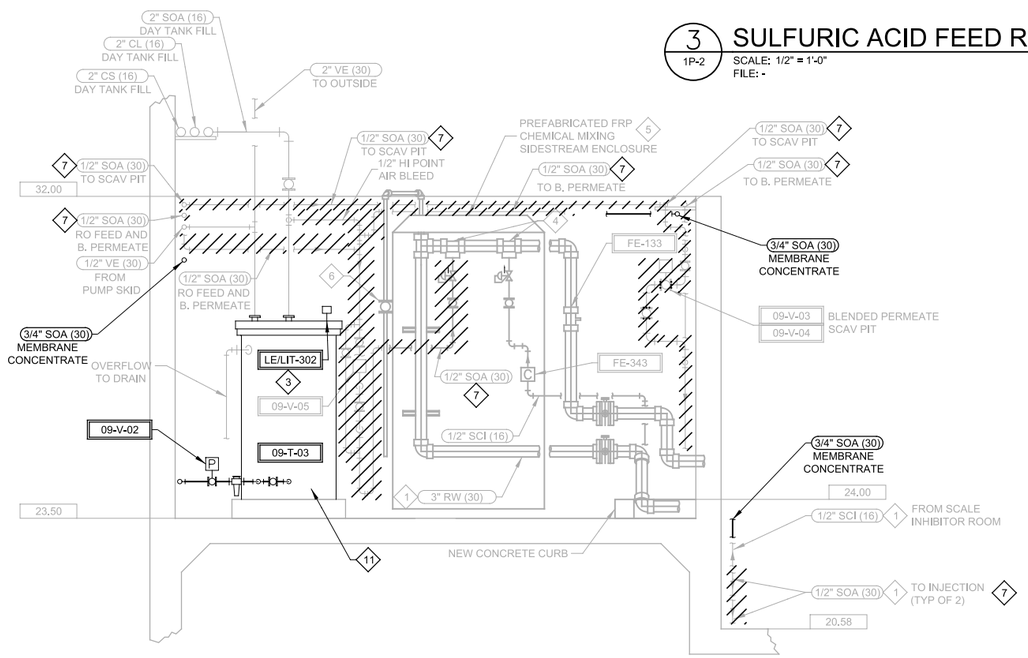
SCALE: 1/2" = 1'-0"
FILE: -

GENERAL NOTES:

1. REFER TO GENERAL MECHANICAL NOTES FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
2. INSTALL CORIOLIS MASS FLOW METERS WITH THE FLOW DIRECTION VERTICAL UP TO PREVENT AIR TRAPPING.
3. PROVIDE MANUAL BYPASS VALVE AROUND PNEUMATICALLY ACTUATED ISOLATION VALVES IN CHEMICAL INJECTION LINES.
4. SECURE PNEUMATICALLY ACTUATED CHEMICAL ISOLATION VALVES IN HORIZONTAL FLOW CONFIGURATION. ACTUATOR TO BE INSTALLED AT TOP OF QUARTER-TURN VALVE.

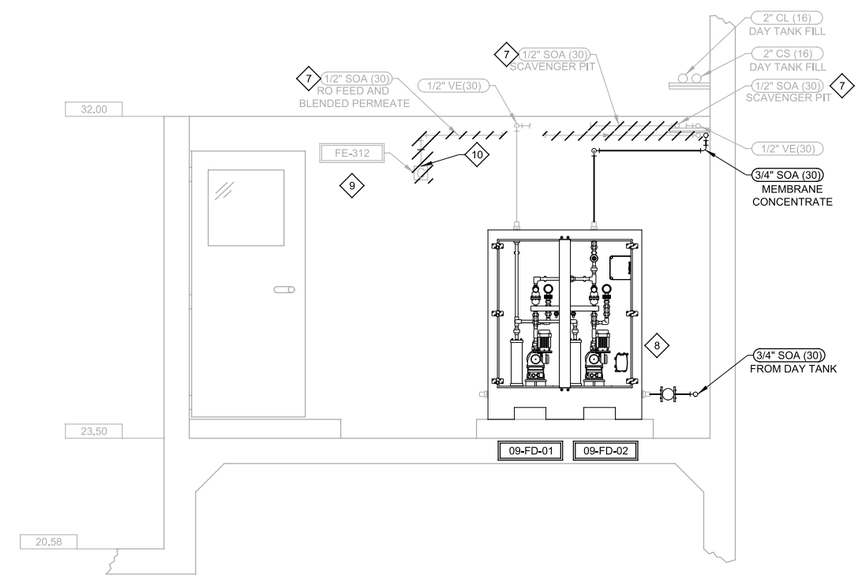
KEY NOTES:

1. FILL UNUSED EXISTING WALL PENETRATIONS WITH GROUT. DO NOT CUT EXISTING METAL REINFORCEMENT IN WALL.
2. NOT USED
3. REPLACE EXISTING LEVEL TRANSMITTER WITH NEW RADAR-TYPE TRANSMITTER.
4. FURNISH AND INSTALL NEW PLATE-TYPE STATIC INJECTION MIXER. "WESTFALL MODEL 2800" OR EQUAL.
5. FURNISH AND INSTALL FULL LENGTH SAFETY STRIPS AROUND PERIMETER OF CHEMICAL MIXING STATION. REFER TO SECTION 11258 FOR MATERIALS APPROVED FOR CHEMICAL SERVICE.
6. 1" MANUAL AIR RELEASE VALVE.
7. REMOVE EXISTING SULFURIC ACID LINE.
8. REMOVE AND REPLACE EXISTING SULFURIC ACID METERING PUMP SKID WITH NEW PUMP SKID.
9. REMOVE EXISTING MASS FLOW METER.
10. REMOVE EXISTING PIPING.
11. PROVIDE NEW SULFURIC ACID DAY TANK TO MATCH EXISTING SIZE PER SPECIFICATION 43_41_43. TANK SHALL BE CONSTRUCTED OF SPECIAL SULFURIC ACID RESIN TO RESIST OPTICAL DEGRADATION. EXISTING LINES SHALL BE CONNECTED TO NEW TANK.
12. REPLACE EXISTING RADAR-TYPE LEVEL TRANSMITTER.



A / - SECTION - SULFURIC ACID FEED ROOM

SCALE: 1/2" = 1'-0"
FILE: 8367A40_2P-5.DWG



B / - SECTION - SULFURIC ACID FEED ROOM

SCALE: 1/2" = 1'-0"
FILE: 8367A40_2P-5.DWG

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DATE DECEMBER 2016

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Lee County Southwest Florida

LEE COUNTY UTILITIES
NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM
MECHANICAL
SULFURIC ACID FEED ROOM
ENLARGED PLAN AND SECTION

VERIFY SCALES
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0 1"
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JOB NO. 10180C.10
DRAWING NO. 2P-12

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GENERAL
Architectural Units PROJECT NO. 10180C.10 FILE NAME: 10180C10002P-12.dgn

ELECTRICAL SYMBOLS

PLAN

- EXPOSED OR CONCEALED CONDUIT
- CONDUIT RUN UNDERGROUND OR IN CONCRETE
- CONDUIT RUN – CHANGE IN ELEVATION
- CONDUIT TURNING UP
- CONDUIT TURNING DOWN
- CONDUITS GROUPED TOGETHER BUT SHOWN AS A SINGLE LINE FOR CLARITY
- FROM FLOOR ABOVE TO FLOOR BELOW
- CONDUIT CAPPED, OR SEALED
- HOMERUN TO EQUIPMENT INDICATED (3/4" CONDUIT, 2 #12, 1 #12 GND UNLESS OTHERWISE INDICATED)
- RACEWAY BOX
  * – BOX TYPE
  MH —— MANHOLE
  HH —— HANDHOLE
  PB —— PULLBOX
- (J) JUNCTION BOX OR FITTING
- (X) CONDUIT X – CONDUIT NUMBER (SEE CONDUIT SCHEDULE FOR DETAILS)
- X–#a INCANDESCENT, HPS OR MH FIXTURE
  X – LIGHTING PANEL DESIGNATION
  # – CIRCUIT NUMBER, a – SWITCH DESIGNATION
- UNSWITCHED FIXTURE (NIGHT LIGHT)
- WALL MOUNTED FIXTURE
- POLE, BRACKET, ARM AND STREETLIGHT
- FLUORESCENT LIGHTING FIXTURE
- FLUORESCENT LIGHT FIXTURE, UNSWITCHED
- EMERGENCY LIGHT FIXTURE, BATTERY OPERATED
- EXIT LIGHT, SHOWN WITH TWO ILLUMINATED SIDES, ARROWS INDICATE DIRECTION OF EXIT
- A / # – FIXTURE TYPE (SEE LIGHTING FIXTURE SCHEDULE FOR DETAILS)
  # INDICATES APPROX. MOUNTING HEIGHT ABOVE FINISHED FLOOR.
  CLG INDICATES CEILING MOUNT
- $*X–#a LIGHT SWITCH
  X – LIGHTING PANEL DESIGNATION
  # – CIRCUIT DESIGNATION
  a – SWITCH DESIGNATION
  * – SWITCH TYPE
  3 —— 3 WAY
  4 —— 4 WAY
  D —— DIMMER
  M —— MANUAL MOTOR STARTER
- X–#* 120V DUPLEX RECEPTACLE, NEMA CONFIGURATION 5–20R (WALL MOUNT)
  X – LIGHTING PANEL DESIGNATION
  # – CIRCUIT DESIGNATION
  * – TYPE
  WP —— WEATHERPROOF
  XP —— EXPLOSION PROOF
  GFCI —— GROUND FAULT CIRCUIT INTERRUPTER
- 120V DUPLEX RECEPTACLE, NEMA CONFIGURATION 5–20R (FLOOR MOUNT)
- * SINGLE SPECIAL PURPOSE RECEPTACLE 240V 1 PHASE, ASTRISK INDICATES AMPERAGE
- * WELDING RECEPTACLE ASTRISK INDICATES AMPERAGE
- * SPECIAL PURPOSE RECEPTACLE 480 VAC, ASTRISK INDICATES AMPERAGE
- FLOOR TYPE TELEPHONE OUTLET
- WALL TYPE TELEPHONE SYSTEM OUTLET
- WALL TYPE COMPUTER OUTLET
- LIGHTING PANEL
- POWER PANEL
- DISCONNECT SWITCH
- COMBINATION STARTER WITH DISCONECT SWITCH
- (M) MOTOR
- (T) THERMOSTAT
- HORN
- GROUND ROD AND GROUND WELL
- GROUND ROD ƒ" x 10' – 0" (UNLESS OTHERWISE NOTED)
- GROUND CONNECTION BOLTED TYPE
- GROUND CONNECTION – EXOTHERMIC TYPE
- BARE COPPER GROUND TO GROUND WIRE IN SLAB, OR UNDERGROUND GROUND GRID, SIZE AS NOTED
- F ALARM HORN WITH STROBE
- A F AMPLIFIER/LOUDSPEAKER
- (*) DETECTOR, * INDICATES TYPE
  SD —— SMOKE DETECTOR
  HD —— HEAT DETECTOR
  CD —— COMBINATION DETECTOR
- FA FIRE ALARM PULL STATION
- F SEPARATE OR ACCESSORY STROBE LIGHT
- F FIRE BELL WITH STROBE LIGHT
- FS FIRE SUPRESSION SWITCH
- ER END–OF–LINE TERMINATOR
- I* INTERCOM SPEAKER
  * INDICATES TYPE, REFER TO SPECIFICATIONS
- I* INTERCOM SPEAKER WITH STROBE LIGHT
  * INDICATES TYPE, REFER TO SPECIFICATIONS
- I INTERCOM WALL JACK
- HS I INTERCOM HANDSET, WALL MOUNTED
- VC* VIDEO CAMERA
  * INDICATES TYPE
  F —— FIXED
  PTZ —— PAN–TILT–ZOOM
- * SECURITY ACCESS DEVICE, * INDICATES TYPE
  CR —— CARD READER
  KS —— KEY SWITCH
  PS —— DIGITAL KEYPAD

SINGLE LINE DIAGRAM

- MEDIUM VOLTAGE VACUUM DRAW–OUT STARTER
- 52 MEDIUM VOLTAGE DRAWOUT BREAKER
- (*)# ANSI RELAY DEVICE
  * INDICATES ANSI DEVICE
  (#) INDICATES QUANTITY
  25 —— SYNCHRONISM CHECK RELAY
  27 —— UNDERVOLTAGE
  27/47 —— UNDERVOLTAGE, PHASE SEQUENCE, UNBALANCED VOLTAGE
  27/59 —— UNDER/OVER VOLTAGE RELAY
  32 —— DIRECTIONAL POWER RELAY
  41 —— FIELD CONTACTOR
  43 —— SELECTOR SWITCH
  47 —— PHASE SEQUENCE VOLTAGE RELAY
  49 —— HIGH OIL TEMPERATURE
  50/51 —— INSTANTANEOUS AND TIME OVERCURRENT
  50/51N —— INSTANTANEOUS AND TIME RESIDUALLY CONNECTED GROUND OVERCURRENT
  51G —— GROUND FAULT
  60 —— VOLTAGE BALANCE
  62 —— TIME DELAY
  63 —— SUDDEN PRESSURE
  67 —— AC DIRECTIONAL CURRENT RELAY
  67V —— CONDITIONAL DIRECTIONAL POWER RELAY
  71L —— LOW OIL LEVEL
  81 —— FREQUENCY RELAY
  83 —— CONTROL POWER TRANSFORMER
  86 —— LOCKOUT
  87TL —— TRANSFORMER DIFFERENTIAL
  87M —— MOTOR DIFFERENTIAL
- THERMAL MAGNETIC
  100/30 — FRAME (AMPS) / TRIP (AMPS)
- MCP
  30/MCP — CONTINUOUS AMPS / TRIP SETTING BASED ON MOTOR HORSEPOWER
- 1200/1200 LOW VOLTAGE DRAWOUT CIRCUIT BREAKER
- 30/MCP COMBINATION NEMA RATED STARTER WITH MCP DISCONNECT AND CONTROL POWER TRANSFORMER
  ROMAN NUMERIAL – NEMA SIZE
  * – STARTER TYPE
  NO SUBSCRIPT —— FULL VOLTAGE NON–REVERSING
  RVAT —— REDUCED VOLTAGE AUTO TRANSFORMER
  FVR —— FULL VOLTAGE REVERSING
  2S2W —— TWO SPEED TWO WINDING
  2S1W —— TWO SPEED ONE WINDING
- * VFD VARIABLE FREQUENCY DRIVE
  * INDICATES AMPERE RATING
- * RVSS REDUCED VOLTAGE SOLID STATE STARTER
  * INDICATES AMPERE RATING
- * * PACKAGED EQUIPMENT
  * INDICATES KW, KVA OR HP RATING AS INDICATED
- (E) ELECTRICAL INTERLOCK
- GENERATOR, RATINGS AS INDICATED
- MANUAL OR AUTOMATIC TRANSFER SWITCH RATINGS AS INDICATED
- (*) METERING DEVICE
  * INDICATES METER TYPE
  WHM – WATT HOUR METER
  WM – WATT METER
  AM – AMMETER
  VM – VOLTMETER
  PFM – POWER FACTOR METER
- AS AMMETER SWITCH
- VS VOLTMETER SWITCH
- 480–120V POTENTIAL TRANSFORMER, RATIO AND NUMBER OF PT'S AS NOTED
- (2) 600/5 (1) CURRENT TRANSFORMER, RATIO AND NUMBER OF CT'S AS NOTED
- 5A FUSE, SIZED AS NOTED
- (7?)* MOTOR, HORSEPOWER AS NOTED
  * INDICATES FULL LOAD AMPS
- TRANSFORMER WITH GROUNDED SECONDARY, KVA SIZE & VOLTAGE RATIO AS INDICATED
- FUSED CONTROL POWER TRANSFORMER
- MOV ELECTRICAL MOTOR OPERATED VALVE, WITH INTEGRAL REVERSING STARTER
- ZSC XXX SOV SOLENIOD OPERATED VALVE WITH POSITION SWITCH
- 30A DISCONNECT SWITCH, SIZE AS NOTED
- 30A FUSED DISCONNECT SWITCH, SIZED AS NOTED
- CAPACITOR
- TVSS TRANSIENT VOLTAGE SURGE SUPRESSOR
- SSM SOLID STATE METERING DEVICE
- SSMP SOLID STATE MOTOR PROTECTIVE DEVICE
- SSMP UNINTERRUPTIBLE POWER SUPPLY
- LIGHTNING ARRESTOR AND SURGE CAPACITOR
- CROSSING OF CONDUCTORS–NOT CONNECTED
- CONDUCTORS CONNECTED

ADS Engineering
4701 N FEDERAL HWY. SUITE 390
POMPANO BEACH, FL 33064

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DATE DECEMBER 2016

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Lee County Southwest Florida

LEE COUNTY UTILITIES
NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM
ELECTRICAL SYMBOLS - 1

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

JOB NO. 10180C.10
DRAWING NO. GE-01

ELECTRICAL SYMBOLS

SCHEMATIC DIAGRAM

CONTROL RELAY OR COIL
* INDICATES DEVICE
CR —— CONTROL RELAY
TD —— TIME DELAY RELAY (TIMING RANGE AS INDICATED)
M —— MOTOR STARTER
PC —— PHOTOCLELL

NORMALLY OPEN CONTACT

NORMALLY CLOSED CONTACT

TIMED CONTACTS - CONTACT ACTION DELAYED AFTER COIL IS:

ENERGIZED

NORMALLY OPEN WITH TIME DELAY CLOSING

NORMALLY CLOSED WITH TIME DELAY OPENING

DE-ENERGIZED

NORMALLY OPEN WITH INSTANT CLOSING AND TIME DELAY OPENING

NORMALLY CLOSED WITH INSTANT OPENING AND TIME DELAY CLOSING

NORMALLY OPEN PUSHBUTTON

NORMALLY CLOSED PUSHBUTTON,

NO/NC MAINTAINED PUSHBUTTON

H O A
THREE-POSITION SELECTOR SWITCH,
H —— HAND
M —— MANUAL
R —— REMOTE
L —— LOCAL
A —— AUTOMATIC
O —— OFF

ON OFF
TWO-POSITION SELECTOR SWITCH:

RESET OFF ON
THREE POSITION SPRING RETURN-TO-CENTER MOMENTARY CONTACT SWITCH

ON–OFF
SINGLE POLE TOGGLE SWITCH

VACUUM OR PRESSURE SWITCH, CLOSE ON RISING PRESSURE

VACUUM OR PRESSURE SWITCH, OPEN ON RISING PRESSURE

FLOAT LEVEL SWITCH, CLOSE ON RISING LEVEL

FLOAT LEVEL SWITCH, OPEN ON RISING LEVEL

NORMALLY OPEN

NORMALLY CLOSED

NORMALLY OPEN HELD CLOSED

NORMALLY CLOSED HELD OPEN

MAINTAINED POSITION

TEMPERATURE SWITCH, CLOSE ON RISING TEMPERATURE

TEMPERATURE SWITCH, OPEN ON RISING TEMPERATURE

FLOW SWITCH, CLOSE ON INCREASING FLOW

FLOW SWITCH, OPEN ON INCREASING FLOW

TORQUE SWITCH OPENS ON INCREASING TORQUE

LOCATION LEGEND:
ALL DEVICES ARE LOCATED IN THE MOTOR CONTROLLER UNLESS INDICATED OTHERWISE

1 FIELD TERMINATION
2 LCS
3 LCP
4 MCC
5 PLC

DI — DIGITAL INPUT TO PLC/RTU/DCS

DIGITAL OUTPUT FROM PLC/RTU/DCS NORMALLY OPEN

DIGITAL OUTPUT FROM PLC/RTU/DCS NORMALLY CLOSED

AI — ANALOG INPUT TO PLC/RTU/DCS 4-20 mA UNLESS OTHER OTHERWISE NOTED

AO — ANALOG OUTPUT FROM PLC/RTU/DCS 4-20 mA UNLESS OTHER OTHERWISE NOTED

SV — SOLENOID VALVE

PILOT LIGHT
* INDICATES LENS COLOR
R —— RED
G —— GREEN
A —— AMBER
W —— WHITE

PILOT LIGHT PUSH-TO-TEST SEE ABOVE FOR LENS COLORS

HORN

ETM — ELAPSED TIME METER

HEATER

GROUND CONNECTION

CROSSING OF CONDUCTORS-NOT CONNECTED

CONDUCTORS CONNECTED

FUSE

VOLTAGE SURGE SUPPRESSOR

LIGHTNING PROTECTION/GROUNDING NOTES

1. GENERAL:
A SYSTEM OF LIGHTNING PROTECTION SHALL BE PROVIDED AND INSTALLED IN COMPLIANCE WITH THE PROVISIONS OF THE LATEST EDITION OF NFPA 780 LIGHTNING PROTECTION CODE AS ADOPTED BY THE NATIONAL FIRE PROTECTION ASSOCIATION AND THE UNDERWRITER'S LABORATORIES (UL) INC.

2. AIR TERMINALS:
AIR TERMINALS SHALL BE 3/8" X 24" SOLID COPPER AND SHALL EXTEND AT LEAST 24" ABOVE THE TOP OF THE STRUCTURE. AIR TERMINAL BASE SHALL BE CAST BRONZE WITH STAINLESS STEEL BOLT PRESSURE CABLE CONNECTIONS.

3. CONDUCTORS:
CONDUCTORS SHALL CONSIST OF U.L. LISTED 29 STRANDS OF 14 GAUGE COPPER WIRE WEIGHING 190 LBS. PER 1000 FT. AND INSTALLED IN ACCORDANCE WITH THE U.L. CODE (CLASS 1). DOWN CONDUCTORS SHALL BE IN 1" PVC SCH. 80 CONDUIT.

4. GROUND TERMINALS:
ALL GROUNDING TERMINALS (RODS) SHALL BE NO LESS THAN 3/4" IN DIAMETER AND 10 FEET LONG, AND SHALL BE COPPER-CLAD STEEL, SOLID COPPER, OF STAINLESS STEEL. GROUND TERMINALS SHALL BE DRIVEN TO A MINIMUM DEPTH OF 10 FT. OR MORE IF NECESSARY TO REACH PERMANENT MOISTURE. ONE GROUND ROD SHAL BE BONDED TO STEEL PIPE, GROUNDING TERMINALS SHALL BE LOCATED AT THE BASE OF THE STRUCTURE AND IN NO CASE SHALL AVERAGE OVER 100 FT. APART.

5. CABLE CONNECTORS:
ALL CABLE CONNECTORS SHALL BE CAST BRONZE WITH SCREW TYPE STAINLESS STEEL BOLTS AND NUTS. CONDUCTOR FASTENERS SHALL BE AN APPROVED TYPE OF NON-CORROSIVE METAL, HAVE AMPLE STRENGTH TO SUPPORT CONDUCTORS AND SHALL BE SPACED 3 FT. ON CENTERS.

6. INTERCONNECTION OF METALS:
ALL METAL BODIES WITHIN 6 FT. OF THE CONDUCTOR SHALL BE BONDED TO THE SYSTEM WITH APPROVED FITTINGS AND CONDUCTORS. CONNECTIONS BETWEEN DISSIMILAR METALS SHALL BE MADE WITH APPROVED BIMETALLIC CONNECTIONS. PRIMARY BONDS FOR METAL BODIES OF CONDUCTANCE SHALL BE BONDED WITH APPROPRIATE FITTINGS AND FULL SIZE CONDUCTORS.

7. COMMON GROUNDING:
ALUMINUM TO COPPER CONNECTIONS SHALL BE MADE WITH BIMETALLIC CONNECTORS. GROUNDINGS FOR ELECTRICAL AND TELEPHONE SERVICES, AND LIGHTNING GROUNDS SHALL BE TIED TOGETHER TO FORM A COMMON GROUND.

8. MATERIALS:
ALL LIGHTNING PROTECTION EQUIPMENT SHALL BE MANUFACTURED BY HEARY BROTHERS LIGHTNING PROTECTION CO., THOMPSON LIGHTNING PROTECTION CO., CAPITAL LIGHTNING PROTECTION CO., OR EQUAL.

ADS Engineering
4701 N FEDERAL HWY, SUITE 390
POMPANO BEACH, FL 33064

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DESIGNED: ADS
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CHECKED: MDG
DATE: DECEMBER 2016

carollo

Lee County Southwest Florida

LEE COUNTY UTILITIES
NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM
ELECTRICAL SYMBOLS - 2 AND GENERAL NOTES

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

JOB NO. 10180C.10
DRAWING NO. GE-02

ELECTRICAL PLAN/LAYOUT

SYMBOL	DESCRIPTION
TTC	TELEPHONE TERMINAL CABINET
	TERMINAL JUNCTION BOX
	ELECTRICAL EQUIPMENT
X	CEILING MOUNTED DOWNLIGHT LUMINAIRE - SEE SCHEDULE FOR TYPE
X	FLOURESCENT 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
E X Y Z (TYP)	LIGHTING FIXTURE POWER AND SWITCHING LEGEND X=FIXTURE TYPE Y=PANEL-CIRCUIT BRKR E=EMERGENCY BATTERY PACK Z=SWITCH NL= CONNECT DIRECTLY TO CIRCUIT BREAKER 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
DB	DIRECT BURIED CONDUIT
	CONDUIT, STUBBED AND CAPPED AS SHOWN
	GROUND WIRE, 4/O UNLESS OTHERWISE NOTED
C	CABLE TRAY
	6 FOOT GROUND WIRE PIGTAIL, 4/O UNLESS OTHERWISE NOTED
	GROUND ROD - 5/8" x 20' COPPER CLAD UNLESS OTHERWISE NOTED
S	WALL SWITCH: 2- DOUBLE POLE, 3- THREE WAY, 4- FOUR WAY, WP- WEATHERPROOF, P- PILOT LIGHT, K- KEY OPERATED, D- DIMMER, CRE- CORROSION RESISTANT
	CONVENIENCE RECEPTACLE - 20A DUPLEX UNLESS SPECIFIED OTHERWISE WP- WEATHERPROOF, TL- TWIST LOCK, GFI-GROUND FAULT INTERRUPTER, C- CLOCK HANGER, CRE- CORROSION RESISTANT
	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/COMMUNITCATIONS RECEPTACLE (OUTLET BOX, 18" AFF) W - WALL MOUNTED, 54" AFF
	TELEPHONE 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
W	ELEVATOR WARNING LIGHT
TV	CABLE TV OUTLET (OUTLET BOX 18"AFF)
S	SOUND SYSTEM SPEAKER
BI	DOOR BUZZER/INTERCOM
R	EMERGENCY CALL SYSTEM RESET BUTTON

SYMBOL	DESCRIPTION
	FIRE ALARM SMOKE DETECTOR
	FIRE ALARM HEAT DETECTOR
FACP	FIRE ALARM CONTROL PANEL
FAAP	FIRE ALARM ANNUNCIATOR PANEL
CO	CARBON DIOXIDE MONITOR
D	DUCT SMOKE DETECTOR
RTS	REMOTE TEST STATION
TS	TAMPER SWITCH
FS	FLOW SWITCH

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
BLDG	BUILDING
BRKR	BREAKER
C	CONDUIT, CONTACTOR
CB	CIRCUIT BREAKER
CBTR	CABLE TRAY
CKT	CIRCUIT
CMS	COMBINATION MOTOR STARTER
CNTL	CONTROL
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY
CT	CURRENT TRANSFORMER
DC	DIRECT CURRENT
DIV	DIVISION
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
FS	FLOAT SWITCH, FLOW SWITCH
FT	FLOW TRANSMITTER
FUT	FUTURE
FVNR	FULL VOLTAGE NON-REVERSING STARTER
G	GREEN, GROUND
GALV	GALVANIZED
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
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

ABBREVIATIONS	DESCRIPTION
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
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
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
RIO	REMOTE INPUT/OUTPUT
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	SPEED
SSRVS	SOLID STATE REDUCED VOLTAGE STARTER
SST	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
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
TYP	TYPICAL
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
400 600	DRAWOUT CIRCUIT BREAKER, MEDIUM VOLTAGE 600= FRAME RATING, 400=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, PM - PHASE MONITOR V - VOLTS, P - POWER METER
	FUSE
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
	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, G - GREEN B - BLUE, R - RED C - CLEAR, W - WHITE
A	PUSH TO TEST AND CONNECT INDICATING LIGHT SCHEMATIC DIAGRAMS ONLY A - AMBER, G - GREEN B - BLUE, R - RED C - CLEAR, W - WHITE

SYMBOL	DESCRIPTION
S M	MANUAL MOTOR STARTER SWITCH, NEMA 4X UNLESS OTHERWISE NOTED. NUMBER OF POLES AS REQUIRED
PB 4X	PUSH-BUTTON STATION, NEMA 12 ENCLOSURE UNLESS INDICATED OTHERWISE. 4X = NEMA 4X 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 STAINLESS STEEL
F 40 60 4X	FUSED DISCONNECT SWITCH, SIZE INDICATED (60 = SWITCH RATING: 40 = FUSE RATING) 3 POLE UNLESS INDICATED OTHERWISE, NEMA 12 ENCLOSURE, 4X = NEMA 4X 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 STAINLESS STEEL
2 4X	MAGNETIC STARTER, NEMA SIZE INDICATED, NEMA 12 ENCLOSURE, UNLESS INDICATED OTHERWISE. SEE CONTROL DIAGRAM. 4X = NEMA 4X STAINLESS STEEL COMBINATION (FUSE OR CIRCUIT BREAKER AS INDICATED).
2 4X	MAGNETIC STARTER, NEMA SIZE INDICATED, NEMA 12 ENCLOSURE UNLESS INDICATED OTHERWISE. SEE CONTROL SCHEMATIC DIAGRAM. 4X = NEMA 4X 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 X - CLOSED CONTACT O - OPEN CONTACT

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

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
4701 N FEDERAL HWY, SUITE 390
POMPANO BEACH, FL 33064

REV	DATE	BY	DESCRIPTION

DESIGNED ADS
DRAWN IVZ
CHECKED MDG
DATE DECEMBER 2016

carollo

Lee County Southwest Florida

LEE COUNTY UTILITIES

NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM

ELECTRICAL SYMBOLS - 3

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

JOB NO. 10180C.10

DRAWING NO. GE-03

ABBREVIATIONS

A	AMPERE, AUTOMATIC
AC	ALTERNATING CURRENT
AF	CIRCUIT BREAKER FRAME SIZE
AM	AMMETER
ANN	ANNUNCIATOR
AS	ADJUSTABLE SPEED
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AWG	AMERICAN WIRE GAUGE
BATT	BATTERY
BC	BARE COPPER
BKR	BREAKER
C	CONDUIT, CLOSED
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CLF	CURRENT LIMITING FUSE
COM	COMMON
COMP	COMPARTMENT
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY, CARD READER
CT	CURRENT TRANSFORMER
DCS	DISTRIBUTED CONTROL SYSTEM
DISC	DISCONNECT
DISTR	DISTRIBUTION
DPDP	DOUBLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
E	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
ENCL	ENCLOSURE
ETM	ELAPSED TIME METER
F	FREQUENCY, FUSE, FIXED
FDR	FEEDER
FLA	FULL LOAD AMPS
FLUOR	FLUORESCENT
FM	FREQUENCY METER
FO	FIBER OPTIC
FVR	FULL VOLTAGE REVERSING
FVNR	FULL VOLTAGE NON-REVERSING
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
H	HAND
HD	HEAT DETECTOR
HH	HAND HOLE
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTOMATIC
HPS	HIGH PRESSURE SODIUM
HS	HAND SWITCH
HZ	HERTZ
IMC	INTERMEDIATE METALLIC CONDUIT
INCAND	INCANDESCENT
IND	INDICATION
INST	INSTANTANEOUS
I/O	INPUT/OUTPUT
Isc	SHORT CIRCUIT CURRENT, AMPS
ISO	ISOLATION
J	JUNCTION BOX
KA	THOUSAND AMPERES
KAIC	THOUSAND AMP INTERRUPTING CURRENT
KCMIL	THOUSAND CIRCULAR MILS
KVA	KILOVOLT AMPERE
L	LOCAL
LCP	LOCAL CONTROL PANEL
LCS	LOCAL CONTROL STATION
LOC	LOCAL
LOR	LOCAL-OFF-REMOTE
LOS	STOP LOCKOUT PUSHBUTTON
LP	LIGHTING PANEL
LRA	LOCKED ROTOR AMPS
LS	LEVEL SWITCH
LTG	LIGHTING
LTS	LIGHTS
M	MOTOR CONTACTOR COIL
mA	MILLIAMPERE
MCP	MOTOR CIRCUIT PROTECTOR
MLO	MAIN LUGS ONLY
MOV	MOTOR OPERATED VALVE
MS	MANUAL MOTOR STARTER
MTS	MANUAL TRANSFER SWITCH
NEUT	NEUTRAL
NP	NAMEPLATE
O	OPEN, OFF
OL	OVERLOAD
PA	PUBLIC ADDRESS
PB	PUSHBUTTON, PULLBOX
PC	PHOTOCELL
PCM	PROCESS CONTROL MODULE
PF	POWER FACTOR
PFM	POWER FACTOR METER
PH	PHASE
PL	PILOT LIGHT
PNBLD	PANELBOARD
PP	POWER PANELBOARD
POS	POSITION
POT	POTENTIOMETER
PRI	PRIMARY
PT	POTENTIAL TRANSFORMER
PTZ	PAN-TILT-ZOOM
PWR	POWER
R	REMOTE
RECPT	RECEPTACLE
RGS	RIGID GALVANIZED STEEL
RMS	ROOT MEAN SQUARE
RTU	REMOTE TERMINAL UNIT
RVSS	REDUCED VOLTAGE SOLID STATE
SEL SW	SELECTOR SWITCH
SEQ	SEQUENCE
SHLD	SHIELDED
SIG	SIGNAL
SP	SPARE
SPDT	SINGLE POLE DOUBLE THROW
SSM	SOLID STATE METER
SSMP	SOLID STATE MOTOR PROTECTOR
SP HTR	SPACE HEATER
SPST	SINGLE POLE SINGLE THROW
ST, SH	SHUNT TRIP
STR	STARTER
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
TACH	TACHOMETER
TB	TERMINAL BOX
TERM	TERMINAL
TM	REPEAT CYCLE TIMER
TD	TIME DELAY RELAY
TS	TEMPERATURE SWITCH
UPS	UNINTERRUPTABLE POWER SUPPLY
V	VOLTAGE, VOLTS
VA	VOLT AMPERE
VAR	VOLT AMPERE REACTIVE
VFD	VARIABLE FREQUENCY DRIVE
VM	VOLTMETER
VP	VAPOR PROOF
W	WATTS, WIRE
WM	WATT METER
WP	WEATHERPROOF
XFMR	TRANSFORMER
XMTR	TRANSMITTER
XP	EXPLOSION PROOF

GENERAL NOTES

1. ALL RACEWAYS AND EQUIPMENT SHALL BE INSTALLED AND GROUNDED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE AND APPLICABLE LOCAL CODES.
2. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF TERMINAL BOXES AND CONDUIT ENTRANCES OF ALL EQUIPMENT AGAINST APPROVED SHOP DRAWINGS BEFORE STUBBING UP CONDUITS.
3. REFER TO SPECIFICATION SECTION 16110 FOR REQUIREMENTS RELATED TO FLEXIBLE CONDUIT INSTALLATION
4. CONDUIT RUNS ARE SHOWN DIAGRAMMATICALLY ONLY AND SHALL BE INSTALLED IN A MANNER TO PREVENT CONFLICTS WITH EQUIPMENT OR STRUCTURAL CONDITIONS. EXPOSED CONDUIT SHALL BE INSTALLED PARALLEL OR PERPENDICULAR TO BEAMS AND WALLS. REFER TO SPECIFICATION 16110.
5. CONDUIT STUB-UPS SHALL NOT BE MORE THEN 6" FROM THE CENTER LINE OF TERMINAL BOXES.
6. IN THE EVENT OF INTERFERENCE BETWEEN ELECTRICAL EQUIPMENT SHOWN ON THE DRAWINGS AND OTHER EQUIPMENT, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING AND THE ENGINEER SHALL APPROVE PROPOSED CHANGES BEFORE THEY ARE MADE.
7. ALL SURFACE MOUNTED PANELS AND PANELBOARDS ON THE INTERIOR OF EXTERIOR WALLS ABOVE GRADE OR IN OTHER LOCATIONS CONSIDERED DAMP OR WET SHALL BE MOUNTED SO AS TO MAINTAIN A ." (MINIMUM) AIR SPACE BETWEEN THE ENCLOSURE AND THE WALL.
8. LOCATION OF PULLBOXES ARE APPROXIMATE. THE CONTRACTOR SHALL COORDINATE EXACT LOCATION OF PULLBOXES WITH MECHANICAL PIPING AND SHALL BE 6" (MINIMUM) AWAY FROM MECHANICAL PIPING FLOW LINES.
9. ONLY MAJOR PULLBOXES ARE SHOWN. THE CONTRACTOR SHALL PROVIDE ADDITIONAL PULLBOXES WHERE REQUIRED TO MAKE A WORKABLE INSTALLATION.
10. THE WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE DETAILS WHETHER OR NOT THEY ARE REFERENCED ON THE DRAWINGS.
11. ALL CONDUIT RUNS CROSSING EXPANSION JOINTS SHALL HAVE EXPANSION OR EXPANSION AND DEFLECTION TYPE FITTINGS. FOR LOCATIONS OF EXPANSION JOINTS, REFER TO THE STRUCTURAL DRAWINGS.
12. LIGHTING FIXTURES SHALL BE MOUNTED ACCORDING TO THE MOUNTING HEIGHT GIVEN ON THE DRAWINGS, WITH THE DISTANCE BEING MEASURED FROM THE BOTTOM OF THE FIXTURE TO THE FINISHED FLOOR. THE APPROPRIATE MOUNTING BRACKETS AND HARDWARE SHALL BE SUPPLIED.
13. ALL PANELBOARDS SHALL BE MOUNTED SO THAT THE DISTANCE FROM THE TOP CIRCUIT BREAKER OPERATING HANDLE TO THE FINISHED FLOOR SHALL NOT EXCEED 6'-7".
14. THE WIRING DIAGRAMS, QUANTITY AND SIZE OF WIRES AND CONDUIT REPRESENT A SUGGESTED ARRANGEMENT BASED UPON SELECTED STANDARD COMPONENTS OF ELECTRICAL EQUIPMENT. MODIFICATIONS ACCEPTABLE TO THE ENGINEER MAY BE MADE BY THE CONTRACTOR TO ACCOMMODATE EQUIPMENT ACTUALLY PURCHASED. THE BASIC SEQUENCE AND METHOD OF CONTROL MUST BE MAINTAINED AS INDICATED ON THE DRAWINGS AND/OR SPECIFICATIONS.
15. CONNECTIONS BETWEEN RIGID CONDUIT AND MOTOR TERMINAL BOXES OR SIMILAR EQUIPMENT SUBJECT TO VIBRATION SHALL BE FLEXIBLE LIQUID-TIGHT CONDUIT.
16. CONDUITS SHALL BE TERMINATED SO AS TO PERMIT NEAT CONNECTION TO MOTORS AND OTHER EQUIPMENT.
17. CONDUITS FOR FUTURE EQUIPMENT OR EXTENSION SHALL BE TERMINATED AS SHOWN IN DETAIL OR AS SPECIFIED.
18. MCC AND SWITCHGEAR COMPARTMENT DESIGNATIONS SHALL BE AS INDICATED BELOW:

    BLANK/SPACE: CONTAINS NECESSARY BUS AND HARDWARE FOR FUTURE ADDITION OF BREAKERS OR STARTERS.

    SPARE: CONTAINS A COMPLETE INSTALLED BREAKER OR STARTER AVAILABLE FOR FUTURE USE.
19. ALL MOTOR STARTER CONTROL POWER TRANSFORMERS SHALL BE SIZED TO PROVIDE SUFFICIENT VOLT-AMPERE CAPACITY FOR OPERATING ALL LOCAL AND REMOTE ELECTRICAL DEVICES ASSOCIATED WITH CONTROL OF THE MOTOR IN ADDITION TO THE STARTER COIL.
20. MOTOR CONTROL CENTERS AND ALL FREE STANDING PANELS SHALL BE SET ON CONCRETE HOUSEKEEPING PADS WITH LEVELING CHANNELS EMBEDDED IN THE PAD.
21. SEPARATE POWER, CONTROL AND INSTRUMENTATION WIRING (SEE SPECIFICATION 26_05_04). PROVIDE SEPARATE CONDUIT, PULL AND JUNCTION BOXES. PROVIDE SUITABLE CABLE BARRIER WITHIN PULL OR JUNCTION BOXES WHERE SEPARATION OF WIRING IS NOT SHOWN ON THE DRAWINGS.
22. ALL RECEPTACLES IN OUTDOOR AND ANTICIPATED WET AREAS SHALL BE GROUND FAULT CIRCUIT INTERRPUTER RECEPTACLES WITH WEATHERPROOF COVERS.
23. ELECTRICAL CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING THE PROJECT TO VERIFY THE SCOPE OF WORK WITH FIELD CONDITIONS. PARTICULAR ATTENTION SHOULD BE GIVEN TO NEW CONDUIT RUNS IN EXISTING BUILDING.
24. EQUIPMENT LOCKOUTS SHALL BE IN STRICT ACCORDANCE WITH OWNER'S REQUIREMENTS.
25. ELECTRICAL DEMOLITION NOTES, WHERE APPLICABLE

    BIDDING CONTRACTORS SHALL VISIT THE SITE TO ASSESS THE SCOPE OF DEMOLITION, REMOVAL AND MODIFICATION WORK.

    ELECTRICAL CONTRACTOR AND THE OWNER SHALL DE-ENERGIZE ALL WIRING PRIOR TO REMOVAL OF EQUIPMENT. DEVICES, MOTORS, INSTRUMENTATION CONTROL PANELS, ETC. CONTRACTOR SHALL OBTAIN PRIOR APPROVAL FROM THE OWNER.

    ELECTRICAL CONTRACTOR SHALL FIELD VERIFY CONDUIT RUNS PRIOR TO DEMOLITION AND REMOVAL.

    EXPOSED RACEWAYS: REMOVE CONDUIT, WIRES AND BOXES. PATCH TO MATCH EXISTING FINISH-ALL OPENINGS IN WALLS AND FLOORS.

    CONCEALED CONDUITS IN THE SLAB: REMOVE EXISTING WIRES TO THE EXTENT POSSIBLE AND ABANDON CONDUITS IN THE SLAB. CUT CONDUIT FLUSH AND PATCH THE FLOOR TO MATCH EXISTING.

    CONTROL PANEL: ELECTRICAL CONTRACTOR SHALL DE-ENERGIZE AND REMOVE ALL CONDUIT AND WIRE AS DESCRIBED ABOVE. CONTRATOR SHALL REMOVE PANELS AS NOTED ON THE CONTRACT DRAWINGS. REFER TO NOTE ABOVE FOR DISPOSITION OF ENCASED CONDUITS.

    MOTOR CONTROL CENTERS: DISCONNECT AND REMOVE ALL CONDUITS AND WIRING TO EXISTING STARTERS AND/OR BREAKERS, PANELBOARDS, BRANCH CIRCUITS, INTERLOCKS AND STATUS WIRING WITHIN THE MCC.

    REFER TO SECTION 26_05_04 FOR ADDITIONAL ELECTRICAL DEMOLITION AND REMOVAL REQUIREMENTS.
26. THE CONTRACTOR SHALL NOT BE ALLOWED TO SPLICE CONDUCTORS UNDERGROUND UNDER ANY CIRCUMSTANCES.
27. ALL POWER FEEDER CONDUCTORS TO BE XHHW-2.
28. CONDUIT MATERIALS USED SHALL BE THE FOLLOWING:
    (NOT IN DUCT BANK)

APPLICATION	MATERIAL
OUTDOOR LIGHTING UNDERGROUND	PVC SCHEDULE 80
ABOVE GROUND AND OFFICE AREAS	ALUMINUM (PER SPEC 16110)
CORROSIVE ENVIRONMENTS INDOORS	ALUMINUM (PER SPEC 16110)

29. ALL ELECTRICAL EQUIPMENT REQUIRING LEVELING CHANNELS SHALL BE COORDINATED WITH THE ENGINEER PRIOR TO CONCRETE POUR. REFER TO DETAIL E-400 FOR FURTHER INFORMATION.
30. THE CONTRACTOR IS RESPONSIBLE FOR THE COMPLETION OF THE LIGHTING, RECEPTACLE AND REQUIRED FIRE ALARM RISERS. THE CONTRACTOR SHALL UTILIZE ALL ELECTRICAL PANELS MENTIONED IN THESE DRAWINGS TO POWER LIGHTING, RECEPTACLES AND MISCELLANEOUS LOADS. ANY VARIATION REQUIRED SHALL BE COORDINATED WITH THE ENGINEER PRIOR TO FINAL INSTALLAITON.
31. TAG ALL CONDUITS AND PULL BOXES "FED FROM..."

ADS Engineering
4701 N FEDERAL HWY, SUITE 390
POMPANO BEACH, FL 33064

REV	DATE	BY	DESCRIPTION

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DATE DECEMBER 2016

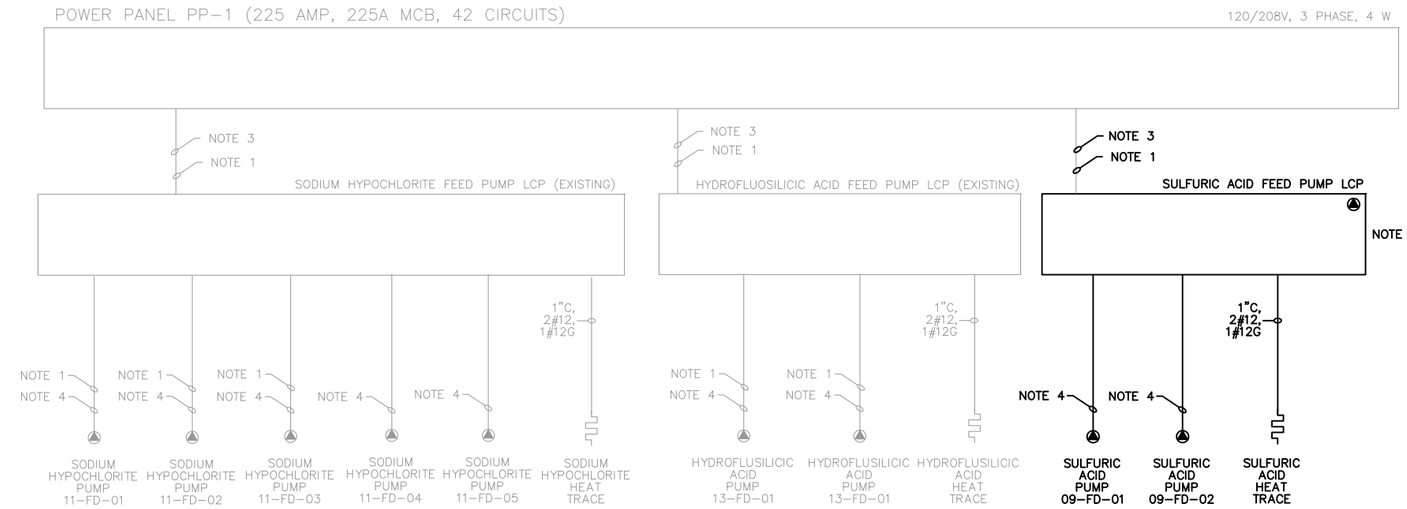
carollo

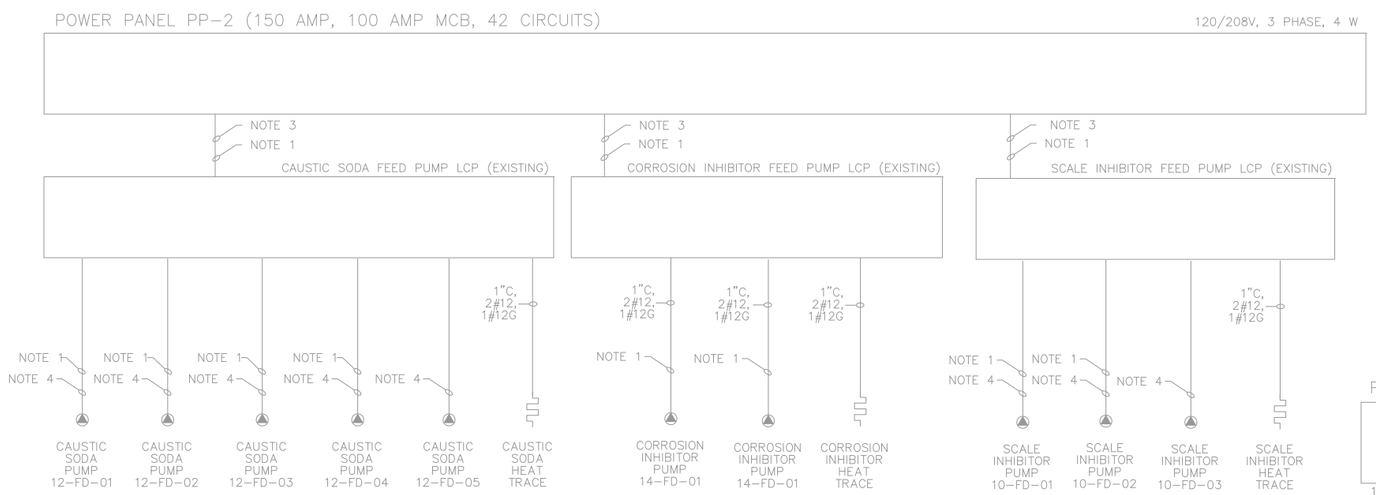
Lee County Southwest Florida

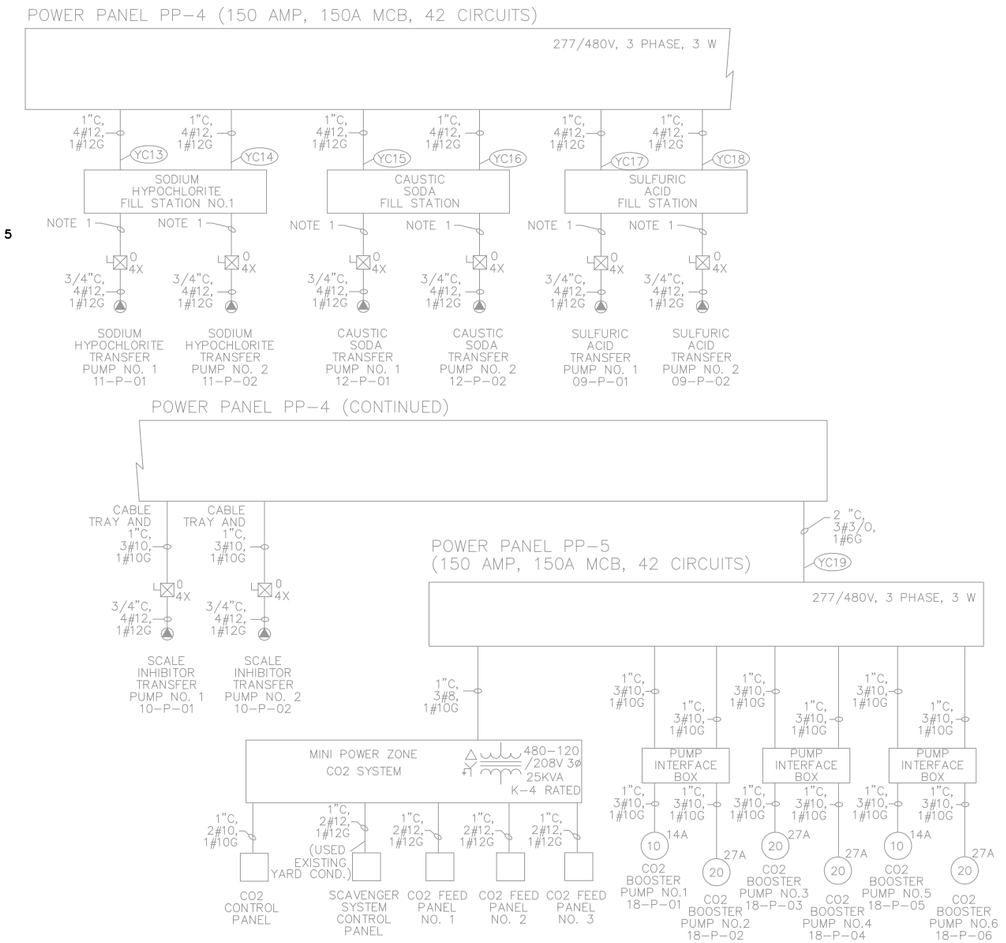
LEE COUNTY UTILITIES
NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM
ELECTRICAL ABBREVIATIONS AND GENERAL NOTES

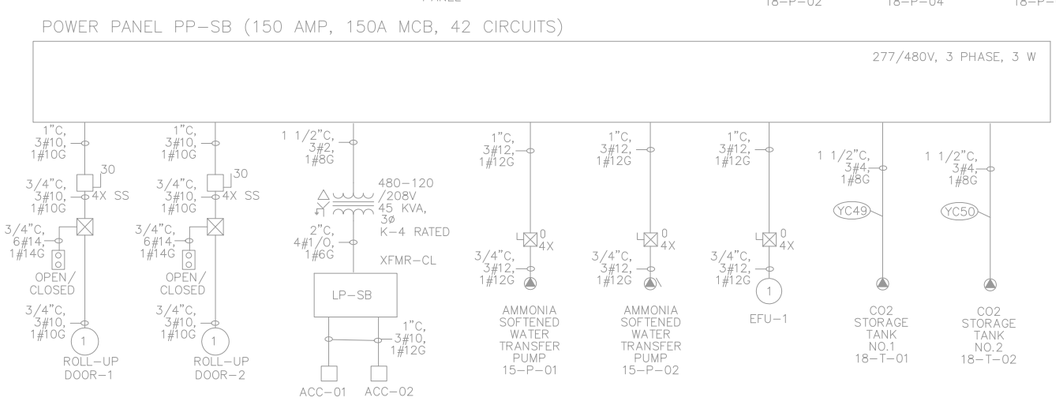
VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10180C.10
DRAWING NO. GE-04









NOTES:

1. CONTRACTOR SHALL REUSE EXISTING CONDUIT, WIRES AND CONDUCTORS IF FEASIBLE. PROVIDE NEW CONDUIT, WIRES AND CONDUCTORS IF NECESSARY.
2. CONTRACTOR SHALL ADD NEW CIRCUIT BRAKERS FOR NEW PUMPS IN APPROPRIATE LCP. CONTRACTOR SHALL INCREASE CIRCUIT BREAKERS THAT FEED CHEMICAL LOCAL CONTROL TO 30A MINIMUM.
3. CONTACTOR SHALL FIELD VERIFY EXISTING WIRE SIZE AND UPSIZE IT TO ACCOMODATE ADDITIONAL LOAD PER NEC.
4. FOR PUMPS FACTORY WIRED TO SKID MOUNTED JUNCTION BOX, USE MANUFACTURER SPECIFIED CONDUIT, WIRES AND CONDUCTORS. IF NOT FEASIBLE, PROVIDE 1"C, 2#12, 1#12G
5. DISCONNECT AND REMOVE EXISTING FEED PUMP LCP. INSTALL NEW PUMP FEED LCP IN PLACE,.

EXISTING

NEW

ADS Engineering
4701 N FEDERAL HWY, SUITE 390
POMPANO BEACH, FL 33064

REV	DATE	BY	DESCRIPTION

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DRAWN IVZ
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carollo

Lee County Southwest Florida

LEE COUNTY UTILITIES

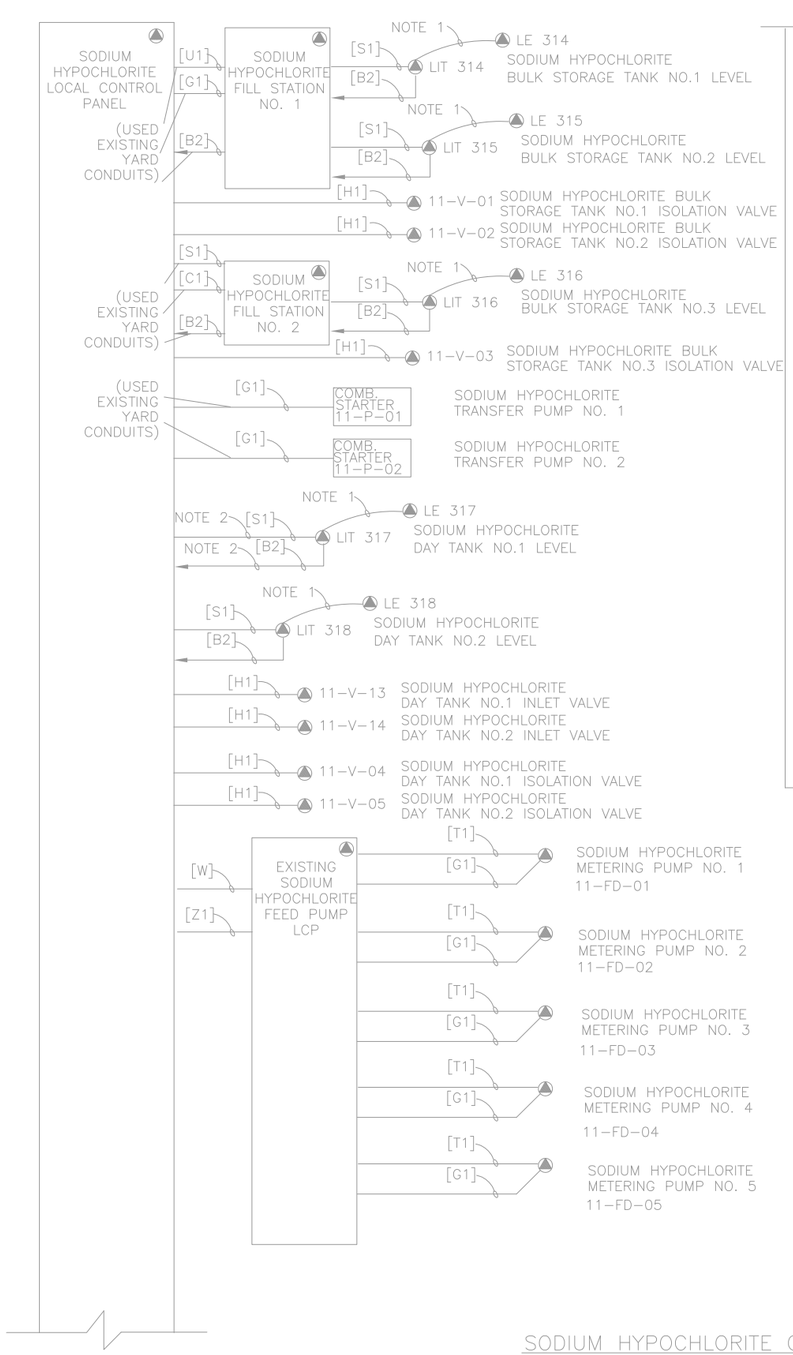
NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM

POWER PANELS PP-1, PP-2, PP-4, PP-5 AND PP-SB
ONE LINE DIAGRAMS AND CONDUIT DEVELOPMENT

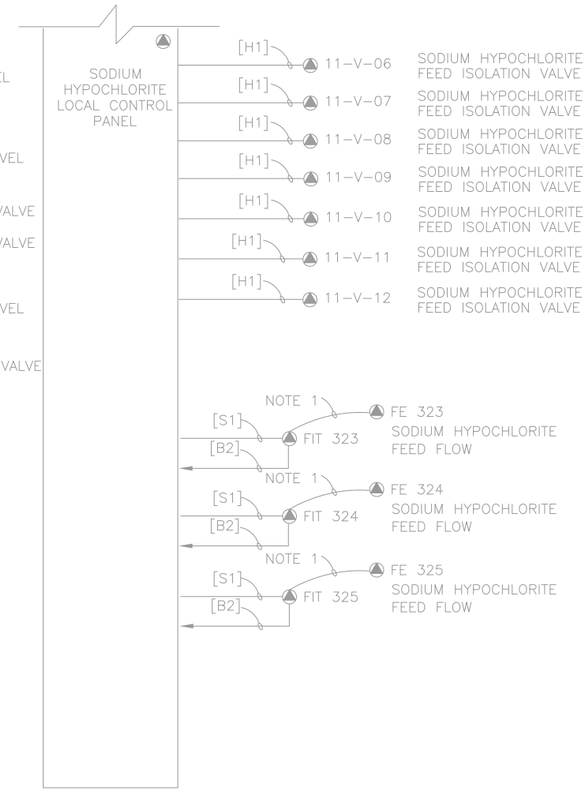
VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

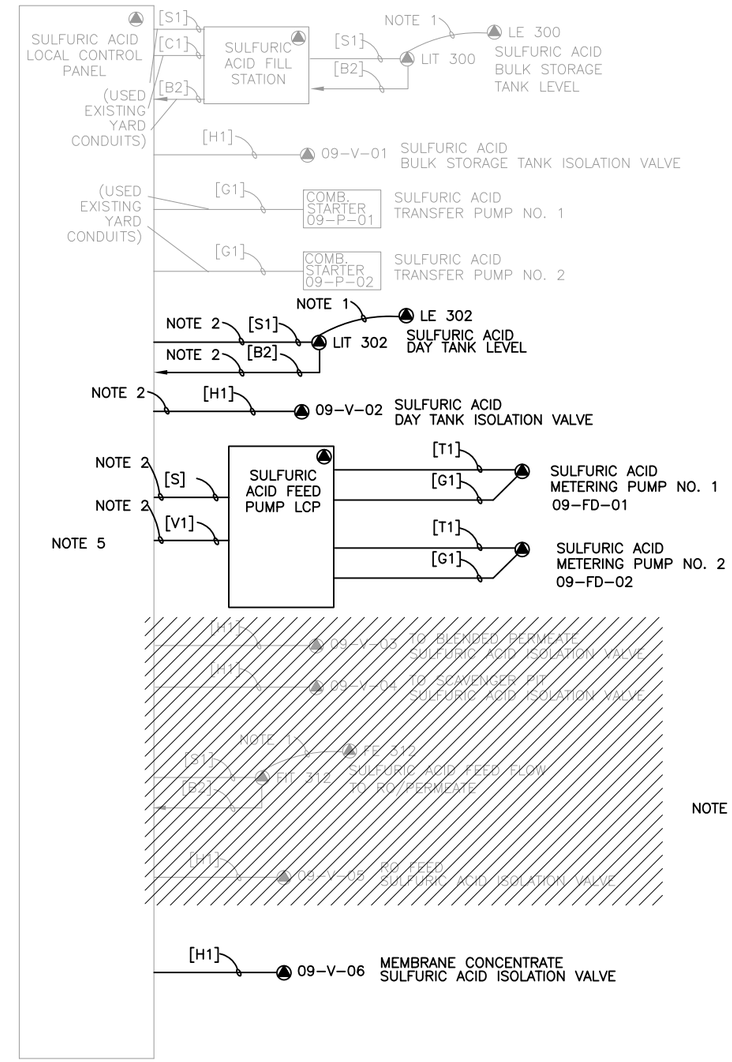
JOB NO. 10180C.10

DRAWING NO. GE-15



SODIUM HYPOCHLORITE CONTROL PANEL
RISER DIAGRAM
NOT TO SCALE





SULFURIC ACID CONTROL PANEL
RISER DIAGRAM
NOT TO SCALE

NOTES:

1. CABLE FURNISHED BY EQUIPMENT SUPPLIER. PROVIDE AND INSTALL 3/4"C. VERIFY CONDUIT SIZE WITH EQUIPMENT SUPPLIER.
2. CONTRACTOR SHALL FIELD VERIFY AND REUSE EXISTING CONDUIT, AND WIRES IF FEASIBLE. PROVIDE NEW CONDUIT, WIRES AND CONDUCTORS IF NECESSARY
3. CONTACTOR SHALL FIELD VERIFY EXISTING WIRE SIZE AND UPSIZE IT TO ACCOMODATE ADDITIONAL LOAD PER NEC.
4. REMOVE THE EXISTING MASS FLOW METER. DISCONNECT AND REMOVE EXISTING ISOLATION VALVES.
5. PANEL TO BE MODIFIED BY INSTRUMENTATION CONTRACTOR.

EXISTING

NEW

ADS Engineering
4701 N FEDERAL HWY, SUITE 390
POMPANO BEACH, FL 33064

REV	DATE	BY	DESCRIPTION

DESIGNED ADS
DRAWN IVZ
CHECKED MDG
DATE DECEMBER 2016

carollo

Lee County Southwest Florida

LEE COUNTY UTILITIES
NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM
RISER DIAGRAMS - 4

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

JOB NO. 10180C.10
DRAWING NO. GE-19

FIXTURE SCHEDULE

TYPE	DESCRIPTION	MANUFACTURER	MODEL	FIXTURE TYPE	MOUNTING	REMARK
1	COMPACT EXIT LIGHT AND EMERGENCY LIGHTING UNIT	BEGHELLI	APE-R-B-Exit/Emergency	2-5W HALOGEN	SURFACE	MOUNT MIN. 8' ABOVE WALKWAY.
2	EXIT LIGHT, LED SERIES THERMOPLASTIC CONSTRUCTION.	MCPHILBEN	CXXL-3-R-W	LED LAMPS	SURFACE	SINGLE FACE WITH EMERGENCY NICAD BATTERY
3	DUST AND MOISTURE TIGHT FLUORESCENT PLASTIC HOUSING, CORROSION RESISTANT	WILLIAMS	GL-4-454T5H-SCHA118-EB4-UNV	2-54 WATT FLUOR, 120V	SURFACE	SUSPEND MINIMUM 8' AFF. COORDINATE HIGHT WITH OTHER TRADES.
4	DUST AND MOISTURE TIGHT FLUORESCENT PLASTIC HOUSING, CORROSION RESISTANT	WILIAMS	HE3G-D24-232-26S-EB2	2-32 WATT FLUOR, 120V	SURFACE	SUSPEND MINIMUM 8' AFF. COORDINATE HIGHT WITH OTHER TRADES.
5	WALLPACK	GARDCO	111-MT-42TRF-UNV-BRP	42 WATT FLUOR, 120V	WALL	PROVIDE MOUNTING HARDWARE.

PANELBOARD SCHEDULE "LP-SB"

BUS AMPS A	BUS AMPS B	BUS AMPS C	LOAD	POLES	AMPS	BUS A B C		AMPS	POLES	LOAD	BUS AMPS A	BUS AMPS B	BUS AMPS C
5.4			LIGHT – STORAGE MAIN ROOM	1	20	1	2	20	1	LIGHT – SMALL ROOM 1	2.0		
	2.0		LIGHT – SMALL ROOM 2	1	20	3	4	20	1	RECEPT – STORAGE MAIN ROOM		6.0	
		6.0	RECEPT – SMALL ROOM 2	1	20	5	6	20	1	RECEPT – SMALL ROOM 1			6.0
6.0			RECEPT – SMALL ROOM 1 – PC	1	20	7	8	30	1	ACC-01	12		
	0.35		LIGHT-EXTER.-CONTACTOR LC-1	1	20	9	10	30	1	ACC-02		12	
		6.0	RECEPT – SMALL ROOM 2 – PC	1	20	11	12	20	1	SPARE			–
–			SPARE	1	20	13	14	20	1	SPARE	–		
	–		SPARE	1	20	15	16	20	1	SPARE		–	
		–	SPARE	1	20	17	18	20	1	SPARE			–
–			SPARE	1	20	19	20	20	1	SPARE	–		
	–		SPARE	1	20	21	22	20	1	SPARE		–	
		–	SPARE	1	20	23	24	20	1	SPARE			–
–			SPARE	1	20	25	26	20	1	SPARE	–		
	–		SPARE	1	20	27	28	20	1	SPARE		–	
		–	SPARE	1	20	29	30	20	1	SPARE			–
–			SPARE	1	20	31	32	20	1	SPARE	–		
	–		SPARE	1	20	33	34	20	1	SPARE		–	
		–	SPARE	1	20	35	36	20	1	SPARE			–
–			SPARE	1	20	37	38	20	1	SPARE	–		
	–		SPARE	1	20	39	40	20	1	SPARE		–	
		–	SPARE	1	20	41	42	20	1	SPARE			–

TOTAL AMPS: BUS A 25.4 BUS B 20.4 BUS C 18.0 CONNECTED Kva 7.7

RATED VOLTAGE: ■ 120/208 ☐ 277/480 3 PHASE, 4 WIRE | BRANCH POLES ☐ 12 ☐ 20 ☐ 30 ■ 42

RATED AMPS: ☐ 100 ■ 225 ☐ 400 ☐ _____ | CABINET: ■ SURFACE ☐ FLUSH

NEUTRAL BUS ■ 100% ☐ 150% ☐ 200% | ■ GROUND BUS | ■ HINGED DOOR | ■ KEYED DOOR LATCH | LOCATION: NEW STORAGE BUILDING

■ CIRCUIT BREAKER (BOLT-IN) BRANCH DEVICES | ■ TVSS | ENCLOSURE TYPE ☐ NEMA 1 ■ NEMA 3R ☐ NEMA 4X ☐ _____

☐ MAIN LUGS ONLY | MAIN 125 AMPS ■ BREAKER | ☐ _____ TO BE GFI BREAKERS

PANELBOARD MUST BE RATED TO INTERRUPT A SHORT CIRCUIT ISC OF ____10,000 AMPS SYMMETRICAL.

APPROVED MFRS. SQUARE D, GE, CUTLER-HAMMER, ALLEN-BRADLEY, SIEMENS | COPPER BUSSES | MAIN LUGS _____ SETS SIZE: _____

CIRCUIT SCHEDULE
3PH, 3W OR 1PH, 3W

CKT I.D.	CONDUIT AND CONDUCTOR SIZE	CKT AMPS
[A3]	[3/4 "C, 3#12, 1#12G]	20
[B3]	[3/4 "C, 3#10, 1#10G]	30
[C3]	[1"C, 3#8, 1#10G]	40
[D3]	[1"C, 3#6, 1#10G]	50
[E3]	[1 1/4 "C, 3#4, 1#10G]	60
[F3]	[1 1/4 "C, 3#4, 1#8G]	70
[G3]	[1 1/4 "C, 3#3, 1#8G]	80
[H3]	[1 1/2 "C, 3#2, 1#8G]	90
[J3]	[1 1/2 "C, 3#2, 1#8G]	100
[K3]	[1 1/2 "C, 3# 1, 1#6G]	150
[L3]	[2"C, 3#2/0, 1#6G]	175
[M3]	[2"C, 3#3/0, 1#6G]	200
[N3]	[2 1/2 "C, 3#4/0, 1#4G]	225
[P3]	[2 1/2 "C, 3-250KCMIL, 1#4G]	250
[Q3]	[3"C, 3-500KCMIL, 1#3G]	300
[R3]	2 EA.[2 "C, 3-3/0, 1#3G]	400
[S3]	2 EA.[2 1/2 "C, 3-250KCMIL, 1#2G]	500
[T3]	2 EA.[3"C, 3-350KCMIL, 1#1G]	600
[U3]	2 EA.[4"C, 3-500KCMIL, 1#1/0G]	700
[V3]	3 EA.[3"C, 3-350KCMIL, 1#1/0G]	800
[W3]	3 EA.[3 1/2"C, 3-500KCMIL, 1#2/0G]	1000
[X3]	4 EA.[3"C, 3-350KCMIL, 1#3/0G]	1200
[Y3]	5 EA.[4"C, 3-500KCMIL, 1#4/0G]	1600
[Z3]	6 EA.[4"C,3-500KCMIL,1-250KCMILG]	2000
[ZA3]	8 EA.[4"C,3-600KCMIL,1-600KCMILG]	3000
[ZB3]	10 EA.[4"C,3-600KCMIL,1-600KCMILG]	4000

CIRCUIT SCHEDULE
3PH, 4W

CKT I.D.	CONDUIT AND CONDUCTOR SIZE	CKT AMPS
[A4]	[3/4 "C, 4#12, 1#12G]	20
[B4]	[3/4 "C, 4#10, 1#10G]	30
[C4]	[1"C, 4#8, 1#10G]	40
[D4]	[1"C, 4#6, 1#10G]	50
[E4]	[1 1/4 "C, 4#4, 1#10G]	60
[F4]	[1 1/4 "C, 4#4, 1#8G]	70
[G4]	[1 1/2 "C, 4#3, 1#8G]	80
[H4]	[1 1/2"C, 4#2, 1#8G]	90
[J4]	[1 1/2"C, 4#2, 1#8G]	100
[K4]	[2"C, 4#1/0, 1#6G]	150
[L4]	[2"C, 4#2/0, 1#6G]	175
[M4]	[2 1/2 "C, 4#3/0, 1#6G]	200
[N4]	[2 1/2 "C, 4#4/0, 1#4G]	225
[P4]	[3"C, 4-250KCMIL, 1#4G]	250
[Q4]	[3 1/2"C, 4-350KCMIL, 1#3G]	300
[R4]	2 EA.[2 1/2 "C, 4#3/0, 1#3G]	400
[S4]	2 EA.[3"C, 4-250KCMIL, 1#2G]	500
[T4]	2 EA.[4"C, 4-350KCMIL, 1#1G]	600
[U4]	2 EA.[4"C, 4-500KCMIL, 1#1/0 G]	700
[V4]	3 EA.[4"C, 4-350KCMIL, 1#1/0 G]	800
[W4]	3 EA.[4"C, 4-500KCMIL, 1#2/0 G]	1000
[X4]	4 EA.[4"C, 4-350KCMIL, 1#3/0 G]	1200
[Y4]	5 EA.[4"C, 4-500KCMIL, 1#4/0 G]	1600
[Z4]	6 EA.[4"C, 4-500KCMIL, 1-250KCMIL G]	2000

CIRCUIT SCHEDULE
CONTROL, INSTRUMENTATION

CKT I.D.	CONDUIT AND CONDUCTOR SIZE
[A1]	[3/4 "C, 2#14, 1#14G]
[B1]	[3/4 "C, 3#14, 1#14G]
[C1]	[3/4 "C, 4#14, 1#14G]
[D1]	[3/4 "C, 5#14, 1#14G]
[E1]	[3/4 "C, 6#14, 1#14G]
[F1]	[3/4 "C, 7#14, 1#14G]
[G1]	[3/4 "C, 9#14, 1#14G]
[H1]	[1"C, 11#14, 1#14G]
[J1]	[1 1/4"C, 30#14, 1#14G]
[K1]	[1"C, 7/C TYPE A]
[L1]	[1 1/4"C, 12/C TYPE A]
[M1]	[1 1/2 "C, 19/C TYPE A]
[N1]	[2"C, 25/C TYPE A]
[P1]	[2"C, 37/C TYPE A]
[Q1]	[3/4 "C, 1-#16, TW PR]
[R1]	[3/4 "C, 1-TYPE B, TW SHLD PR]
[S1]	[3/4 "C, 2-TYPE B, TW SHLD PR]
[T1]	[1"C, 3-TYPE B, TW SHLD PR]
[U1]	[1 1/4 "C, 4-TYPE B, TW SHLD PR]
[V1]	[1 1/2 "C, 8-TYPE B, TW SHLD PR]
[W1]	[1"C, 1-BELDEN 3085A DEVICENET]
[X1]	[2 1/2 "C, 100#14, 1#12G]
[Y1]	[1"C, 20#14, 1#14G]
[Z1]	[2"C, 14-TYPE B, TW SHILD PR]

CIRCUIT SCHEDULE
1PH, 2W

CKT I.D.	CONDUIT AND CONDUCTOR SIZE	CKT AMPS
[A2]	[3/4 "C, 2#14, 1#14G]	15
[B2]	[3/4 "C, 2#12, 1#12G]	20
[C2]	[3/4 "C, 2#10, 1#10G]	30
[D2]	[3/4 "C, 2#8, 1#10G]	40
[E2]	[3/4 "C, 2#6, 1#10G]	50
[F2]	[1"C, 2#4, 1#10G]	60
[G2]	[1"C, 2#4, 1#8G]	70
[H2]	[1 1/4 "C, 2#3, 1#8G]	80
[J2]	[1 1/4 "C, 2#2, 1#8G]	90
[K2]	[1 1/4 "C, 2#1, 1#8G]	100
[L2]	[1 1/2 "C, 2#1/0, 1#6G]	150
[M2]	[1 1/2 "C, 2#2/0, 1#6G]	175
[N2]	[2"C, 2#3/0, 1#6G]	200
[P2]	[2"C, 2#4/0, 1#4G]	225
[Q2]	[2 1/2 "C, 2-250KCMIL, 1#4G]	250
[R2]	[2 1/2 "C, 2-350KCMIL, 1#4G]	300
[S2]		
[T2]		
[U2]		
[V2]		
[W2]		
[X2]		
[Y2]		
[Z2]		

[A] = [3/4 "C, 4#12, 1#12G]
[B] = [3/4 "C, 8#14, 1#14G]
[C] = [1"C, 6#12, 1#12G]
[D] = [1"C, 4#10, 1#10G]
[E] = [1"C, 12#14, 1#14G]
[F] = [1 "C, 16#14, 1#14G]
[G] = [2 1/2"C, 3-2/0, 350KCMN,1#2G]
[H] = [2 "C, 3#3, 1#1/0 N, 1#4G]
[I] = [1 1/2"C, 3#4, 1#2 N, 1#6G]
[J] = [2 "C, 3#1, 1 #3/0 N, 1#4G]
[K] = [1 "C, 6#10, #10G]
[L] = [3/4 "C, WITH NYLON PULL STRING]
[M] = [3/4"C, WITH NYLON PULL STRING]
[N] = [2"C, FOR FIBER OPTIC CABLES]
[O] = [1-1/2"C, WITH NYLON PULL STRING]
[P] = [2"C, EMPTY]
[Q] = 8 EA.[4"C,3-500KCM,1-350KCM G]
[R] = [1 1/2"C, 40#14, 1#14G]
[S] = [1 1/4"C, 20#14, 2#12, 1#12G]
[T] = [4"C-3#600 KCM, 1#2G]
[W] = [2"C, 60#14, 1#14G]
[Y] = [2"C, 18-TYPE B, TW SHILD PR]
[Z] = [1"C-4-CAT. 6e]

ADS Engineering
4701 N FEDERAL HWY, SUITE 390
POMPANO BEACH, FL 33064

REV	DATE	BY	DESCRIPTION

DESIGNED ADS
DRAWN IVZ
CHECKED MDG
DATE DECEMBER 2016

carollo

Lee County Southwest Florida

LEE COUNTY UTILITIES
NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM
PANELBOARD SCHEDULES - 1

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

JOB NO. 10180C.10
DRAWING NO. GE-21

120/208VOLTS
100 A MAIN BREAKER
3 PH
4 W
150 A
PANELBOARD: PP-1
LOCATION: MCC-1
FEED: TOP
MOUNTING: INSIDE MCC

LOAD DESCRIPTION	AMPS PH A	AMPS PH B	AMPS PH C	LTG	REC	MIS	CIR	BKR	BKR	CIR	MIS	REC	LTG	AMPS PH A	AMPS PH B	AMPS PH C	LOAD DESCRIPTION
SPARE							1	20	20	2							TVSS
POST TREAT. SAMPLE PUMP LCP							3	20	20	4							TVSS
CLEAN SYS. DRUM PUMP 08-P-01							5	20	20	6							TVSS
SPARE							7	20	20	8							SPARE
SULFURIC ACID FEED PUMP LCP							9	30	30	10							FLUORIDE FEED PUMP LCP
SOUTH GATE CONTROLER							11	20	20	12							AC-1 SUPPLY FAN #1/LOUVER #1
SOUTH GATE CONTROLER							13	20	20	14							SPARE
SODIUM HYPO. FEED PUMP LCP							15	30	20	16	1				1.2		GENERATOR BUSS DUCT HEAT STRIP
SPARE							17	20	20	18	1					1.2	UTILITY BUS DUCT HEAT STRIP
FLUORIDE LCP	2.0					1	19	20	20	20							SPARE
CORROSION INHIBITOR LCP		2.0				1	21	20	20	22							SPARE
CAUSTIC SODA LCP			4.5			1	23	20	20	24							SPARE
PP-6	40.0						25	50	20	26							SPARE
SPARE							27	20	20	28							SPARE
SPARE							29	20	20	30							SPARE
SPARE							31	20	20	32							2ND FL. MECHANICAL ROOM RECEPT.
SPARE							33	20	20	34							SPARE
SPARE							35	20	20	36							SPARE
SPARE							37	20	20	38							SPARE
SPARE							39	20	20	40							SPARE
SPACE							41	20	20	42							SPARE
							TOTAL		TOTAL								
	PHASE LOAD								TOTAL LOAD								
									KVA								

480/277VOLTS
150 A MAIN BREAKER
3 PH
4 W
200 A
PANELBOARD: PP-3
LOCATION: ELECTRICAL ROOM
FEED: TOP
MOUNTING: SURFACE

LOAD DESCRIPTION	AMPS PH A	AMPS PH B	AMPS PH C	LTG	REC	MIS	CIR	BKR	BKR	CIR	MIS	REC	LTG	AMPS PH A	AMPS PH B	AMPS PH C	LOAD DESCRIPTION
SPLIT STREAM FCV							1	40	20	2						SITE	LIGHTING FRONT ENTRANCE
01-V-53						1	3		2P	4							
							5	3P	20	6							SITE LIGHTING NORTHWEST
CAUSTIC FEED ROOM.	20.8						7	30	2P	8							
SPACE HEATERS RECEPTACLES		20.8					9		20	10							SPARE
			20.8				11	3P	2P	12							SPARE
SPARE							13	40	20	14							SITE LIGHTING SOUTHWEST
SPARE							15	40	2P	16							
SPARE							17	40	20	18							SPARE
SPARE							19	20	2P	20							SPARE
SPARE							21	20	20	22							SPARE
SPARE							23	20	20	24							SPARE
SPARE							25	20	20	26							
SPARE							27	20	20	28							EAST ROLLUP DOOR
SPARE							29	20	20	30							
SPARE							31	20	20	32							
SPARE							33	20	20	34							WEST ROLLUP DOOR
SPARE							35	20	2P	36							
WATER HEATER 2ND. FL.	---						37	20		38							
MECHANICAL ROOM		---					39			40							SHOP ROLLUP DOOR
			---				41	3P		42							
							TOTAL		TOTAL								
	PHASE LOAD								TOTAL LOAD								
									KVA								

EXISTING
NEW

120/208VOLTS
100 A MAIN BREAKER
3 PH
4 W
150 A
PANELBOARD: PP-2
LOCATION: MCC-2
FEED: TOP
MOUNTING: INSIDE MCC

LOAD DESCRIPTION	AMPS PH A	AMPS PH B	AMPS PH C	LTG	REC	MIS	CIR	BKR	BKR	CIR	MIS	REC	LTG	AMPS PH A	AMPS PH B	AMPS PH C	LOAD DESCRIPTION
SHOP FUTURE RECEPT.							1	20	20	2							TVSS
SEPTIC TANK PUMP LCP							3	20	20	4							TVSS
CORROSION INHIB. FEED PUMP LCP							5	30*	20	6							TVSS
CAUSTIC SODA FEED PUMP LCP	---						7	30*	30*	8							SCALE INHIBITOR FEED PUMP LCP
SHOP HI-BAY LIGHTS							9	20	20	10							SPARE
IRIGATION CONTROL PANEL							11	20	20	12							NORTH GATE MOTOR #2
SPARE							13	20	20	14							NORTH GATE MOTOR #2
SPARE							15	20	20	16							SPARE
SPARE							17	20	20	18							AIR CONDITION CONTROL PANEL
AC-2 SUPPLY FAN #2/LOUVER #2							19	20	20	20							SPARE
SPARE							21	20	20	22							SPARE
SPARE							23	20		24							SPARE
HYPOCHLORITE LCP	5.0					1	25	20		26							SPARE
SULFURIC ACID LCP		5.0				1	27	30		28							SPARE
SCALE INHIBITOR LCP			2.0			1	29	20		30							SPARE
AMMONIA LCP	12.0					1	31	20		32							SPARE
SPARE							33	20		34							SPARE
SPARE							35			36							SPARE
SPARE							37			38							SPARE
SPARE							39			40							SPARE
SPACE							41			42							SPARE
							TOTAL		TOTAL								
	PHASE LOAD								TOTAL LOAD								
									KVA								

120/208VOLTS
125 A MAIN BREAKER
3 PH
4 W
150 A
PANELBOARD: IP-2
LOCATION: ELECTRICAL ROOM
FEED: TOP
MOUNTING: SURFACE

LOAD DESCRIPTION	AMPS PH A	AMPS PH B	AMPS PH C	LTG	REC	MIS	CIR	BKR	BKR	CIR	MIS	REC	LTG	AMPS PH A	AMPS PH B	AMPS PH C	LOAD DESCRIPTION
FIT-133 RAW WATER FLOW	0.05						1	20	20	2				3.0			RO TRAIN #3 WET PANEL
AMMONIA LCP		12.0					3	20	20	4					3.0		RO TRAIN #4 WET PANEL
CO2 CONTROL PANEL			2.0				5	20	20	6						2.0	RO SKIDS RIO
AIR SYSTEM LCP	3.0						7	20	20	8				2.0			SURGE SYSTEM LCP
SPACE		---					9	20	20	10					6.0		FIT400,FIT401,AIT400,AIT401
SPACE			---				11	20	20	12						---	SPACE
SPACE	---						13	20	20	14				---			SPACE
SPACE		---					15	20	20	16					---		SPACE
SPACE			---				17	20	20	18						---	SPACE
SPACE	---						19	20	20	20				---			SPACE
SPACE		---					21	20	20	22					---		SPACE
SPACE			---				23	20	20	24						---	SPACE
SPACE	---						25	20	20	26				---			SPACE
SPACE		---					27	20	20	28					---		SPACE
SPACE			---				29	20	20	30						---	SPACE
SPACE	---						31	20	20	32				---			SPACE
SPACE		---					33	20	20	34					---		SPACE
SPACE			---				35	20	20	36						---	SPACE
SPACE	---						37	20		38				---			SPACE
SPACE		---					39	20		40					---		SPACE
SPACE			---				41			42						---	SPACE
	3.05	12.0	2.0				TOTAL		TOTAL					5.0	9.0	2.0	
	PHASE AMPS								TOTAL LOAD								
	8.05	21.0	4.0						3.97KVA								

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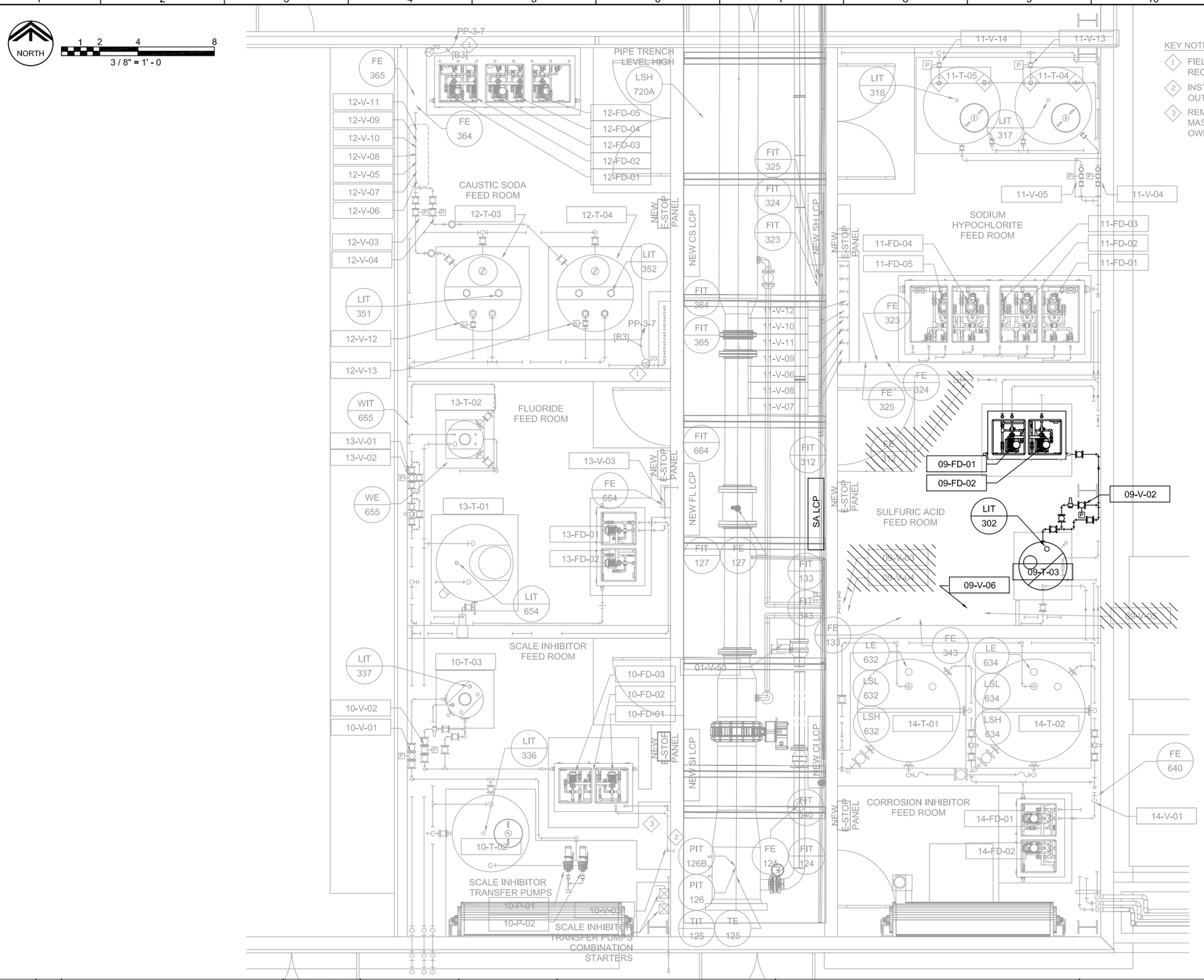
LEE COUNTY UTILITIES
NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM
PANELBOARD SCHEDULES - 3

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

JOB NO. 10180C.10
DRAWING NO. GE-23



KEY NOTES

1. FIELD LOCATE 2 SPACE HEATERS WITH RECEPTACLES
2. INSTRUMENTS TO BE LOCATED OUTSIDE OF PROCESS TRENCH
3. REMOVE EXISTING SCALE INHIBITOR MASS FLOW METER AND RETURN TO OWNER

CHEMICAL FEED ROOM

SCALE: 3/8" = 1'-0"

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Lee County Southwest Florida

LEE COUNTY UTILITIES

NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM

CHEMICAL FEED ROOM
EQUIPMENT AND INSTRUMENTATION LOCATION

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

JOB NO. 10180C.10

DRAWING NO. 2E-02

GENERAL INSTRUMENT OR FUNCTION SYMBOLS

PRIMARY LOCATION NORMALLY ACCESSIBLE TO OPERATOR | FIELD MOUNTED | AUXILIARY LOCATION NORMALLY ACCESSIBLE TO OPERATOR

DISCRETE INSTRUMENTS

SHARED DISPLAY, SHARED CONTROL OR COMPUTER FUNCTION

PROGRAMMABLE LOGIC CONTROL FUNCTION

NORMALLY INACCESSIBLE OR BEHIND-THE-PANEL DEVICES OR FUNCTIONS MAY BE DEPICTED BY USING THE SAME SYMBOL BUT WITH DASHED HORIZONTAL BARS, i.e.:

INSTRUMENTS SHARING COMMON HOUSING

DENOTES EQUIPMENT SPECIFIED UNDER OTHER SECTIONS OF THIS CONTRACT

DENOTES NEW EQUIPMENT

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

FUTURE EQUIPMENT

CONTROL INTERLOCK FUNCTION, SOFTWARE OR HARDWIRED. SEE DESCRIPTION PROVIDED, ELECTRICAL SCHEMATIC, AND/OR SYSTEM SPECIFICATIONS FOR SPECIFIC FUNCTION.

DETAIL NUMBER IF USED

DIGITAL SYSTEM I/O INTERFACE. DIRECTION OF TRIANGLE DENOTES WHETHER INPUT OR OUTPUT

LETTER DENOTES SIGNAL TYPE. THE LETTER 'A' DENOTES AN ANALOG SIGNAL.

THE LETTER 'D' DENOTES A DISCRETE SIGNAL

NUMBER DENOTES NUMBER OF TYP. SIGNALS (INPUTS)

TYPICAL TAG NUMBERS & DESIGNATION

LOOP NO. 1234

CL2

AE

A

TYPICAL LOOP NUMBER

ADDITIONAL INSTRUMENT IDENTIFICATION SEE FUNCTION SYMBOLS & ABBREVIATIONS

WHEN USED, LETTER DISTINGUISHES BETWEEN MULTIPLE, SIMILIAR DEVICES IN THE SAME INSTRUMENT LOOP.

WHEN USED, NUMBER DENOTES DEVICES IN IDENTICAL DUPLICATE SYSTEMS.

GENERAL NOTES

1. THIS IS A GENERAL LEGEND SHEET, SOME SYMBOLS AND ABBREVIATIONS MAY NOT APPLY TO THIS SPECIFIC PROJECT.
2. THIS LEGEND APPLIES TO INSTRUMENTATION DIAGRAMS ONLY AND MAY DIFFER FROM LEGENDS FOR OTHER SHEETS.
3. IN GENERAL THIS LEGEND SHEET AND THE INSTRUMENTATION DIAGRAMS ARE BASED ON INSTRUMENT SOCIETY OF AMERICA, STANDARDS FOR PRACTICES FOR INSTRUMENTATION. SOME MODIFICATIONS, ADDITIONS AND ALTERATIONS HAVE BEEN MADE AS REQUIRED TO ACCOMODATE THE PROJECT REQUIREMENTS.
4. SOME PROCESS ITEMS, SUCH AS EQUIPMENT ISOLATION VALVES, BYPASS LINES, etc., WHICH ARE NOT CRITICAL FOR AN UNDERSTANDING OF THE INSTRUMENTATION FUNCTIONS ARE NOT SHOWN ON THE INSTRUMENTATION SHEETS.
5. SEE ELECTRICAL SHEETS AND SPECIFICATIONS FOR ADDITIONAL CONTROL AND INTERLOCK REQUIREMENTS FOR EQUIPMENT NOT SHOWN IN THE LOOP DIAGRAMS.
6. ALL EQUIPMENT AND DEVICES SHOWN ARE TO BE SUPPLIED BY THE GENERAL. EQUIPMENT FURNISHED BY GENERAL SHALL COMPLY WITH THE CONTROL AND INSTRUMENTATION REQUIREMENTS SHOWN ON THE RESPECTIVE LOOP DIAGRAMS.

LINE SYMBOLS

MAJOR PROCESS PIPING, FLOW CHANNEL WITH FLOW OR SIGNAL OR DATA HIGHWAY DIRECTION AS SHOWN.

MINOR PROCESS PIPING WITH FLOW DIRECTION AS SHOWN

MISCELLANEOUS PIPING WITH FLOR DIRECTION AS SHOWN

ETHERNET

ELECTRIC OR ELECTRONIC SIGNAL WITH SIGNAL DIRECTION AS SHOWN

SOFTWARE SIGNAL LINK

HYDRAULIC SIGNAL

PNEUMATIC SIGNAL

CAPILLARY TUBE OR FILLED SYSTEM SIGNAL

ELECTROMAGNETIC OR SONIC SIGNAL

PROCESS OR SIGNAL LINE CONTINUED AT ANOTHER LOCATION

PROCESS OR SIGNAL LINE CONTINUED FROM ANOTHER LOCATION (MATCH LETTERS)

REDUNDANT FIBER OPTIC ETHERNET BACKBONE

REDUNDANT FIBER OPTIC REMOTE I/O NETWORK

PROCESS DEVICE SYMBOLS

DIAPHRAGM SEAL

ANNULAR TYPE DIAPHRAGM SEAL

BUBBLER SYSTEM

PURGE OR FLUSHING DEVICE

REDUCER OR ENLARGER

PRIMARY ELEMENT VENTURI TUBE

PRIMARY ELEMENT MAGNETIC FLOWMETER

PRIMARY ELEMENT ULTRASONIC FLOWMETER

PRIMARY ELEMENT PARSHALL FLUME OR TRAPEZOIDAL FLUME

PRIMARY ELEMENT ORIFICE PLATE

PRIMARY ELEMENT WEIR FLOWMETER

PRIMARY ELEMENT TURBINE OR PROPELLER TYPE METER

PRIMARY ELEMENT PITOT TUBE

PRIMARY ELEMENT ROTAMETER

NUCLEAR DENSITY METER

PRIMARY ELEMENT STRAP ON ULTRASONIC METER

LE DR FE

PRIMARY ELEMENT ULTRASONIC FLOW OR LEVEL METER

FLOAT SWITCH

PULSATION DAMPENER

LE

RADAR-TYPE LEVEL TRANSMITER

PRESSURE REGULATING VALVE SELF CONTAINED

BALL VALVE

VALVE: GLOBE OR OTHER IN-LINE TYPE NOT OTHERWISE IDENTIFIED

V

AIR RELEASE VALVE

BUTTERFLY VALVE

SWING CHECK VALVE

PRESSURE RELIEF OR SAFETY VALVE

RUPTURE DISK

CENTRIFUGAL BLOWER

CENTRIFUGAL PUMP

GEAR PUMP OR BLOWER (POSITIVE DISPLACEMENT)

RATE SET

STROKE ADJUST

DIAPHRAGM PUMP AND MOTOR

HOSE PUMP

VERTICAL PUMP

HORIZONTAL PUMP

MIXER

MOTOR - MAY BE ELECTRIC, HYDRAULIC OR PNEUMATIC ARROW DENOTES VARIABLE SPEED

D

DRAIN

ANTI-SIPHON VALVE

LOGIC SYMBOLS

DI, DI, DI → A → DO AND FUNCTION

DI, DI, DI → OR → DO OR FUNCTION

DI → SYMBOL MAY BE DRAWN TANGENT TO AN ADJACENT LOGIC SYMBOL → DO INVERTER OR NOT FUNCTION

DI → S, DI → R → DO SET/RESET FUNCTION (OPERATES LIKE LATCHING RELAY)

STATEMENT OF SPECIAL REQUIREMENTS

DI → DO RELATIONSHIP FUNCTION

DI → DI t → DO TIME DELAY ON (AFTER INITIATION) t DENOTES TIME DELAY IN SECONDS UNLESS NOTED OTHERWISE

DI → DT t → DO TIME DELAY OFF (AFTER TERMINATION) t DENOTES TIME DELAY IN SECONDS UNLESS NOTED OTHERWISE

SETPOINT

INPUT → K S %/∡ → OUTPUT CONTROLLER FUNCTION PROPORTIONAL PLUS INTEGRAL PLUS DERIVATIVE SHOWN AS EXAMPLE. OTHER COMBINATIONS POSSIBLE.

OCM OPTIC MEDIA CONVERTER

FUNCTION SYMBOLS AND ABBREVIATIONS

k	PROPORTIONAL GAIN OR ATTENUATE (INPUT:OUTPUT)
-k	REVERSE PROPORTIONAL GAIN OR ATTENUATE (INPUT:OUTPUT)
Σ	SUMMING
Σ/n	AVERAGING
Δ	SUBTRACTING
√	EXTRACT SQUARE ROOT
÷	DIVIDE
x	MULTIPLY
∫	INTEGRATE
+	BIAS POSITIVE
-	BIAS NEGATIVE
F(x)	NONLINEAR OR UNSPECIFIED FUNCTION
>	HIGH SELECT
<	LOW SELECT
⊳	HIGH LIMIT
k	LOW LIMIT
/	SIGNAL TRANSDUCER OR CONVERTER (INPUT/OUTPUT) * DEFINED AS FOLLOWS: E - VOLTAGE; I - CURRENT; P - PNEUMATIC; PD - PULSE DURATION; H - HYDRAULIC; O - ELECTROMAGNETIC, SONIC; R - RESISTANCE (ELECTRIC)

CHEMICAL ABBREVIATIONS
STANDARD CHEMICAL FORMULAS ARE USED.

HAND SWITCH ABBREVIATIONS
H - HAND; O - OFF OR OPEN; C - COMPUTER OR CLOSE; A - AUTOMATIC; L - LOCAL; R - REMOTE; S - START OR STOP; M - MODULATE

VALVE ACTUATOR SYMBOLS

S SOLENOID

M ROTARY MOTOR

P PNEUMATIC

FOR PRESSURE RELIEF OR SAFETY VALVES ONLY

OR NO SYMBOL MANUALLY (HAND) OPERATED

FLEXIBLE CONNECTOR

DAMPER

BASKET STRAINER

VERTICAL SUMP PUMP

SUBMERSIBLE SUMP PUMP

ALARM LIGHTS

SPRING CHECK VALVE

BALL CHECK VALVE

AI	ANALOG INPUT	H202	PEROXIDE
AO	ANALOG OUTPUT	HYP	HYPOCHLOR
AS	AIR SUPPLY	MC	MOTOR CONTROLLER
ATM	ATMOSPHERE	NC	NORMALLY CLOSED
COND	CONDUCTIVITY	NO	NORMALLY OPEN
CL	CHLORINE	PAC	POWDER ACTIVATED CARBON
CL2G	CHLORINE GAS	P.C.	PARTICLE COUNT ANALYZER
CPOL	CATIONIC POLYMER	pH	HYDROGEN ION CONCENTRATION
CR	CHLORINE RESIDUAL	PLC	PROGRAMMABLE LOGIC CONTROLLER
CTU	CENTRAL TELEMETRY UNIT	POLM	POLYMER
DCU	DISTRIBUTED CONTROL UNIT	RIO	REMOTE INPUT/OUTPUT
DI	DIGITAL OR DISCRETE INPUT	RTU	REMOTE TERMINAL UNIT
DO	DISSOLVED OXYGEN OR DIGITAL OUTPUT	SA	SAMPLE
ES	ELECTRIC SUPPLY	S.C.	STREAMING CURRENT ANALYZER
ETM	ELAPSED TIME METER	TURB	TURBIDITY
FC	FAIL CLOSED	VFD	VARIABLE FREQUENCY DRIVE
FLP	FAIL LAST POSITION	VIB	VIBRATION
FO	FAIL OPEN	VSD	VARIABLE SPEED DRIVE
FW	FLUSHING WATER		

MEANINGS OF IDENTIFICATION LETTERS

THIS TABLE APPLIES TO THE FUNCTIONAL IDENTIFICATION OF INSTRUMENTS.

	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION		EMERGENCY	USER'S CHOICE	USER'S CHOICE
C	USER'S CHOICE		CLEANER	CONTROL	
D	DENSITY (MASS) OR SPECIFIC GRAVITY	DIFFERENTIAL			
E	VOLTAGE (EMF)		PRIMARY ELEMENT		
F	FLOW RATE	RATIO (FRACTION)			
G	GAUGING (DIMENSIONAL)		GLASS		
H	HAND (MANUALLY INITIATED)				HIGH OR OPEN
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME OR TIME SCHEDULE			CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW OR CLOSED
M	USER'S CHOICE	MOMENTARY			MIDDLE OR INTERMEDIATE
N	USER'S CHOICE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE (RESTRICTION)		
P	PRESSURE OR VACUUM		POINT (TEST CONNECTION)		
Q	QUANTITY	INTERGRATE OR TOTALIZE			
R	RUN		RECORD		
S	SPEED OR FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VISCOSITY, VIBRATION			VALVE, DAMPER OR LOUVER	
W	WEIGHT OR FORCE		WELL		
X	FAILURE	X AXIS			
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION, DIMENSION	Z AXIS		DRIVE, ACTUATE OR UNCLASSIFIED CONTROL ELEMENT	

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Lee County Southwest Florida

LEE COUNTY UTILITIES

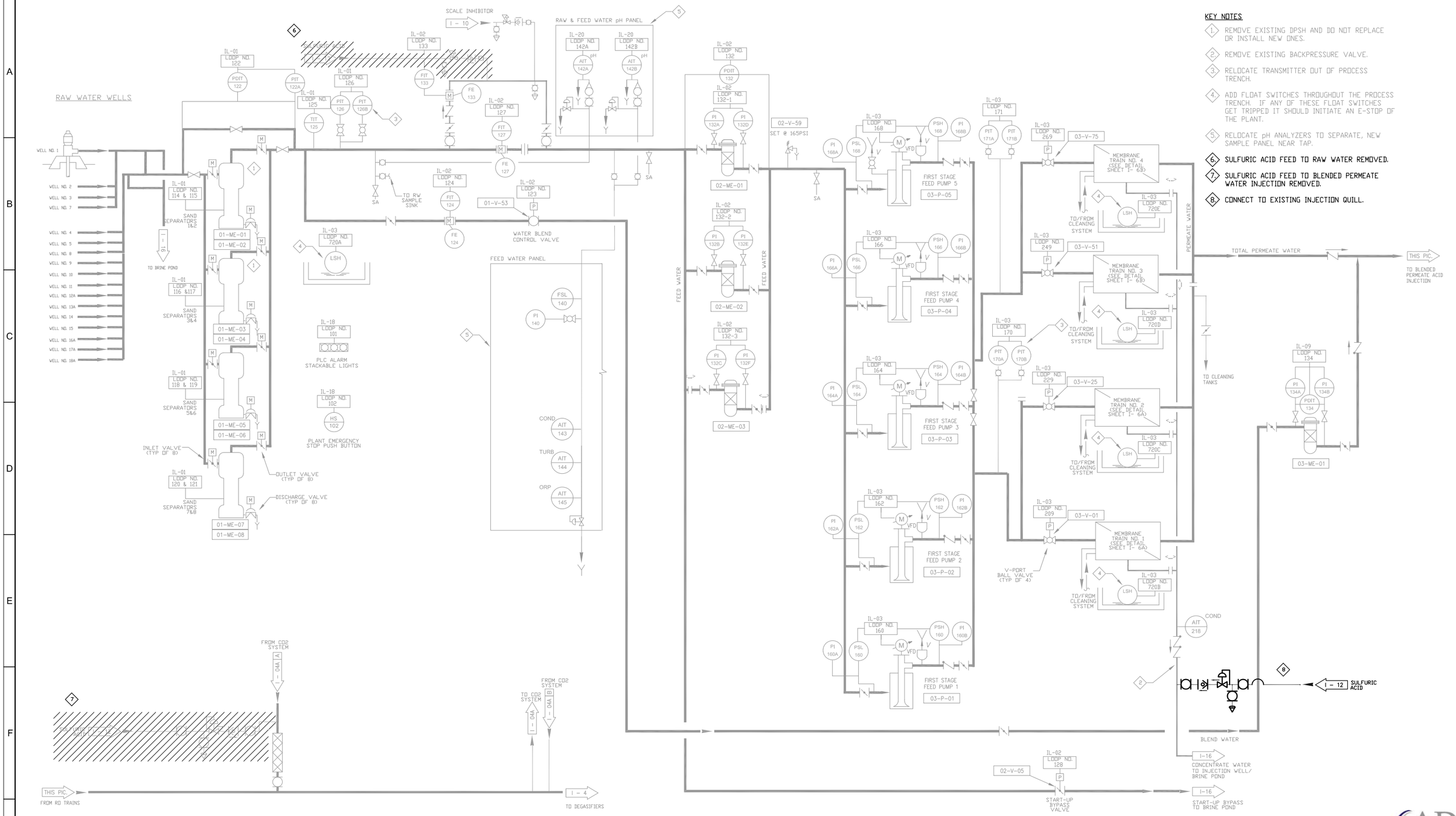
NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM

INSTRUMENTATION LEGEND

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

JOB NO. 10180C.10

DRAWING NO. I-01



KEY NOTES

1. REMOVE EXISTING DPSH AND DO NOT REPLACE OR INSTALL NEW ONES.
2. REMOVE EXISTING BACKPRESSURE VALVE.
3. RELOCATE TRANSMITTER OUT OF PROCESS TRENCH.
4. ADD FLOAT SWITCHES THROUGHOUT THE PROCESS TRENCH. IF ANY OF THESE FLOAT SWITCHES GET TRIPPED IT SHOULD INITIATE AN E-STOP OF THE PLANT.
5. RELOCATE pH ANALYZERS TO SEPARATE, NEW SAMPLE PANEL NEAR TAP.
6. SULFURIC ACID FEED TO RAW WATER REMOVED.
7. SULFURIC ACID FEED TO BLENDED PERMEATE WATER INJECTION REMOVED.
8. CONNECT TO EXISTING INJECTION QUILL.

BLENDED PERMEATE ACID INJECTION

CARTRIDGE FILTERS

FIRST STAGE RO FEED PUMPS

MEMBRANE TRAINS

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NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM

MEMBRANE FEED SYSTEM

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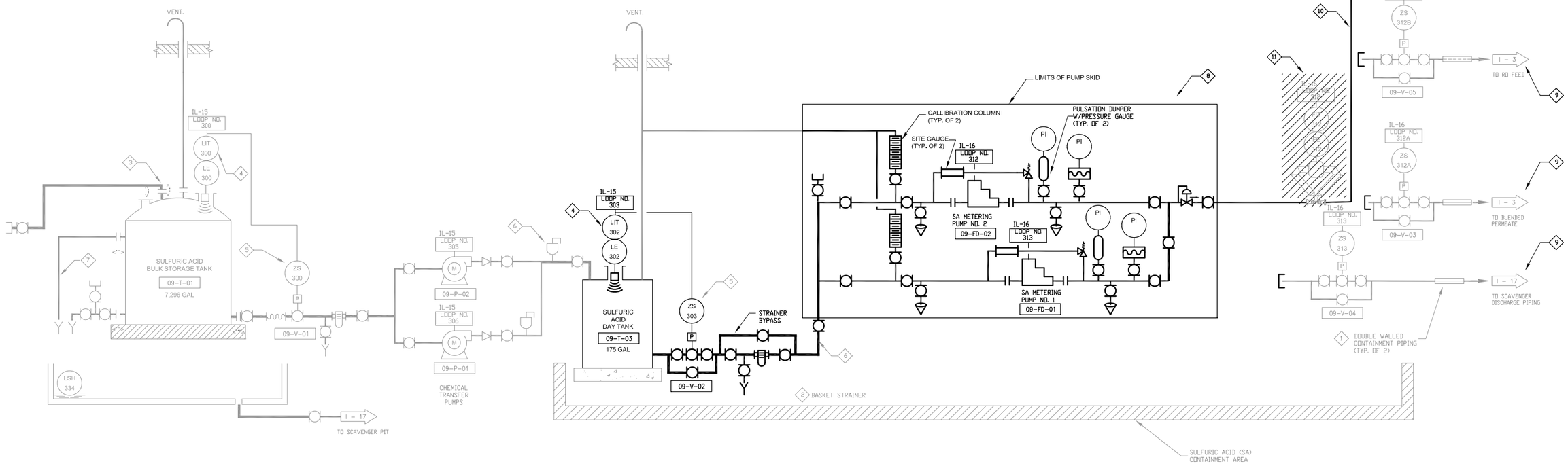
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10180C.10
DRAWING NO. I-03

KEY NOTES

1. FURNISH AND INSTALL DOUBLE CONTAINED PIPING WITH SITE GLASS LEAK DETECTOR AT LOW POINT IN PIPING
2. FURNISH AND INSTALL BASKET STRAINER BETWEEN METERING PUMP SKID AND DAY TANKS. CONSTRUCT BYPASS AROUND STRAINER TO FACILITATE SYSTEM OPERATION DURING STRAINER MAINTENANCE
3. DEMOLISH EXISTING ANTI-SIPHON VALVES ON BULK STORAGE TANK FILL LINES
4. PROVIDE NEW DAY TANK LEVEL TRANSMITTER RADAR TYPE.
5. REPLACE EXISTING DIAPHRAGM VALVE WITH PNEUMATICALLY OPERATED QUARTER-TURN BALL VALVE
6. PROVIDE ANTI SIPHON VALVE AT COMMON DISCHARGE OF CHEMICAL TRANSFER PUMPS
7. FIELD ROUTE NEW OVERFLOW PIPING TO CONTAINMENT AREA DRAIN
8. REMOVE AND REPLACE EXISTING SULFURIC ACID METERING PUMP SKID (09-FD-01 AND 09-FD-02) WITH NEW PUMP SKID.
9. SULFURIC ACID PIPING REMOVED.
10. SULFURIC ACID PIPING REPLACED WITH 3/4" CPVC PIPING.
11. REMOVE EXISTING MASS FLOW METER.



SULFURIC ACID

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DESIGNED: ADS
DRAWN: IVZ
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DATE: DECEMBER 2016

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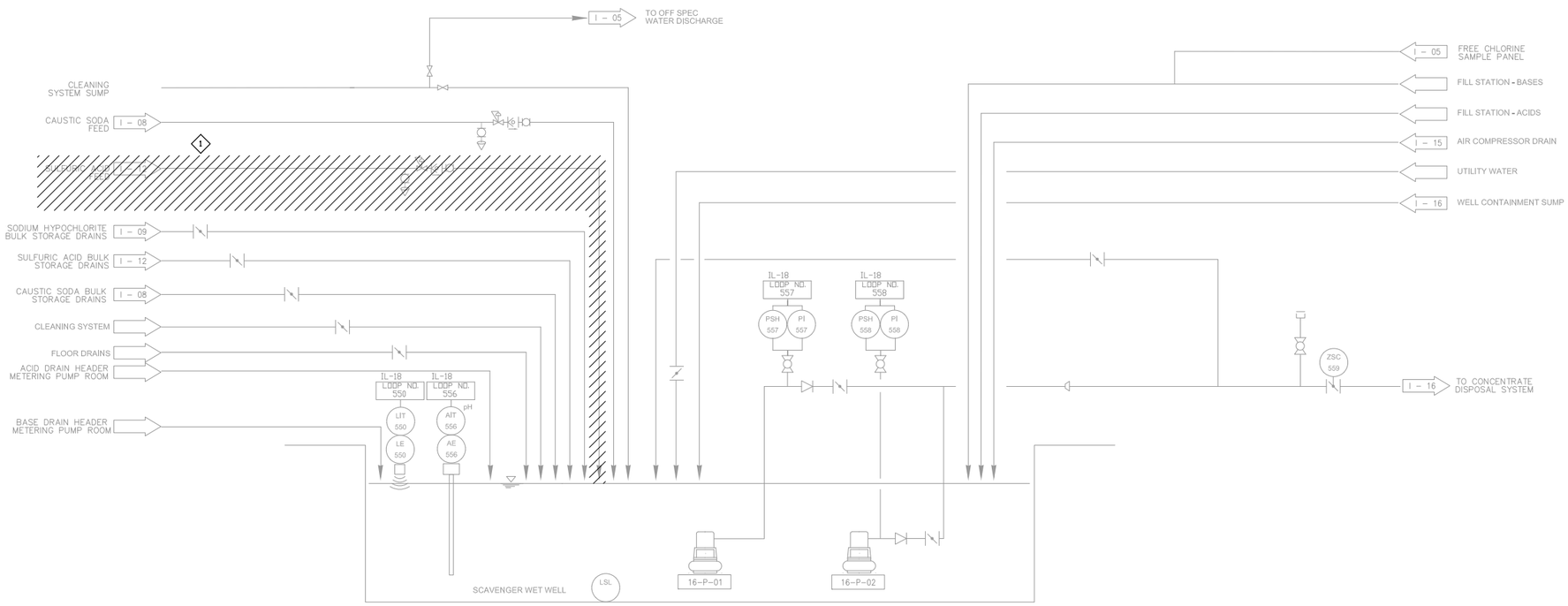
NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM
SULFURIC ACID SYSTEM

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

JOB NO. 10180C.10
DRAWING NO. I-12

KEY NOTES:

1. SULFURIC ACID FEED TO SCAVENGER WET WELL REMOVED.



SCAVENGER SYSTEM

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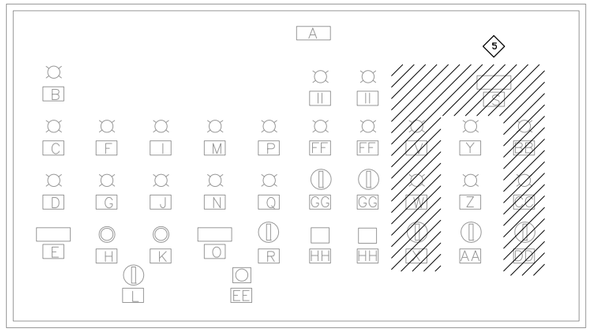
LEE COUNTY UTILITIES
NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM
SCAVENGER SYSTEM

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

JOB NO. 10180C.10
DRAWING NO. I-17



SULFURIC ACID NAMEPLATE SCHEDULE	
A	SULFURIC ACID LCP
B	STORAGE TANK LEVEL ALARM LOW
C	STORAGE TANK ISOLATION VALVE POSITION OPEN
D	STORAGE TANK ISOLATION VALVE POSITION CLOSED
E	STORAGE TANK LEVEL INDICATION
F	TRANSFER PUMP NO.1 FAIL
G	TRANSFER PUMP NO.1 RUN
H	TRANSFER PUMP NO.X START
I	TRANSFER PUMP NO.2 FAIL
J	TRANSFER PUMP NO.2 RUN
K	TRANSFER PUMP NO.X START
L	TRANSFER PUMP SELECTION SWITCH
M	DAY TANK LOW LEVEL ALARM
N	DAY TANK HIGH LEVEL ALARM
O	DAY TANK LEVEL INDICATION
P	DAY TANK ISOLATION VALVE POSITION OPEN
Q	DAY TANK ISOLATION VALVE POSITION CLOSED
R	DAY TANK ISOLATION VALVE SWITCH
S	RO FEED BLENDED PERMEATE FEED FLOW
T	SCAVENGER ISOLATION VALVE POSITION OPEN
U	SCAVENGER ISOLATION VALVE POSITION CLOSED
V	SCAVENGER ISOLATION VALVE SWITCH
W	RO FEED ISOLATION VALVE POSITION OPEN
X	RO FEED ISOLATION VALVE POSITION CLOSED
AA	RO FEED ISOLATION VALVE SWITCH
BB	BLENDED PERMEATE ISOLATION VALVE POSITION OPEN
CC	BLENDED PERMEATE ISOLATION VALVE POSITION CLOSED
DD	BLENDED PERMEATE ISOLATION SWITCH
EE	TRANSFER PUMP EMERGENCY STOP
FF	FEED PUMP NO.Y RUN
GG	FEED PUMP NO.Y HOR SWITCH
HH	FEED PUMP NO.Y SPEED DIALER
II	FEED PUMP NO.Y FAIL

Y = 1, 2

SULFURIC ACID (LCP)

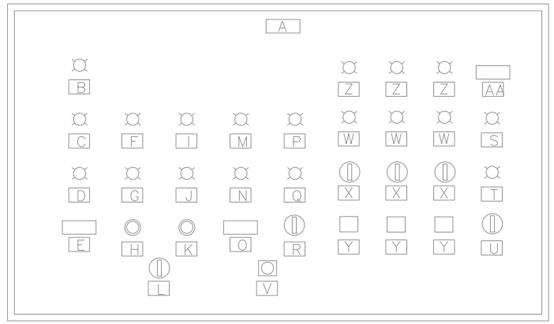
1. NEMA 4X FRP ENCLOSURE WITH A BACK PANEL FOR INTERNAL COMPONENT MOUNTING.
2. PUSHBUTTONS AND SELECTOR SWITCHES SHALL BE HEAVY DUTY OIL TYPE SUITABLE FOR USE IN NEMA 4X APPLICATIONS.
3. INDICATOR LIGHTS SHALL BE HEAVY DUTY PUSH–TO–TEST TYPE SUITABLE FOR USE IN NEMA 4X APPLICATION. DIGITAL DISPLAYS SHALL BE NEMA 4X.
4. PROVIDE CONTROL LOGIX REMOTE IO PER SPECIFICATIONS AND LOOP DRAWINGS.

5. CONTRACTOR SHALL MODIFY THE EXISTING CONTROL PANEL TO ACCOMMODATE ALL WORK DEFINED BY DRAWINGS AND SPECIFICATIONS INCLUDING BUT NOT LIMITED TO: REMOVING EXISTING MASS FLOW METER DISPLAY, REMOVING CONTROLS FOR ISOLATION VALVES, CLOSING OPENINGS WITH 316 SS PLATES TO PROVIDE NEMA 4X RATING, ETC.

6. CONTRACTOR HAS AN OPTION TO REUSE CONTROLS FROM DISCONNECTED ISOLATION VALVES TO CONTROL THE NEW ISOLATION VALVE TO CONCENTRATE. REPLACE NAME TAGS ACCORDINGLY.

PROVIDE POWER AND CIRCUIT BREAKERS FOR THE FOLLOWING EQUIPMENT:

SA–FS–1	SA FILL STATION
LIT 342	SA DAY TANK LEVEL
FIT 343	SA FEED FLOW RO FEED/BLENDED PERMEATE



SCALE INHIBITOR NAMEPLATE SCHEDULE	
A	SCALE INHIBITOR LCP
B	STORAGE TANK LEVEL ALARM LOW
C	STORAGE TANK ISOLATION VALVE POSITION OPEN
D	STORAGE TANK ISOLATION VALVE POSITION CLOSED
E	STORAGE TANK LEVEL INDICATION
F	TRANSFER PUMP NO.1 FAIL
G	TRANSFER PUMP NO.1 RUN
H	TRANSFER PUMP NO.X START
I	TRANSFER PUMP NO.2 FAIL
J	TRANSFER PUMP NO.2 RUN
K	TRANSFER PUMP NO.X STOP
L	TRANSFER PUMP SELECTION SWITCH
M	DAY TANK LOW LEVEL ALARM
N	DAY TANK HIGH LEVEL ALARM
O	DAY TANK LEVEL INDICATION
P	DAY TANK ISOLATION VALVE POSITION OPEN
Q	DAY TANK ISOLATION VALVE POSITION CLOSED
R	DAY TANK ISOLATION VALVE SWITCH
S	ISOLATION VALVE POSITION OPEN
T	ISOLATION VALVE POSITION CLOSE
U	ISOLATION VALVE SWITCH
V	TRANSFER PUMP EMERGENCY STOP
W	FEED PUMP NO.Y RUN
X	FEED PUMP NO.Y HOR SWITCH
Y	FEED PUMP NO.Y SPEED DIALER
Z	FEED PUMP NO.Y FAIL
AA	SCALE INHIBITOR FEED FLOW

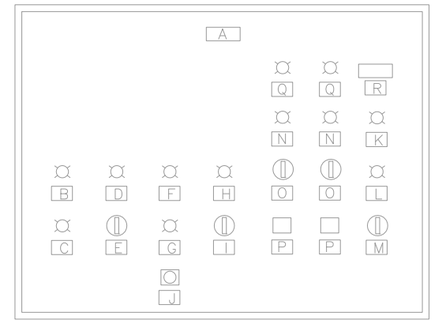
Y = 1, 2, 3

SCALE INHIBITOR (LCP)

1. NEMA 4X FRP. ENCLOSURE WITH A BACK PANEL FOR INTERNAL COMPONENT MOUNTING.
2. PUSHBUTTON AND SELECTOR SWITCHES SHALL BE HEAVY DUTY OIL TYPE SUITABLE FOR USE IN NEMA 4X APPLICATIONS.
3. INDICATOR LIGHTS SHALL BE HEAVY DUTY PUSH–TO–TEST TYPE SUITABLE FOR USE IN NEMA 4X APPLICATION. DIGITAL DISPLAYS SHALL BE NEMA 4X.
4. PROVIDE CONTROL LOGIX REMOTE IO PER SPECIFICATIONS AND LOOP DRAWINGS.

PROVIDE POWER AND CIRCUIT BREAKERS FOR THE FOLLOWING EQUIPMENT:

LIT 337	SI DAY TANK LEVEL
LIT 336	SI BULK STORAGE TANK LEVEL
FIT 343	SI FEED FLOW 1



CORROSION INHIBITOR NAMEPLATE SCHEDULE	
A	CORROSION INHIBITOR LCP
B	TANK NO.1 LOW LEVEL ALARM
C	TANK NO.1 HIGH LEVEL ALARM
D	MIXER NO.1 RUN
E	MIXER NO.1 SELECTION SWITCH
F	TANK NO.2 LOW LEVEL ALARM
G	TANK NO.2 HIGH LEVEL ALARM
H	MIXER NO.2 RUN
I	MIXER NO.2 SELECTION SWITCH
J	MIXER EMERGENCY STOP
K	ISOLATION VALVE POSITION OPEN
L	ISOLATION VALVE POSITION CLOSED
M	ISOLATION VALVE SWITCH
N	FEED PUMP NO.X RUN
O	FEED PUMP NO.X HOR SWITCH
P	FEED PUMP NO.X SPEED DIALER
Q	FEED PUMP NO.X FAIL
R	CORROSION INHIBITOR FEED FLOW

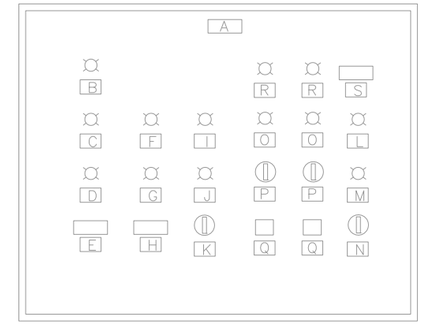
X = 1, 2

CORROSION INHIBITOR (LCP)

1. NEMA 4X FRP. ENCLOSURE WITH A BACK PANEL FOR INTERNAL COMPONENT MOUNTING.
2. PUSHBUTTON AND SELECTOR SWITCHES SHALL BE HEAVY DUTY OIL TYPE SUITABLE FOR USE IN NEMA 4X APPLICATIONS.
3. INDICATOR LIGHTS SHALL BE HEAVY DUTY PUSH–TO–TEST TYPE SUITABLE FOR USE IN NEMA 4X APPLICATION. DIGITAL DISPLAYS SHALL BE NEMA 4X.
4. PROVIDE CONTROL LOGIX REMOTE IO PER SPECIFICATIONS AND LOOP DRAWINGS.

PROVIDE POWER AND CIRCUIT BREAKERS FOR THE FOLLOWING EQUIPMENT:

FIT 460	CI FEED FLOW



FLUORIDE NAMEPLATE SCHEDULE	
A	FLUORIDE SYSTEM LCP
B	STORAGE TANK LEVEL ALARM LOW
C	STORAGE TANK ISOLATION VALVE POSITION OPEN
D	STORAGE TANK ISOLATION VALVE POSITION CLOSED
E	STORAGE TANK LEVEL INDICATION
F	DAY TANK LOW WEIGHT ALARM
G	DAY TANK HIGH WEIGHT ALARM
H	DAY TANK WEIGHT INDICATION
I	DAY TANK ISOLATION VALVE POSITION OPEN
J	DAY TANK ISOLATION VALVE POSITION CLOSED
K	DAY TANK ISOLATION VALVE SWITCH
L	ISOLATION VALVE POSITION OPEN
M	ISOLATION VALVE POSITION CLOSE
N	ISOLATION VALVE SWITCH
O	FEED PUMP NO.X RUN
P	FEED PUMP NO.X HOR SWITCH
Q	FEED PUMP NO.X SPEED DIALER
R	FEED PUMP NO.X FAIL
S	FLUORIDE FEED FLOW

X = 1, 2

FLUORIDE SYSTEM (LCP)

1. NEMA 4X FRP. ENCLOSURE WITH A BACK PANEL FOR INTERNAL COMPONENT MOUNTING.
2. PUSHBUTTON AND SELECTOR SWITCHES SHALL BE HEAVY DUTY OIL TYPE SUITABLE FOR USE IN NEMA 4X APPLICATIONS.
3. INDICATOR LIGHTS SHALL BE HEAVY DUTY PUSH–TO–TEST TYPE SUITABLE FOR USE IN NEMA 4X APPLICATION. DIGITAL DISPLAYS SHALL BE NEMA 4X.
4. PROVIDE CONTROL LOGIX REMOTE IO PER SPECIFICATIONS AND LOOP DRAWINGS.

PROVIDE POWER AND CIRCUIT BREAKERS FOR THE FOLLOWING EQUIPMENT:

LIT 654	HF BULK STORAGE TANK LEVEL
WIT 655	HF DAY TANK WEIGHT
FIT 664	HF FEED FLOW 1

ADS Engineering
4701 N FEDERAL HWY, SUITE 390
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Lee County Southwest Florida

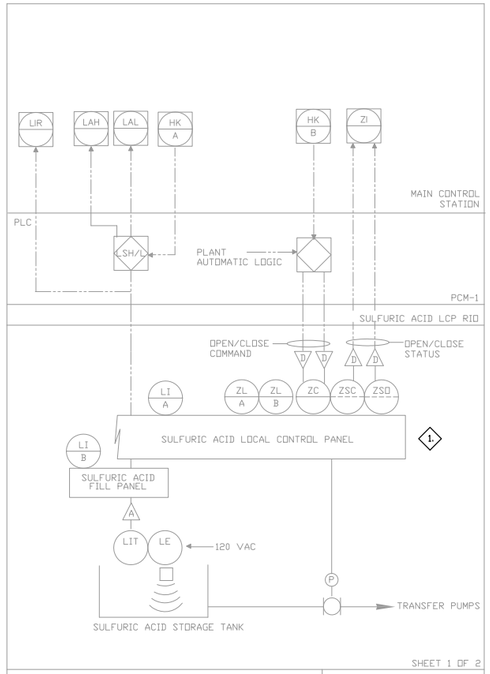
LEE COUNTY UTILITIES

NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM

PANEL LAYOUTS - 1

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

JOB NO. 10180C.10
DRAWING NO. ID-3

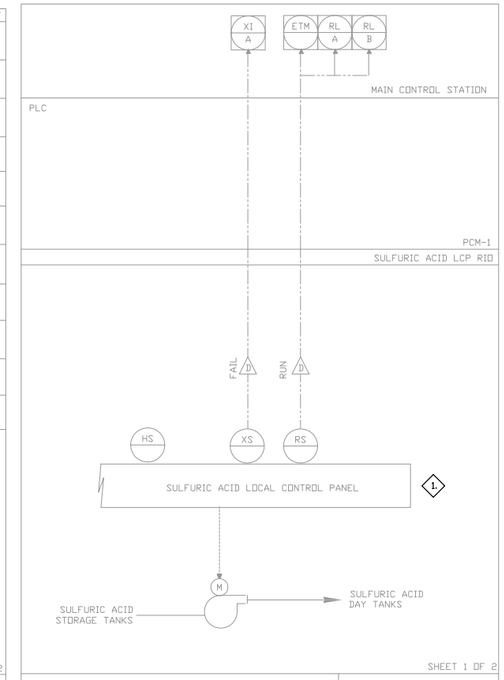


SULFURIC ACID STORAGE TANK LEVEL AND ISOLATED VALVE | LOOP NO. 300

ITEM	DESCRIPTION	TYPE	CRITERIA	NAME TAG/SERVICE	QTY
LIT	LEVEL TRANSMITTER	RADAR TYPE	' NPT	SULFURIC STORAGE TANK LEVEL	1
LIR	LEVEL INDICATING RECORDER	INITIATED THRU SOFTWARE	RANGE: 0-100%	SULFURIC STORAGE TANK LEVEL	1
LAH	LEVEL ALARM HIGH	INITIATED THRU SOFTWARE	TRIP ADJUSTABLE	SULFURIC STORAGE TANK LEVEL HIGH	1
LAL	LEVEL ALARM LOW	INITIATED THRU SOFTWARE	TRIP ADJUSTABLE	SULFURIC STORAGE TANK LEVEL LOW	1
HK A	MANUAL STATION	INITIATED THRU SOFTWARE		SET POINT ADJUSTABLE	1
ZC	POSITION CONTROLLER	HAND SWITCH SELECTOR	OPEN/AUTO/CLOSE	SULFURIC STORAGE ISOLATED VALVE POSITION	1
ZSC /ZSO	POSITION SWITCHES	DRY CONTACTS		SULFURIC STORAGE ISOLATED VALVE POSITION	1
ZI	POSITION INDICATING	INITIATED THRU SOFTWARE		SULFURIC STORAGE ISOLATED VALVE POSITION	1
HK B	MANUAL STATION	INITIATED THRU SOFTWARE		SULFURIC STORAGE ISOLATED VALVE VALVE CONTROL	1
LI A/B	LEVEL INDICATION		RANGE: 0-100%	SULFURIC STORAGE TANK LEVEL	1
ZL A/B	POSITION INDICATOR	PANEL LIGHT INDICATORS	GREEN = OPEN RED = CLOSED	SULFURIC STORAGE ISOLATED VALVE POSITION	2

SHEET 2 OF 2

SULFURIC ACID STORAGE TANK LEVEL AND ISOLATED VALVE | LOOP NO. 300



SULFURIC ACID TRANSFER PUMP | LOOP NO. 30X

ITEM	DESCRIPTION	TYPE	CRITERIA	NAME TAG/PRESSURE	QTY
HS	HAND SWITCH	PUSHBUTTON	RUN/OFF	SULFURIC ACID TRANS.PUMP NO. * CONTROL	2
XS	TROUBLE SWITCH	DRY CONTACT FOR EACH PUMP	PROVIDED UNDER DIVISION 16	SULFURIC ACID TRANS. PUMP NO. X FAILURE	2
RS	RUNNING SWITCH	DRY CONTACT FOR EACH PUMP	PROVIDED UNDER DIVISION 16	SULFURIC ACID TRANS. PUMP NO. X STATUS	2
XA A	TROUBLE ALARM	SOFTWARE FUNCTION		SULFURIC ACID TRANS. PUMP NO. X TROUBLE ALARM	2
RL A/B	RUNNING LIGHTS	INITIATED THRU SOFTWARE	GREEN = ON RED = OFF	SULFURIC ACID TRANS. PUMP NO. X STATUS	4
ETM	ELAPSED TIME METER	INITIATED THRU SOFTWARE		SULFURIC ACID TRANS. PUMP NO. X RUN TIME	2

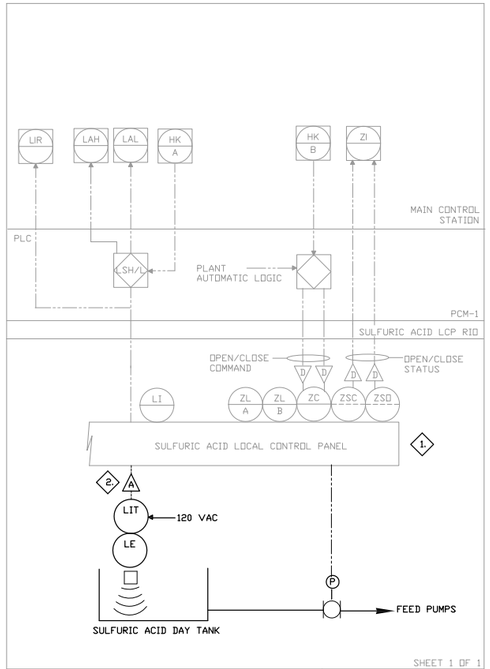
X DENOTES (2) IDENTICAL LOOPS:
SULFURIC ACID TRANSFER PUMP NO. 1 LOOP NO. 305
SULFURIC ACID TRANSFER PUMP NO. 2 LOOP NO. 306

SHEET 2 OF 2

SULFURIC ACID TRANSFER PUMP | LOOP NO. 30X

NOTES

1. MODIFY THE EXISTING LCP AS REQUIRED.
2. REUSE EXISTING SIGNAL.

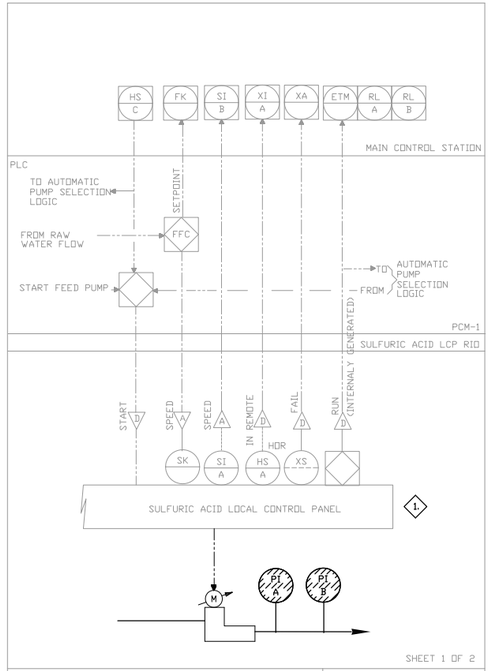


SULFURIC ACID DAY TANK LEVEL AND ISOLATED VALVE | LOOP NO. 303

ITEM	DESCRIPTION	TYPE	CRITERIA	NAME TAG/SERVICE	QTY
LIT	**LEVEL TRANSMITTER**	**RADAR TYPE**	**' NPT**	**SULFURIC DAY TANK LEVEL**	**1**
LIR	LEVEL INDICATING RECORDER	INITIATED THRU SOFTWARE	RANGE: 0-100%	SULFURIC DAY TANK LEVEL	1
LAH	LEVEL ALARM HIGH	INITIATED THRU SOFTWARE	TRIP ADJUSTABLE	SULFURIC DAY TANK LEVEL HIGH	1
LAL	LEVEL ALARM LOW	INITIATED THRU SOFTWARE	TRIP ADJUSTABLE	SULFURIC DAY TANK LEVEL LOW	1
HK A	MANUAL STATION	INITIATED THRU SOFTWARE		SET POINT ADJUSTABLE	1
ZC	POSITION CONTROLLER	HAND SWITCH SELECTOR	OPEN/AUTO/CLOSE	SULFURIC DAY ISOLATED VALVE POSITION	1
ZS	POSITION SWITCHES	DRY CONTACTS		SULFURIC DAY ISOLATED VALVE POSITION	1
ZI	POSITION INDICATING	INITIATED THRU SOFTWARE		SULFURIC DAY ISOLATED VALVE POSITION	1
HK B	MANUAL STATION	INITIATED THRU SOFTWARE		SULFURIC DAY ISOLATED VALVE VALVE CONTROL	1
LI	LEVEL INDICATION	DIGITAL DISPLAY	RANGE: 0-100%	SULFURIC DAY TANK LEVEL	1
ZL A/B	POSITION INDICATOR	PANEL LIGHT INDICATORS	GREEN = OPEN RED = CLOSED	SULFURIC DAY TANK ISOLATED VALVE POSITION	2

SHEET 1 OF 1

SULFURIC ACID STORAGE TANK LEVEL AND ISOLATED VALVE | LOOP NO. 303



SULFURIC ACID FEED PUMP | LOOP NO. 31X

ITEM	DESCRIPTION	TYPE	CRITERIA	NAME TAG/SERVICE	QTY
FFC	FLOW RATIO CONTROLLER	PLC FUNCTION		SULFURIC ACID FEED PUMP NO. * RATIO CONTROL	2
FK	FLOW STATION	INITIATED THRU SOFTWARE		SULFURIC ACID FEED PUMP NO. * CONTROL	2
SI A	SPEED INDICATOR	DIGITAL SPEED DISPLAY		SULFURIC ACID FEED PUMP NO. * SPEED	2
SI B	SPEED INDICATOR	INITIATED THRU SOFTWARE		SULFURIC ACID FEED PUMP NO. * SPEED	2
RS	RUNNING SWITCH	SOFTWARE OTHER DIVISION		SULFURIC ACID FEED PUMP NO. * STATUS	2
XS	TROUBLE SWITCH	DRY CONTACT FOR EACH PUMP		SULFURIC ACID FEED PUMP NO. * FAILURE	2
XA	TROUBLE ALARM	SOFTWARE FUNCTION		SULFURIC ACID FEED PUMP NO. * TROUBLE ALARM	2
HS C	HAND SWITCH	PLC FUNCTION	RUN/AUTO/OFF	SULFURIC ACID FEED PUMP NO. * CONTROL	2
XI A	HAND/OFF/REMOTE INDICATION	INITIATED THROUGH SOFTWARE		SULFURIC ACID FEED PUMP NO. * IN REMOTE	2
HS A	HAND SWITCH	SELECTOR SWITCH	HAND/OFF/REMOTE PROVIDED UNDER DIVISION 11	SULFURIC ACID FEED PUMP NO. * CONTROL	2
PI A	PRESSURE INDICATOR	PRESSURE GAUGE LIQUID FILLED 312 S.S.	DIAL SIZE: SCALE=	SULFURIC ACID FEED PUMP NO. * PRESSURE	2
PI B	PRESSURE INDICATOR	PRESSURE GAUGE LIQUID FILLED 312 S.S.	DIAL SIZE: SCALE=	SULFURIC ACID FEED PUMP NO. * PRESSURE	2
SK	SPEED CONTROL STATION	LOCAL SPEED CONTROL	0-100%	SULFURIC ACID FEED PUMP NO. * SPEED CONTROL	2
ETM	ELAPSED TIME METER	INITIATED THRU SOFTWARE		SULFURIC ACID FEED PUMP NO. * RUN TIME	2
RL A,B	RUNNING LIGHT	INITIATED THRU SOFTWARE	GREEN = ON RED= OFF	SULFURIC ACID FEED PUMP NO. * STATUS	2

X DENOTES (2) IDENTICAL LOOPS:
FEED PUMP NO. 1 LOOP NO. 313
FEED PUMP NO. 2 LOOP NO. 312

SHEET 2 OF 2

SULFURIC ACID FEED PUMP | LOOP NO. 31X

ADS Engineering
4701 N FEDERAL HWY, SUITE 390
POMPANO BEACH, FL 33064

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Lee County Southwest Florida

LEE COUNTY UTILITIES

NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM

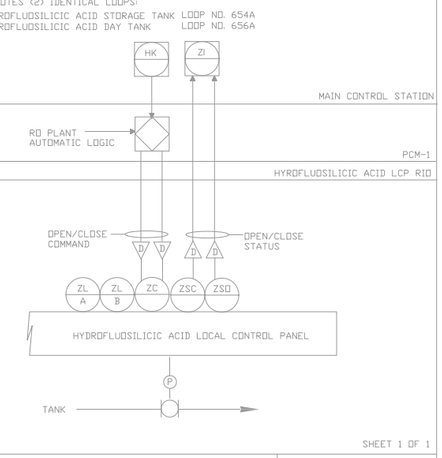
INSTRUMENTATION
LOOP DIAGRAMS SHEET 15

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

JOB NO. 10180C.10

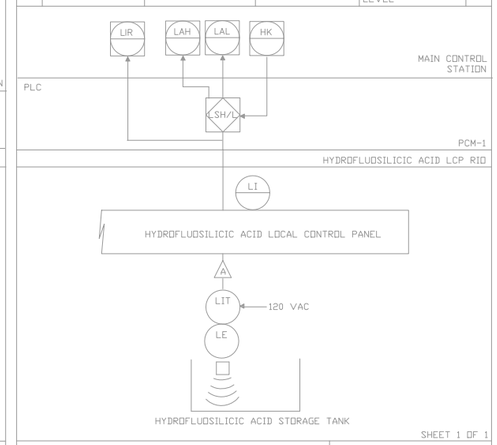
DRAWING NO. IL-15

ITEM	DESCRIPTION	TYPE	CRITERIA	NAME TAG/SERVICE	QTY
ZC	POSITION CONTROLLER	HAND SWITCH SELECTOR	OPEN/AUTO/CLOSE	SULFURIC ACID ISOLATION VALVE POSITION	1
ZSC /ZSO	POSITION SWITCHES	DRY CONTACTS		SULFURIC ACID ISOLATION VALVE POSITION	1
ZI	POSITION INDICATING	INITIATED THRU SOFTWARE		SULFURIC ACID ISOLATION VALVE POSITION	1
HK	MANUAL STATION	INITIATED THRU SOFTWARE		SULFURIC ACID ISOLATION VALVE VALVE CONTROL	1
ZL A/B	POSITION INDICATOR	PANEL LIGHT INDICATORS	GREEN = OPEN RED = CLOSED	SULFURIC ACID ISOLATION VALVE POSITION	2



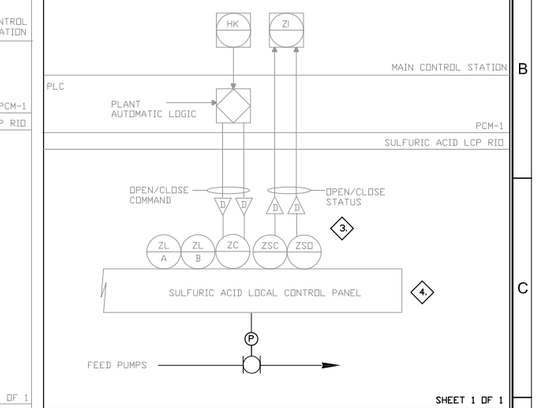
HYRDFLUDSILICIC ACID STORAGE/DAY TANK ISOLATED VALVE | LOOP NO. 65XA

ITEM	DESCRIPTION	TYPE	CRITERIA	NAME TAG/SERVICE	QTY
LIT	LEVEL TRANSMITTER	RADAR TYPE	' NPT	FLUORIDE DAY TANK LEVEL	1
LIR	LEVEL INDICATING RECORDER	INITIATED THRU SOFTWARE	RANGE: 0-100%	FLUORIDE DAY TANK NO. * LEVEL	1
LAH	LEVEL ALARM HIGH	INITIATED THRU SOFTWARE	TRIP ADJUSTABLE	FLUORIDE DAY TANK LEVEL HIGH	1
LAL	LEVEL ALARM LOW	INITIATED THRU SOFTWARE	TRIP ADJUSTABLE	FLUORIDE DAY TANK LEVEL LOW	1
HK	MANUAL STATION	INITIATED THRU SOFTWARE		SET POINT ADJUSTABLE	1
LIT	LEVEL INDICATION	DIGITAL DISPLAY	RANGE: 0-100%	FLUORIDE DAY TANK LEVEL	1



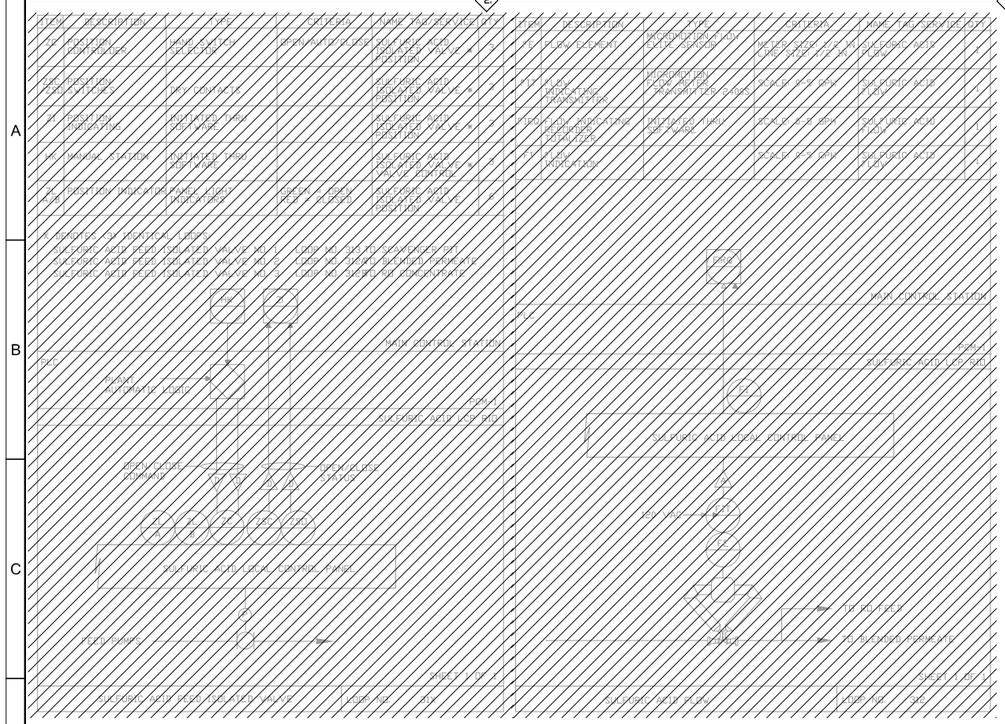
HYRDFLUDSILICIC ACID STORAGE TANK LEVEL | LOOP NO. 654

ITEM	DESCRIPTION	TYPE	CRITERIA	NAME TAG/SERVICE	QTY
ZC	POSITION CONTROLLER	HAND SWITCH SELECTOR	OPEN/AUTO/CLOSE	SULFURIC ACID ISOLATION VALVE POSITION	1
ZSC /ZSO	POSITION SWITCHES	DRY CONTACTS		SULFURIC ACID ISOLATION VALVE POSITION	1
ZI	POSITION INDICATING	INITIATED THRU SOFTWARE		SULFURIC ACID ISOLATION VALVE POSITION	1
HK	MANUAL STATION	INITIATED THRU SOFTWARE		SULFURIC ACID ISOLATION VALVE VALVE CONTROL	1
ZL A/B	POSITION INDICATOR	PANEL LIGHT INDICATORS	GREEN = OPEN RED = CLOSED	SULFURIC ACID ISOLATION VALVE POSITION	2

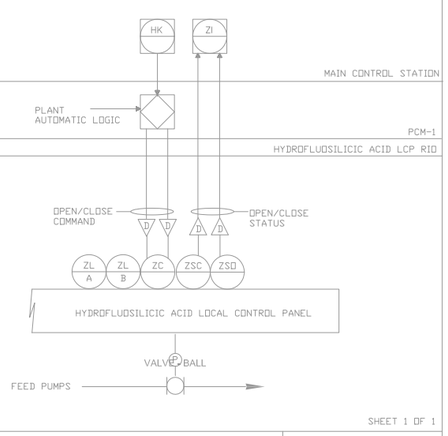


SULFURIC ACID FEED ISOLATED VALVE TO CONCENTRATE | LOOP NO. 312C

X DENOTES (2) IDENTICAL LOOPS:
SULFURIC ACID FEED ISOLATED VALVE NO. 1 LOOP NO. 313 TO SCAVENGER PIT
SULFURIC ACID FEED ISOLATED VALVE NO. 2 LOOP NO. 314 TO BLENDED PERMEATE
SULFURIC ACID FEED ISOLATED VALVE NO. 3 LOOP NO. 315 TO CONCENTRATE

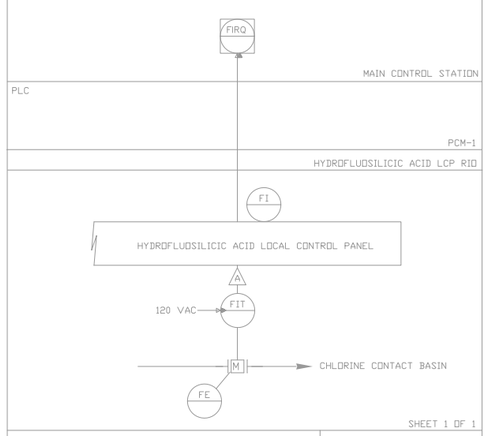


ITEM	DESCRIPTION	TYPE	CRITERIA	NAME TAG/SERVICE	QTY
ZC	POSITION CONTROLLER	HAND SWITCH SELECTOR	OPEN/AUTO/CLOSE	FLUORIDE ISOLATED VALVE POSITION	1
ZSC /ZSO	POSITION SWITCHES	DRY CONTACTS		FLUORIDE ISOLATED VALVE POSITION	1
ZI	POSITION INDICATING	INITIATED THRU SOFTWARE		FLUORIDE ISOLATED VALVE POSITION	1
HK	MANUAL STATION	INITIATED THRU SOFTWARE		FLUORIDE ISOLATED VALVE VALVE CONTROL	1
ZL A/B	POSITION INDICATOR	PANEL LIGHT INDICATORS	GREEN = OPEN RED = CLOSED	FLUORIDE ISOLATED VALVE POSITION	2



HYDROFLUDSILICIC ACID FEED ISOLATED VALVE | LOOP NO. 666

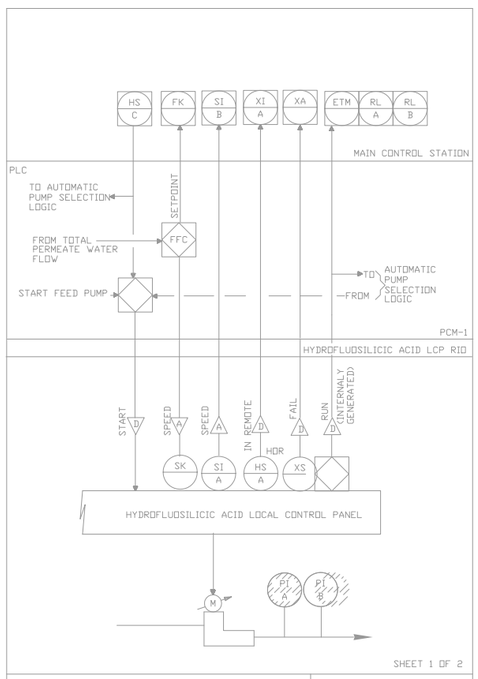
ITEM	DESCRIPTION	TYPE	CRITERIA	NAME TAG/SERVICE	QTY
FE	FLOW ELEMENT	MAGNETIC FLOW METER	METER SIZE: 1/2 IN LINE SIZE: 1/2 IN	FLUORIDE FLOW	1
FIT	FLOW INDICATING TRANSMITTER		SCALE: 0-2 GPH	FLUORIDE FLOW	1
FIRQ	FLOW INDICATING RECORDER TOTALIZER	INITIATED THRU SOFTWARE	SCALE: 0-2 GPH	FLUORIDE FLOW	1
FI	FLOW INDICATION	DIGITAL DISPLAY	SCALE: 0-2 GPH	FLUORIDE FLOW	1



HYDROFLUDSILICIC ACID FLOW | LOOP NO. 664

NOTES

1. REMOVE EXISTING MASS FLOW METER AND DISCONNECT I/O IN THE PANEL.
2. DISCONNECT AND ABANDON IN PLACE EXISTING ISOLATION VALVES. DISCONNECT I/O-S IN THE PANEL.
3. REUSE AVAILABLE I/O-S TO INTERFACE NEW ISOLATION VALVE TO CONCENTRATE.
4. MODIFY THE EXISTING LCP AS REQUIRED.



HYDROFLUDSILICIC ACID FEED PUMP | LOOP NO. 67X

ITEM	DESCRIPTION	TYPE	CRITERIA	NAME TAG/SERVICE	QTY
FFC	FLOW RATIO CONTROLLER	PLC FUNCTION		FLUORIDE FEED PUMP NO. * RATIO CONTROL	2
FK	FLOW STATION	INITIATED THRU SOFTWARE		FLUORIDE FEED PUMP NO. * CONTROL	2
SI A	SPEED INDICATOR	DIGITAL SPEED DISPLAY		FLUORIDE FEED PUMP NO. * SPEED	2
SI B	SPEED INDICATOR	INITIATED THRU SOFTWARE		FLUORIDE FEED PUMP NO. * SPEED	2
RS	RUNNING SWITCH	PROVIDED UNDER OTHER DIVISION		FLUORIDE FEED PUMP NO. * STATUS	2
XS	TROUBLE SWITCH	DRY CONTACT FOR EACH PUMP		FLUORIDE FEED PUMP NO. * FAILURE	2
XA	TROUBLE ALARM	SOFTWARE FUNCTION		FLUORIDE FEED PUMP NO. * TROUBLE ALARM	2
HS C	HAND SWITCH	PLC FUNCTION	RUN/AUTO/OFF	FLUORIDE FEED PUMP NO. * CONTROL	2
XI A	HAND/OFF/REMOTE INDICATION	INITIATED THROUGH SOFTWARE		FLUORIDE FEED PUMP NO. * IN REMOTE	2
HS A	HAND SWITCH	SELECTOR SWITCH	HAND/OFF/REMOTE PROVIDED UNDER DIVISION 11	FLUORIDE FEED PUMP NO. * CONTROL	2
PI A	PRESSURE INDICATOR	PRESSURE GAUGE LIQUID FILLED 312 S.S.	DIAL SIZE: SCALE=	FLUORIDE FEED PUMP NO. * PRESSURE	2
PI B	PRESSURE INDICATOR	PRESSURE GAUGE LIQUID FILLED 312 S.S.	DIAL SIZE: SCALE=	FLUORIDE FEED PUMP NO. * PRESSURE	2
SK	SPEED CONTROL STATION	LOCAL SPEED CONTROL	0-100%	FLUORIDE FEED PUMP NO. * SPEED CONTROL	2
ETM	ELAPSED TIME METER	INITIATED THRU SOFTWARE		FLUORIDE FEED PUMP NO. * RUN TIME	2
RL A,B	RUNNING LIGHT	INITIATED THRU SOFTWARE	GREEN = ON RED= OFF	FLUORIDE FEED PUMP NO. * STATUS	2

X DENOTES (2) IDENTICAL LOOPS:
FEED PUMP NO. 1 LOOP NO. 670
FEED PUMP NO. 2 LOOP NO. 671

SHEET 2 OF 2

HYDROFLUDSILICIC ACID FEED PUMP | LOOP NO. 67X

REV	DATE	BY	DESCRIPTION

DESIGNED ADS
DRAWN IVZ
CHECKED MDG
DATE DECEMBER 2016

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Lee County Southwest Florida

LEE COUNTY UTILITIES

NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM

INSTRUMENTATION
LOOP DIAGRAMS SHEET 16

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

JOB NO. 10180C.10
DRAWING NO. IL-16

ADS Engineering
4701 N FEDERAL HWY, SUITE 390
POMPANO BEACH, FL 33064

VALVES

- AIR RELEASE
- BUTTERFLY
- GATE
- 3-WAY
- 5-WAY
- BALL
- V-PORT BALL
- NEEDLE
- DIAPHRAGM
- GLOBE
- GATE VALVE, BURIED W/ VALVE BOX

CHECK VALVES

- BACKFLOW PREVENTER
- BALL
- DOUBLE FLAP
- GENERAL SPRING LOADED
- SWING

PRESSURE VALVES

- BACKPRESSURE REG EXTERNAL PRESSURE TAP
- BACKPRESSURE REGULATING SELF CONTAINED
- PRESSURE REDUCING EXTERNAL PRESSURE TAP
- PRESSURE REDUCING SELF CONTAINED
- RELIEF
- VACUUM

PIPING

- AIR GAP
- BLIND FLANGE
- CAPPED OR PLUGGED
- CONCENTRIC INCREASER
- CONCENTRIC REDUCER
- DRAIN
- ECCENTRIC INCREASER
- ECCENTRIC REDUCER
- FLANGED CONNECTION
- FLEXIBLE CONNECTION
- QUICK DISCONNECT
- STRAINER WYE TYPE
- UNION

METERS/PUMPS/BLOWERS

- ROTAMETER
- MAGNETIC FLOWMETER
- CORIOLIS FLOWMETER
- ULTRASONIC (STRAP-ON TYPE) FLOWMETER
- ENERGY RECOVERY TURBINE
- CENTRIFUGAL PUMP
- SUBMERSIBLE PUMP
- CHEMICAL METERING PUMP
- VERTICAL TURBINE PUMP
- CENTRIFUGAL BLOWER

MISC

- HOSE CONNECTION
- CHANGE IN MATERIALS
- BATCH TOTALIZER
- MOTOR
- MIXER
- SCREEN / FILTER
- DIAPHRAGM SEAL
- EJECTOR
- PULSATION DAMPENER
- CALIBRATION COLUMN
- BASKET STRAINER
- SIGHT TUBE
- VENT TO ATMOSPHERE
- WATER LEVEL
- RADAR LEVEL INDICATOR
- TANK VENT
- GAUGE
- ELECTRIC DISCRETE OPERATOR

MISC CONT'D.

- SOLENOID OPERATOR
- MOTORIZED OPERATOR
- PNEUMATIC OPERATOR
- STRAINER WYE TYPE
- INLINE STATIC MIXER
- SAMPLE PORT
- ORIFICE PLATE

INSTRUMENT TAG IDENTIFICATION LETTERS

THIS TABLE APPLIES TO THE FUNCTIONAL IDENTIFICATION OF INSTRUMENTS.

	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION		EMERGENCY	USERS CHOICE	USERS CHOICE
C	USERS CHOICE		CLEANER	CONTROL	
D	DENSITY (MASS) OR SPECIFIC GRAVITY	DIFFERENTIAL			
E	VOLTAGE (EMF)		PRIMARY ELEMENT		
F	FLOW RATE	RATIO (FRACTION)			
G	GAUGING (DIMENSIONAL)		GLASS		
H	HAND (MANUALLY INITIATED)				HIGH OR OPEN
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME OR TIME SCHEDULE			CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW OR CLOSED
M	USERS CHOICE	MOMENTARY			MIDDLE OR INTERMEDIATE
N	USERS CHOICE		USERS CHOICE	USERS CHOICE	USERS CHOICE
O	USERS CHOICE		ORIFICE (RESTRICTION)		
P	PRESSURE OR VACUUM		POINT (TEST CONNECTION)		
Q	QUANTITY	INTERGATE OR TOTALIZE			
R	RUN		RECORD		
S	SPEED OR FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VISCOSITY, VIBRATION			VALVE, DAMPER OR LOUVER	
W	WEIGHT OR FORCE		WELL		
X	FAILURE	X AXIS			
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION, DIMENSION	Z AXIS		DRIVE, ACTUATOR OR UNCLASSIFIED CONTROL ELEMENT	

PROCESS LINE SYMBOLS

- PRIMARY PROCESS FLOW IN PIPE
- SECONDARY PROCESS FLOW IN PIPE
- PRIMARY PROCESS FLOW IN CHANNEL
- SECONDARY PROCESS FLOW IN CHANNEL

MISCELLANEOUS P&ID SYMBOLS

- UNIQUE IDENTIFIER
- CONTINUATION FROM SHEET
- CONTINUATION TO SHEET
- CONTINUATION TAG (A, B, C)
- PIPE CALLOUT — PIPE SIZE
- * = DOUBLE-CONTAINED PIPING (WHEN SHOWN) 1/2" I.D. FEP CHEMICAL TUBING INSIDE 2" SCH 80 PVC/CPVC OUTER SHEATH — PIPE SIZE *
- TRANSITION BETWEEN SINGLE AND DOUBLE-CONTAINMENT PIPE

REV	DATE	BY	DESCRIPTION

DESIGNED ECC
DRAWN DVP
CHECKED TFS/JSN
DATE DECEMBER 2016

carollo®

Lee County Southwest Florida

LEE COUNTY UTILITIES

NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM

INSTRUMENTATION

INSTRUMENTATION SYMBOLS

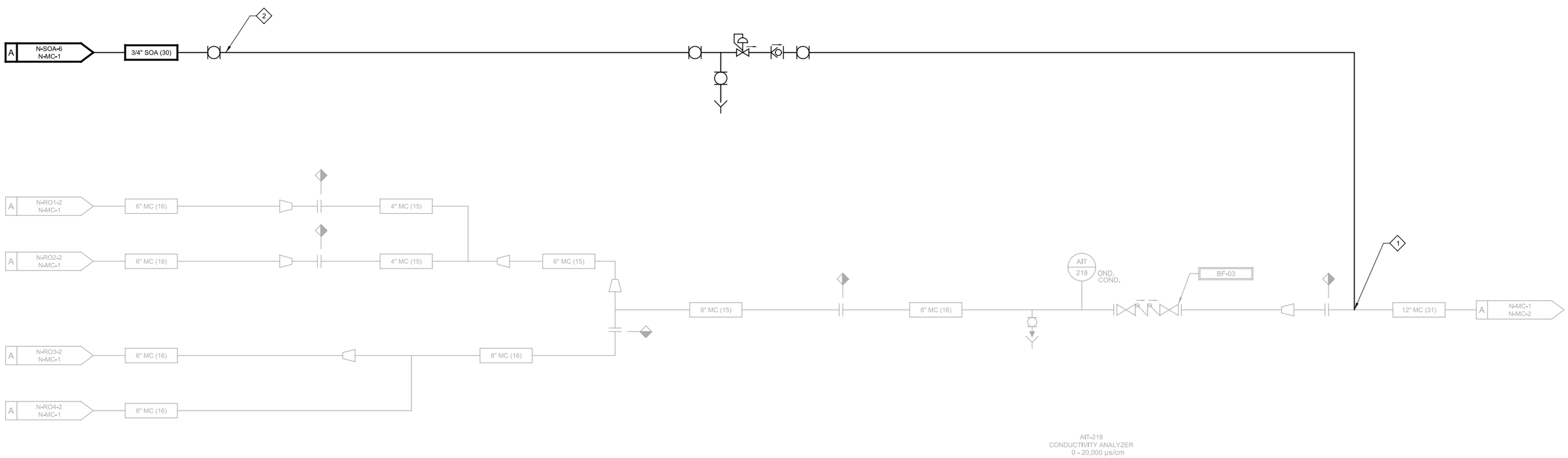
VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 10180C.10
DRAWING NO. N-1

Plot Date: 06-DEC-2016 1:21:55 PM
User: svcPW
PlotScale: 2:1
DesignScript: Carollo_Std_Pen_v0905.pen
ColorTable: gshade.ctb
Model: Layout1
LAST SAVED BY: dperry
PROJECT NO. 10180C.10
FILE NAME: 10180C1000N01.dgn

KEY NOTES:

1. CONNECT NEW 3/4" PTFE TUBING TO EXISTING INJECTION QUILL.
2. MATERIAL TRANSITION TO NEW 3/4" PTFE TUBING INSIDE TRENCH TO INJECTION QUILL.



REV	DATE	BY	DESCRIPTION

DESIGNED ECC
DRAWN DVP
CHECKED TFS/JSN
DATE DECEMBER 2016

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NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM

INSTRUMENTATION

PROCESS PIPING AND INSTRUMENTATION DIAGRAM
MEMBRANE CONCENTRATE

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

JOB NO. 10180C.10

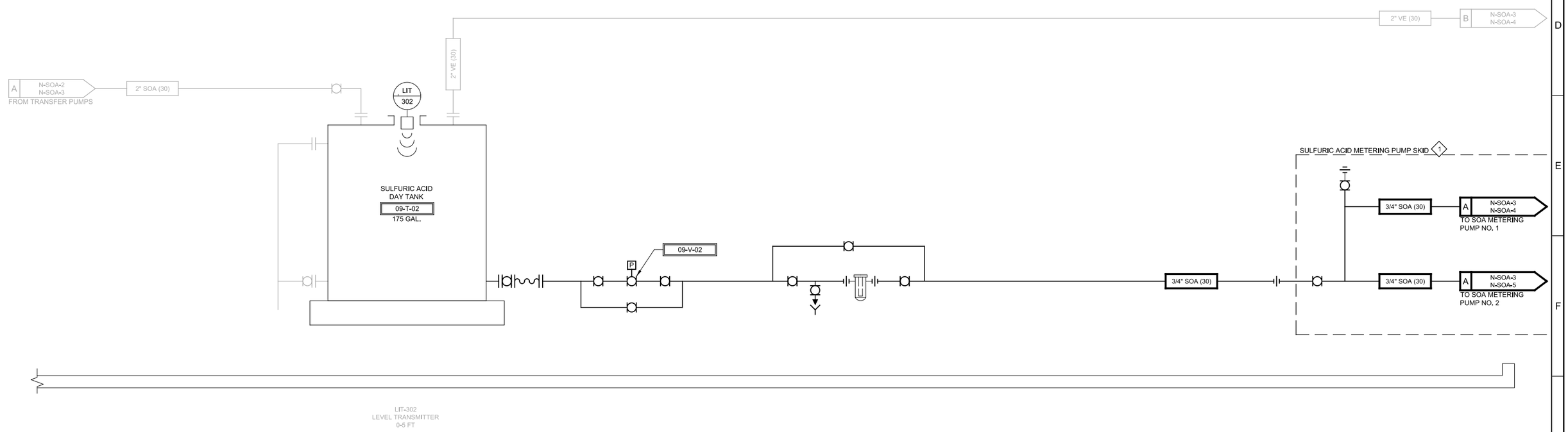
DRAWING NO. N-MC-1

PROJECT NO. 10180C.10 FILE NAME: 10180C1000NMC1.dgn

Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo_Std_Pen_v0905.pen PlotScale: 2:1 User: svcPW Plot Date: 06-DEC-2016 1:21:58 PM LAST SAVED BY: dperry

KEY NOTES:

1. REMOVE AND REPLACE EXISTING SULFURIC ACID METERING PUMP SKID WITH NEW PUMP SKID.



REV	DATE	BY	DESCRIPTION

DESIGNED ECC
DRAWN DVP
CHECKED TFS/JSN
DATE DECEMBER 2016

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LEE COUNTY UTILITIES

NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM

INSTRUMENTATION

PROCESS PIPING AND INSTRUMENTATION DIAGRAM
SULFURIC ACID DAY TANK

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

JOB NO. 10180C.10

DRAWING NO. N-SA-3

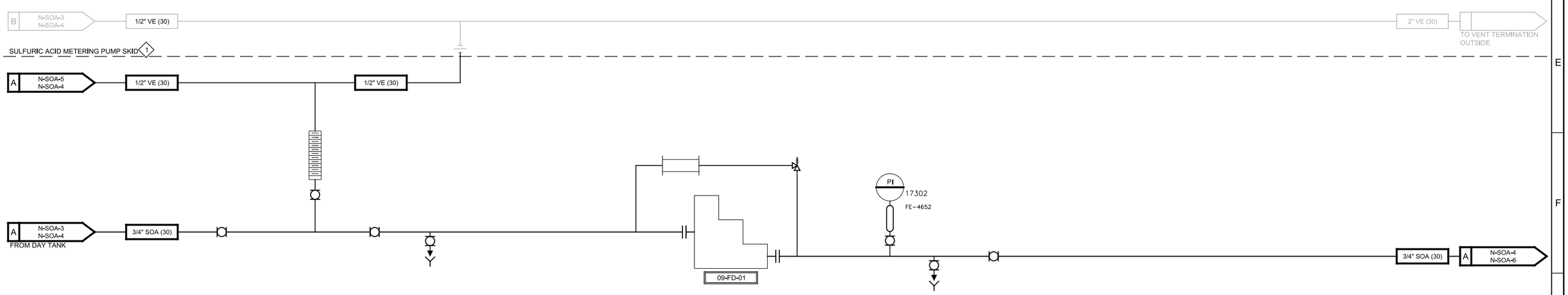
PROJECT NO. 10180C.10 FILE NAME: 10180C1000NSOA3.dgn

Plot Date: 06-DEC-2016 1:21:56 PM
User: svcPW
PlotScale: 2:1
DesignScript: Carollo_Std_Pen_v0905.pen
ColorTable: gshade.ctb
Model: Layout1
LAST SAVED BY: dperry

9-FD-01
SULFURIC ACID METERING PUMP
DESIGN: 35.9 GPH @ 145 psig
MOTOR: 1/3 HP

KEY NOTES:

1. REMOVE AND REPLACE EXISTING SULFURIC ACID METERING PUMP SKID WITH NEW PUMP SKID.



REV	DATE	BY	DESCRIPTION

DESIGNED ECC
DRAWN DVP
CHECKED TFS/JSN
DATE DECEMBER 2016

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LEE COUNTY UTILITIES
NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM
INSTRUMENTATION
PROCESS PIPING AND INSTRUMENTATION DIAGRAM
SULFURIC ACID METERING PUMPS

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

JOB NO. 10180C.10
DRAWING NO. N-SA-4

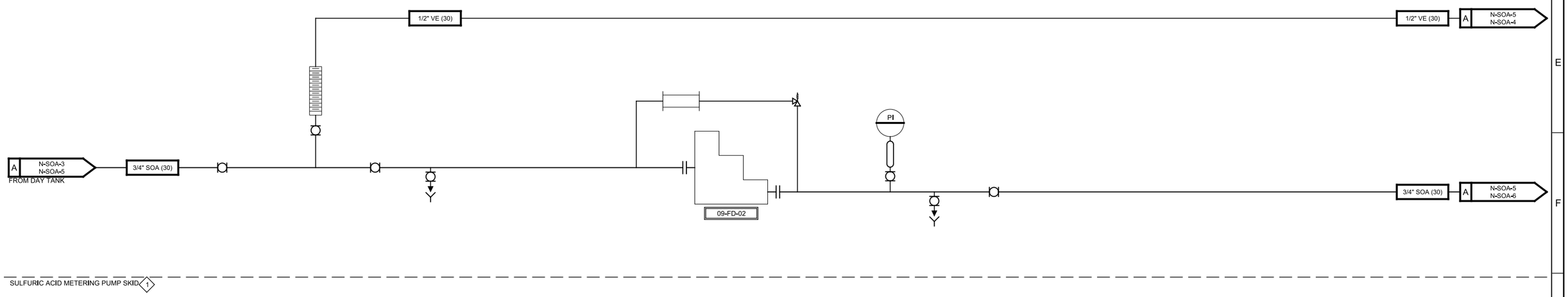
PROJECT NO. 10180C.10 FILE NAME: 10180C1000NSOA4.dgn

Plot Date: 06-DEC-2016 1:22:02 PM
User: svcPW
PlotScale: 2:1
DesignScript: Carollo_Std_Pen_v0905.pen
ColorTable: gshade.ctb
Model: Layout1
LAST SAVED BY: dperry

9-FD-02
SULFURIC ACID METERING PUMP
DESIGN: 35.9 GPH @ 145 psig
MOTOR: 1/3 HP

KEY NOTES:

1. REMOVE AND REPLACE EXISTING SULFURIC ACID METERING PUMP SKID WITH NEW PUMP SKID.



REV	DATE	BY	DESCRIPTION

DESIGNED ECC
DRAWN DVP
CHECKED TFS/JSN
DATE DECEMBER 2016

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LEE COUNTY UTILITIES
NORTH LEE COUNTY WATER TREATMENT PLANT
RO CONCENTRATE ACID FEED SYSTEM
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VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

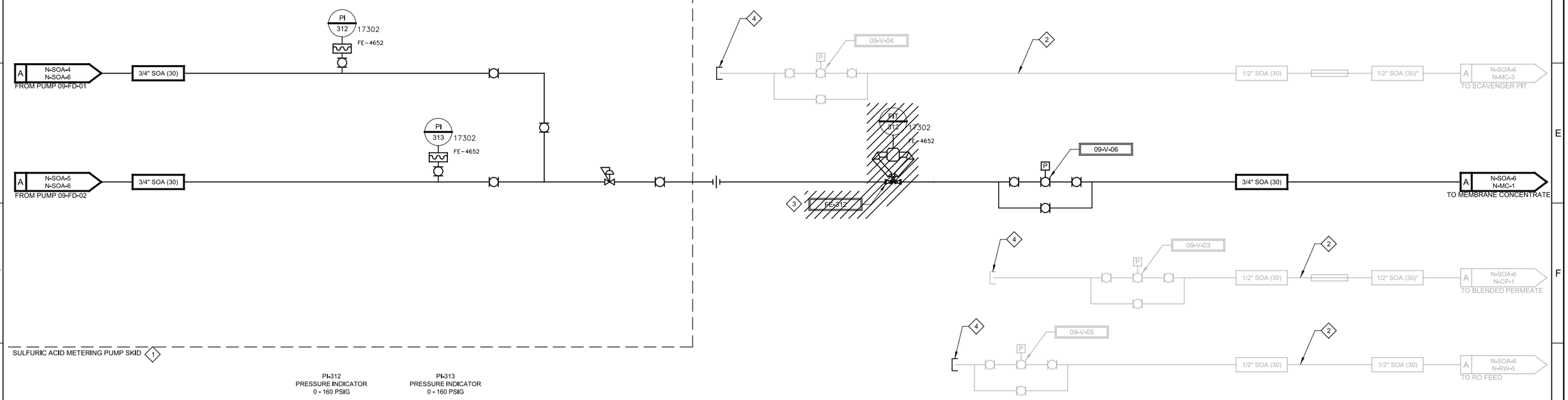
JOB NO. 10180C.10
DRAWING NO. N-SA-5

PROJECT NO. 10180C.10 FILE NAME: 10180C1000NSOA5.dgn

Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo_Std_Pen_v0905.pen PlotScale: 2:1 User: svcPW Plot Date: 06-DEC-2016 1:22:28 PM LAST SAVED BY: dperry

KEY NOTES:

1. REMOVE AND REPLACE EXISTING SULFURIC ACID METERING PUMP SKID WITH NEW PUMP SKID.
2. SULFURIC ACID PIPING REMOVED.
3. REMOVE EXISTING MASS FLOW METER.
4. EXISTING PIPING REMOVED.



PI-312
PRESSURE INDICATOR
0 - 160 PSIG

PI-313
PRESSURE INDICATOR
0 - 160 PSIG

REV	DATE	BY	DESCRIPTION

DESIGNED ECC
DRAWN DVP
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0 1"
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JOB NO. 10180C.10

DRAWING NO. N-SA-6

Plot Date: 06-DEC-2016 1:36:24 PM
User: svcPW
PlotScale: 2:1
DesignScript: Carollo_Std_Pen_v0905.pen
ColorTable: gshade.ctb
Model: Layout1
LAST SAVED BY: dperry