CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4 MGD TO 6 MGD

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TETRA TECH

PROJECT LOCATION:
SOUTH REGIONAL WTP
OSMOSIS DR SE
PALM BAY, FL 32909

CLIENT INFORMATION:
CITY OF PALM BAY
250 OSMOSIS DR SE
PALM BAY, FL 32909

Tt PROJECT No.:
200-08507-19001

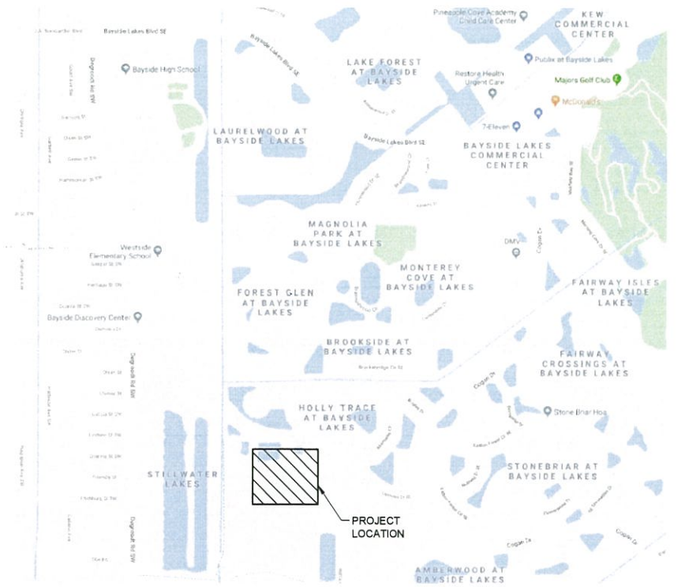
CLIENT PROJECT No.:
47-0-2018/JM

PROJECT DESCRIPTION / NOTES:
THE PROJECT INCLUDES EXPANSION OF THE SOUTH REGIONAL WATER TREATMENT PLANT (SRWTP) CAPACITY FROM 4.0 TO 6.0 MGD. UPGRADES INCLUDE THE ADDITION OF A NEW SUPPLY WELL, RAW WATER PIPING, TWO (2) PRETREATMENT CARTRIDGE FILTERS, ONE (1) RO FEED PUMP, TWO (2) NEW REVERSE OSMOSIS SKIDS, ONE (1) FINISHED WATER TRANSFER PUMP, A 2.0 MG GROUND STORAGE TANK, TWO (2) NEW HIGH SERVICE PUMPS, CARBON DIOXIDE STORAGE AND FEED SYSTEM, ONE (1) DEGASIFIER BLOWER, EXPANSION OF THE ELECTRICAL POWER AND MCC FACILITIES, AS WELL AS MISCELLANEOUS FACILITY AND PROCESS REHABILITATION AND IMPROVEMENTS.

ISSUED:
BID SET - JUNE 2020

JONATHAN C. BUNDY
LICENSE
No. 62561
STATE OF
FLORIDA
PROFESSIONAL ENGINEER
6/18/20

VICINITY MAP:



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BID SET

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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

DRAWING INDEX

PROJ:	200-08507-19001
DESN:	JCR
DRWN:	JTE
CHKD:	JCB

G-001

Bar Measures 1 inch, otherwise drawing not to scale

LIST OF STANDARD ABBREVIATIONS

A	
AAP	ALARM ANNUNCIATOR PANEL
AARV	AUTOMATIC AIR RELEASE VALVE
AAV	AUTOMATIC AIR VENT
AB	ANCHOR BOLT
ABAN	ABANDONE(D)
ABRSV	ABRASIVE
ABS	ACRYLONITRILE BUTADIENE STYRENE
ABV	ABOVE
AC	ALTERNATING CURRENT
ACCMP	ASPHALT-COATED CORRUGATED METAL PIPE
ACP	ASBESTOS CEMENT PIPE
ADDM	ADDENDUM
ADH	ADHESIVE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFS	ABOVE FINISHED SLAB
AHD	AHEAD
AL	ALUMINUM
ALT	ALTERNATE
AMP	AMPERE
AMT	AMOUNT
APPROX	APPROXIMATE(LY)
ARCH	ARCHITECT(URAL)
ARV	AIR RELEASE VALVE
AS	ALUM SOLUTION
ASPH	ASPHALT
ASSY	ASSEMBLY
AVE	AVENUE
A/C	AIR CONDITIONING
A/VV	AIR/VACUUM AIR VALVE
B	
BAF	BAFFLE
BCV	BALL CHECK VALVE
BF	BLIND FLANGE
BFP	BACKFLOW PREVENTER
BFV	BUTTERFLY VALVE
BHP	BRAKE HORSEPOWER
BI	BLACK IRON
BITUM	BITUMINOUS OR BITUMASTIC
B/L	BASELINE
BLDG	BUILDING
BLK	BLOCK
BM	BENCHMARK
BOC	BACK OF CURB
BOT	BOTTOM
BP	BASE PLATE
BRG	BEARING
BSP	BLACK STEEL PIPE
BV	BALL VALVE
BW	BOTH WAYS
BWW	BACKWASH WATER
C	
CAP	CAPACITY
CA	COMPRESSED AIR
CAV	COMBINATION AIR VALVE
CB	CATCH BASIN
CCC	CHLORINE CONTACT CHAMBER
CE	CHLORINATED EFFLUENT
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CV	CHECK VALVE
CI	CAST IRON
CIP	CAST IRON PIPE
CISP	CAST IRON SOIL PIPE
CJ	CONSTRUCTION JOINT
CKT	CIRCUIT
C/L	CENTER LINE
CL2	CHLORINE GAS
CLF	CHAIN LINK FENCE
CLR	CLEAR OR CLEARANCE
CLVT	CULVERT
CM	CONCRETE MONUMENT
CMP	CORRUGATED METAL PIPE
CMPA	CORRUGATED METAL PIPE ARCH
CMU	CONCRETE MASONRY UNIT
CND	CONDUIT
CNR	CORNER
CO	CLEAN OUT
CO2	CARBON DIOXIDE
COAG	COAGULANT
COL	COLUMN
COM	COMMON
CONC	CONCRETE
CONN	CONNECTION
CONST	CONSTRUCT(ION)
CONT	CONTINUOUS
CONTR	CONTRACT(OR)
COORD	COORDINATE
CO	COMPANY
CP	CONCRETE PIPE
CPP	CORRUGATED PLASTIC PIPE
CPA	CONCRETE PIPE ARCH
CPLG	COUPLING
CPVC	CHLORINATED POLYVINYL CHLORIDE
CR	CONCENTRIC REDUCER
CS	CHLORINE SOLUTION
CSG	CASING
CTV	CABLE TELEVISION
CY	CUBIC YARD
CYL	CYLINDER
C&G	CURB AND GUTTER
C/C	CENTER TO CENTER
D	
DAT	DATUM
DBH	DIAMETER AT BREAST HEIGHT
DBL	DOUBLE
DC	DIRECT CURRENT
DEMO	DEMOLITION
DEPT	DEPARTMENT
DESC	DESCRIPTION
DET	DETAIL
DF	DIESEL FUEL
DI	DUCTILE IRON
DIA	DIAMETER
DIFF	DIFFUSER
DIM	DIMENSION
DIP	DUCTILE IRON PIPE
DISCH	DISCHARGE
DIR	DIRECTION
DMH	DROP MANHOLE
DN	DOWN
DR	DRAIN
DV	DIAPHRAGM VALVE
DW	DRIVEWAY
DWG	DRAWING
DWV	DRAIN, WASTE, AND VENT
E	
E	EAST
EA	EACH
EB	ELECTRIC RISER
ECC	ECCENTRIC
EF	EACH FACE
EFF	EFFLUENT
E/L	EASEMENT LINE
EL	ELEVATION
ELAST	ELASTOMERIC
ELEC	ELECTRICAL
EMER	EMERGENCY
EMC	ENCASE(MENT)
ENGR	ENGINEER
EP	EDGE OF PAVEMENT
EPDM	ETHYLENE PROPYLENE DIENE MONOMER
EPRF	EXPLOSION PROOF
EQUIP	EQUIPMENT
ER	ECCENTRIC REDUCER
ESTM	EASEMENT
EST	ESTIMATE(D)
ET	ELECTRIC TRANSFORMER
EW	EACH WAY
EXC	EXCAVATE
EXP	EXPANSION
EXST	EXISTING
EXST GR	EXISTING GRADE
EXT	EXTERIOR
EXTN	EXTENSION
F	
FAB	FABRICATE(D)
FCA	FLANGED COUPLING ADAPTER
FB	FLAT BAR
FCV	FLOW-CONTROL VALVE
FD	FLOOR DRAIN
FDN	FOUNDATION
FE	FILTER(ED) EFFLUENT
FHY	FIRE HYDRANT
FIG	FIGURE
FIN	FINISH(ED)
FIN FLR	FINISH FLOOR
FIN GR	FINISH GRADE
FL	FLUORIDE
FLG	FLANGE(D)
FLL	FLOW LINE
FLTR	FILTER
FM	FORCE MAIN
FO	FIBER OPTIC
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FRP	FIBERGLASS REINFORCED PLASTIC
FT	FOOT OR FEET
FUT	FUTURE
FV	FOOT VALVE
FW	FINISHED WATER
FWP	FACTORY WIRED PANEL
F/F	FACE TO FACE
G	
GA	GAUGE
GAL	GALLON(S)
GALV	GALVANIZED
GIP	GALVANIZED IRON PIPE
GJ	GROOVE JOINT
GND	GROUND
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GPS	GALLONS PER SECOND
GR	GRADE
GRTG	GRATING
GS	GALVANIZED STEEL
GSP	GALVANIZED STEEL PIPE
GSR	GROUND STORAGE RESERVOIR
GST	GROUND STORAGE TANK
GT	GROUT
GV	GATE VALVE
H	
HB	HOSE BIBB
HD	HEAVY-DUTY
HDPE	HIGH-DENSITY POLYETHYLENE
HDR	HYDRAULIC
HFA	HYDROFLUOSILICIC ACID
HFAC	HARNESSED FLANGED ADAPTER COUPLING
HGR	HANGER
HGT	HEIGHT
HNDRL	HAND RAIL
HOA	HAND-OFF-AUTO
HORIZ	HORIZONTAL
HP	HORSEPOWER
HPA	HIGH PRESSURE AIR
HR	HOUR
HVAC	HEATING, VENTILATION, AND AIR CONDITIONING
HWL	HIGH WATER LEVEL
HWY	HIGHWAY
HZ	HERTZ
I	
ID	INSIDE DIAMETER
IN	INCH(ES)
INF	INFLUENT
INT	INTERSECTION
INTR	INTERIOR
INV	INVERT
IP	IRON PIPE
IPS	INTERNATIONAL PIPE STANDARD
IR	INTERNAL RECYCLE
IW	IRRIGATION WATER
J	
JB	JUNCTION BOX
JT	JOINT
K	
K	KIP (1,000 LB)
KPL	KICK PLATE
KV	KILOVOLT
KVA	KILOVOLT-AMPERE
KW	KILOWATT
KWH	KILOWATT-HOUR
L	
L	LEFT
LAB	LABORATORY
LAM	LAMINATE OR LAMINATION
LATL	LATERAL
LAV	LAVATORY
LEN	LENGTH
LB	POUND(S)
LF	LINEAR FEET
LP	LIGHT POLE
LS	LIME SLURRY
LSS	LIME STABILIZED SLUDGE
LVR	LOUVER
LWL	LOW WATER LEVEL
M	
M	METER
MAINT	MAINTAIN OR MAINTENANCE
MAN	MANUAL(LY)
MAS	MASONRY
MATL	MATERIAL
MAX	MAXIMUM
MB	MAILBOX
MCC	MOTOR CONTROL CENTER
ME	MITERED END
MECH	MECHANICAL
MEG	MATCH EXISTING GRADE
MFR	MANUFACTURE(R)
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
MH	MANHOLE
MI	MILE(S)
MIN	MINIMUM, MINUTE(S)
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
ML	MIXED LIQUOR
MO	MASONRY OPENING
MON	MONUMENT
MOT	MAINTENANCE OF TRAFFIC
MPH	MILES PER HOUR
MPT	MALE PIPE THREAD
MS	MOTOR STARTER
MSP	MOTOR STARTER PANEL
MTD	MOUNTED
MV	MOTORIZED VALVE
MW	MANWAY
MWL	MEAN WATER LEVEL
MWP	MAXIMUM WORKING PRESSURE
N	
N	NORTH
NaOCl	SODIUM HYPOCHLORITE
ND	NAIL DISK
NE	NORTHEAST
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NPF	NATIONAL PIPE THREAD
NPT	NATIONAL PIPE TAPER (THREAD)
NPW	NON-POTABLE WATER
NRS	NON-RISING SYSTEM
NTS	NOT TO SCALE
NW	NORTHWEST
N/A	NOT APPLICABLE
O	
O2	OXYGEN
OC	ON CENTER
OD	OUTSIDE DIAMETER
ODP	OPEN DRIP PROOF
OF	OUTSIDE FACE
OH	OVER HEAD
OHW	OVER HEAD WIRE
OPP	OPPOSITE
OPT	OPTIONAL
OR	OFFICIAL RECORDS
OSY	OUTSIDE SCREW AND YOKE
O&M	OPERATION AND MAINTENANCE
P	
PA	PROCESS AIR
PC	POINT OF CURVE
PCM	PERMANENT CONTROL MONUMENT
PE	PLAIN END
PG	PRESSURE GAGE
PI	POINT OF INTERSECTION
PL	PLATE
P/L	PROPERTY LINE
PNV	PINCH VALVE
POB	POINT OF BEGINNING
POJ	PUSH-ON JOINT
POL	POLYMER
PP	POWER POLE
PPD	POUNDS PER DAY
PPM	PARTS PER MILLION
PREFAB	PREFABRICATED
PRESS	PRESSURE
PRV	PRESSURE REDUCING VALVE
PRW	PROCESS WATER
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAGE
PT	POINT OF TANGENCY
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
PW	POTABLE WATER
PWR	POWER
Q	
Q	FLOW
QTY	QUANTITY
R	
RAD	RADIUS
RAS	RETURN ACTIVATED SLUDGE
RC	REINFORCED CONCRETE
RCB	REINFORCED CONCRETE BOX
RCP	REINFORCED CONCRETE PIPE
RCPA	REINFORCED CONCRETE PIPE ARCH
RD	ROAD
RDCR	REDUCER
REBAR	REINFORCING STEEL
REF	REFERENCE
REINF	REINFORCE(D)(ING)(MENT)
REM	REMOVE(ABLE)
REQ'D	REQUIRED
RF	RAISED FACE
RJ	RESTRAINED JOINT
RM	ROOM
RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
RPM	REVOLUTIONS PER MINUTE
RR	RAILROAD
RT	RIGHT
RVT	RIVETED
R/W	REUSE (RECLAIMED) WATER MAIN
RW-DD	REUSE WATER DIRECTIONAL DRILL
RW-OT	REUSE WATER OPEN TRENCH
RWW	RAW WASTEWATER
R/W	RIGHT-OF-WAY
S	
S	SOUTH
SA	SAMPLE LINE
SAM	SAMPLE LINE
SAN	SANITARY
SCHED	SCHEDULE
SD	STORM DRAIN
SE	SOUTHEAST
SECT	SECTION
SEFF	SECONDARY EFFLUENT
SF	SQUARE FOOT OR FEET
SHT	SHEET(ED)(ING)
SIG	SIGNAL
SIM	SIMILAR
SL	SLUDGE
SLV	SLEEVE
SM	SHEET METAL
SOLN	SOLUTION
SP	SOIL PIPE, SPACE(ING)
SPEC	SPECIFICATION
SPRT	SUPPORT
SQ	SQUARE
SS	SANITARY SEWER
SSE	SUBSTANDARD EFFLUENT
SST	STAINLESS STEEL
ST	STREET
STA	STATION
STD	STANDARD
STK	STAKE
STL	STEEL
STR	STRAIGHT
STRUCT	STRUCTURAL
SURF	SURFACE
SV	SOLENOID VALVE
SVCE	SERVICE
SVW	SERVICE WATER
SW	SOUTHWEST
SWD	SIDEWATER DEPTH
SWSH	SURFACE WASH
SYM	SYMBOL
SYMM	SYMMETRICAL
S/W	SIDEWALK
T	
TAN	TANGENT
TB	TOP OF BEAM
TBM	TEMPORARY BENCH MARK
TB-xx	TEST BORING-xx (e.g. TB-1)
TD	TRENCH DRAIN
TDH	TOTAL DYNAMIC HEAD
TE	TOTALLY ENCLOSED
TEFC	TOTALLY ENCLOSED FAN COOLED
TEL	TELEPHONE
TENV	TOTALLY ENCLOSED NON-VENTILATED
THD	THREAD(ED)
THK	THICK(NESS)
TLM	TELEMETRY
TOB	TOP OF BANK
TOC	TOP OF CURB
TOS	TOE OF SLOPE
TOT	TOTAL
TP	TELEPHONE POLE
TS	THICKENED SLUDGE
TV	TELEVISION
TYP	TYPICAL
T&B	TOP AND BOTTOM
U	
UD	UNDERDRAIN
UE	UNDERGROUND ELECTRIC
UG	UNDERGROUND
ULT	ULTIMATE
UN	UNION
UON	UNLESS OTHERWISE NOTED
UT	UNDERGROUND TELEPHONE
UTIL	UTILITY
V	
V	VOLT(S)
VAC	VACUUM
VAR	VARIES
VC	VERTICAL CURVE
VCP	VITRIFIED CLAY PIPE
VEL	VELOCITY
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
W	
W	WATER MAIN
WAS	WASTE ACTIVATED SLUDGE
WCO	WALL CLEAN OUT
WF	WIDE FLANGE
WH	WALL HYDRANT
WL	WATER LINE
WM	WATER METER
WP	WATER PROOF(ING), WORKING POINT
WPR	WORKING PRESSURE
WS	WATER SURFACE
WSP	WELDED STEEL PIPE
WT	WEIGHT
WTP	WATER TREATMENT PLANT
WW	WASH WATER
WWF	WELDED WIRE FABRIC
WWM	WELDED WIRE MESH
WWTP	WASTEWATER TREATMENT PLANT
W/	WITH
W/O	WITHOUT
WV	WATER VALVE
X	
XFER	TRANSFER
Y	
YD	YARD(S)
YH	YARD HYDRANT
YR	YEAR(S) YR

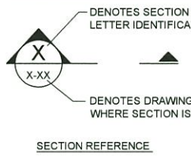
PIPING LEGEND

FITTING/ APPURTENANCE	FLANGED				MECHANICAL JOINT				GROOVE JOINT				SOLVENT WELD			
	SINGLE-LINE		DOUBLE-LINE		SINGLE-LINE		DOUBLE-LINE		SINGLE-LINE		DOUBLE-LINE		SINGLE-LINE		DOUBLE-LINE	
	EXISTING	PROPOSED	EXISTING	PROPOSED	EXISTING	PROPOSED	EXISTING	PROPOSED	EXISTING	PROPOSED	EXISTING	PROPOSED	EXISTING	PROPOSED	EXISTING	PROPOSED
BEND																
TEE																
WYE																
REDUCER																
CAP/ BLIND FLANGE					N/A	N/A	N/A	N/A								
PLUG	N/A	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A	
BUTTERFLY VALVE																
BALL VALVE					N/A	N/A	N/A	N/A								
CHECK VALVE					N/A	N/A	N/A	N/A								
GATE VALVE																
PLUG VALVE																
AUTOMATIC CONTROL VALVE					N/A	N/A	N/A	N/A								
PINCH VALVE					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A				

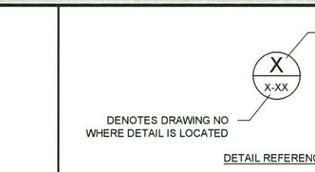
CIVIL LEGEND

- PROPERTY LINE
- RIGHT OF WAY LINE (R-O-W)
- EXISTING LOT LINES
- 130 — PROPOSED CONTOUR MAJOR
- 129 — PROPOSED CONTOUR MINOR
- 130 — EXISTING CONTOUR MAJOR
- 129 — EXISTING CONTOUR MINOR
- EXISTING WATER
- WATER, REUSE OR FORCEMAIN (OPEN CUT)
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- EXST SANITARY SEWER
- PROP SANITARY SEWER (FM)
- PROPOSED FENCE
- EXISTING UNDERDRAIN
- ×XX.XX SPOT ELEVATION
- TOP / BOTTOM EMBANKMENT
- TREE - EVERGREEN
- TREE - PALM TREE
- TREE - DECIDUOUS
- TREE TO BE REMOVED
- MAILBOX
- LIGHT POLE
- POWER POLE
- UTILITY POLE
- MH-X MANHOLE
- SV EXST SEWER VALVE
- CO SEWER CLEANOUT
- WV EXST WATER VALVE
- WM WATER METER
- FH HYDRANT
- ARV AIR RELEASE VALVE
- GATE VALVE
- TH TEST HOLE

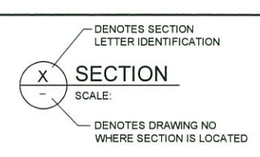
REFERENCE SYMBOLS



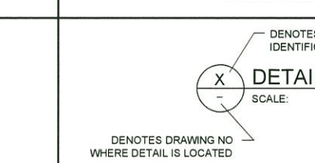
SECTION REFERENCE



DETAIL REFERENCE



SECTION TITLE



DETAIL TITLE

HATCHING LEGEND

- ASPHALT SURFACE
- ROADWAY/SIDEWALK OPEN CUT RESURFACE
- ASPHALT OVERLAY (MILL 3/4" AND OVERLAY W/ 1" PER PROJECT SPECIFICATIONS 02575 & 02574
- SODDED OR SEEDED AND MULCHED AREA OR EXISTING WETLAND
- EXISTING PIPES, STRUCTURES, EQUIPMENT TO BE REMOVED
- CAST-IN-PLACE CONCRETE
- PRECAST CONCRETE
- GROUT
- CONCRETE UNIT MASONRY (PLAN)
- STEEL
- ALUMINUM
- DIRECTIONAL DRILL WORK AREA

MECHANICAL/DRAFTING LEGEND

	EXISTING	PROPOSED
VISIBLE LINE		
HIDDEN LINE		
CENTER LINE		
PHANTOM LINE		
MATCHLINE		
BREAK LINE		
DIMENSION LINES AND LEADERS	1 3/32"	NOTE

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No. 62581
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PROFESSIONAL ENGINEER

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

LEGEND AND ABBREVIATIONS

PROJ:	200-08507-19001
DESN:	JCR
DRWN:	JTE
CHKD:	JCB

G-002

Bar Measures 1 inch, otherwise drawing not to scale

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GENERAL NOTES:

1. GENERAL NOTES ARE INTENDED TO AUGMENT THE DRAWINGS AND SPECIFICATIONS. SHOULD CONFLICTS ARISE BETWEEN THE DRAWINGS, SPECIFICATIONS AND GENERAL NOTES, THE STRICTEST PROVISION SHALL GOVERN. FOLLOW ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION.

2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATION, DEPTH, AND CHARACTER OF ALL UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY SUNSHINE ONE CALL AND FIELD-VERIFY LOCATIONS AND ELEVATIONS OF UTILITIES AT LEAST 72 HOURS IN ADVANCE OF WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE CAUSED BY HIS OPERATIONS.

3. EXISTING UTILITY LOCATIONS AS SHOWN ARE APPROXIMATE AND WERE BASED ON RECORD DRAWINGS AND HAVE NOT BEEN FIELD-VERIFIED. THE EXISTING UTILITIES SHOWN SHALL NOT BE CONSTRUED AS BEING ALL-INCLUSIVE OF UTILITIES IN THE AREA. ANY INTERRUPTION OF SERVICE SHALL BE COORDINATED WITH THE OWNER OF THE UTILITY.

4. THE CONTRACTOR SHALL ENSURE ALL NECESSARY PERMITS ARE IN HAND BEFORE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SATISFYING ALL REQUIREMENTS OF REGULATORY AGENCY PERMITS IN REGARD TO CONSTRUCTION ACTIVITIES AND CONDITIONS STATED.

5. ALL NEW VALVES BEING INSTALLED SHALL REMAIN CLOSED DURING CONSTRUCTION. KEEP VALVES ON ALL WET TAPS CLOSED UNTIL CLEARED. DO NOT CONNECT ANY PROPOSED WATER MAIN TO ANY EXISTING WATER MAIN UNLESS CLEARED BY FDEP AND THE CITY.

6. FLUSH OUT NEW WATER MAIN WITH POTABLE WATER (USE "JUMPER" ASSEMBLY WITH BACKFLOW PREVENTER TO MAKE TEMPORARY CONNECTIONS TO AN EXISTING WATER SOURCE.) CONTRACTOR SHALL COORDINATE WITH THE CITY TO DETERMINE THE LOCATION OF CONNECTION TO EXISTING WATER MAIN.

7. ALL PIPE AND FITTINGS SHALL BE PRESSURE TESTED AS SPECIFIED IN SECTION 15044.

8. ALL PIPING SHALL HAVE 3 FEET MINIMUM COVER UNLESS SHOWN OTHERWISE. CONTRACTOR SHALL TAKE CARE TO PROVIDE PROPER GRADE ELEVATIONS AND ALIGNMENTS.

9. HORIZONTAL SEPARATION BETWEEN UNDERGROUND WATER MAINS AND SANITARY OR STORM SEWERS AND WASTEWATER FORCE MAINS, PER 62-555.314 FAC.
   A) NEW OR RELOCATED, UNDERGROUND WATER MAINS SHALL BE LAID TO PROVIDE A HORIZONTAL DISTANCE OF AT LEAST THREE FEET BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF ANY EXISTING OR PROPOSED STORM SEWER.
   B) NEW OR RELOCATED, UNDERGROUND WATER MAINS SHALL BE LAID TO PROVIDE A HORIZONTAL DISTANCE OF AT LEAST SIX FEET AND PREFERABLY TEN FEET, BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF ANY EXISTING OR PROPOSED GRAVITY-TYPE SANITARY SEWER AND WASTEWATER FORCE MAIN. THE MINIMUM HORIZONTAL SEPARATION DISTANCE BETWEEN WATER MAINS AND GRAVITY-TYPE SANITARY SEWERS SHALL BE REDUCED TO THREE FEET WHERE THE BOTTOM OF THE WATER MAIN IS LAID AT LEAST SIX INCHES ABOVE THE TOP OF THE SEWER.

10. VERTICAL SEPARATION BETWEEN UNDERGROUND WATER MAINS AND SANITARY OR STORM SEWERS AND WASTEWATER FORCE MAINS, PER 62-555.314 FAC.
    A) NEW OR RELOCATED, UNDERGROUND WATER MAINS CROSSING ANY EXISTING OR PROPOSED GRAVITY-TYPE SANITARY SEWER OR STORM SEWER SHALL BE LAID SO THE OUTSIDE OF THE WATER MAIN IS AT LEAST SIX INCHES, AND PREFERABLY 12 INCHES, ABOVE OR AT LEAST 12 INCHES BELOW THE OUTSIDE OF THE OTHER PIPELINE. HOWEVER, IT IS PREFERABLE TO LAY THE WATER MAIN ABOVE THE OTHER PIPELINE.
    B) NEW OR RELOCATED, UNDERGROUND WATER MAINS CROSSING ANY EXISTING OR PROPOSED WASTEWATER OR STORMWATER FORCE MAIN SHALL BE LAID TO THE OUTSIDE OF THE WATER MAIN AT LEAST 12 INCHES ABOVE OR BELOW THE OUTSIDE OF THE OTHER PIPELINE. HOWEVER, IT IS PREFERABLE TO LAY THE WATER MAIN ABOVE THE OTHER PIPELINE.
    C) AT THE UTILITY CROSSINGS DESCRIBED IN PARAGRAPHS (A) AND (B) ABOVE, ONE FULL LENGTH OF WATER MAIN PIPE SHALL BE CENTERED ABOVE OR BELOW THE OTHER PIPELINE SO THE WATER MAIN JOINTS WILL BE AS FAR AS POSSIBLE FROM THE OTHER PIPELINE. ALTERNATIVELY, AT SUCH CROSSINGS, THE PIPES SHALL BE ARRANGED SO THAT ALL WATER MAIN JOINTS ARE AT LEAST THREE FEET FROM ALL JOINTS IN STORM SEWERS AND AT LEAST SIX FEET FORM ALL JOINTS IN GRAVITY-TYPE SANITARY SEWERS AND WASTEWATER FORCE MAINS.

11. ALL PAVING, STABILIZED EARTH, DRIVEWAYS, CURBS, SIDEWALKS, FENCES, SOD, LANDSCAPING, IRRIGATION SYSTEMS, CULVERTS, ETC. DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED TO EQUAL OR BETTER CONDITION. ALL CULVERTS THAT ARE REPLACED AND ARE RELOCATED WITHIN THE RIGHT-OF-WAY SHALL HAVE THE INVERT ELEVATIONS DETERMINED BY THE CITY ENGINEERING DEPARTMENT.

12. FITTINGS MAY BE USED FOR PIPE ALIGNMENT CHANGES RATHER THAN DEFLECTING AT THE CONTRACTOR'S OPTION AND WITH NO ADDITIONAL COMPENSATION.

13. DEWATERING MAY BE REQUIRED IN SOME AREAS TO ACHIEVE THE NECESSARY EXCAVATION AND SUBSEQUENT CONSTRUCTION, BACKFILLING, AND COMPACTING. NO EXTRA COMPENSATION FOR DEWATERING WILL BE ALLOWED.

14. PRIOR TO BID PREPARATION, THE CONTRACTOR MUST FAMILIARIZE HIMSELF WITH THE OVERALL SITE CONDITIONS AND PERFORM ADDITIONAL INVESTIGATIONS AS HE DETERMINES NECESSARY TO UNDERSTAND THE LIMIT AND DEPTH OF EXPECTED ORGANIC SILT PEAT AREAS, ADEQUACY OF EXISTING MATERIALS AS FILL, DEWATERING REQUIREMENTS, CLEAN FILL REQUIRED FROM OFF SITE, AND MATERIALS TO BE DISPOSED OF OFF SITE, ALL OF WHICH WILL AFFECT HIS PRICING. ANY DELAY, INCONVENIENCE, OR EXPENSE CAUSED TO THE CONTRACTOR DUE TO INADEQUATE INVESTIGATION OF EXISTING CONDITIONS SHALL BE INCIDENTAL TO THE CONTRACT AND NO EXTRA COMPENSATION WILL BE ALLOWED. THE MATERIALS ANTICIPATED TO BE ENCOUNTERED DURING CONSTRUCTION MAY REQUIRE DRYING PRIOR TO USE AS BACKFILL, AND THE CONTRACTOR MAY HAVE TO BRING IN MATERIALS AT NO EXTRA COST FROM OFF SITE TO MEET THE REQUIREMENTS FOR COMPACTION AND PROPER FILL.

15. ALL DRAINAGE AREAS THAT ARE CROSSED BY PIPELINES SHALL BE LEFT OPEN AT ALL TIMES EXCEPT FOR SHORT PERIODS AS MAY BE NECESSARY DURING ACTUAL CONSTRUCTION HOURS.

16. ALL WATER MAINS SHALL BE FLUSHED CLEAN OF ALL DELETERIOUS MATERIAL PRIOR TO ANY TESTING. FULL DIAMETER FLUSHING IS REQUIRED. ALL RAW, PROCESS AND FINISHED WATER MAINS EITHER INSTALLED OR DISTURBED DURING CONSTRUCTION SHALL BE DISINFECTED IN ACCORDANCE WITH AWWA C-651-92 (SUBSECTION 4.8) AND FLORIDA ADMINISTRATIVE CODE (FAC). A REPRESENTATIVE FROM THE CITY MUST BE PRESENT DURING THE TAKING OF ALL WATER SAMPLES.

17. EACH BACTERIOLOGICAL SAMPLE POINT SHALL BE EQUIPPED WITH A CORPORATION STOP, DISCHARGE PIPE, AND ABOVE-GRADE VALVE. FOLLOWING PASSAGE OF BACTERIOLOGICAL TESTING, THE CONTRACTOR SHALL REMOVE THE CORPORATION STOP AND PLUG THE CONNECTION.

18. DUCTILE IRON PIPE AND FITTINGS SHALL BE ENCASED IN POLYETHYLENE TWENTY (20) FEET ON EACH SIDE OF ANY PERPENDICULAR CROSSING OF METALLIC GAS MAINS OR ANY OTHER CATHODICALLY PROTECTED PIPELINE AND FOR ALL LOCATIONS PARALLEL TO AND WITHIN TEN FEET OF ANY METALLIC GAS MAINS OR ANY OTHER CATHODICALLY PROTECTED PIPELINE AND THROUGH THE AREA OF INFLUENCE OF ANY CATHODICALLY PROTECTION ANODE BED AS OUTLINED IN AWWA C105/ANSI A21.5.

19. ALL EXISTING POTABLE WATER MAINS SHALL REMAIN OPERATIONAL AND SHALL NOT BE TAKEN OUT OF SERVICE DURING CONSTRUCTION WITHOUT APPROVAL FROM THE CITY. ANY APPROVED REMOVAL FROM SERVICES SHALL NOT EXCEED 4 HOURS. FOR EQUIPMENT AND PIPELINE INSTALLATIONS REQUIRING A SHUT DOWN OF SERVICE UPSTREAM OF THE GROUND STORAGE TANK, SHUTDOWN TIME SHALL NOT EXCEED 12 HOURS. REFER TO SPECIFICATION SECTION 01010 FOR CONSTRUCTION SEQUENCING AND PLANT OPERATIONS REQUIREMENTS.

20. ALL MATERIALS, COATINGS AND CHEMICALS THAT COME IN CONTACT WITH RAW WATER AND/OR DRINKING WATER SHALL BE IN CONFORMANCE WITH ANSI/NSF STANDARDS 60 & 61 AND ALL APPLICABLE AWWA STANDARDS.

21. THE CONTRACTOR SHALL PRESERVE AND MAINTAIN ALL EXISTING UTILITIES WITHIN THE CONSTRUCTION AREA.

22. LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES EXPOSED DURING CONSTRUCTION SHALL BE ACCURATELY RECORDED ON THE CONSTRUCTION DRAWINGS. THE ENGINEER SHALL BE IMMEDIATELY NOTIFIED OF ANY CONFLICTS WITH PROPOSED CONSTRUCTION.

23. IF IT IS DETERMINED THAT UTILITY POLES REQUIRE HOLDING OR RELOCATION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXPENSES ASSOCIATED WITH THEIR HOLDING AND/OR RELOCATION.

GENERAL NOTES (CONTINUED):

24. THE CONTRACTOR SHALL LOCATE PROPOSED TIE IN LOCATIONS TO VERIFY ACTUAL LOCATION, SIZE, ELEVATION AND MATERIAL PRIOR TO ORDERING NEW MATERIAL. WHERE A CONNECTION IS MADE IN THE FIELD TO AN EXISTING PIPE, THE CONTRACTOR WILL EXCAVATE THE AREA TO VERIFY THE TYPE OF PIPE AND PIPE SIZE, AND OBTAIN THE OWNER'S APPROVAL OF THE PROPOSED METHOD OF CONNECTION; PRIOR TO ORDERING AND INSTALLING MATERIALS. WHERE CONNECTING TO EXISTING UTILITIES CONTRACTOR SHALL RESTRAIN EXISTING PIPELINE TO PREVENT MOVEMENT OF THE INSTALLATION WHEN TEST PRESSURE IS SUPPLIED.

25. THE CONTRACTOR SHALL TAKE ALL MEASURES NECESSARY TO CONTROL TURBIDITY INCLUDING, BUT NOT LIMITED TO, THE INSTALLATION OF TURBIDITY BARRIERS AT ALL LOCATIONS WHERE THE POSSIBILITY OF INFERRING SUSPENDED SOLIDS INTO THE RECEIVING WATER BODY EXISTS DUE TO THE PROPOSED WORK. TURBIDITY BARRIERS MUST BE MAINTAINED AT ALL LOCATIONS UNTIL CONSTRUCTION IS COMPLETED AND DISTURBED SOIL AREAS ARE STABILIZED. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR REMOVING THE BARRIERS.

26. THE CONTRACTOR SHALL NOT PLACE ANY FILL MATERIALS WITHIN A WETTED DITCH OR WETLAND AREA WHEN WORKING ADJACENT TO EITHER TYPE OF AREA.

27. THE CONTRACTOR SHALL OBTAIN THE SERVICES OF A REGISTERED PROFESSIONAL LAND SURVEYOR FOR RESTORING ALL MONUMENTS AND PROPERTY CORNERS DISTURBED DURING CONSTRUCTION. PROOF OF REGISTRATION SHALL BE SUBMITTED TO ENGINEER.

28. THE CONTRACTOR SHALL MAINTAIN NORMAL TRANSPORT VEHICLE ACCESS TO WATER SUPPLY FACILITIES AT ALL TIMES.

29. CONTRACTOR SHALL FURNISH A PROCESS PIPING SUPPORT PLAN TO ENGINEER FOR APPROVAL PRIOR TO INSTALLATION.

30. EQUIPMENT PAD DIMENSIONS AND EQUIPMENT ANCHOR BOLT REQUIREMENTS ARE DEPENDENT UPON EQUIPMENT SELECTED. DIMENSIONS INDICATED ON THE DRAWINGS SHALL BE VERIFIED WITH MANUFACTURER FOR ACTUAL SIZE OF EQUIPMENT SELECTED.

31. REMOVAL OF DELETERIOUS MATERIAL AND SUBGRADE PREPARATION TO BE PERFORMED IN ACCORDANCE WITH GEOTECHNICAL DESIGN REPORT.

32. ALL STRUCTURAL, MECHANICAL, PIPING, ELECTRICAL AND I&C REQUIREMENTS TO BE COORDINATED AND CONFIRMED BY THE CONTRACTOR WITH EQUIPMENT SUBMITTALS.

33. COORDINATE WITH OTHER TRADES THE LOCATION OF SLEEVES AND WALL PIPES THROUGH WALLS, SLABS AND CEILINGS. REFER TO MECHANICAL, ELECTRICAL, STRUCTURAL, AND PROCESS DRAWINGS FOR SPECIFIC REQUIREMENTS.

34. ALL EXPANSION JOINTS, COUPLINGS AND FLANGED COUPLING ADAPTERS SHALL BE PROVIDED WITH THRUST TIES, OR ANCHORS, UNLESS OTHERWISE NOTED. THRUST PROTECTION SHALL BE ADEQUATE FOR TEST PRESSURES SPECIFIED.

35. ALL PIPING JOINTS SHALL BE RESTRAINED. THRUST BLOCKS SHALL NOT BE ALLOWED UNLESS APPROVED BY THE ENGINEER.

36. WHERE BURIED PIPE 4 INCHES AND LARGER CROSS, A MINIMUM VERTICAL CLEARANCE BETWEEN PIPES OF 12 INCHES SHALL BE MAINTAINED WHERE POSSIBLE. IF A CLEARANCE BETWEEN PIPES OF 12 INCHES CANNOT BE MAINTAINED, A CONCRETE SADDLE SHALL BE INSTALLED BETWEEN THE PIPES.

37. ALL PIPING UNDER STRUCTURES SHALL BE CONCRETE ENCASED.

38. IN THE EVENT THAT THE POTABLE WATER SYSTEM DOES NOT MEET FEDERAL AND STATE REQUIREMENTS DUE TO THE CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL BE RESPONSIBLE, UNDER THE DIRECTION OF THE OWNER, STATE, LOCAL REGULATORY AGENCY, FOR CORRECTING ANY SUCH PROBLEM INCLUDING DISINFECTION, TESTING AND OTHER CORRECTIVE ACTION.

39. ALL PIPE TO BE COLOR-CODED AS SPECIFIED IN SECTION 09905.

40. MAINTAIN POSITIVE DRAINAGE DURING CONSTRUCTION FOLLOWING GOOD CONSTRUCTION PRACTICES IN ORDER TO AVOID ADVERSELY AFFECTING THE EXISTING OR PROPOSED CONSTRUCTION SITE.

41. CONTRACTOR SHALL ADHERE TO THE REQUIREMENTS OF THE LATEST CITY TREE ORDINANCE. WORK COMPLETED TO ADHERE TO THE CITY TREE ORDINANCE WILL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE CONSIDERED SUBSIDIARY TO OTHER BID ITEMS.

42. ONLY CITY STAFF SHALL OPERATE WATER, WASTEWATER AND RECLAIMED WATER VALVES. COORDINATE VALVE OPERATION WITH THE CITY'S UTILITY INSPECTOR.

43. THE UTILITY IMPROVEMENTS AND ADJUSTMENTS SHOWN ON THESE PLANS ARE INTENDED TO MAINTAIN THE INTEGRITY OF THE PALM BAY WATER, WASTEWATER AND RECLAIMED WATER SYSTEMS. ALL MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE PALM BAY UTILITIES STANDARDS AND CONSTRUCTION SPECIFICATION MANUAL. THE PLANS DO NOT INCLUDE WORK PERFORMED ON OR FOR UTILITY SYSTEMS OWNED BY OTHERS, UNLESS STATED OTHERWISE ON THE PLANS.

44. THE CONTRACTOR SHALL PROVIDE SUPPORT FOR EXISTING POWER POLES, TELEPHONE POLES AND STRUCTURES DURING CONSTRUCTION.

45. THE CONTRACTOR SHALL PROVIDE A SIGN ABOVE ALL HOSE BIBBS WHICH SHALL STATE EITHER "POTABLE" OR "NON-POTABLE, DO NOT DRINK". THE SIGN SHALL BE MADE OF LAMINATED PLASTIC WITH A BLACK FACE AND WHITE LETTERS APPROXIMATELY 3/4-INCH HIGH. ATTACH A SIGN TO STRUCTURE OR HANDRAIL WITH STAINLESS STEEL HARDWARE.

46. ALL BURIED VALVES SHALL BE MINIMUM 2-INCHES WITH 2-INCH NUT AT VALVE BOX ASSEMBLY.

47. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ALL EXCESS FILL FROM THE SITE AT NO ADDITIONAL COST TO THE OWNER.

TRENCH EXCAVATION SAFETY PROTECTION NOTES:

1. CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES. THE CONTRACTOR'S IMPLEMENTATION OF THE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES WITH AS A MINIMUM, OSHA STANDARDS 29 CFR - "EXCAVATION" - 1926 SUBPART P FOR TRENCH SAFETY; SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

2. CONTINUOUS INSPECTION OF ALL TRENCH EXCAVATION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR CONTROLS THE SIZE, WEIGHT, AND SPEED OF OPERATION OF EQUIPMENT AND PIPE INSTALLATION, WHICH DIRECTLY AFFECTS ALL SAFETY MEASURES IN A TRENCH. IF PROBABLE CAUSE OF UNSAFE TRENCH CONDITIONS EXIST, ALL WORK SHALL CEASE IMMEDIATELY UNTIL NECESSARY PRECAUTIONS TO SAFEGUARD EMPLOYEES ARE TAKEN.

3. CONTRACTOR SHALL OBSERVE OSHA REQUIREMENTS FOR WORKING IN CONFINED SPACES.

EROSION CONTROL NOTES:

1. TEMPORARY STABILIZATION IS REQUIRED OF ALL SOIL LEFT BARE FOR GREATER THAN 14 DAYS.
2. PERMANENT SOIL STABILIZATION REQUIRED. SEE CIVIL PLANS FOR SOD AND PROTECTION LOCATIONS.
3. REQUIRED INSPECTIONS BY CONTRACTOR DURING CONSTRUCTION:
   a. ONCE EACH WEEK OR WITHIN 24 HRS OF A STORM EVENT (GREATER THAN 1/2 IN.) INSPECT ALL CONTROL MEASURES.
   b. REPAIR ALL DAMAGED AREAS WITHIN 24 HRS OF DISCOVERY.
   c. AT LEAST 30 DAYS PRIOR TO THE START OF CONSTRUCTION, CONTRACTOR SHALL DEVELOP AN INTERIM GRADING & DRAINAGE PLAN THAT DEPICTS HOW THE CONSTRUCTION PHASE RUNOFF WILL BE ROUTED TO THE DETENTION POND FOR REVIEW & APPROVAL BY THE ENGINEER.
   d. REMOVE ANY BUILT-UP SEDIMENT AROUND FENCES THAT REACHES 1/3 OF THE SILT FENCE HEIGHT.
   e. SILT FENCES TO BE INSPECTED FOR DEPTH OF SEDIMENT AND TEARS TO INSURE FABRIC HAS NOT PULLED AWAY FROM POSTS.
   f. INSPECT ALL TEMPORARY AND PERMANENT SOIL STABILIZATION FOR WASHOUTS OR BARE SPOTS.
   g. INSPECTION REPORTS MUST BE AVAILABLE FOR INSPECTION AT ALL TIMES. THE SITE SUPERINTENDENT SHALL CONDUCT ALL INSPECTIONS AND MAINTAIN REPORTS.
4. THE CONTRACTOR SHALL UPHOLD GOOD HOUSEKEEPING PRACTICES AND MAINTAIN THE SITE IN AN ORDERLY FASHION. THE CONTRACTOR SHALL INSURE THE FOLLOWING ITEMS ARE ADDRESSED:
   a. AN EFFORT TO STORE ONLY WHAT IS NEEDED ON THE SITE.
   b. STORE MATERIALS IN A NEAT AND ORDERLY FASHION IN THE ORIGINAL CONTAINERS WHEN POSSIBLE.
   c. FOLLOW ALL MANUFACTURERS RECOMMENDED PROCEDURES FOR DISPOSAL OF WASTE MATERIAL.
   d. INSPECT DAILY TO INSURE WASTE MATERIAL IS DISPOSED OF PROPERLY.

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DO NOT SIGN 6/17/2020

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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
GENERAL NOTES

PROJ:	200-08507-19001
DESN:	JCR
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G-003

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Bar Measures 1 inch, otherwise drawing not to scale

PIPING MATERIALS SCHEDULE

ABBREVIATION	DESCRIPTION	BURIED	BURIED COLOR	EXPOSED	EXPOSED COLOR	MAX. WORKING PRESSURE	TEST PRESSURE	SPECIFICATIONS
AIR	AIR LOW PRESSURE	NA	NA	FIBERGLASS REINFORCED DUCT	MATCH SERVICE	35	150	11305
AS	ANTISCALANT (SCALE INHIBITOR)	PFA CARRIER TUBING IN SCH 80 PVC SECONDARY CONTAINMENT PIPE	NA	PVC SCH 80, SOLVENT WELD	ORANGE	75	150	15070, 15090
CAS	CARBONIC ACID SOLUTION	PVC SCH 80, SOLVENT WELD	WHITE PVC WITH ORANGE STRIPES	PVC SCH 80, SOLVENT WELD, 316 SST, SCH 40	WHITE PVC WITH ORANGE BANDS	75	150	15066, 15070, 15090
CLNS/CLNC	CLEANING SOLUTION FEED/CONCENTRATE	NA	NA	PVC SCH 80, SOLVENT WELD	LIGHT GRAY	75	120	15070
CLNP	CLEANING PRODUCT	NA	NA	PVC SCH 80, SOLVENT WELD	LIGHT GRAY	75	120	15070
CNT	RO CONCENTRATE	C900 DR18 PVC BELL & SPIGOT PIPE WITH PVC FITTINGS	WHITE PVC WITH BROWN STRIPES	316 SST, SCH 40	NA	100	150	15066
CO2	CARBON DIOXIDE GAS	NA	NA	316 SST, SCH 40, COMPRESSION OR THREADED JOINTS	NA	150	225	15066, 15090
DCLNS	DEGASIFIER CLEANING SOLUTION	PVC SCH 80, SOLVENT WELD	NA	PVC SCH 80, SOLVENT WELD	LIGHT GRAY	75	120	15070
DD	DEGASIFIER DISCHARGE	NA	NA	316 SST, SCH 40	NA	25	50	15066
DR	DRAIN	<4": PVC SCH 80; >= 4" PVC SEWER PIPE, SDR 26 W/ PVC FITTINGS, DUCTILE IRON PIPE FOR GST	GREEN PIGMENTED PVC	PVC SCH 80, SOLVENT WELD	DARK GRAY	25	NA	15062, 15064, 15090
FW	FINISHED WATER	<3": PVC SCH 80; >= 3": DUCTILE IRON PIPE W/ DUCTILE IRON FITTINGS	PVC: BLUE PIGMENTED OR DUCTILE IRON: BLUE STRIPES PER F.A.C. 62-555.320(21) (b) (3)	<3": PVC SCH 80; >= 3" DUCTILE IRON PIPE W/ DUCTILE IRON FITTINGS	DARK BLUE	75	150	15062, 15070
FWW	FINISHED WATER TO WASTE	DUCTILE IRON PIPE W/ DUCTILE IRON FITTINGS	NA	DUCTILE IRON PIPE W/ DUCTILE IRON FITTINGS	GREY	25	50	15062
H2SO4	SULFURIC ACID	NA	NA	PVDF	YELLOW WITH RED BANDS	75	120	15074
NAOCL	SODIUM HYPOCHLORITE	PFA CARRIER TUBING IN SCH 80 PVC SECONDARY CONTAINMENT PIPE	NA	PVC SCH 80, SOLVENT WELD	YELLOW	75	120	15070, 15090
NAOH	SODIUM HYDROXIDE	PFA CARRIER TUBING IN SCH 80 PVC SECONDARY CONTAINMENT PIPE	NA	PVC SCH 80, SOLVENT WELD	YELLOW WITH GREEN BANDS	75	120	15070, 15090
OF	OVERFLOW	NA	NA	CPVC, SCH 80 SOLVENT WELD FOR SULFURIC ACID, PVC, SCH 80, SOLVENT WELD FOR ALL OTHER CHEMICALS, DUCTILE IRON PIPE FOR GST	MATCH SERVICE	NA (GRAVITY)	15 ft wch	15062, 15070, 15074, 15090
ROP	RO PERMEATE	NA	NA	PVC SCH 80, SOLVENT WELD	AQUA	50	75	15070
PO4	PHOSPHATE INHIBITOR	PFA CARRIER TUBING IN SCH 80 PVC SECONDARY CONTAINMENT PIPE	NA	PVC SCH 80, SOLVENT WELD	LIGHT GREEN WITH RED BANDS	75	150	15070, 15090
PTRW	PRETREATED RAW WATER	NA	NA	316 SST, SCH 40	NA	60	90	15066
PW	POTABLE WATER	<3": PVC SCH 80; >= 3": DUCTILE IRON PIPE W/ DUCTILE IRON FITTINGS	PVC: BLUE PIGMENTED OR DUCTILE IRON: BLUE STRIPES PER F.A.C. 62-555.320(21) (b) (3)	<3": PVC SCH 80; >= 3" DUCTILE IRON PIPE W/ DUCTILE IRON FITTINGS	DARK BLUE	75	150	15062, 15070
ROBW	RO BLEND WATER	C900 DR18 PVC BELL & SPIGOT PIPE WITH PVC FITTINGS	WHITE PVC WITH AQUA STRIPES	PVC SCH 80, SOLVENT WELD	AQUA	50	100	15066
ROF	RO FEED	NA	NA	316 SST, SCH 40	NA	200	300	15066
ROPW	RO PERMEATE TO WASTE	ADS STORM PIPE	NA	PVC SCH 80, SOLVENT WELD	LIGHT GRAY	25	50	15064, 15070
RW	RAW WATER	C900 DR18 PVC BELL & SPIGOT PIPE W/ PVC FITTINGS	GREEN PIGMENTED PVC	316 SST, SCH 40	NA	150	225	15066
SMPL	SAMPLE	PVC SCH 80, SOLVENT WELD	MATCH SERVICE	PVC SCH 80, SOLVENT WELD OR 316 SST AS NOTED ON DWGS	MATCH SERVICE	150	225	15066, 15070
SS	SANITARY SEWER	<4": PVC SCH 40; >= 4" PVC SEWER PIPE, SDR 26 W/ PVC FITTINGS	GREEN PIGMENTED PVC	NA	DARK GRAY	NA (GRAVITY)	15 ft wch	15064, 15400
STS	STORM SEWER	RCP	NA	NA	NA	NA	NA	NA
VNT	VENT	NA	NA	PVC, SCH 80, SOLVENT WELD	MEDIUM GRAY	NA	NA	15070
WR	WASTE RETURN	C900 DR18 PVC BELL & SPIGOT PIPE WITH PVC FITTINGS	GREEN PIGMENTED PVC	PVC SCH 80, SOLVENT WELD	DARK GRAY	25	50	15064, 15070

NOTES:

1. ALL PIPELINES TO BE AS LISTED IN THE PIPE MATERIAL SCHEDULE UNLESS NOTED OTHERWISE IN THE DRAWINGS.
2. ALL CHEMICAL FEED PIPING CONSISTING OF SCH 80 PVC TO BE MINIMUM 3/4" DIA UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
3. SECONDARY CONTAINMENT SCH 80 PVC PIPING TO BE NOMINAL 3" DIA UNLESS OTHERWISE NOTED ON DRAWINGS.
4. CHEMICAL TUBING TO BE CHEMFLARE PFA TUBING AS MANUFACTURED BY CHEMLINE PLASTICS WITH MINIMUM PRESSURE RATING OF 116 PSI. TUBING SIZE AS NOTED ON DRAWINGS REFERS TO OUTSIDE DIAMETER.
5. ALL EXPOSED PROCESS PIPING IS TO BE PAINTED PER THE PAINTING SPECS, EXCEPT STAINLESS STEEL, FRP AND COPPER PIPE.
6. WORKING PRESSURE RATING OF FITTINGS TO MEET OR EXCEED THE RATING OF THE PIPE.
7. PIPING MATERIALS TO BE AS LISTED IN THE PIPING SCHEDULE UNLESS OTHERWISE SHOWN IN THE DRAWINGS.
8. ALL GRAVITY/PRESSURE PIPING UNDER BUILDING FOUNDATION SHALL BE CONCRETE ENCASED
9. DOMESTIC WATER DISTRIBUTION PIPING IN CHEMICAL AREAS SHALL BE CPVC ASTM D-1784 W/ SOLVENT JOINTS PER ASTM F-493.

PIPE MATERIAL CODES

ABBREVIATION	DESCRIPTION
C2O	SCHEDULE 40 CARPENTER 20 ALLOY PIPE
CMLS	CEMENT MORTAR-LINED STEEL PIPE
CPVC	SCHEDULE 80 CPVC PIPE
CU	COPPER TUBING
DI	DUCTILE IRON PIPE
EPDM	EPDM TUBING
FRP	150 PSI PRESSURE CLASS FIBERGLASS REINFORCED PLASTIC PIPE
HDPE	150 PSI PRESSURE CLASS HIGH-DENSITY POLYETHYLENE PIPE
PTFE(T)	150 PSI PRESSURE RATED TEFLON TUBING
PP	150 PSI PRESSURE CLASS POLYPROPYLENE PIPE
PVC	SCHEDULE 80 PVC PIPE (OR) C900 PVC PRESSURE PIPING
PVC-D	PVC GRAVITY SEWER PIPE
PVDF	230 PSI PRESSURE CLASS POLYVINYLIDENE FLUORIDE PIPE
SST	TYPE 316/316L STAINLESS STEEL PIPE
STL	FABRICATED STEEL PIPE
STL-EL	FABRICATED STEEL, EPOXY LINED PIPE

EQUIPMENT IDENTIFICATION

ABBREVIATION	DESCRIPTION
BWR	BLOWER
CAL	CALIBRATION COLUMN
CF	CARTRIDGE FILTER
CMP	CHEMICAL METERING PUMP
CP	CONTROL PANEL
DGS	DEGASIFIER
ES	EMERGENCY EYEWASH / SHOWER
IQ	INJECTION QUILL
M	MECHANICAL EQUIPMENT
MP	METERING PUMP
MM	MECHANICAL MIXER
MOV	MOTOR OPERATED VALVE
PMP	PUMP
PD	PULSATION DAMPENER
SM	STATIC MIXER
STR	STRAINER
TK	TANK

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JONATHAN C. BUNDY
LICENSE
No. 62561
STATE OF FLORIDA
PROFESSIONAL ENGINEER

AT SET

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

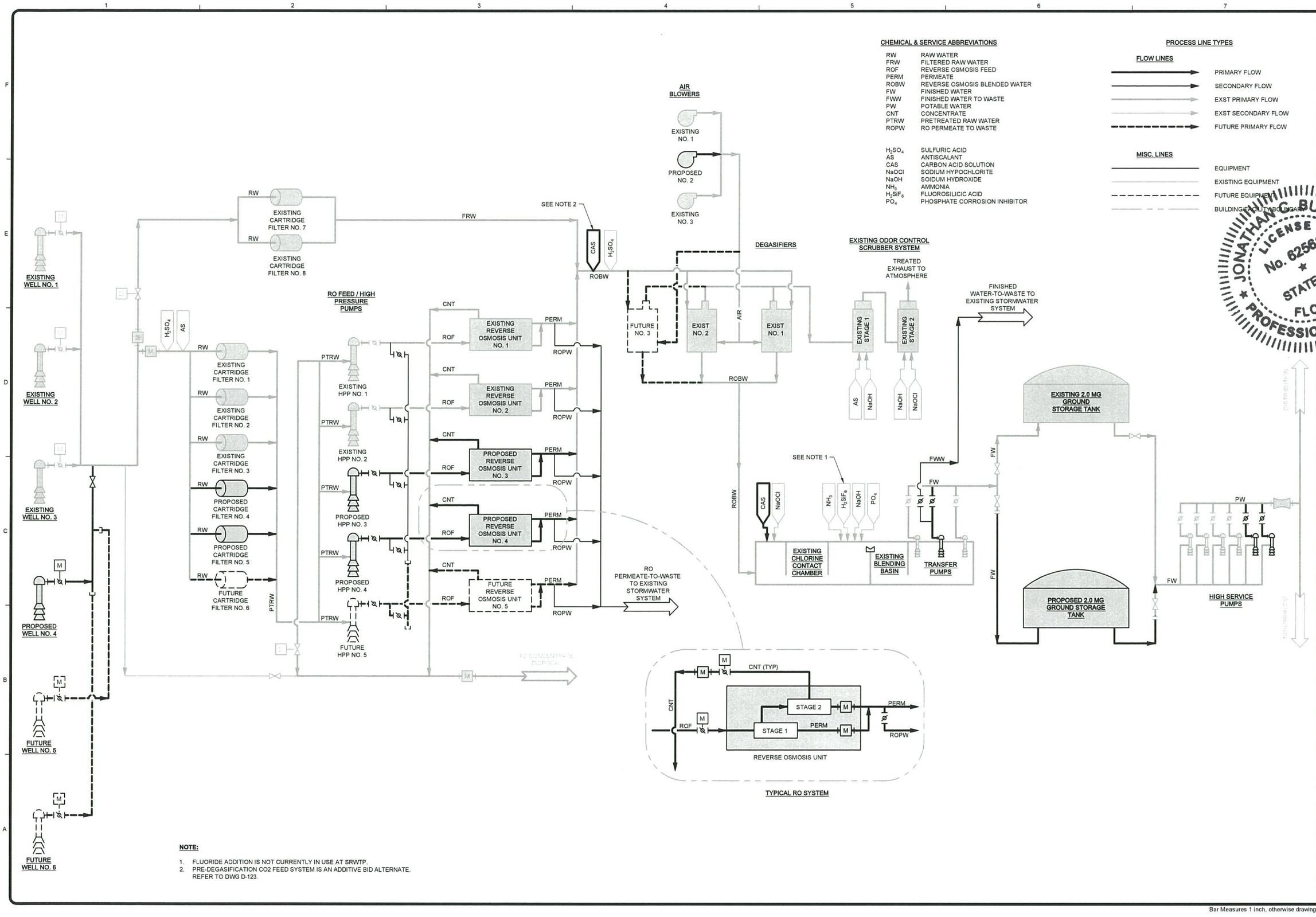
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

FLOW STREAM IDENTIFICATION TABLE

PROJ:	200-08507-19001
DESN:	JCR
DRWN:	JTE
CHKD:	JCB

G-004

Bar Measures 1 inch, otherwise drawing not to scale



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BID SET

JONATHAN C. BUNDY LICENSE No. 62561 STATE OF FLORIDA PROFESSIONAL ENGINEER

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

OVERALL PROCESS FLOW DIAGRAM

PROJ:	200-08507-19001
DESN:	JCR
DRWN:	JTE
CHKD:	JCB

G-005

Bar Measures 1 inch, otherwise drawing not to scale

LEGAL DESCRIPTION

PARCEL#: 29-37-30-00-251
OWNER: CITY OF PALM BAY
OFFICIAL RECORDS 4268, PAGE 0585

LEGAL DESCRIPTION:
A PORTION OF THE FLORIDA INDIAN RIVER LAND COMPANY, PLAT BOOK 1, PAGE 165 IN SECTION 30, TOWNSHIP 29 SOUTH, RANGE 37 EAST CITY OF PALM BAY, BREVARD COUNTY, FLORIDA, AND BEING MORE PATRICIANLY DESCRIBED AS FOLLOWS:

COMMENCE AT THE NORTHWEST CORNER OF SAID SECTION 30, TOWNSHIP 29 SOUTH, RANGE 37 EAST AND RUN S00°32'06"E ALONG THE WEST LINE OF SAID SECTION 30, TOWNSHIP 29 SOUTH, RANGE 37 EAST A DISTANCE OF 3442.41 FEET; THENCE RUN N89°49'31"E A DISTANCE OF 58 FEET TO THE EAST RIGHT OF WAY LINE OF MELBOURNE TILLMAN DRAINAGE DISTRICT CANAL NO. 37 SAID POINT OF BEGINNING OF THE HEREIN DESCRIBED PARCEL; THENCE RUN N00°32'06"W ALONG SAID EAST RIGHT OF WAY LINE OF SAID MELBOURNE TILLMAN DRAINAGE DISTRICT CANAL NO. 37 A DISTANCE OF 2624.18 FEET; THENCE RUN S87°25'03"E A DISTANCE 1538.03 FEET; THENCE RUN S20°33'14"E A DISTANCE 2377.19 FEET TO THE NORTHERLY LINE OF PORT MALABAR UNIT 25, ACCORDING TO THE PLAT THEREOF AS RECORDED IN PLAT BOOK 16, PAGES 68-83, OF THE PUBLIC RECORDS OF BREVARD COUNTY, FLORIDA; THENCE RUN ALONG SAID NORTHERLY LINE OF PORT MALABAR UNIT 25 FOR THE FOLLOWING THREE COURSES; S89°49'23"W A DISTANCE OF 1179.14 FEET; S51°54'15"W A DISTANCE OF 523.44 FEET; S89°49'13"W A DISTANCE OF 755.50 FEET TO THE POINT OF BEGINNING.

NOTES

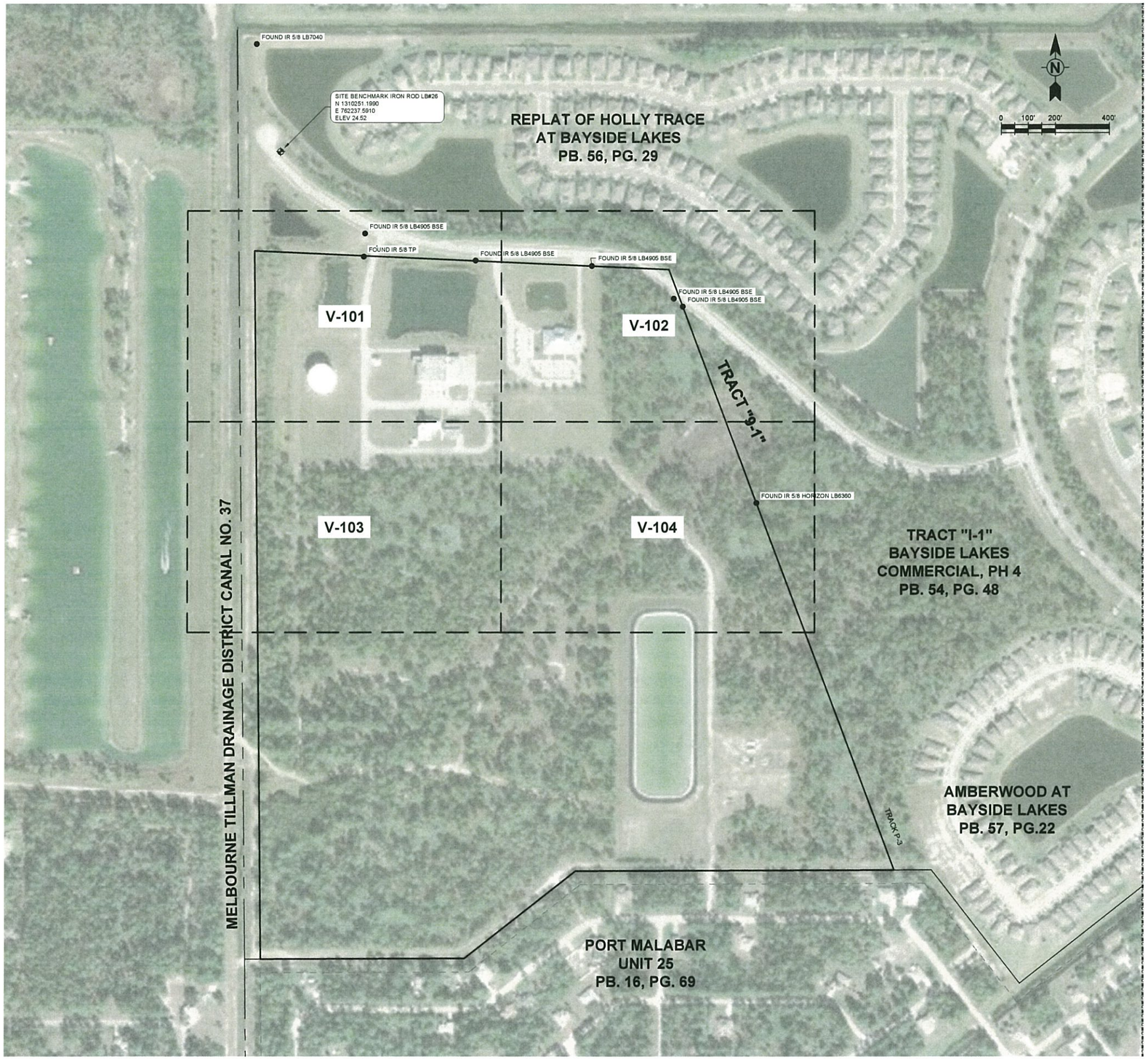
1. THE PURPOSE OF THIS SURVEY IS TO SHOW THE EXISTING GROUND IN RELATION TO THE NATURAL GROUND ELEVATION.
2. HORIZONTAL COORDINATES ARE BASED ON NAD83 (1990), FLORIDA EAST ZONE.
3. BEARINGS SHOWN HEREON ARE BASED ON THE WEST LINE OF SECTION 20 AS BEING N00°29'36"E.
4. ELEVATIONS SHOWN HEREON ARE BASED IN NAVD 88.
5. THERE MAY BE EASEMENTS AND RESTRICTIONS OF RECORDS AND/OR PRIVATE AGREEMENTS NOT FURNISHED TO THIS SURVEYOR THAT MAY AFFECT PROPERTY RIGHTS AND/OR LAND USE RIGHTS OF THE LANDS SHOWN HEREON.
6. NO UNDERGROUND INSTALLATIONS, FOUNDATION FOOTINGS OR IMPROVEMENTS HAVE BEEN LOCATED EXCEPT AS NOTED.
7. THIS SURVEY WAS PERFORMED IN ACCORDANCE WITH THE STANDARDS OF PRACTICE FOR SURVEYS AS SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL SURVEYORS AND MAPPERS, CHAPTER 5J-17, FLORIDA ADMINISTRATIVE CODE.
8. BASED ON THE NATIONAL FLOOD INSURANCE PROGRAM "FIRM" MAP COMMUNITY - PANEL NUMBER 12009C0670 G DATED 03/17/2014 THE ABOVE DESCRIBED PROPERTY IS LOCATED IN ZONE "X".
9. THIS FIELD SURVEY WAS PERFORMED ON MAY 3, 2019 .

LEGEND

BM BENCHMARK	ELECTRIC TRANSFORMER	SPIGOT
ND NAIL & DISK	EVERGREEN TREE	SPRINKLER HEAD
TP TRAVERSE POINT	FIRE HYDRANT	TRAFFIC SIGN
F FOUND IRON (TYPE)	FLAG (AS SHOWN)	UTILITY MARKER (AS SHOWN)
S SET 1/2" IRON ROD LB# 26	GUY ANCHOR	UTILITY MANHOLE (AS SHOWN)
F FOUND MONUMENT (TYPE)	LIGHT POLE	UTILITY METER (AS SHOWN)
S SET MONUMENT (TYPE)	MAIL BOX	UTILITY RISER (AS SHOWN)
SC SECTION CORNER	PALM TREE	UTILITY VALVE (AS SHOWN)
CO CLEANOUT	P POST	UTILITY POLE (AS SHOWN)
DECIDUOUS TREE	SATELLITE DISH	WELL

ABBREVIATIONS

ANT	ANTENNA	G	GAS	RR	RAILROAD
BFP	BACK FLOW PREVENTER	GM	GAS METER	RW	RECLAIMED WATER
BM	BENCHMARK	GV	GAS VALVE	S	SET
(C)	CALCULATED	INV	INVERT	SC	SECTION CORNER
CO	CLEANOUT	IP	IRON PIPE	SH	SPRINKLER HEAD
CONC	CONCRETE	IR	IRON ROD	SPIG	WATER SPIGOT
CM	CONCRETE MONUMENT	IRRV	IRRIGATION VALVE	SS	SANITARY SEWER
CMP	CORRUGATED METAL PIPE	JBL	JURISDICTIONAL BOUNDARY LINE	SD	STORM DRAIN
CPP	CORRUGATED PLASTIC PIPE	(M)	MEASURED	SV	SANITARY SEWER VALVE
(D)	AS DESCRIBED	MB	MAILBOX	TB	TELEPHONE RISER
DIP	DUCTILE IRON PIPE	MH	MANHOLE	TEL	TELEPHONE
DH	DRILL HOLE	MW	MONITORING WELL	TP	TRAVERSE POINT
EB	ELECTRIC RISER	ND	NAIL & DISK	TSC	TRAFFIC SIGNAL CONTROL
ELEC	ELECTRIC	NL	NAIL	TSP	TRAFFIC SIGNAL POLE
EM	ELECTRIC METER	OE	OVERHEAD UTILITY LINES	TV	CABLE TELEVISION
EOP	EDGE OF PAVEMENT	OR	OFFICIAL RECORDS	UE	UNDERGROUND UTILITY LINES
ET	ELECTRIC TRANSFORMER	P	POST	W	WATER
F	FOUND	(P)	PER PLAT	WM	WATER METER
FDC	FIRE DEPT CONNECTION	PB	PLAT BOOK	WV	WATER VALVE
FF	FINISHED FLOOR	PG	PAGE	XC	X CUT
FH	FIRE HYDRANT	PK	PK NAIL		
FO	FIBER OPTIC	POL	POINT ON LINE		
		RCP	REINFORCED CONC PIPE		



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BID SET

LAWRENCE E. JENKINS
PROFESSIONAL SURVEYOR
AND MAPPER FLORIDA
REGISTRATION #5364
TETRA TECH - LB #26

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SIGNATURE AND THE ORIGINAL
RAISED SEAL OF A FLORIDA
LICENSED SURVEYOR AND MAPPER

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT
PLANT EXPANSION - 4-MGD TO 6-MGD

KEY MAP

PROJ: 200-08507-19001
DESN:
DRWN: BLS
CHKD: LEJ

V-100

Bar Measures 1 inch, otherwise drawing not to scale

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TEST HOLE				
ID TAG	TOP OF PIPE	SIZE	MATERIAL	UTILITY TYPE
TH 1	19.5	30"	METAL	SANITARY FM
TH 2	20.4	24.5"	METAL	SANITARY FM
TH 3B	18.9	12.5"	PVC	RECLAIM WATER
TH 4A	18.4	24.5"	DIP	RECLAIM WATER
TH 7	19.5	6.5"	PVC	WATER
TH 7H	20.1	5X1"	PVC	NA

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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

TOPOGRAPHIC SURVEY

PROJ:	200-08507-19001
DESN:	
DRWN:	BLS
CHKD:	LEJ

V-101

Bar Measures 1 inch, otherwise drawing not to scale

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TEST HOLE				
ID TAG	TOP OF PIPE	SIZE	MATERIAL	UTILITY TYPE
TH 09	19.2	12.5"	DIP	SANITARY FM

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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT
PLANT EXPANSION - 4-MGD TO 6-MGD

TOPOGRAPHIC SURVEY

PROJ: 200-08507-19001
DESN:
DRWN: BLS
CHKD: LEJ

V-102

Bar Measures 1 inch, otherwise drawing not to scale

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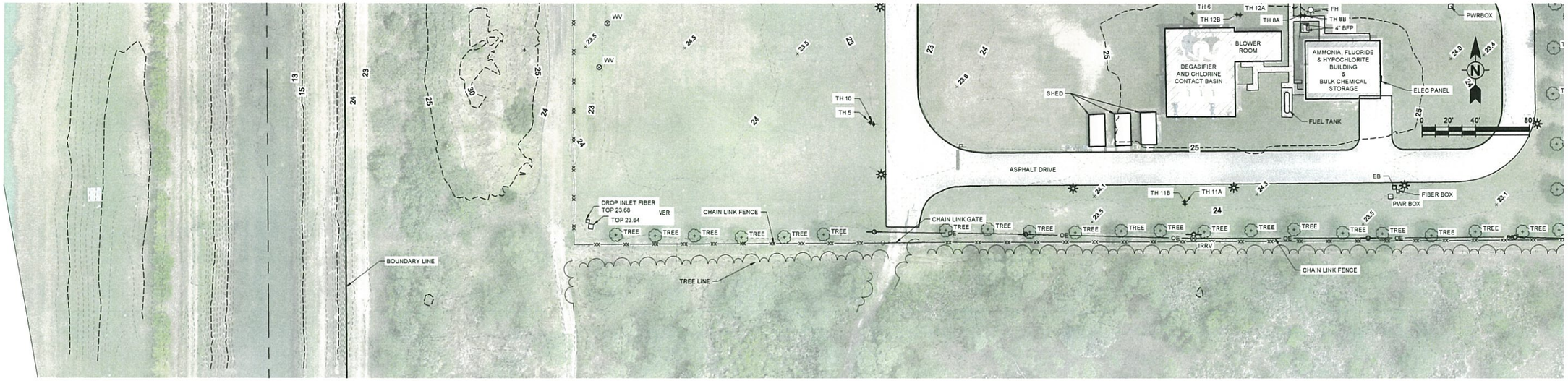

TEST HOLE				
ID TAG	TOP OF PIPE	SIZE	MATERIAL	UTILITY TYPE
TH 5	19.6	30.5"	DIP	SANITARY FM
TH 6	21.8	24.5"	DIP	SANITARY FM
TH 8A	22.5	4.5"	DIP	SANITARY FM
TH 8B	22.0	6.5"	DIP	WATER
TH 10	19.0	NA	CONCRETE	ELECTRIC DUCT BANK
TH 11A	19.7	4.5"	PVC	ELECTRIC DUCT BANK
TH 11B	19.7	2.5"	PVC	FIBER OPTIC CABLE
TH 12A	NA	NA	NOT FOUND	NA
TH 12B	NA	NA	NOT FOUND	NA

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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

TOPOGRAPHIC SURVEY

PROJ: 200-08507-19001
DESN:
DRWN: BLS
CHKD: LEJ

V-103

Bar Measures 1 inch, otherwise drawing not to scale

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LICENSED SURVEYOR AND MAPPER

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT
PLANT EXPANSION - 4-MGD TO 6-MGD

TOPOGRAPHIC SURVEY

PROJ:	200-08507-19001
DESN:	
DRWN:	BLS
CHKD:	LEJ

V-104

Bar Measures 1 inch, otherwise drawing not to scale

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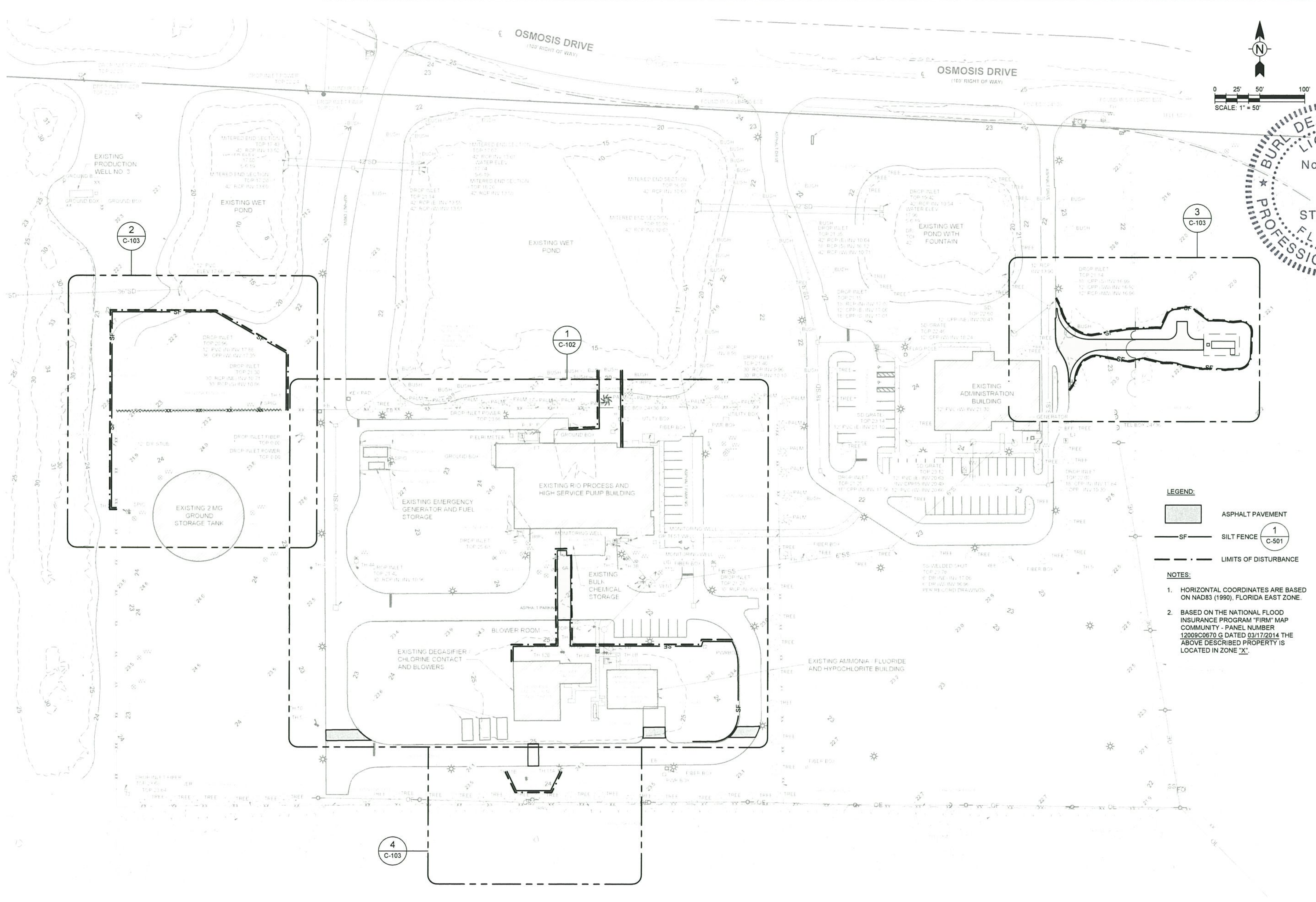

LEGEND:

ASPHALT PAVEMENT

SF — SILT FENCE (1 / C-501)

LIMITS OF DISTURBANCE

NOTES:

1. HORIZONTAL COORDINATES ARE BASED ON NAD83 (1990), FLORIDA EAST ZONE.
2. BASED ON THE NATIONAL FLOOD INSURANCE PROGRAM "FIRM" MAP COMMUNITY - PANEL NUMBER 12009C0670 G DATED 03/17/2014 THE ABOVE DESCRIBED PROPERTY IS LOCATED IN ZONE "X".

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BURL DEAN
LICENSE
No 64037
STATE OF FLORIDA
PROFESSIONAL ENGINEER
6/19/20

BID SET

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

OVERALL EX. CONDITIONS, DEMOLITION AND EROSION CONTROL PLAN

PROJ:	200-08507-19001
DESN:	BDR
DRWN:	HCR
CHKD:	RKC

C-101

Bar Measures 1 inch, otherwise drawing not to scale

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1 C-501 PROPOSED SILT FENCE (TYPICAL)

EXISTING FENCE TO BE REMOVED AND REPLACED

EXISTING TREE TO BE REMOVED

LIMITS OF DISTURBANCE

EXISTING 6" BFP

EXISTING 2" BFP

EXISTING EMERGENCY GENERATOR AND FUEL STORAGE

EXISTING R/O PROCESS AND HIGH SERVICE PUMP BUILDING

EXISTING OPERATIONS BUILDING

EXISTING CONC. WALK

EXISTING ASPHALT PARKING

EXISTING 2" BFP

EXISTING 2" BFP

EXISTING BULK CHEMICAL STORAGE

N 1309354.07
E 762808.21

EXISTING TEST WELL

N 1309348.70
E 762823.01

EXISTING POWER PANEL

EXISTING 1" BFP

EXISTING CONC. WALK

APPROX 6" FM

2 C-501 OPEN CUT ASPHALT PAVEMENT

EXISTING CURB TO BE DEMOLISHED

LIMITS OF DISTURBANCE

N 1309277.01
E 762823.53

N 1309276.89
E 762808.90

EXISTING ASPHALT PARKING

EXISTING ASPHALT PARKING

N 1309253.20
E 762970.13

N 1309247.86
E 762968.66

N 1309247.86
E 762822.85

N 1309247.84
E 762809.17

N 1309247.39
E 762759.27

1 C-501 PROPOSED SILT FENCE (TYPICAL)

LIMITS OF DISTURBANCE

N 1309253.20
E 763002.64

EXISTING 4" BFP

BLOWER ROOM

N 1309229.10
E 763009.32

EXISTING DEGASIFIER / CHLORINE CONTACT AND BLOWERS

EXISTING AMMONIA / FLUORIDE AND HYPOCHLORITE BUILDING

EXISTING ELEC PANEL

2 C-501 OPEN CUT ASPHALT PAVEMENT

N 1309173.12
E 763009.73

N 1309146.91
E 763028.94

N 1309158.73
E 763007.95

N 1309158.96
E 763033.90

EXISTING SHEDS

EXISTING FUEL TANK

N 1309157.76
E 762903.91

N 1309158.00
E 762928.48

EXISTING CURB TO BE DEMOLISHED

N 1309145.96
E 762903.24

N 1309142.05
E 762959.38

EXISTING CURB TO BE DEMOLISHED

N 1309146.64
E 762998.56

N 1309139.65
E 762775.98

EXISTING CURB TO BE DEMOLISHED

N 1309139.73
E 762787.99

N 1309154.58
E 762551.53

2 C-501 OPEN CUT ASPHALT PAVEMENT

N 1309155.23
E 762587.80

EXISTING CURB TO BE DEMOLISHED

N 1309143.04
E 762602.35

N 1309142.58
E 762551.63

1 C-101 ENLARGED PLAN

SCALE: 1" = 20'

N

0 10' 20' 40'

SCALE: 1" = 20'

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PROFESSIONAL ENGINEER

6/19/20

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BID SET

MARK	DATE	DESCRIPTION	BY

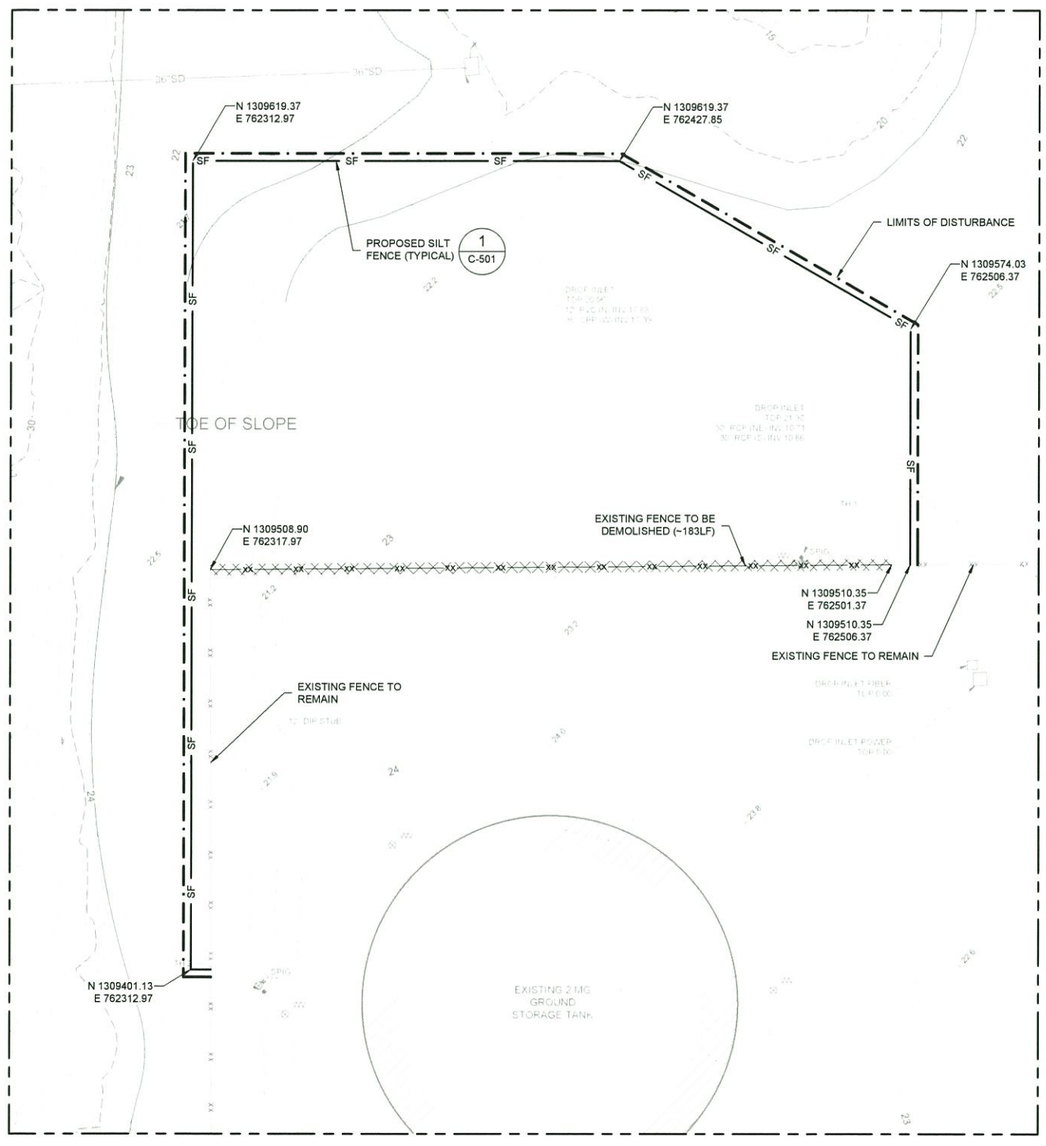
CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

ENLARGED EX. CONDITIONS, DEMOLITION AND EROSION CONTROL PLAN

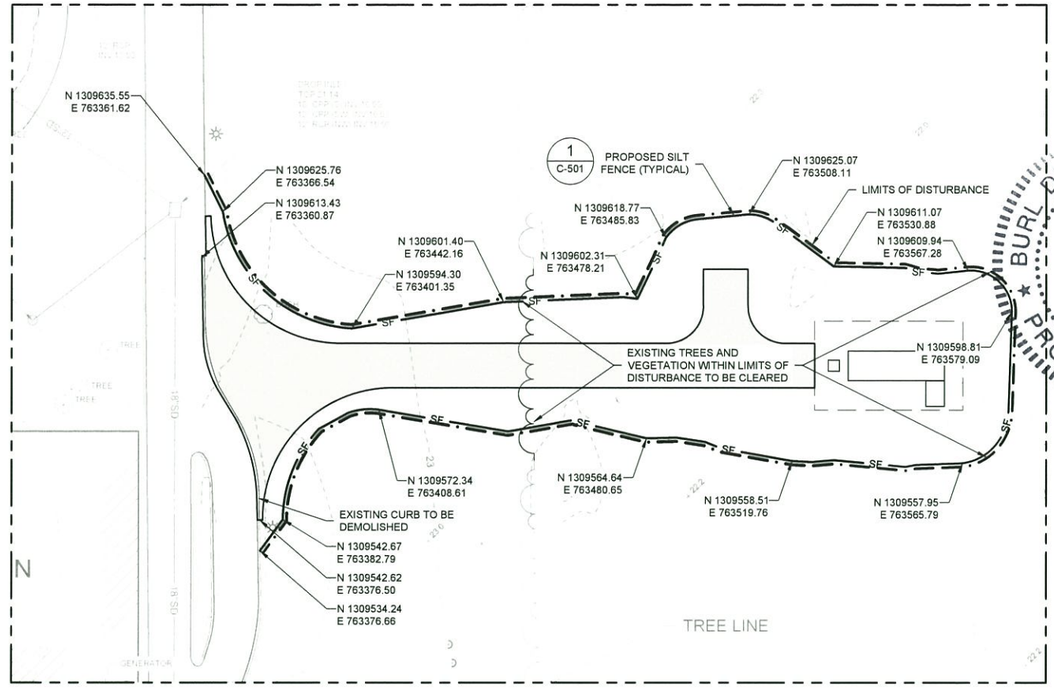
PROJ:	200-08507-19001
DESN:	BDR
DRWN:	HCR
CHKD:	RKC

C-102

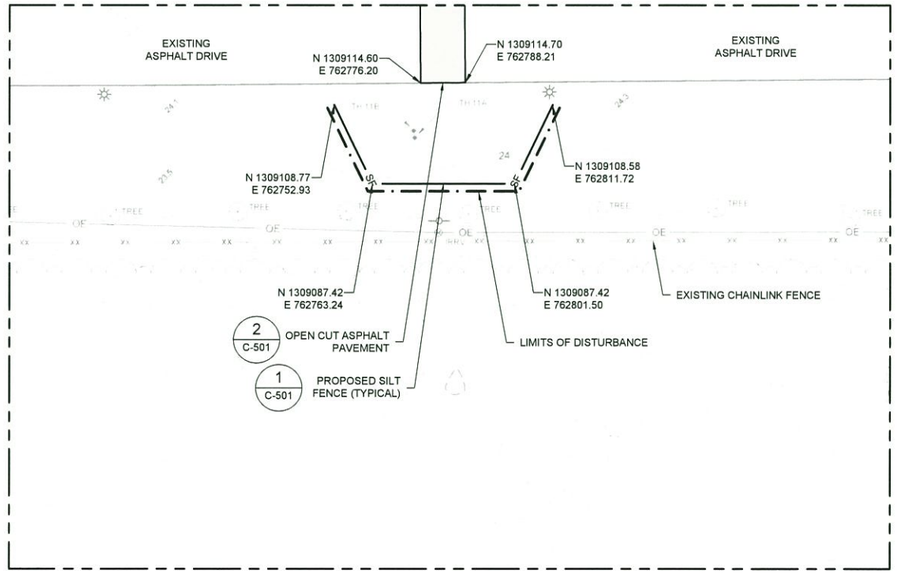
Bar Measures 1 inch, otherwise drawing not to scale



2 C-101 ENLARGED PLAN
SCALE: 1" = 20'



3 C-101 ENLARGED PLAN
SCALE: 1" = 20'



4 C-101 ENLARGED PLAN
SCALE: 1" = 20'

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BID SET

MARK	DATE	DESCRIPTION	BY

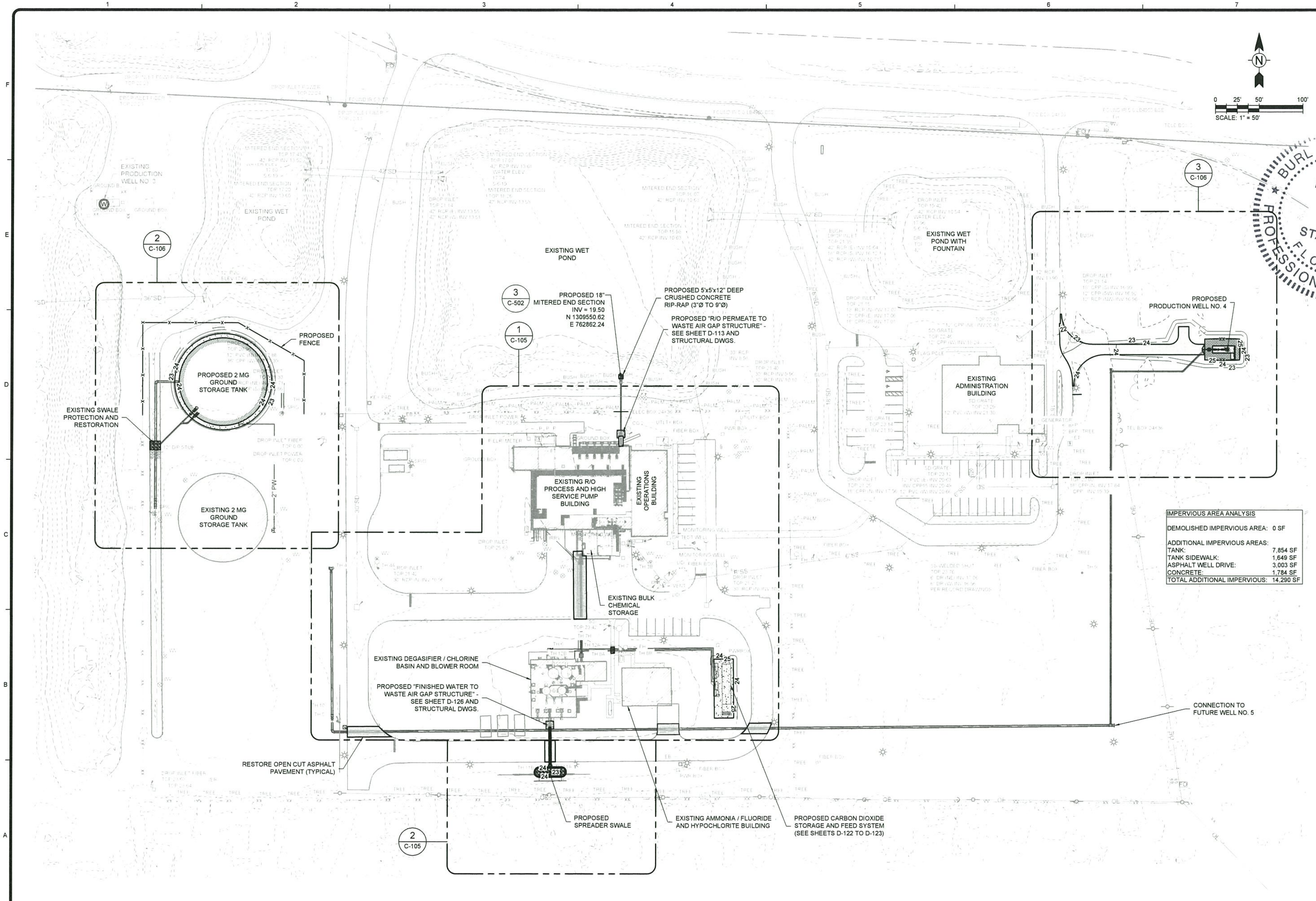
CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

ENLARGED EX. CONDITIONS, DEMOLITION AND EROSION CONTROL PLAN

PROJ:	200-08507-19001
DESN:	BDR
DRWN:	HCR
CHKD:	RKC

C-103

Bar Measures 1 inch, otherwise drawing not to scale



IMPERVIOUS AREA ANALYSIS

DEMOLISHED IMPERVIOUS AREA:	0 SF
ADDITIONAL IMPERVIOUS AREAS:	
TANK:	7,854 SF
TANK SIDEWALK:	1,649 SF
ASPHALT WELL DRIVE:	3,003 SF
CONCRETE:	1,784 SF
TOTAL ADDITIONAL IMPERVIOUS:	14,290 SF

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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

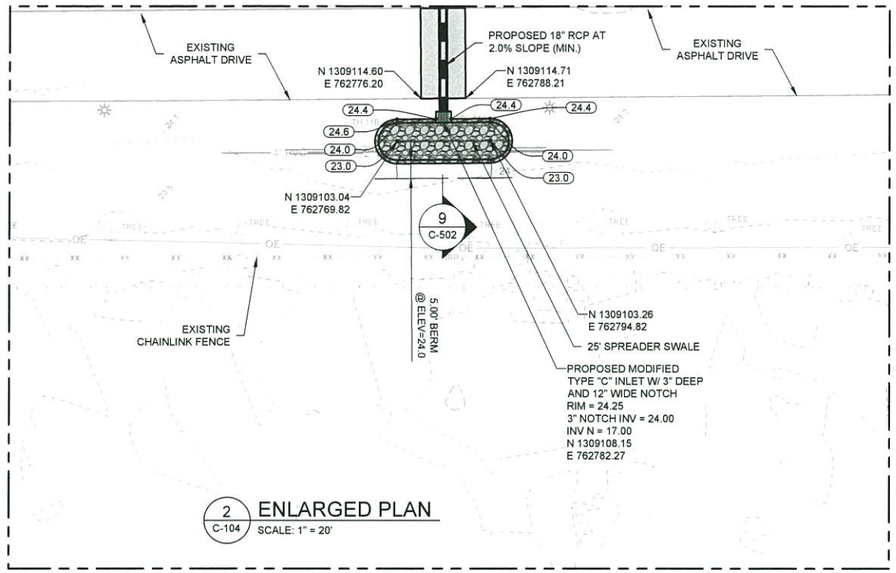
OVERALL SITE GEOMETRY AND GRADING PLAN

PROJ:	200-08507-19001
DESN:	BDR
DRWN:	HCR
CHKD:	RKC

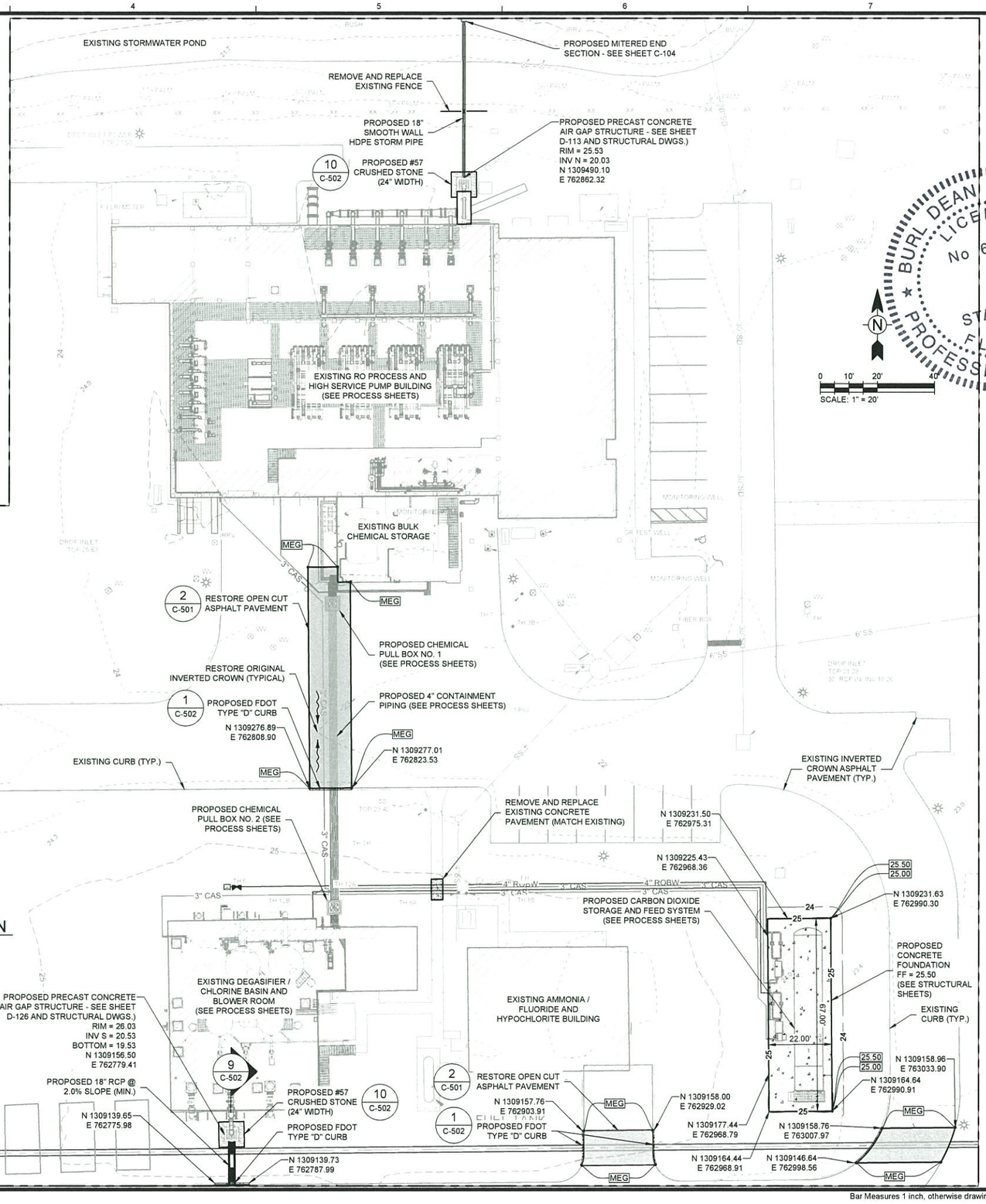
C-104

Bar Measures 1 inch, otherwise drawing not to scale

6/18/2020 3:25:02 PM - O:\PROJECTS\ORLANDO\ER\08507\200-08507-19001\CAD\SHEETFILES\C-104_C-106 SITE GEOMETRY PLAN.DWG - REYES, HECTOR



2 C-104 **ENLARGED PLAN**
SCALE: 1" = 20'



1 C-104 **ENLARGED PLAN**
SCALE: 1" = 20'

0 10' 20' 40'
SCALE: 1" = 20'

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BURL DEAN REYES
LICENSE NUMBER
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STATE OF FLORIDA
PROFESSIONAL ENGINEER
6/18/20

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MARK	DATE	DESCRIPTION	BY

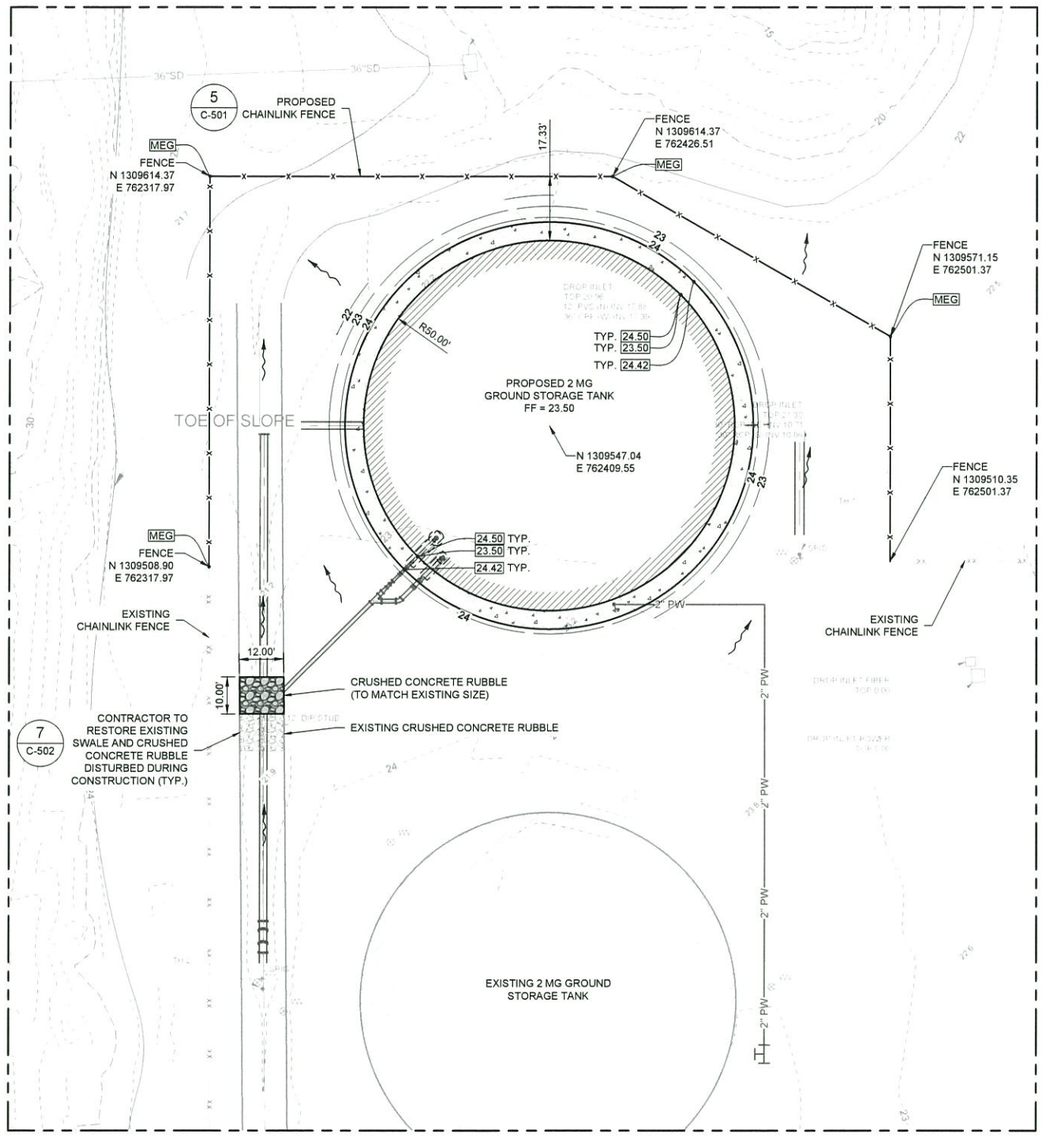
CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

ENLARGED SITE GEOMETRY AND GRADING PLAN

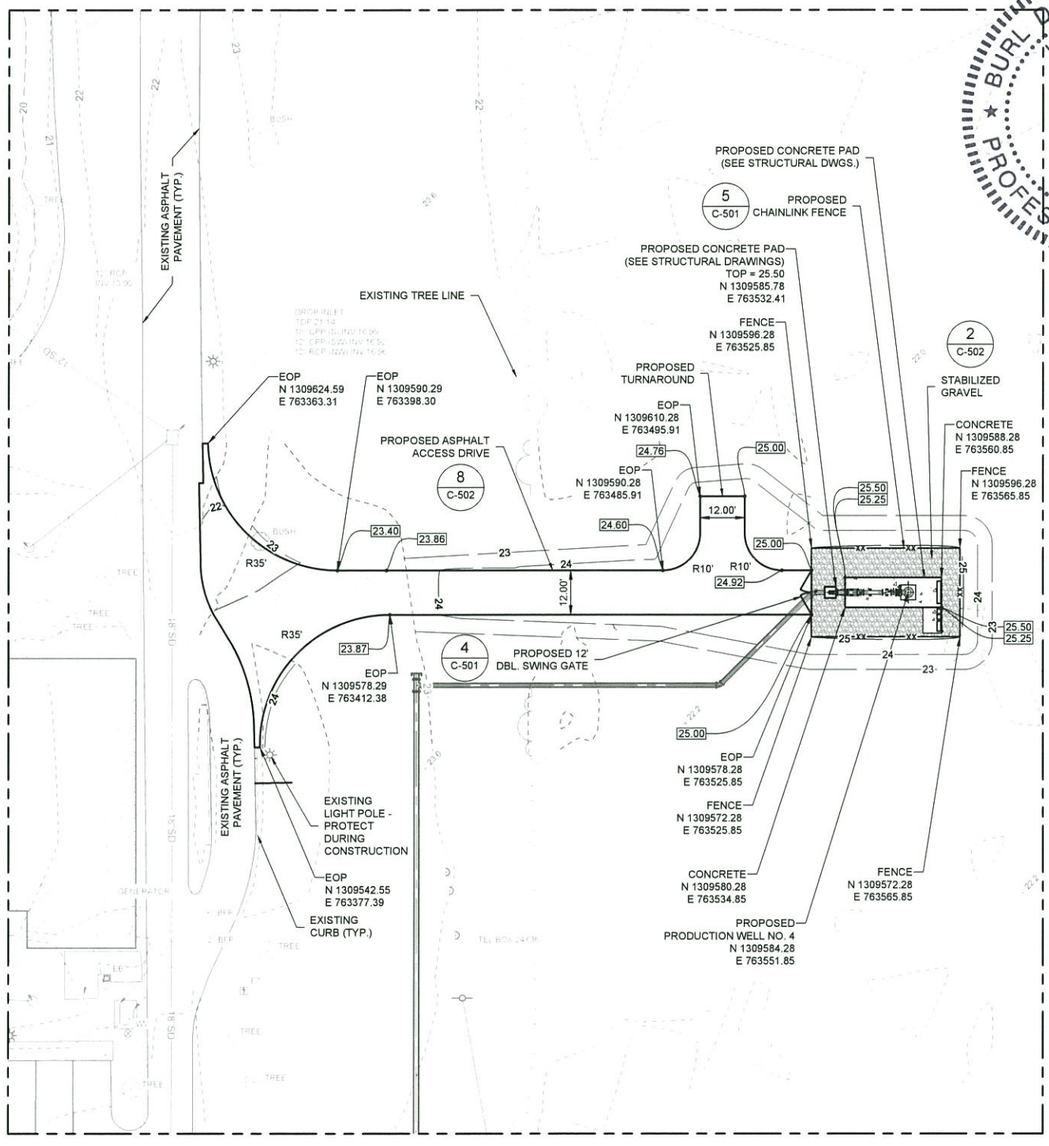
PROJ:	200-08507-19001
DESN:	BDR
DRWN:	HCR
CHKD:	RKC

C-105

Bar Measures 1 inch, otherwise drawing not to scale



2 ENLARGED PLAN
C-104 SCALE: 1" = 20'



3 ENLARGED PLAN
C-104 SCALE: 1" = 20'

SCALE: 1" = 20'

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FLORIDA
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6/19/20

BID SET

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT
PLANT EXPANSION - 4-MGD TO 6-MGD

ENLARGED SITE GEOMETRY AND GRADING PLAN

PROJ:	200-08507-19001
DESN:	BDR
DRWN:	HCR
CHKD:	RKC

C-106

Bar Measures 1 inch, otherwise drawing not to scale

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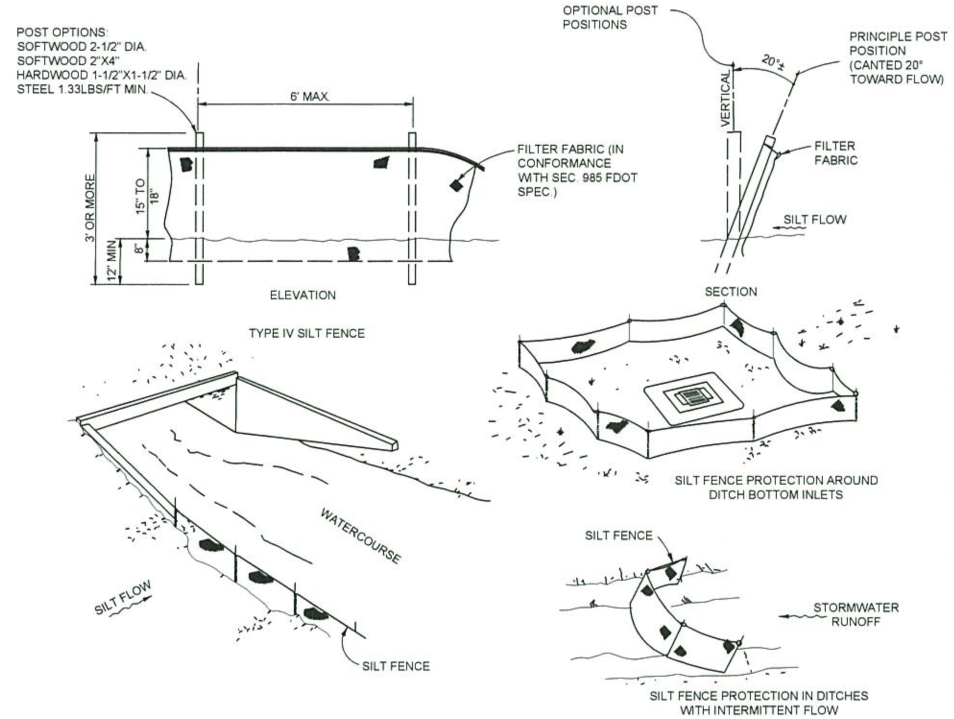
1 SILT FENCE (PER FDOT INDEX 102)

SCALE: NTS

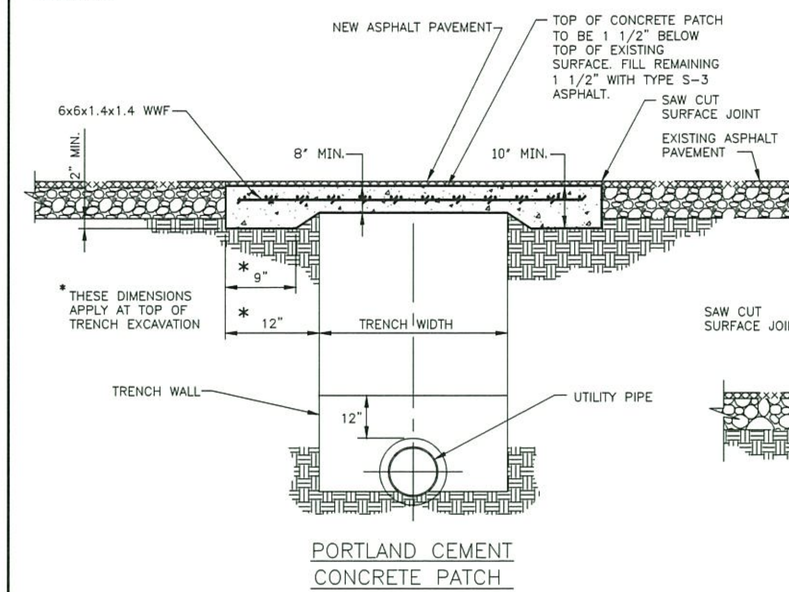


NOTES FOR SILT FENCES

1. TYPE III SILT FENCE TO BE USED AT MOST LOCATIONS. WHERE USED IN DITCHES, THE SPACING FOR TYPE III SILT FENCE SHALL BE IN ACCORDANCE WITH CHART I, SHEET I.
2. TYPE IV SILT FENCE TO BE USED WHERE LARGE SEDIMENT LOADS ARE ANTICIPATED. SUGGESTED USE IS WHERE FILL SLOPE IS 1:2 OR STEEPER AND LENGTH OF SLOPE EXCEEDS 25 FEET. AVOID WHERE THE DETAINED WATER MAY BACK INTO TRAVEL LANES OR OFF THE RIGHT OF WAY.
3. DO NOT CONSTRUCT SILT FENCES ACROSS PERMANENT FLOWING WATERCOURSES. SILT FENCES ARE TO BE UPLAND LOCATIONS AND TURBIDITY BARRIERS USED AT PERMANENT BODIES OF WATER.
4. WHERE USED AS SLOPE PROTECTION, SILT FENCE IS TO BE CONSTRUCTED ON 0% LONGITUDINAL GRADE TO AVOID CHANNELIZING RUNOFF ALONG THE LENGTH OF THE FENCE.
5. SILT FENCE TO BE PAID UNDER THE CONTRACT UNIT PRICE FOR STACKED SILT FENCE, (LF).

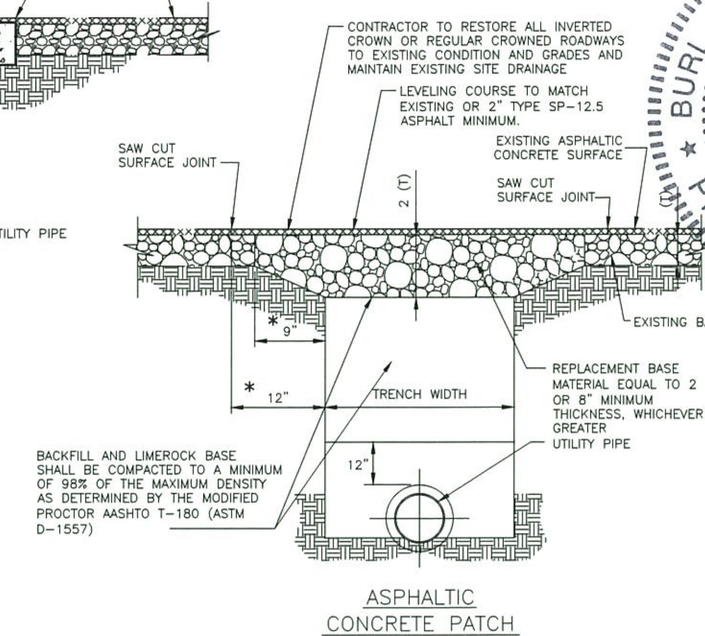
2 STANDARD ROADWAY OPEN CUT (CITY OF PALM BAY DETAIL R-3)

SCALE: NTS



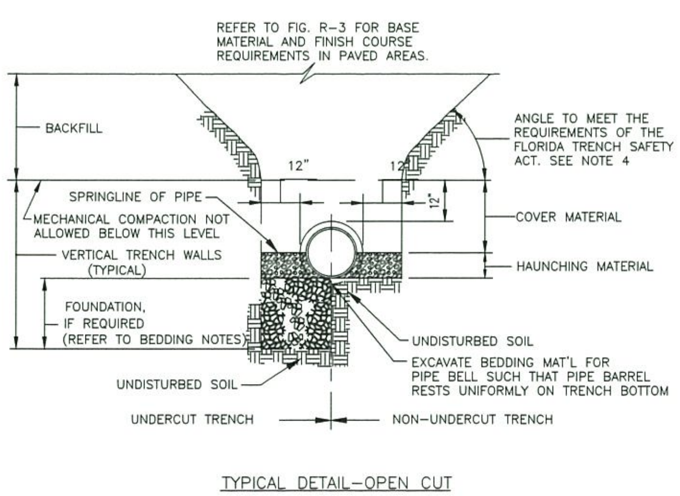
NOTES:

1. ALL PUBLIC ROADS AND PAVED DRIVE CROSSINGS SHALL BE BACKFILLED WITH COMMON FILL MATERIAL AND TOPPED WITH AT LEAST 8" IN THICKNESS OF LIMEROCK BASE COURSE MATERIAL DURING CONSTRUCTION OF UTILITY TRENCH.
2. IN AREAS WHERE ABOVE DETAILS DEVIATE FROM COUNTY AND/OR CITY STANDARDS, THE CONTRACTOR SHALL PROVIDE ALL NECESSARY MATERIALS AND LABOR TO CONFORM TO SAID STANDARDS.
3. ALL EXCAVATIONS SHALL COMPLY WITH THE TRENCH SAFETY ACT (F.S. 553.60 THRU 553.64, LAWS OF FLORIDA). LATEST EDITION.



3 PIPE TRENCHING, BEDDING, BACKFILLING & COMPACTION (CITY OF PALM BAY DETAIL R-4)

SCALE: NTS

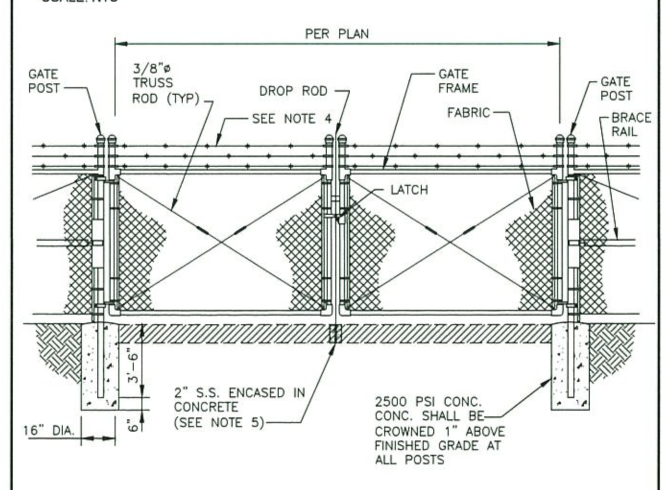


TYPICAL DETAIL-OPEN CUT

1. BEDDING NOTES:
   A. NORMALLY APPROVED CLEAN BACKFILL MATERIAL WILL BE USED AS A 4-INCH TYPICAL BEDDING UNDER THE PIPE. HOWEVER, WHERE UNSTABLE OR UNSUITABLE MATERIAL EXISTS FOR BEDDING, AS DETERMINED BY THE UTILITY INSPECTOR AND / OR DESIGN ENGINEER, A SUFFICIENT DEPTH OF THE UNSTABLE MATERIAL SHALL BE REMOVED AND REPLACED WITH NOT LESS THAN 6-INCHES NOR MORE THAN 24-INCHES OF ONE OF THE FOLLOWING MATERIALS:
      (1) APPROVED CLEAN BACKFILL (FROM ADJACENT AREA)
      (2) FDOT SIZE 6 AGGREGATE (3/8-INCH TO 3/4-INCH)
      (3) CRUSHED SHELL AS REQUIRED TO IMPLEMENT A STABLE BEDDING FOR THE PIPE.
   B. BEDDING COMPACTION OF 95 PERCENT IS REQUIRED WHERE CLEAN BACKFILL MATERIAL IS USED. WHEN USING CRUSHED SHELL OR GRAVEL AS BACKFILL, HAND TAMPING IS REQUIRED.
   C. IF SOLID HARDPAN IS ENCOUNTERED AT THE TRENCH BOTTOM, AND NO UNDERCUT (EXCLUDING TEETH DEPTH) HAS BEEN MADE IN THE HARDPAN, NO COMPACTION IS REQUIRED ON THE MATERIAL USED TO BRING THE EXCAVATION TO THE TRENCH BOTTOM.
   D. ALL ASPECTS OF THIS BEDDING WORK WILL BE DETERMINED BY THE UTILITY INSPECTOR.
2. PERCENT COMPACTION:
   COMPACTION REQUIREMENTS LISTED BELOW ARE IN PERCENTAGES OF MAXIMUM DENSITY AS DETERMINED BY THE MODIFIED PROCTOR AASHTO T-180 (ASTM D-1557) UNLESS OTHERWISE SPECIFICALLY APPROVED.
   A. 95 PERCENT FOR PIPE BEDDING, EXCEPT FOR THE VARIOUS EXCEPTIONS LISTED IN THE BEDDING NOTES IN WHICH NO FORMAL COMPACTION TEST IS REQUIRED.
   B. BAR TAMP HAUNCHING MATERIAL.
   C. 95 PERCENT FOR COVER MATERIAL. (6-INCH LIFTS)
   D. 95 PERCENT FOR BACKFILL IN NON-ROADWAY AREAS. (12-INCH LIFTS)
   E. 98 PERCENT FOR BACKFILL IN ROADWAY AREAS. (12-INCH LIFTS)
3. TESTING FREQUENCY:
   LOCATION OF TESTING STATIONS WILL BE RANDOMLY SELECTED AND WITHIN THE FOLLOWING MINIMUM FREQUENCIES:
   BACKFILL: ONE (1) TEST PER 300 LINEAR FEET OR PORTION THEROF. TYPICAL ELEVATIONS OF TEST POINTS WILL BE EVERY TWO (2) FEET, STARTING ONE FOOT ABOVE TOP OF PIPE. THE PERCENT (%) OF MAXIMUM DENSITY LISTED ABOVE ARE MINIMUMS AND MAY BE INCREASED AT THE DIRECTION OF THE UTILITY INSPECTOR AND / OR DESIGN ENGINEER.
4. IF ANGLE CANNOT BE MET DUE TO TIGHT WORKING CONDITIONS, TRENCH SHALL BE SHEETED OR A TRENCH BOX UTILIZED.

4 DOUBLE SWING GATE (CITY OF PALM BAY DETAIL M-3)

SCALE: NTS

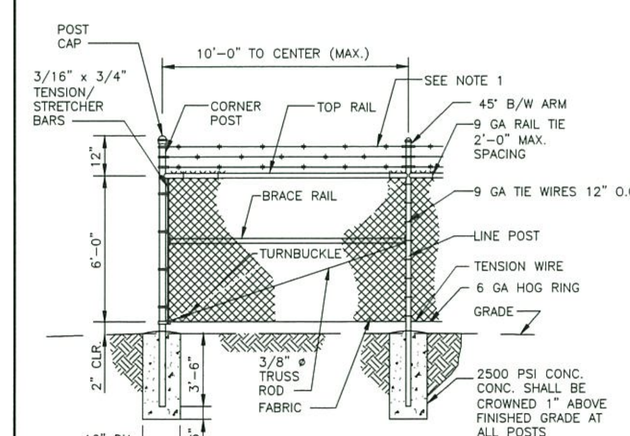


NOTES:

1. TRUSS RODS ARE REQUIRED FOR EACH GATE SECTION AND THE FIRST SPAN ON EACH SIDE OF A CORNER POST ONLY.
2. PROVIDE GATE KEEPERS.
3. ALL POSTS, FABRIC, HARDWARE TO BE BLACK VINYL COATED.
4. BARBED WIRE WILL NOT BE REQUIRED AT SEWAGE LIFT/PUMP STATIONS, BUT WILL BE REQUIRED AT WELL SITES, ELEVATED/GROUND STORAGE TANKS AND TREATMENT PLANT PERIMETERS.
5. PIPE ENCASED IN CONCRETE SHALL BE INSTALLED IN ALL DIRT AND GRAVEL DRIVEWAYS. PIPE SHALL BE 3 FEET LONG, STAINLESS STEEL AND ENCASED IN A 12"ø SONATUBE 12" DEEP.
6. REFER TO SECTION 36.8 OF THIS MANUAL FOR DIMENSIONS AND DETAILS OF FENCE MATERIAL.

5 6' CHAINLINK FENCE (CITY OF PALM BAY DETAIL M-4)

SCALE: NTS



NOTES:

1. BARBED WIRE WILL NOT BE REQUIRED AT SEWAGE LIFT/PUMP STATIONS, BUT WILL BE REQUIRED AT WELL SITES, ELEVATED/GROUND STORAGE TANKS AND TREATMENT PLANT PERIMETERS.
2. REFER TO SECTION 36.8 OF THIS MANUAL FOR DIMENSIONS AND DETAILS OF FENCE MATERIAL.

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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
CIVIL DETAILS

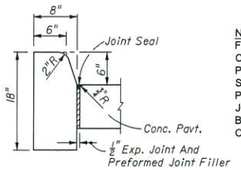
PROJ:	200-08507-19001
DESN:	BDR
DRWN:	HCR
CHKD:	RKC

C-501

Bar Measures 1 inch, otherwise drawing not to scale

1 TYPE "D" CURB (PER FDOT INDEX 300)

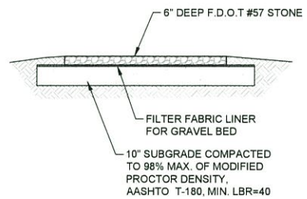
SCALE: NTS



NOTE:
FOR USE ADJACENT TO CONCRETE OR FLEXIBLE PAVEMENT, CONCRETE SHOWN. EXPANSION JOINT, PREFORMED JOINT FILLER AND JOINT SEAL ARE REQUIRED BETWEEN CURBS AND CONCRETE PAVEMENT ONLY.

2 STABILIZED GRAVEL

SCALE: NTS



3 MITERED END SECTION (PER FDOT INDEX 272)

SCALE: NTS

DIMENSIONS AND QUANTITIES

	D	X	A	B	C	E	F	G	H ■	M Single Pipe	M Double Pipe	M Triple Pipe	M Quad Pipe	N	5½" CONCRETE SLAB (CY) ◪ Single Pipe	5½" CONCRETE SLAB (CY) ◪ Double Pipe	5½" CONCRETE SLAB (CY) ◪ Triple Pipe	5½" CONCRETE SLAB (CY) ◪ Quad Pipe	SODDING (SY) Single Pipe	SODDING (SY) Double Pipe	SODDING (SY) Triple Pipe	SODDING (SY) Quad Pipe
1:2 Slope	15"	2'-7"	1'-92"	2'-18"	4'-10"	3'-06"	5"	1'-32"	2'-9"	4.63	7.21	9.79	12.37	1.19	0.38	0.58	0.77	0.96	21	24	27	30
	18"	2'-10"	1'-97"	2'-74"	4'-71"	3'-56"	6"	1'-41"	3'-4"	4.92	7.75	10.58	13.42	1.21	0.44	0.65	0.87	1.09	22	25	28	31
	24"	3'-14"	2'-08"	3'-83"	5'-93"	4'-56"	8"	1'-73"	3'-4"	5.50	8.92	12.33	15.75	1.25	0.54	0.83	1.12	1.42	24	28	32	35
	30"	4'-2"	2'-15"	4'-95"	7'-10"	4'-56"	8"	2'-00"	3'-4"	6.08	10.33	14.58	18.83	1.29	0.66	1.09	1.50	1.91	26	31	35	40
	36"	5'-1"	2'-25"	6'-08"	8'-33"	5'-56"	9"	2'-24"	3'-4"	6.67	11.75	16.83	21.92	1.33	0.81	1.38	1.95	2.51	28	34	39	45
	42"	6'-0"	2'-34"	7'-21"	9'-59"	6'-56"	10"	2'-45"	3'-4"	7.25	13.25	19.25	25.25	1.38	0.97	1.70	2.45	3.19	30	37	43	50
	48"	6'-9"	2'-42"	8'-33"	10'-76"	7'-56"	11"	2'-65"	3'-4"	7.83	14.58	21.33	28.08	1.42	1.13	2.04	2.93	3.84	32	39	47	54
	54"	7'-8"	2'-52"	9'-46"	11'-90"	8'-56"	12"	2'-83"	3'-4"	8.42	15.08"	23.75"	31.42"	1.46"	1.31	2.44	3.58	4.72"	34	42	51	59
	60"	8'-6"	2'-62"	10'-56"	13'-18"	9'-56"	14"	3'-00"	4'-4"	9.00"	17.50"	26.00"	34.50"	1.50"	1.51	2.89	4.28	5.68	36	45	55	64
	66"	9'-3"	2'-71"	11'-68"	14'-39"	10'-56"	13"	3'-18"	4'-4"	9.58"	18.75"	27.92"	37.08"	1.54"	1.68	3.25	4.84	6.43	38	48	58	68
	72"	10'-0"	2'-80"	12'-80"	15'-60"	11'-56"	16"	3'-30"	4'-4"	10.16"	20.16"	30.16"	40.16"	1.58"	1.89	3.74	5.59	7.45	40	51	62	73
1:4 Slope	15"	2'-7"	2'-27"	4'-09"	6'-36"	4'-07"	8"	1'-22"	4'-0"	4.63	7.21	9.79	12.37	1.19	0.57	0.87	1.15	1.44	23	26	29	32
	18"	2'-10"	2'-36"	5'-12"	7'-48"	5'-07"	9"	1'-41"	4'-0"	4.92	7.75	10.58	13.42	1.21	0.66	0.99	1.31	1.65	25	28	31	35
	24"	3'-5"	2'-53"	7'-18" △	9'-71"	7'-07" △	11"	1'-73"	4'-0"	5.50"	8.92"	12.33"	15.75"	1.25"	0.85	1.30	1.75	2.20	28	32	36	40
	30"	4'-2"	2'-76"	9'-23"	11'-88"	9'-07"	13"	2'-00"	4'-0"	6.08"	10.33"	14.58"	18.83"	1.29"	1.10	1.74	2.39	3.05	31	36	41	46
	36"	5'-1"	2'-87"	11'-31" ◇	14'-18"	11'-07" ◇	15"	2'-24"	4'-0"	6.67"	11.75"	16.83"	21.92"	1.33"	1.32	2.21	3.08	3.96	34	40	46	52
	42"	6'-0"	3'-05"	13'-37"	16'-42"	13'-07"	17"	2'-45"	4'-0"	7.25"	13.25"	19.25"	25.25"	1.38"	1.58	2.76	3.91	5.09	38	44	51	58
	48"	6'-9"	3'-22"	15'-42"	18'-65"	15'-07"	19"	2'-65"	4'-0"	7.83"	14.58"	21.33"	28.08"	1.42"	1.85	3.30	4.73	6.17	41	48	56	63
	54"	7'-8"	3'-39"	17'-49"	20'-88"	17'-07"	21"	2'-83"	4'-0"	8.42"	16.08"	23.75"	31.42"	1.46"	2.14	3.95	5.77	7.58	44	52	61	69
	60"	8'-6"	3'-56"	19'-53"	23'-11"	19'-07"	23"	3'-00"	4'-0"	9.00"	17.50"	26.00"	34.50"	1.50"	2.45	4.66	6.87	9.07	47	56	66	75
	66"	9'-3"	3'-73"	21'-62"	25'-35"	21'-07"	25"	3'-18"	4'-0"	9.58"	18.75"	27.92"	37.08"	1.54"	2.88	5.54	8.18	10.84	49	59	69	80
	72"	10'-0"	3'-91"	23'-68"	27'-59"	23'-07"	27"	3'-30"	4'-0"	10.16"	20.16"	30.16"	40.16"	1.58"	3.54	6.61	9.87	13.13	52	63	74	85

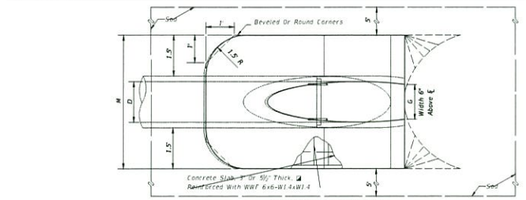
◪ See General Note No. 5. See Sheet 5 For 3" Slab Quantities

■ Values shown for estimating pipe quantities and are for information only.

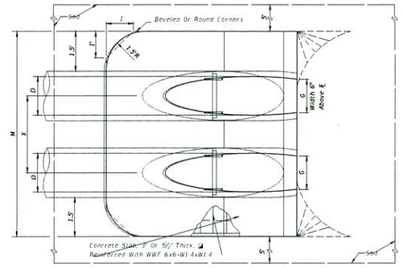
B △ 6.42' E △ 6.25' Dimensions permitted to allow use of 8' standard pipe lengths.

B ◇ 10.40' E ◇ 10.10' Dimensions permitted to allow use of 12' standard pipe lengths.

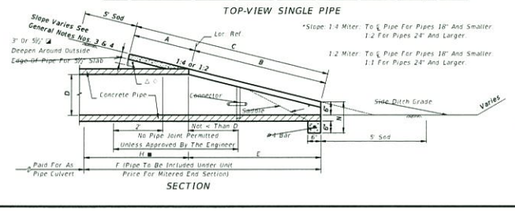
△ ◇ Concrete slab shall be deepened to form bridge across crown of pipe. See section below.



TOP-VIEW SINGLE PIPE



TOP-VIEW MULTIPLE PIPE



*Slope 1:4 Miter. To ℄ Pipe For Pipes 18" And Smaller. 1:2 For Pipes 24" And Larger.

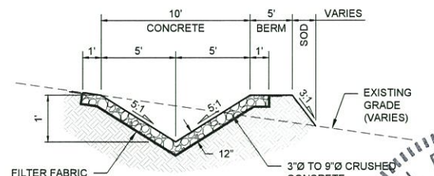
1:2 Miter. To ℄ Pipe For Pipes 18" And Smaller. 1:1 For Pipes 24" And Larger.

SECTION

SINGLE AND MULTIPLE ROUND CONCRETE PIPE

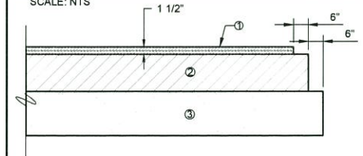
4 SPREADER SWALE

SCALE: NTS



8 ASPHALT PAVEMENT

SCALE: NTS



① 1 1/2" FDOT TYPE SP 12.5 ASPHALTIC CONCRETE

② 6" LIMEROCK BASE MIN. LBR OF 100, COMPACTED TO AT LEAST 98% OF MODIFIED PROCTOR (ASTM D-1557, AASHTO T-180) MAXIMUM DRY DENSITY VALUE.

③ 12" STABILIZED SUBGRADE MINIMUM LBR OF 40, COMPACTED TO AT LEAST 95% OF MODIFIED PROCTOR (ASTM D-1557, AASHTO T-180) MAXIMUM DRY DENSITY VALUE.

5 TYPE "C" INLET (PER FDOT INDEX 232)

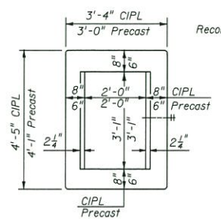
SCALE: NTS

HORIZONTAL WALL REINFORCING SCHEDULES (TABLE I)

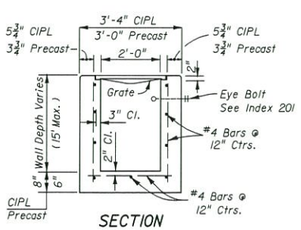
WALL DEPTH	SCHEDULE	AREA (in²/ft)	MAX. SPACING BARS	MAX. SPACING WWF
0'-15'	AI2	0.20	12"	8"

TYPE C

Recommended Maximum Pipe Size:
2'-0" Wall - 18" Pipe
3'-1" Wall - 24" Pipe (18" where an 18" pipe enters a 2'-0" wall)



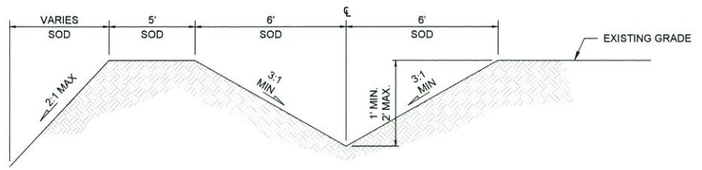
PLAN



SECTION

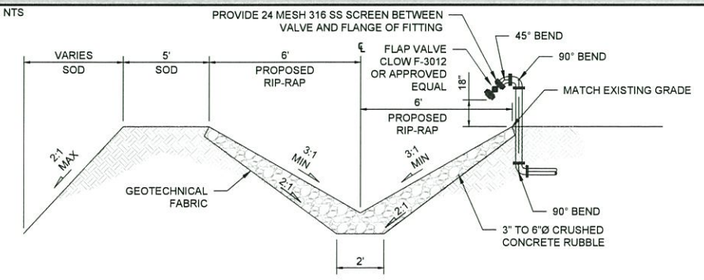
6 EXISTING SWALE AND BERM

SCALE: NTS



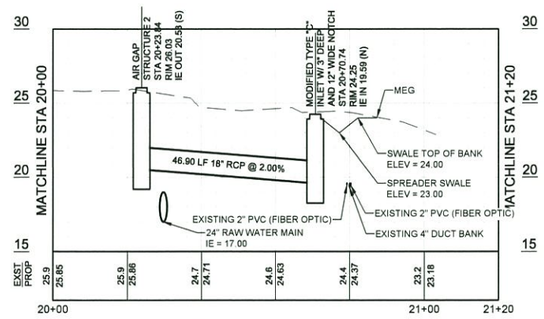
7 SWALE SECTION AT EMERGENCY OVERFLOW DISCHARGE PIPE

SCALE: NTS



9 AIR GAP STRUCTURE TO SPREADER SWALE PROFILE

SCALE: NTS

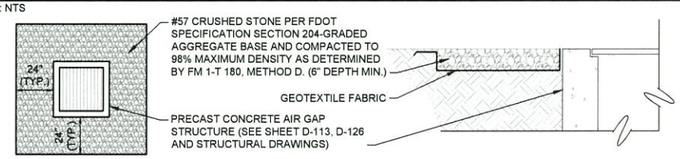


PROFILE AIR GAP STRUCTURE 2

SCALE: HORIZ: 1"= 20' VERT: 1"= 5'

10 GRAVEL COLLAR AT AIR GAP STRUCTURE

SCALE: NTS



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BURL DEAN HARRISON
LICENSE
No 64037
STATE OF FLORIDA
PROFESSIONAL ENGINEER
6/18/20

BID SET

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
CIVIL DETAILS

PROJ:	200-08507-19001
DESN:	BDR
DRWN:	HCR
CHKD:	RKC

C-502

Bar Measures 1 inch, otherwise drawing not to scale

6/18/2020 3:28:02 PM - O:\PROJECTS\ORLANDO\IER\08507\200-08507-19001\CAD\SHEETFILES\C-501 CIVIL DETAILS.DWG - REYES, HECTOR

STRUCTURAL GENERAL NOTES

A. THESE GENERAL NOTES PRESENT AND/OR SUMMARIZE KEY PROJECT INFORMATION FOR THE DRAWING READER'S CONVENIENCE. SEE ALSO INDIVIDUAL DRAWING NOTES AND PROJECT SPECIFICATIONS FOR FURTHER DETAILS AND REQUIREMENTS.

B. ALL REFERENCES TO REFERENCE STANDARDS HEREIN ARE TO MOST RECENT ISSUE IN EFFECT AS OF THE DATE OF THESE DOCUMENTS, UNLESS NOTED OTHERWISE IN PROJECT SPECIFICATIONS OR ON THE DRAWING

C. ALL EXISTING DIMENSIONS SHOWN WITH THE ± SYMBOL ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR BEFORE FABRICATION AND CONSTRUCTION.

D. DIMENSIONS MARKED WITH A "X" SHALL BE DETERMINED BY EQUIPMENT MANUFACTURER AND COORDINATE BY CONTRACTOR

E. SUBMIT SHOP DRAWINGS, PROJECT DATA AND SAMPLES AS SPECIFIED IN PROJECT SPECIFICATIONS.

F. ABBREVIATIONS

AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION	GA	GAGE, GAUGE	REQ	REQUIRE
CLR	CLEAR	GALV	GALVANIZED	REQ'D	REQUIRED
COL	COLUMN	GR.	GRADE	REV	REVISION
CONC	CONCRETE	HK	HOOK	SCHED	SCHEDULE
DIA	DIAMETER	HORIZ	HORIZONTAL	SF	SQUARE FOOT
DIM	DIMENSION	HT	HEIGHT	SHT.	SHEET
DTL.	DETAIL	IN.	INCH	SIM.	SIMILAR
DWG(S)	DRAWING(S)	INSUL	INSULATION	SPEC	SPECIFICATIONS
DWL	DOWEL	LBS	POUNDS	SQ	SQUARE
EA	EACH	LF	LINEAR FOOT (FEET)	STD	STANDARD
EF	EACH FACE	MATL	MATERIAL	STRUCT	STRUCTURE(AL)
EL / ELEV.	ELEVATION	MAX	MAXIMUM	SYM	SYMMETRICAL
ENGR	ENGINEER	MECH	MECANICAL	T/	TOP OF
EW	EACH WAY	N.T.S.	NOT TO SCALE	TOF	TOP OF FOOTING
EXIST	EXISTING	NO	NUMBER	TOS	TOP OF SLAB
F.V.	FIELD VERIFY	O.C.	ON CENTER	TYP	TYPICAL
FND.	FOUNDATION	OPNG	OPENING	UNO	UNLESS NOTED OTHERWISE
FRMG	FRAMING	PSF	POUNDS PER SQUARE FOOT	V.I.F.	VERIFY IN FIELD
FT	FOOT	PSI	POUNDS PER SQUARE INCH	VERT	VERTICAL
FTG	FOOTING	REF	REFERENCE	W/	WITH
		REINF.	REINFORCEMENT	W/O	WITHOUT
				WS	WATER STOP.
				WWF	WELDED WIRE FABRIC

DESIGN CRITERIA

A. REFERENCES:

1. ICC INTERNATIONAL BUILDING CODE, 2015 EDITION
   RISK CATEGORY III IN ACCORDANCE WITH TABLE 1604.5
2. STATE BUILDING CODE: 2017 FLORIDA BUILDING CODE, 6TH EDITION
3. ASCE/SEI 7-10 - MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES

B. DEAD LOADS:

ROOF DEAD LOAD	= (SELF WEIGHT)

C. LIVE LOADS (U.N.O.):

PROCESS SLABS	= 200 PSF
STAIRS AND PLATFORM	= 100 PSF
GRATING	= SEE PLAN
DOME ROOF	= 12 PSF

D. WIND LOAD:

BASIC WIND SPEED, V	= 150 MPH
WIND EXPOSURE CATEGORY	= C
DIRECTIONALITY FACTOR, Kd	= 0.85
TOPOGRAPHY	= 1.0

FOUNDATIONS

A. SEE GEOTECHNICAL/SUBSURFACE INVESTIGATION REPORT BY ARDAMAN & ASSOCIATES, INC. DATED OCTOBER 1, 2019: IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE WHETHER OR NOT ADDITIONAL GEOTECHNICAL INFORMATION IS REQUIRED AND TO PROVIDE SUCH INFORMATION AS THE CONTRACTOR DEEMS NECESSARY.

B. ALLOWABLE BEARING PRESSURES AS FOLLOWS:
SLAB ON GRADE = 1000 PSF
GROUND STORAGE TANK SLAB = 2,500 PSF

C. GEOTECHNICAL ENGINEER SHALL BE RETAINED BY CONTRACTOR TO PROVIDE OBSERVATION AND TESTING SERVICES DURING THE GRADING AND FOUNDATION PHASE OF CONSTRUCTION. INSPECTION AND TESTING REPORTS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER.

D. PRIOR TO PLACING ENGINEERED FILL, THE SITE SHALL BE STRIPPED AND PROOF ROLLED. ANY SOFT SPOTS ENCOUNTERED SHALL BE REMOVED AND REPLACED WITH ENGINEERED FILL. REFER TO EARTHWORK SPECIFICATION FOR ADDITIONAL INFORMATION.

STRUCTURAL CONCRETE

A. REFERENCES:

1. ACI 318-14 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
2. ACI 350-06 CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES
3. ACI SP-66 ACI DETAILING MANUAL
4. CRSI MSP-2-01 MANUAL OF STANDARD PRACTICE
5. CRSI REINFORCING BAR DETAILING
6. CRSI PLACING REINFORCING BARS

B. MATERIALS

1. STRUCTURAL CONCRETE
   a) MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS (f'c).....4500 PSI
   b) ALL CONCRETE EXPOSED TO THE ELEMENTS SHALL BE AIR-ENTRAINED IN ACCORDANCE WITH ASTM C260 SEE SPECIFICATIONS.
   c) ALL CONCRETE IN 8" WALLS OR COLUMNS WITH TWO PLANES OF REINFORCEMENT SHALL HAVE MAXIMUM 3/4" AGGREGATE. IT IS RECOMMENDED THAT THE CONTRACTOR CONSIDER SUPER-PLASTICIZED CONCRETE PER SPECIFICATIONS.
   d) ALL CONCRETE AGGREGATE SHALL COMPLY WITH ASTM C33 (NORMAL WEIGHT).

STRUCTURAL CONCRETE

2. REINFORCEMENT
   a) REINFORCING BARS: ASTM A615, GRADE 60
   b) WELDED SMOOTH WIRE FABRIC - ASTM A185 (SHEETS ONLY, ROLL FABRIC NOT ALLOWED)

3. ACCESSORIES
   a) BAR SUPPORTS CLASS 1, MAXIMUM PROTECTION (CRSI MANUAL OF STANDARD PRACTICE) FOR ALL SLABS AND BEAMS WITH SOFFITS EXPOSED TO VIEW

4. ANCHOR RODS
   a) SHALL BE GALVANIZED, FURNISHED WITH CHAMFERED ENDS, AND SHALL MEET STRENGTH AND DUCTILITY REQUIREMENTS EQUIVALENT ASTM F1554, GR 55 WELDABLE MATERIAL.

5. MECHANICAL (TORQUE-CONTROLLED) ANCHORS
   a) APPROVED SYSTEMS INCLUDE HILTI KWIK BOLT TZ (ICC ESR 1917) OR HILTI KWIK HUS-EZ (ICC ESR 3027) OR EQUAL CONSIDERING LOAD RESISTANCE. MECHANICAL ANCHORS SHALL BE APPROVED FOR USE WITH CRACKED CONCRETE PER AC 193. CURRENT ICC-ESR SHALL BE SUBMITTED. ALL PERSONNEL INSTALLING ANCHORS SHALL BE TRAINED BY THE MANUFACTURER ON PROPER INSTALLATION TECHNIQUE. TRAINING DOCUMENTATION FROM THE MANUFACTURER SHALL BE AVAILABLE ON REQUEST

6. ADHESIVE ANCHORS
   a) APPROVED SYSTEMS INCLUDE HILTI HIT-RE 500 V3 (ICC ESR 3814) OR HILTI HIT-HY 200 HAS WITH SAFESET TECHNOLOGY (ICC ESR 3187) OR EQUAL CONSIDERING LOAD RESISTANCE, IN-SERVICE AND INSTALLATION TEMPERATURE, AVAILABILITY OR COMPREHENSIVE INSTALLATION INSTRUCTIONS, AND CREEP. ADHESIVE ANCHORS SHALL BE APPROVED FOR USE WITH CRACKED CONCRETE PER AC 308. CURRENT ICC-ESR SHALL BE SUBMITTED.
   b) ALL PERSONNEL INSTALLING ANCHORS SHALL BE TRAINED BY THE MANUFACTURER ON PROPER INSTALLATION TECHNIQUE. TRAINING DOCUMENTATION FROM THE MANUFACTURER SHALL BE AVAILABLE ON REQUEST.
   c) HOLE SIZES AND INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS (MPII)
   d) ADHESIVE FOR REBAR AND ANCHORS SHALL HAVE BEEN TESTED IN ACCORDANCE WITH ACI 355.4 AND ICC-ES AC308 FOR CRACKED CONCRETE AND SEISMIC APPLICATIONS. DESIGN ADHESIVE BOND STRENGTH HAS BEEN BASED ON ACI 355.4 TEMPERATURE CATEGORY A WITH INSTALLATIONS INTO DRY OR WATER SATURATED HOLES DRILLED USING A CARBIDE DRILL BIT INTO CONCRETE THAT HAS BEEN CURED FOR AT LEAST 21 DAYS.
   e) ANY ADHESIVE ANCHOR INSTALLED HORIZONTALLY OR IN A VERTICALLY INCLINED PLANE SHALL BE INSTALLED BY CERITIFIED ADHESIVE ANCHOR INSTALLER, PER ACI 318-14 17.8.2.2
   f) FILL IN ALL ABANDONED HOLES WITH IN 2" OF NEW ANCHOR LOCATIONS.

7 GROUT: HIGH STRENGTH, NON-SHRINK STRUCTURAL GROUT. SEE SPECIFICATIONS.

C. REINFORCEMENT DETAILING

1. ALL REINFORCING STEEL DETAILS SHALL BE IN ACCORDANCE WITH THE ACI CODE REQUIREMENTS (ACI 318 OR 350 - CURRENT EDITIONS).
2. REINFORCING STEEL PLACING DRAWINGS AND BAR LISTS SHALL CONFORM TO THE ACI OR CRSI DETAILING MANUALS. ALL BAR AND MESH SUPPORTS MUST BE CLEARLY DETAILED
3. CONCRETE COVER FOR REINFORCING SHALL BE INDICATED ON THE APPLICABLE REINFORCING STEEL SHOP DRAWINGS. HOWEVER, NO REINFORCING IN AREAS EXPOSED TO EARTH, WEATHER ,SEWAGE OR WATER SHALL HAVE COVER LESS THAN TWO INCHES.

4. SPECIFIED COVER FOR REINFORCING PER ACI 350 (WATER CONTAINMENT STRUCTURES):
   PIERS/SADDLE (PRIMARY REINF).....2.5"
   PIERS/SADDLE (STIRRUPS/TIES).....2.0"
   SLAB-ON-GRADE (REBAR)..... 2" FROM TOP OF SLAB (U.N.O.)

5. REINFORCEMENT IN WALL SHALL BE CONTINUOUS. HORIZONTAL BAR LAP SPLICES SHALL BE STAGGERED
6. PROVIDE CORNER BARS AT ALL WALL AND FOUNDATION CORNERS TO BE LAPPED WITH THE HORIZONTAL BARS. CORNER BARS ARE TO MATCH THE HORIZONTAL BARS IN SIZE, GRADE AND SPACING UNLESS OTHERWISE SHOWN.
7. HOOKS AND BENDS SHALL MEET ACI STANDARD UNLESS OTHERWISE INDICATED.
8. SPLICES: CONTINUOUS REINFORCING BARS SHALL BE FURNISHED WITH CLASS 'B' TENSION LAPS SPLICES INCLUDING CORNER BARS, UNLESS NOTED OTHERWISE.
9. MECHANICAL SPLICES SHALL NOT BE PERMITTED UNLESS SHOWN ON THE DRAWINGS OR APPROVED BY THE ENGINEER
10. REINFORCING STEEL FABRICATION AND PLACEMENT SHALL BE IN ACCORDANCE WITH CRSI MANUAL OF STANDARD PRACTICE AND CRSI PLACING REINFORCING BARS (LATEST EDITIONS).
11. REINFORCING STEEL IN FOOTINGS SHALL BE ASSEMBLED IN MAT GRILLES EQUALLY SPACED AND SECURELY WIRED TOGETHER BEFORE THE CONCRETE IS POURED.
12. WALL FOOTING DOWELS ARE TO HAVE A FULL TENSION LAP SPLICE WITH THE WALL STEEL UNLESS NOTED OTHERWISE.
13. PIER REINFORCEMENT SHALL BE DOWELED TO THE FOOTING. PROVIDE DOWELS EQUAL IN SIZE, NUMBER AND GRADE TO THE PIER REINFORCEMENT UNLESS OTHERWISE INDICATED. DOWELS SHALL BE HOOKED 90 DEGREES AT THE BOTTOM LEVEL OF FOOTING REINFORCEMENT. DOWELS SHALL BE LAPPED WITH THE PIER REINFORCEMENT
14. SPREAD BARS AROUND SMALL OPENINGS AND SLEEVES IN SLABS AND WALLS WHERE POSSIBLE AND WHERE BAR SPACING WILL NOT EXCEED 1.5 TIMES THE NORMAL SPACING. DISCONTINUE BARS AT LARGE OPENINGS WHERE NECESSARY AND PROVIDE AN AREA OF REINFORCEMENT EQUAL TO THE INTERRUPTED REINFORCEMENT DISTRIBUTING ONE-HALF OF THIS REINFORCEMENT EACH SIDE OF THE OPENING (TENSION LAP SPLICED). HOLES LARGER THAN 12 INCHES IN ANY DIRECTION SHALL HAVE (2) #6 X 4'-0" DIAGONAL BARS IN BOTH FACES AT EACH CORNER
15. ALL REINFORCING SHALL BE HELD SECURELY IN POSITION WITH STANDARD ACCESSORIES IN CONCRETE
16. NO REINFORCING STEEL SHALL BE FIELD BENT WITHOUT THE APPROVAL OF THE STRUCTURAL ENGINEER. FIELD BENDING OF PLAIN REINFORCEMENT, IF PERMITTED, SHALL BE PERFORMED USING AN APPROVED AND APPROPRIATE SIZED PORTABLE HYDRAULIC DEVICE THAT MAKES ACI STANDARD RADIUS BENDS. NO OTHER FIELD BENDING METHOD SHALL BE PERMITTED.
17. WELDING, INCLUDING TACK WELDING, FOR REINFORCING STEEL IS PROHIBITED. WELDING OF REINFORCING STEEL AND HIGH STRENGTH BOLTS, IE. A36, F1554, WILL BE PERMITTED ONLY BY WRITTEN APPROVAL OF THE ENGINEER.
18. ALL OPENINGS THROUGH WALLS, SLABS OR OTHER STRUCTURAL ELEMENTS NOT DETAILED ON THE STRUCTURAL DRAWINGS MUST BE LOCATED BY THE CONTRACTOR AND SHOWN ON THE APPLICABLE REINFORCING STEEL SHOP DRAWINGS. THE FINAL LOCATION OF ALL OPENINGS MUST BE REVIEWED BY THE ENGINEER BEFORE THE CONCRETE IS POURED.

D. FOOTINGS

1. CENTER ALL FOOTINGS ON WALL, PIER OR COLUMN ABOVE UNLESS OTHERWISE INDICATED.

E. FORMWORK

1. SEE SPECIFICATIONS
2. CAMBER: PROVIDE CAMBER TO COMPENSATE FOR DISPLACEMENT OF FORMS (SEE ALSO SPECS.) AND TO PROVIDE AS-CAST MEMBER CAMBER AS NOTED ON DRAWINGS.
3. RUSTICATION STRIPS, CHAMFERS, DRIPS, MISC. EMBEDS, ETC. SEE DRAWINGS AND/OR ARCHITECTURAL DRAWINGS.
4. PROVIDE 3/4" CHAMFER AT ALL EXPOSED CORNERS OF BEAMS, WALLS ETC. UNLESS OTHERWISE NOTED.
5. OPENINGS FOR MEP TRADES ARE TO BE INCLUDED IN THE BID. ALL HOLES FOR OTHER TRADES WHICH MUST BE CUT OR FORMED AND WHICH ARE NOT SHOWN ON THE STRUCTURAL DESIGN(S) DRAWINGS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER DESIGNER FOR REVIEW AND APPROVAL. ANY STRENGTHENING OR ADDITIONAL REINFORCEMENT REQUIRED SHALL BE FURNISHED BY THE CONTRACTOR WITHOUT ADDITIONAL COST TO THE OWNER.

F. CONCRETE FINISHES: SEE SPECIFICATIONS

1. FORMED SURFACES:
   a) EXPOSED TO VIEW: GROUT CLEANED FINISH.
   b) BURIED OR NOT EXPOSED: AS-CAST

2. FLATWORK:
   a) EXPOSED TO VIEW: TROWELED
   b) SIDEWALKS, DRIVEWAYS: BROOMED

G. CURING AND PROTECTION: SEE SPECIFICATIONS.

STRUCTURAL CONCRETE

H. SEE THE MECHANICAL, ELECTRICAL AND SUPPLIERS DRAWINGS AND THE SPECIFICATIONS FOR THE LOCATIONS OF SPECIAL ANCHORS, CHAMFERS, SLEEVES, PIPES, CONDUITS AND OTHER DETAILS NOT SHOWN ON THE STRUCTURAL DRAWINGS.

J. EMBEDDED PIPES OR CONDUIT. MAXIMUM DIAMETER ONE THIRD x SLAB OR WALL THICKNESS, SPACED MINIMUM OF 3 TIMES DIAMETER ON CENTER. ALL EMBEDDED PIPES OR CONDUIT SHALL BE APPROVED BY ENGINEER OF RECORD PRIOR TO INSTALLING.

K. SIZE AND LOCATION OF EQUIPMENT PADS AND ANCHOR BOLTS SHALL BE AS REQUIRED BY THE EQUIPMENT MANUFACTURER. ALL CONDUIT PLACED IN SLAB SHALL BE APPROVED BY STRUCTURAL ENGINEER OF RECORD PRIOR TO INSTALLING CONDUIT AND POURING SLAB.

L. CONTRACTOR SHALL DESIGN, FURNISH, INSTALL, TEST, OPERATE, MONITOR, AND MAINTAIN A DEWATERING SYSTEM TO CONTROL HYDROSTATIC PRESSURE AND GROUND WATER ENTERING THE EXCAVATION.

M. SUBMITTALS

1. CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTING THE FOLLOWING DOCUMENTS TO THE ENGINEER OF RECORD:
   a) CONCRETE MIX DESIGN
   b) CONCRETE REINFORCING DRAWINGS

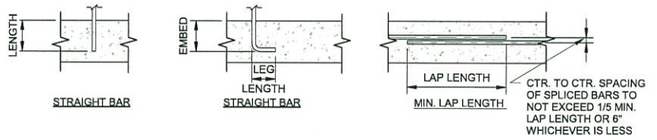
TENSION DEVELOPMENT / LAP SPLICE SCHEDULE (UNCOATED BARS)

DEVELOPMENT / LAP SPLICE LENGTH IN CONCRETE (f'c = 4500 PSI)

BAR SIZE	DEVELOPMENT LENGTH (IN)		CLASS 'B' LAP SPLICE LENGTH (IN)		STD 90 DEG. HOOK (IN)		
	BAR TYPE 1	BAR TYPE 2	BAR TYPE 1	BAR TYPE 2	EMBED	LEG LENGTH	BEND DIA
4	18	27	24	35	7	8	3
5	23	34	30	44	9	10	3 3/4
6	27	41	35	53	10	12	4 1/2
7	40	59	51	77	12	14	5 1/4
8	45	67	59	88	14	16	6
9	51	76	66	99	15	19	9 1/2
10	57	86	74	111	17	22	10 3/4

BAR TYPE 1 - CLEAR SPACING OF BARS BEING DEVELOPED OR SPLICED NOT LESS THAN Db, CLEAR COVER NOT LESS THAN Db, AND STIRRUPS OR TIES THROUGHOUT Ld NOT LESS THAN CODE MINIMUM
OR
CLEAR SPACING OF BARS BEING DEVELOPED OR SPLICED NOT LESS THAN 2*Db AND CLEAR COVER NOT LESS THAN Db.

BAR TYPE 2 - TOP BARS WITH MORE THAN 12" OF FRESH CONCRETE CAST BELOW **AND** OTHER CASES



STRUCTURAL ALUMINUM

A. REFERENCES:
1. AA ALUMINUM DESIGN MANUAL
2. AA ALUMINUM STANDARDS AND DATA
3. ANSI/DWS D1.2 ALUMINUM WELDING CODE

B. MATERIALS:
1. PLATES AND ROLLED SHAPES: 6061-T6
2. STRUCTURAL BOLTS: 316 STAINLESS STEEL

C. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER CONSTRUCTION IS FULLY COMPLETED. IT IS SOLELY THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE BUILDING AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF SHORING, SHEETING, TEMPORARY BRACING, GUYS OR TIE DOWNS WHICH MIGHT BE NECESSARY. SUCH MATERIAL SHALL REMAIN THE CONTRACTOR'S PROPERTY AFTER THE COMPLETION OF THE PROJECT.

D. PROVIDE MIN. (2) 3/4" STAINLESS STEEL BOLTS, WASHERS, AND NUTS FOR ALL CONNECTIONS, UNLESS NOTED OTHERWISE.

E. ALL WELDING SHALL CONFORM TO AWS D1.2 ". SHOP DRAWINGS SHALL SHOW ALL SHOP AND ERECTION DETAILS INCLUDING CUTS, COPE CONNECTIONS, HOLES, THREADED FASTENERS, RIVETS, AND WELDS. GRIND ALL WELDS FOR SMOOTH TRANSITIONS.

F. THE APPROVAL OF THE SHOP DRAWINGS WILL BE FOR SIZE AND ARRANGEMENT OF PRINCIPAL AND AUXILIARY MEMBERS AND STRENGTH OF CONNECTIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DIMENSIONS SHOWN ON THE SHOP DRAWINGS.

G. LAYOUT AND DESIGN FOR GUARDRAIL, HANDRAIL AND THEIR COMPONENTS SHALL ADHERE TO THE APPLICABLE BUILDING CODES.

H. BURNING OF HOLES IN ALUMINUM IS NOT PERMITTED WITHOUT PRIOR APPROVAL OF THE ENGINEER

J. ALUMINUM THAT WILL BE IN CONTACT WITH CONCRETE, GROUT, MASONRY, OR DISSIMILAR MATERIAL SHALL BE PROTECTED BY A HEAVY COAT OF BITUMINOUS PAINT.

K. AFTER ANCHOR BOLTS HAVE BEEN EMBEDDED, PROTECT PROJECTING THREAD BY APPLYING GREASE AND HAVING THE NUTS INSTALLED UNTILL THE TIME OF INSTALLATION OF COLUMNS

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TITUS J MADDRA
LICENSE
No. 82624
6/17/20
STATE OF FLORIDA
PROFESSIONAL ENGINEER

BID SET

MARK	DATE	DESCRIPTION	BY

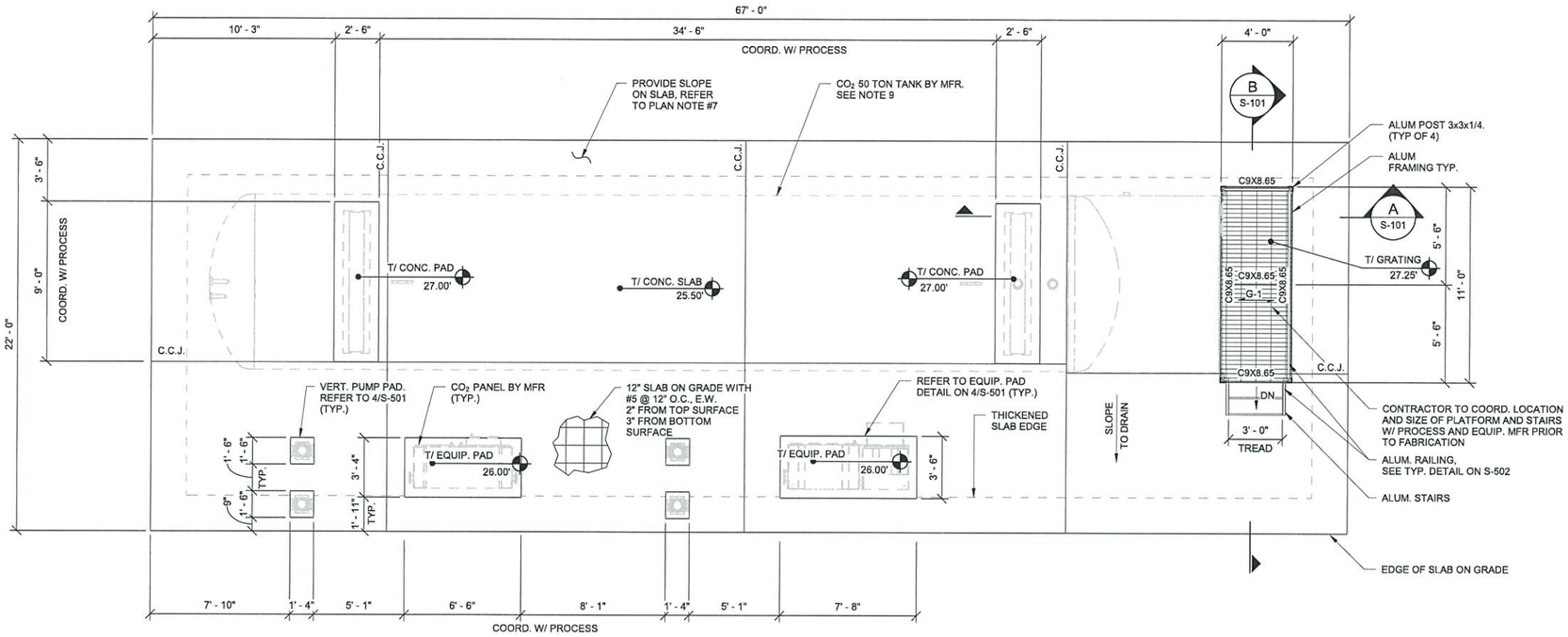
CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4 MGD TO 6 MGD
STRUCTURAL GENERAL NOTES

PROJ:	200-08507-19001
DESN:	NNJ
DRWN:	NNJ
CHKD:	TJM

S-001

BIM 360://200-08507-19001 Palm Bay RO Expansion/08507-CO2-S-2019.rvt
6/9/2020 1:51:56 PM

Bar measures 1 inch, otherwise drawing is not to scale



STRUCTURAL SLAB PLAN

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

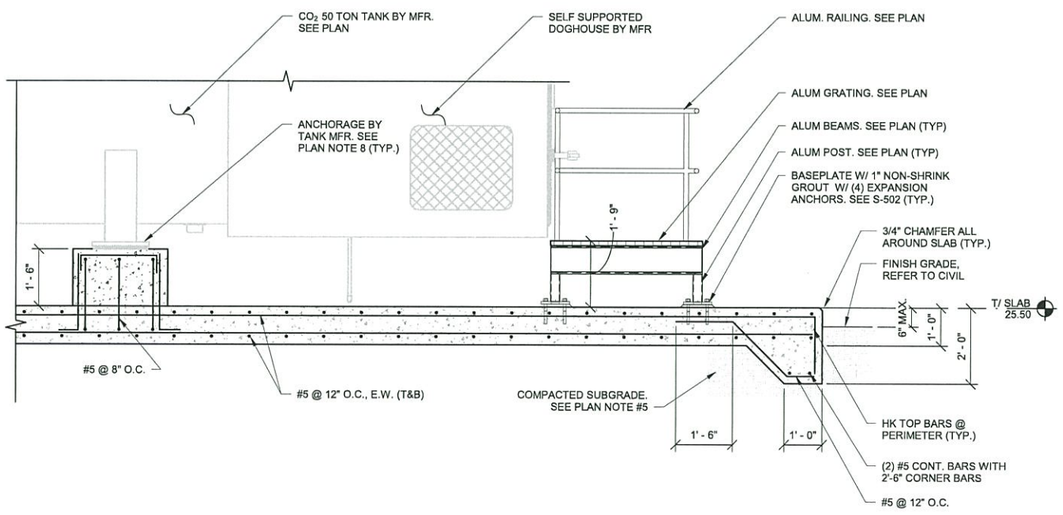
NOTES:

1. REFER TO S-001 FOR GENERAL NOTES AND SITE PLAN ON C-104 FOR STRUCTURE LOCATION.
2. COORDINATE PAD SIZES AND LOCATION WITH PROCESS, ELEC. DRAWINGS AND EQUIP MFR.
3. COORDINATE LOCATION OF ALL MECHANICAL EQUIPMENT AND PIPING WITH MECH DRAWINGS PRIOR TO CONSTRUCTION.
4. PREPARE SUBGRADE AS DESCRIBED IN THE GEOTECHNICAL REPORT.
5. SUBGRADE SHALL BE COMPACTED TO 95% OF MODIFIED PROCTOR ASTM D 1557 MAXIMUM DRY DENSITY, FOR A DEPTH OF 2' - 0" BELOW THE FOUNDATION SLAB. REFER TO FOUNDATION NOTES ON S-001 FOR ADDITIONAL REQUIREMENTS.
6. INDEPENDENT LABORATORY TESTING COMPANY SHALL CONFIRM IN WRITING SPECIFIED SOIL COMPACTION AND FILL REQUIREMENTS ARE MET.
7. PROVIDE POSITIVE SLOPE IN SLAB SURFACE TO DRAIN. COORDINATE WITH CIVIL DWGS.
8. CONTRACTOR / MFR TO DESIGN ANCHORAGE FOR EQUIP. AS PER FBC 6TH EDITION, ACI-318 AND ASCE7-10. PROVIDE SIGNED AND SEALED CALCULATIONS. CONTRACTOR / MFR TO VERIFY ANCHORS TO MEET MINIMUM EMBEDMENT, EDGE DISTANCE AND SPACING REQUIREMENT.
9. CO2 TANK WEIGHT = 45,000LBS (MAX.) CONTRACTOR TO COORD. WEIGTH AND TANK DIMENSION W/ PROCESS AND EQUIP. MFR PRIOR TO POURING SLAB AND NOTIFY ENGINEER IF THE WEIGHT IS EXCEEDS 45,000LBS
10. REFER TO S-502 FOR ALUM. CONNECTION TYP. DTL
11. ALL ALUMINUM SURFACE IN CONTACT WITH CONCRETE, GROUT, OR DISSIMILAR MATERIAL TO BE COATED BY BITUMINOUS PAINT

LEGEND:

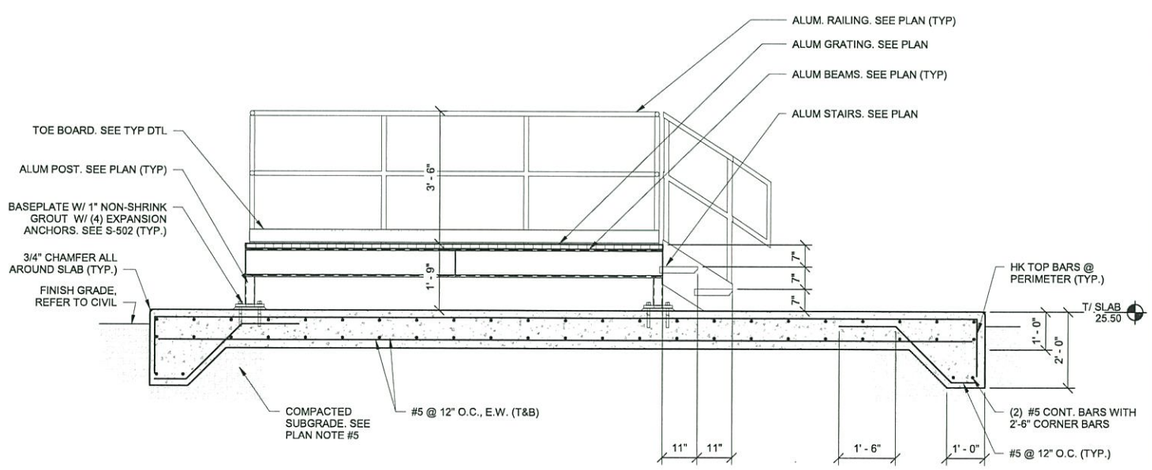
CCJ INDICATES CONSTRUCTION JOINT REFER TO DETAIL ON 5/S-501

G-1 DENOTES 1 1/2" ALUM. GRATING SPAN DIRECTION. DESIGN GRATING FOR 100 PSF LIVE LOAD WITH 1/4" DEFLECTION



A S-101 SECTION

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



B S-101 SECTION

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

0 1' 2' 4'

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

0 2' 4' 8'

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

Bar measures 1 inch, otherwise drawing is not to scale

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TITUS J MADDELA LICENSE No. 82624 STATE OF FLORIDA PROFESSIONAL ENGINEER 6/12/20

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

CARBON DIOXIDE STORAGE & FEED STRUCT. PLAN & SECT.

PROJ:	200-08507-19001
DESN:	NNJ
DRWN:	BRF
CHKD:	TJM

S-101

6/9/2020 1:51:56 PM BIM 360://200-08507-19001 Palm Bay RO Expansion/08507-CO2-S-2019.rvt

NOTES:

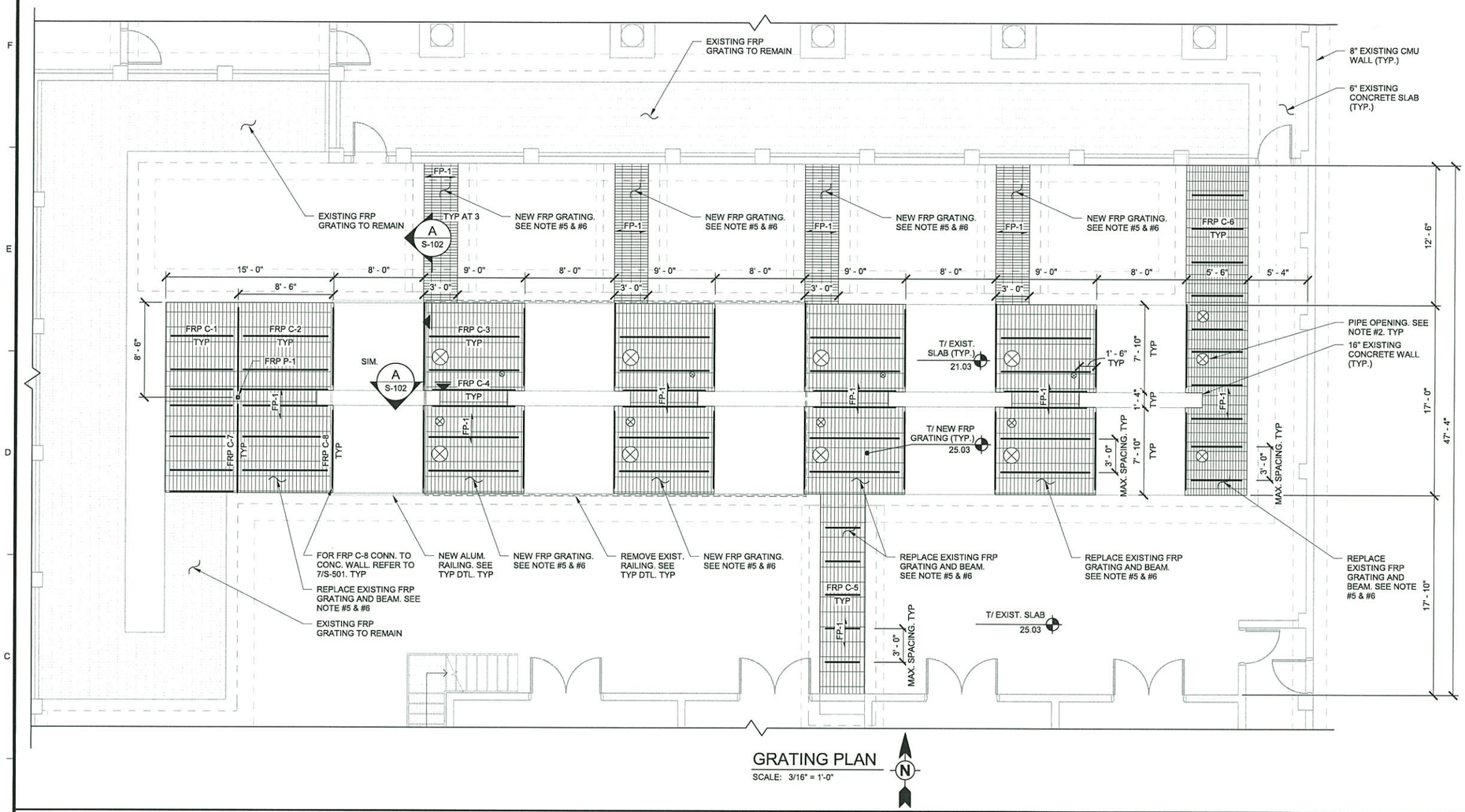
1. REFER TO S-001 FOR GENERAL NOTES AND SITE PLAN ON C-104 FOR STRUCTURE LOCATION.
2. CONTRACTOR TO VERIFY ALL EXIST. FIELD DIMENSIONS AND OPENINGS SIZE AND LOCATION PRIOR TO FABRICATION.
3. FRP GRATING SPAN AND FRP BEAM MEMBER SPACING TO NOT EXCEED 3' - 0".
4. REFER TO 7/S-501 FOR TYP. FRP BEAM TO CONCRETE CONNECTION DETAIL.
5. MFR TO DESIGN AND PROVIDE SIGN AND SEAL DRAWINGS AND CALCULATION FOR APPROVAL. DESIGN FRP MEMBERS FOR 3.5 TON SCISSOR LIFT LOAD (MODEL: JLG R4045 OR APPROVED EQUAL). CONTRACTOR TO CONFIRM AND SUBMIT FINAL SCISSOR LIFT MODEL NUMBER AND LOADS PRIOR TO FABRICATION.
6. FRP TO BE CONTRAST IN COLOR TO DIFFERENTIATE SCISSOR LIFT RATED GRATING WITH EXISTING GRATING. COORD. COLOR SELECTION WITH OWNER FROM MFR'S FULL LINE OF STANDARD COLOR. SCISSOR LIFT OR ANY OTHER EQUIPMENT NOT ALLOWED ON EXISTING GRATING.

LEGEND:

FP-1 — SPAN DIRECTION OF 2" THICK FRP BAR GRATING SUPPORTED BY FRP BEAMS, DESIGNED BY MFR . GRATING SHALL BE BANDED ON ALL OUTSIDE EDGES AND PENETRATIONS. GRATING IS DESIGNED FOR SCISSOR LIFT TRAFFIC. SEE NOTE #5 AND #6

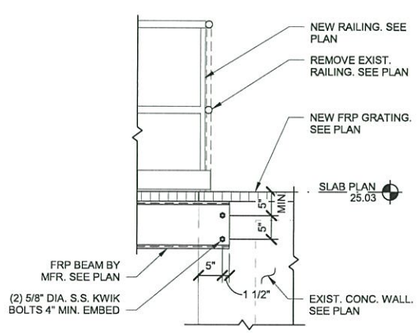
FRP C-# — DENOTES FRP CHANNEL BEAM DESIGNED BY MFR. SEE NOTE #5

FRP P-1 — DENOTES FRP POST DESIGNED BY MFR. SEE NOTE #5



GRATING PLAN

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



A S-102 SECTION

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

0 8" 1'-4" 2'-8"
SCALE: 3/4" = 1'-0"

0 2'-8" 5'-4" 10'-8"
SCALE: 3/16" = 1'-0"

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LICENSED
No. 82624
6/18/20
STATE OF FLORIDA
PROFESSIONAL ENGINEER

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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

RO BUILDING – RO SKID AREA STRUCTURAL PLAN

PROJ:	200-08507-19001
DESN:	NNJ
DRWN:	BRF
CHKD:	TJM

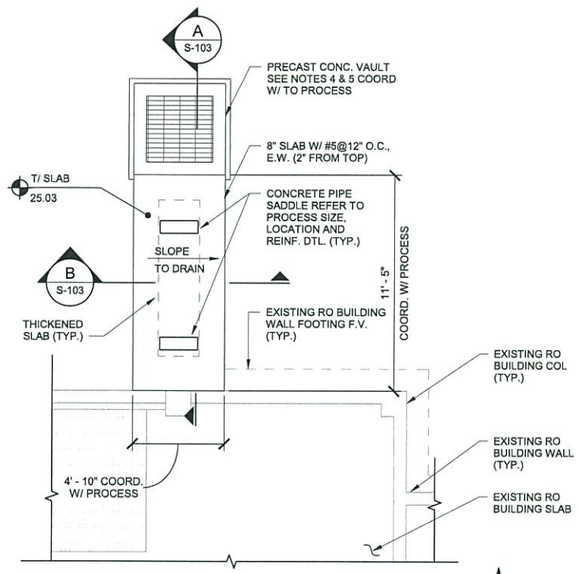
S-102

Bar measures 1 inch, otherwise drawing is not to scale

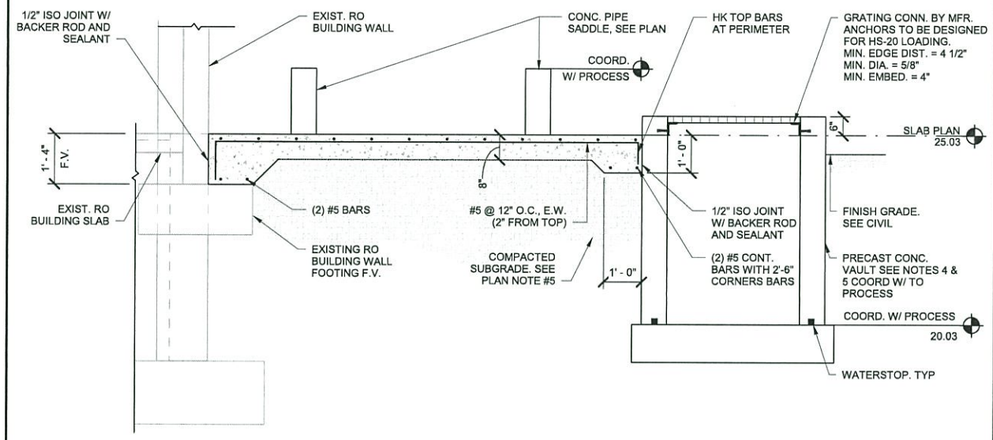
6/18/2020 11:40:09 AM BIM 360://200-08507-19001 Palm Bay RO Expansion/08507-ROBLDG-S-2019.rvt

NOTES:

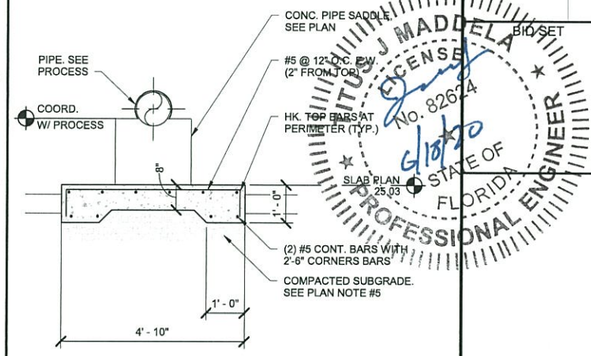
1. REFER TO S-001 FOR GENERAL NOTES AND SITE PLAN ON C-104 FOR STRUCTURE LOCATION.
2. COORDINATE PAD SIZES AND LOCATION WITH PROCESS DRAWINGS.
3. PREPARE SUBGRADE ACCORDING TO THE GEOTECHNICAL REPORT.
4. PRECAST STRUCTURES SHALL BE DESIGNED FOR A WATER TABLE 0 FT BELOW FINISHED GRADE. TOP SLABS SHALL BE DESIGNED FOR LIVE LOAD = 300 PSF. 2" THICK (MIN.) ALUM GRATING. SUBMIT SHOP DRAWINGS FOR REVIEW INCLUDING ALL INFORMATION ON GRATING AND ANGLE CONNECTION PRIOR TO FABRICATION.
5. PRECAST MANUFACTURER SHALL SUBMIT SIGNED AND SEALED DRAWINGS AND CALCULATIONS TO ENGINEER OF RECORD PRIOR TO CONSTRUCTION. CALCULATION TO INCLUDE DESIGN OF PRECAST VAULT, BUOYANCY CHECK, GRATING DESIGN, ANCHOR DESIGN.
6. SUBGRADE SHALL BE COMPACTED TO 95% OF MODIFIED PROCTOR ASTM D 1557 MAXIMUM DRY DENSITY, FOR A DEPTH OF 2' - 0" BELOW THE FOUNDATION SLAB. REFER TO FOUNDATION NOTES ON S-001 FOR ADDITIONAL REQUIREMENTS.
7. INDEPENDENT LABORATORY TESTING COMPANY SHALL CONFIRM IN WRITING SPECIFIED SOIL COMPACTION AND FILL REQUIREMENTS ARE MET.
8. PROVIDE POSITIVE SLOPE IN SLAB SURFACE TO DRAIN. COORDINATE WITH CIVIL DWGS.



PARTIAL RO BUILDING SLAB PLAN
SCALE: 1/4" = 1'-0"



A S-103 SECTION
SCALE: 1/2" = 1'-0"



B S-103 SECTION
SCALE: 1/2" = 1'-0"

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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

RO BUILDING – HIGH SERVICE PUMP PLAN AND SECTION

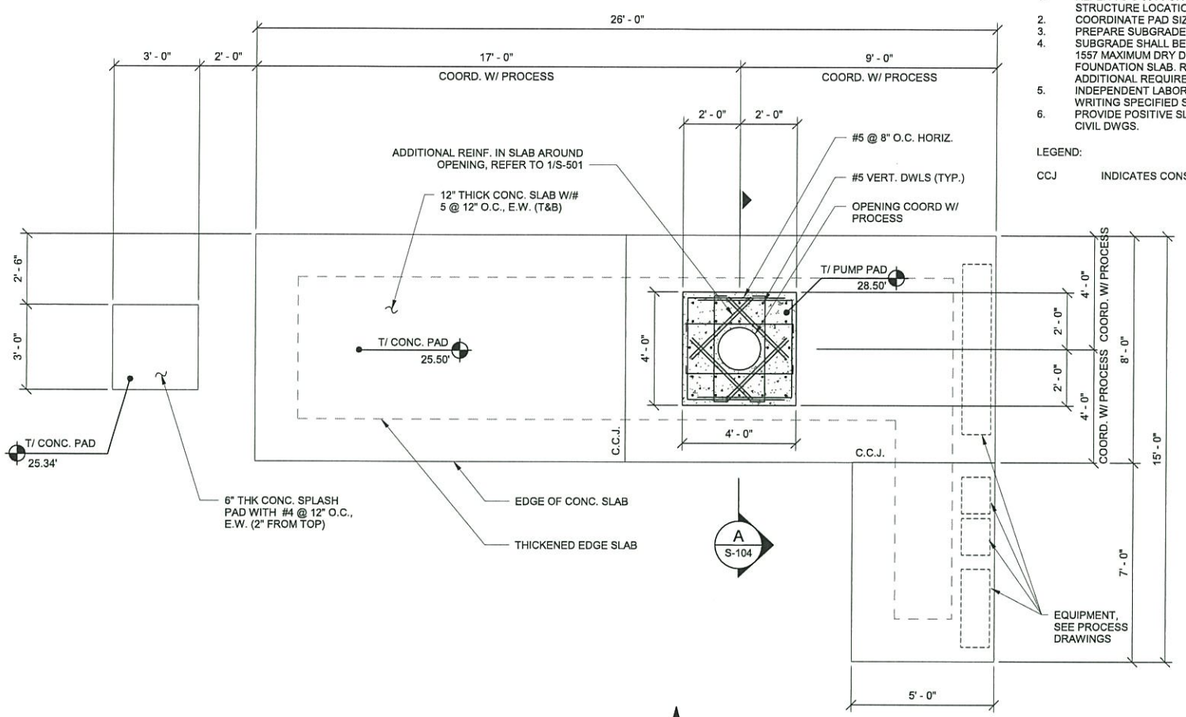
PROJ:	200-08507-19001
DESN:	NNJ
DRWN:	BRF
CHKD:	TJM

S-103

SCALE: 1/4" = 1'-0"
SCALE: 1/2" = 1'-0"

Bar measures 1 inch, otherwise drawing is not to scale

6/18/2020 8:58:36 AM BIM 360://200-08507-19001 Palm Bay RO Expansion/08507-ROBLDG-S-2019.rvt



PLAN - PRODUCTION WELL #4

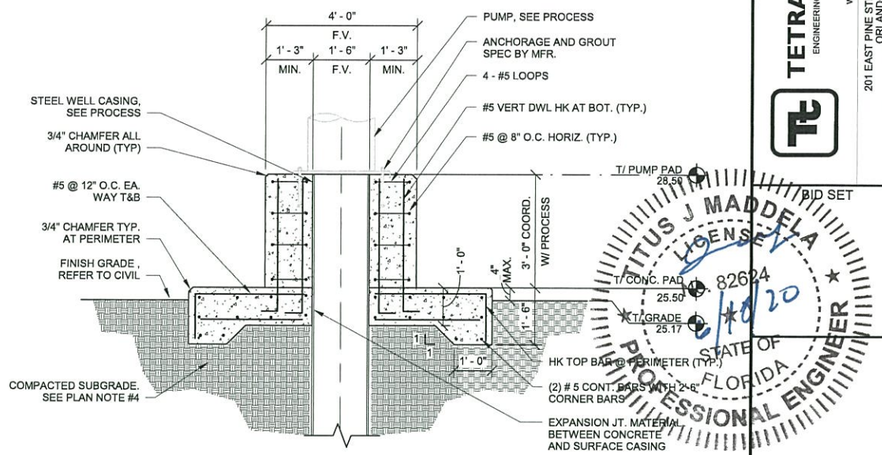
SCALE: 3/8" = 1'-0"

NOTES:

1. REFER TO S-001 FOR GENERAL NOTES AND SITE PLAN ON C-104 FOR STRUCTURE LOCATION.
2. COORDINATE PAD SIZES AND LOCATION WITH PROCESS DRAWINGS.
3. PREPARE SUBGRADE ACCORDING TO THE GEOTECHNICAL REPORT.
4. SUBGRADE SHALL BE COMPACTED TO 95% OF MODIFIED PROCTOR ASTM D 1557 MAXIMUM DRY DENSITY, FOR A DEPTH OF 2' - 0" BELOW THE FOUNDATION SLAB. REFER TO FOUNDATION NOTES ON S-001 FOR ADDITIONAL REQUIREMENTS.
5. INDEPENDENT LABORATORY TESTING COMPANY SHALL CONFIRM IN WRITING SPECIFIED SOIL COMPACTION AND FILL REQUIREMENTS ARE MET.
6. PROVIDE POSITIVE SLOPE IN SLAB SURFACE TO DRAIN. COORDINATE WITH CIVIL DWGS.

LEGEND:

CCJ INDICATES CONSTRUCTION JOINT REFER TO DETAIL ON 5/S-501



A S-104 SECTION

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

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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

RAW WATER PUMP #4 STRUCTURAL PLAN & SECTION

PROJ:	200-08507-19001
DESN:	NNJ
DRWN:	BRF
CHKD:	TJM

S-104

0 1' 2' 4'
SCALE: 1/2" = 1'-0"

0 1'-4" 2'-8" 5'-4"
SCALE: 3/8" = 1'-0"

Bar measures 1 inch, otherwise drawing is not to scale

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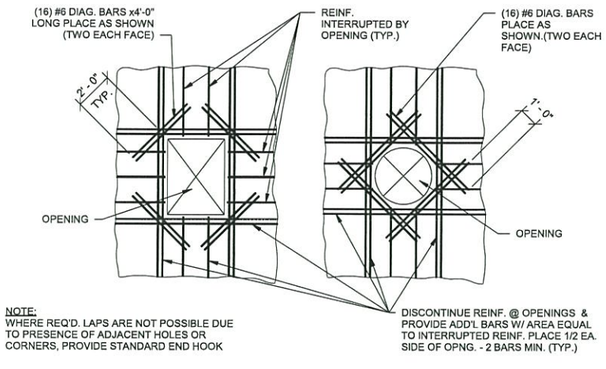
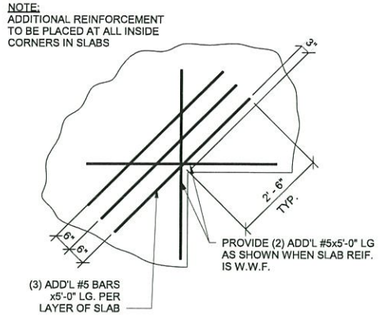
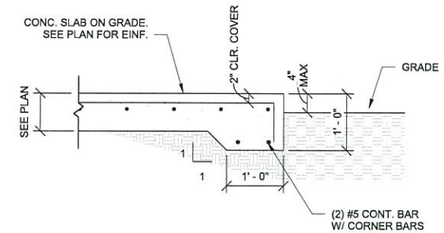


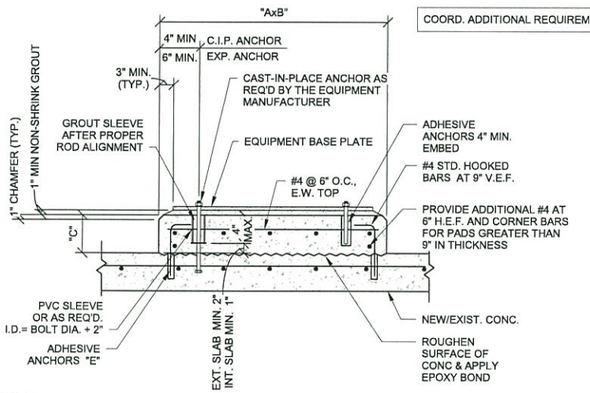
1 REINF. STEEL @ OPENING
SCALE: 1/4" = 1'-0"



2 REINF. SLAB RE-ENTRANT CORNER
SCALE: 1/2" = 1'-0"

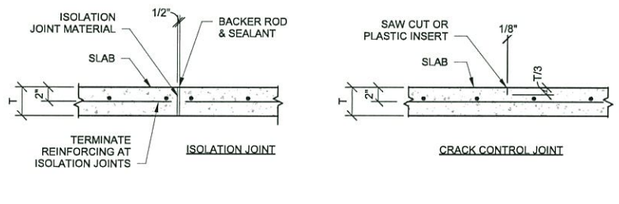


3 TYPICAL THICKENED SLAB FOR S.O.G.
SCALE: 3/4" = 1'-0"

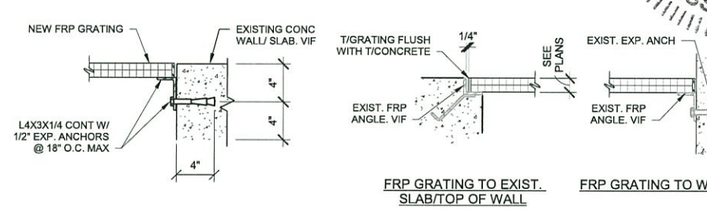


NOTE:
1. "A","B" & "C" DIMS. AS REQ'D TO SUIT EQUIPMENT. ("C" = 6" TYP. AND 4" FOR END SUCTION PUMP. U.N.O.)
2. "E" = 4" EMBED. FOR 6" THICK CONC. AND 3" EMBED. FOR 4 1/2" THICK CONC. U.N.O.

4 TYP. EQUIPMENT PAD
SCALE: 3/4" = 1'-0"



5 TYP. REINF SLAB DETAIL
SCALE: 3/4" = 1'-0"



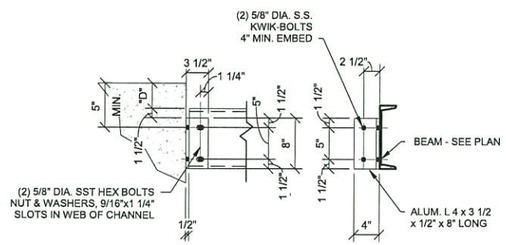
FRP GRATING TO EXIST. SLAB/TOP OF WALL

FRP GRATING TO WALL

NOTES:

1. GRATING MATERIAL AND THICKNESS TO BE AS SPECIFIED ON PLANS
2. ALL FRAMES AND ACCESSORIES TO MATCH GRATING
3. PROVIDE GRATING FRAMES ON ALL SIDES OF OPENING
4. ALL HARDWARE SHALL BE 316 STAINLESS STEEL, U.N.O.
5. PROVIDE MIN 2" STAINLESS STEEL SADDLE HOLD DOWN CLIPS PER PANEL

6 FRP GRATING DETAIL
SCALE: 1 1/2" = 1'-0"

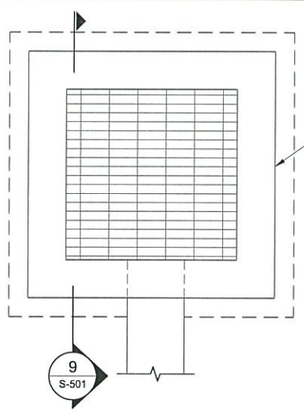


GRATING SUPPORT BEAM CONN

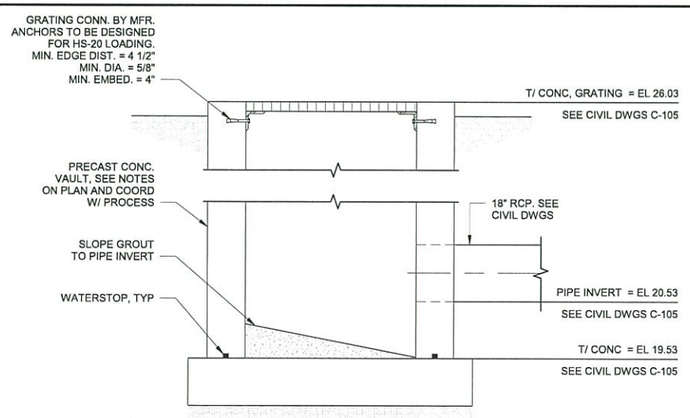
7 TYP. FRP BEAM TO CONC. CONNECTION
SCALE: 1" = 1'-0"

NOTES:

1. REFER TO S-001 FOR GENERAL NOTES AND SITE PLAN ON C-104 FOR STRUCTURE LOCATION
2. PRECAST MANUFACTURER SHALL SUBMIT SIGNED AND SEALED DRAWINGS AND CALCULATIONS TO ENGINEER OF RECORD PRIOR TO CONSTRUCTION. CALCULATION TO INCLUDE DESIGN OF PRECAST VAULT, BOUYANCY CHECK, GRATING DESIGN, ANCHOR DESIGN.
3. PRECAST STRUCTURES SHALL BE DESIGNED FOR A WATER TABLE 0 FT BELOW FINISHED GRADE. TOP SLABS SHALL BE DESIGNED FOR LIVE LOAD = 300 PSF. 2" THICK (MIN.) ALUM GRATING. SUBMIT SHOP DRAWINGS FOR REVIEW INCLUDING ALL INFORMATION ON GRATING AND ANGLE CONNECTION PRIOR TO FABRICATION.



PRECAST WATER BYPASS AIR GAP STR PLAN
8 NTS



PRECAST WATER BYPASS AIR GAP STR SECTION
9 S-501 NTS

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6/18/20
STATE OF FLORIDA
PROFESSIONAL ENGINEER

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MARK	DATE	DESCRIPTION	BY

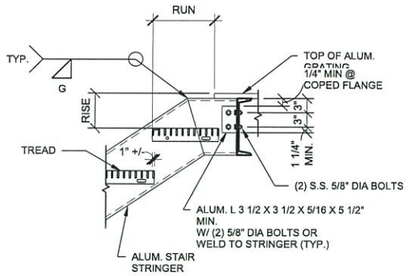
CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
STRUCTURAL TYPICAL DETAILS

PROJ:	200-08507-19001
DESN:	NNJ
DRWN:	BRF
CHKD:	TJM

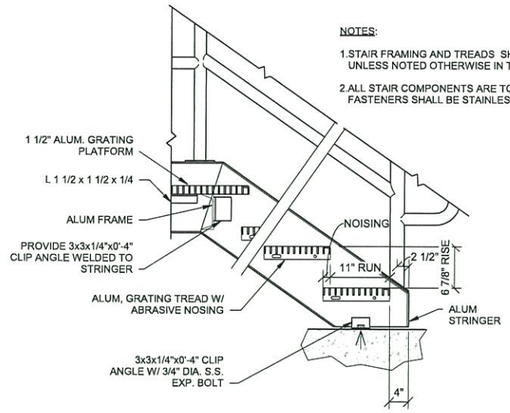
S-501

6/18/2020 8:58:59 AM BIM 360://200-08507-19001 Palm Bay RO Expansion/08507-CO2-S-2019.rvt

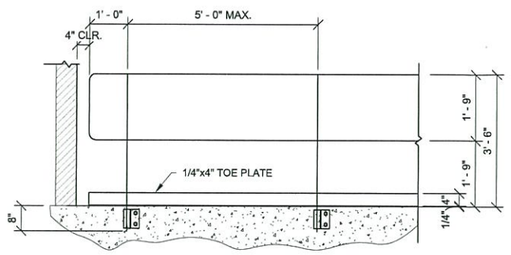
Bar measures 1 inch, otherwise drawing is not to scale



1 STAIR TOP TO CHANNEL CONNECTION
SCALE: 3/4" = 1'-0"

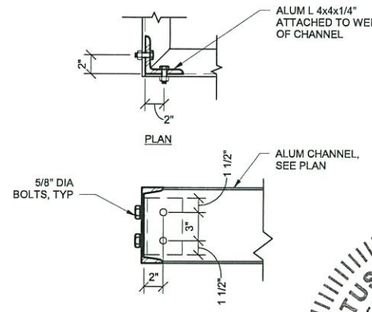


2 TYP. STAIR DETAIL
SCALE: 3/4" = 1'-0"

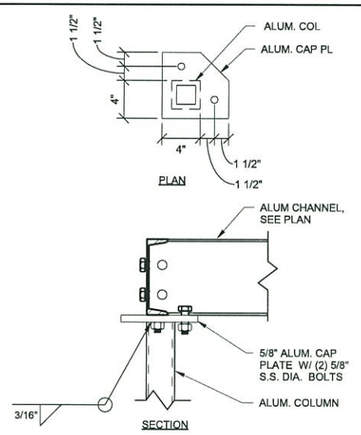


NOTES:
1. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION
2. ALL HANDRAIL, KICK PLATES AND ACCESSORIES SHALL BE ALUMINUM.
3. ALL RAILS AND POST MUST BE SIZED TO SATISFY OSHA AND IBC
4. COAT ALL SURFACES OF ALUM. IN CONTACT WITH STEEL AND CONCRETE

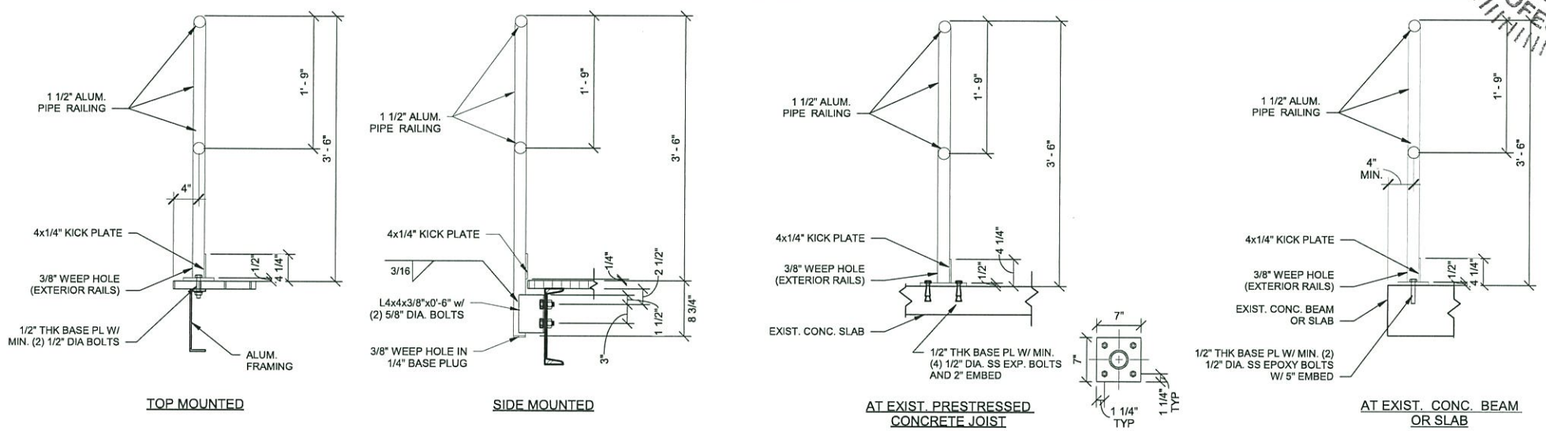
3 TYP. ALUM. GUARDRAIL DETAIL
SCALE: 1/2" = 1'-0"



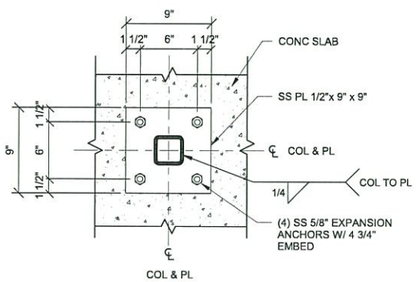
4 TYP. BEAM TO BEAM CONNECTION
SCALE: 1 1/2" = 1'-0"



5 TYP. BEAM TO POST CONNECTION
SCALE: 1 1/2" = 1'-0"



6 TYP. ALUM. GUARDRAIL MOUNTING DETAILS
SCALE: 1" = 1'-0"



7 TYP. BASEPLATE DETAIL
SCALE: 1 1/2" = 1'-0"

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6/17/20

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
STRUCTURAL TYPICAL DETAILS

PROJ:	200-08507-19001
DESN:	NNJ
DRWN:	BRF
CHKD:	TJM

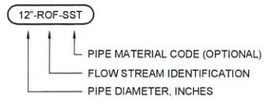
S-502

6/9/2020 1:51:57 PM BIM 360://200-08507-19001 Palm Bay RO Expansion/08507-CO2-S-2019.rvt

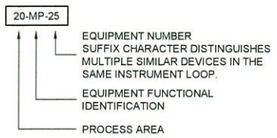
Bar measures 1 inch, otherwise drawing is not to scale

ANNOTATION SYMBOLS

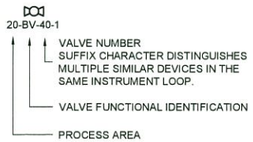
PIPE TAGS



EQUIPMENT TAGS



VALVE TAGS



PROCESS LINE TYPES

FLOW LINES

- PRIMARY FLOW
- SECONDARY FLOW
- EXST PRIMARY FLOW
- EXST SECONDARY FLOW
- FUTURE PRIMARY FLOW
- FUTURE SECONDARY FLOW
- AIR/GAS PROCESS FLOW

MISC. LINES

- EQUIPMENT
- EXISTING EQUIPMENT
- FUTURE EQUIPMENT
- VENDOR BOUNDARY
- BUILDING/FACILITY BOUNDARY
- ELECTRICAL CONNECTION
- DATA CONNECTION

SINGLE LINE VALVE SYMBOLS

- GATE VALVE
- GLOBE VALVE
- BUTTERFLY VALVE
- CHECK VALVE
- BALL CHECK VALVE
- DUAL DISC CHECK VALVE
- DIAPHRAGM CHECK VALVE
- BALL VALVE
- PLUG VALVE
- 3 WAY VALVE
- DIAPHRAGM VALVE
- 4 WAY VALVE
- ROTARY VALVE
- ANGLE VALVE
- DIVERTER VALVE
- EXCESS FLOW VALVE
- GENERIC ROTARY VALVE
- NEEDLE VALVE
- PINCH VALVE
- STOP CHECK VALVE
- KNIFE GATE VALVE
- PRESSURE RELIEF VALVE
- PRESSURE & VACUUM RELIEF VALVE
- SAFETY VALVE
- PILOT OPERATED RELIEF VALVE
- PRESSURE RELIEF WITH SOLENOID
- RUPTURE DISC FOR PRESSURE RELIEF
- RUPTURE DISC FOR VACUUM RELIEF
- AIR/VACUUM RELIEF
- VACUUM BREAKER VALVE
- AIR VENT VALVE
- COMBINATION AIR VALVE
- 5 WAY TURNING VALVE

SINGLE LINE ACTUATOR SYMBOLS

- MANUAL ACTUATOR
- HAND WHEEL ACTUATOR
- SOLENOID
- DIGITAL
- PISTON / PNEUMATIC ACTUATOR
- MOTORIZED ACTUATOR
- DIAPHRAGM ACTUATOR
- THROTTLING ACTUATOR
- PRESSURE REDUCING REGULATOR
- BACKPRESSURE REGULATOR SELF CONTAINED
- PRESSURE REDUCING REGULATOR W/ INTEGRAL OUTLET
- PRESSURE REDUCING REGULATOR W/ EXTERNAL TAP
- BACKPRESSURE REGULATOR W/ EXTERNAL PRESSURE TAP
- PRESSURE BALANCED DIAPHRAGM ACTUATOR
- DIFFERENTIAL PRESSURE REDUCING REGULATOR
- SPRING
- DIAPHRAGM SPRING
- ROTARY MOTOR
- ELECTRO-HYDRAULIC
- SURGE ANTICIPATION RELIEF VALVE
- MOTOR OPERATED ACTUATOR WITH POSITIONER

STREAM TO/FROM PI-4 — STREAM TO AND FROM

STREAM TO/FROM PI-4 — STREAM TO AND FROM

STREAM TO/FROM PI-4 — STREAM TO AND FROM

SINGLE LINE EQUIPMENT LEGEND

- BLOWER
- CENTRIFUGAL PUMP
- SUBMERSIBLE PUMP
- SUMP PUMP
- TURBINE
- VACUUM
- VERTICAL TURBINE PUMP
- PERISTALTIC METERING PUMP
- DIAPHRAGM METERING PUMP
- ELECTROMAGNETIC FLOW METER
- VENTURI FLOW METER
- POSITIVE DISPLACEMENT FLOW METER
- MOTOR
- STATIC MIXER
- PROPELLER MIXER
- VARIABLE AREA METER / ROTAMETER
- FLOAT TYPE LEVEL INDICATOR
- ULTRASONIC LEVEL SENSOR
- PRESSURE GAUGE
- SURFACE MOUNTED TEMPERATURE SENSOR
- INSTRUMENT WELL
- ORIFICE IN PLATE QUICK-CHANGE FITTING
- ORIFICE PLATE
- RESTRICTION ORIFICE
- UNION
- CAP
- QUICK COUPLING/HOSE CONNECTION
- REDUCER
- ECC REDUCER
- FLANGED NOZZLE
- CAMLOCK W/ DUST CAP
- RUPTURE DISK
- FLEX COUPLING
- FLEX CONNECTION
- FLOW NOZZLE
- SAMPLE PORT
- PUMPOUT CONNECTION
- GAP / BREAK
- FLUME
- WEIR
- WYE STRAINER
- DIAPHRAGM SEAL
- PIPE INSULATION
- CONTAINMENT PIPING
- INJECTOR
- VENT
- INLINE 2 CHARACTER
- INLINE 3 CHARACTER
- CALIBRATION COLUMN
- PULSATION DAMPENER
- STRAINER
- MISC EQUIP
- NORMAL LIQUID LEVEL
- PIPE MATERIAL CHANGE
- PIPE CROSSING
- INJECTION QUILL WITH CORP STOP

TANKS AND VESSELS

- STORAGE TANK AS IDENTIFIED
- STORAGE TANK AS IDENTIFIED
- STORAGE TANK AS IDENTIFIED
- TANK/PROCESS AS IDENTIFIED
- PRESSURIZED TANK/PROCESS AS IDENTIFIED
- CARTRIDGE FILTER

DOUBLE LINE MISC EQUIPMENT

- MAGNETIC FLOW METER (PLAN)
- MAGNETIC FLOW METER (SECTION)

DOUBLE LINE COUPLINGS

- SLEEVE COUPLING
- EXPANSION JOINT
- FLANGED ADAPTER COUPLING
- DISMANTLING JOINT
- HARNESSED MECHANICAL COUPLING

DOUBLE LINE FITTINGS

ELBOW
- FLANGED
- MECHANICAL JOINT
- SOCKET PVC
- WELDED

TEE
- FLANGED
- MECHANICAL JOINT
- SOCKET PVC
- WELDED

WYE
- FLANGED
- MECHANICAL JOINT
- SOCKET PVC
- WELDED

REDUCER
- FLANGED
- MECHANICAL JOINT
- SOCKET PVC
- WELDED

CAP / BLIND FLANGE / PLUG
- FLANGED
- MECHANICAL JOINT
- SOCKET PVC
- WELDED

DOUBLE LINE VALVES (TYP 4" AND LARGER)

- FLG GATE VALVE
- MJ GATE VALVE
- FLG KNIFE GATE VALVE
- FLG BUTTERFLY VALVE
- MJ BUTTERFLY VALVE
- FLG PLUG VALVE
- MJ PLUG VALVE
- FLG CHECK VALVE
- FLG PINCH VALVE
- FLG BALL VALVE
- FLG CONTROL VALVE (PLAN)
- FLG CONTROL VALVE (SECTION)

NOTE:
NOT ALL VALVES SHOWN. IF NOT SHOWN, STD SINGLE LINE SYMBOLS MAY BE USED W/ APPROPRIATE PIPE CONNECTION.

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JONATHAN C. BUNKLEY LICENSE No. 62561 STATE OF FLORIDA PROFESSIONAL ENGINEER

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MARK	DATE	DESCRIPTION	BY

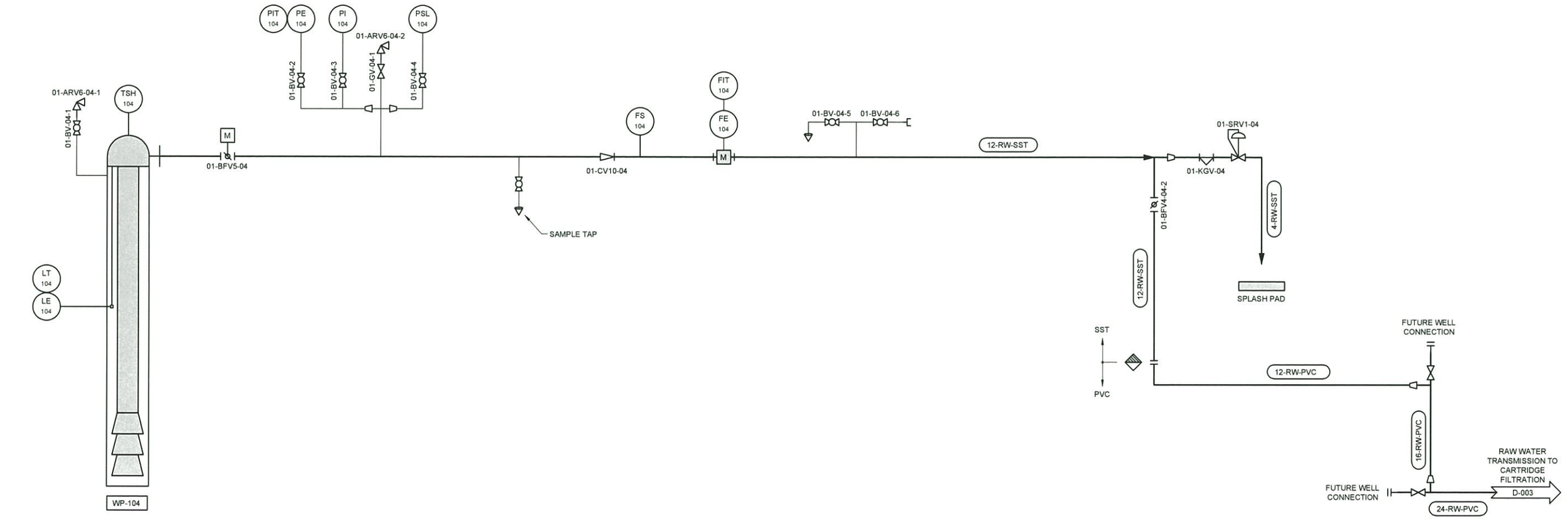
CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

PROCESS LEGEND AND ABBREVIATIONS

PROJ:	200-08507-19001
DESN:	ACN
DRWN:	CIS
CHKD:	JCB

D-001

Bar Measures 1 inch, otherwise drawing not to scale



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PROFESSIONAL ENGINEER

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT
PLANT EXPANSION - 4-MGD TO 6-MGD

PRODUCTION WELL
PROCESS FLOW DIAGRAM

PROJ:	200-08507-19001
DESN:	ACN
DRWN:	CIS
CHKD:	JCB

D-002

Bar Measures 1 inch, otherwise drawing not to scale

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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

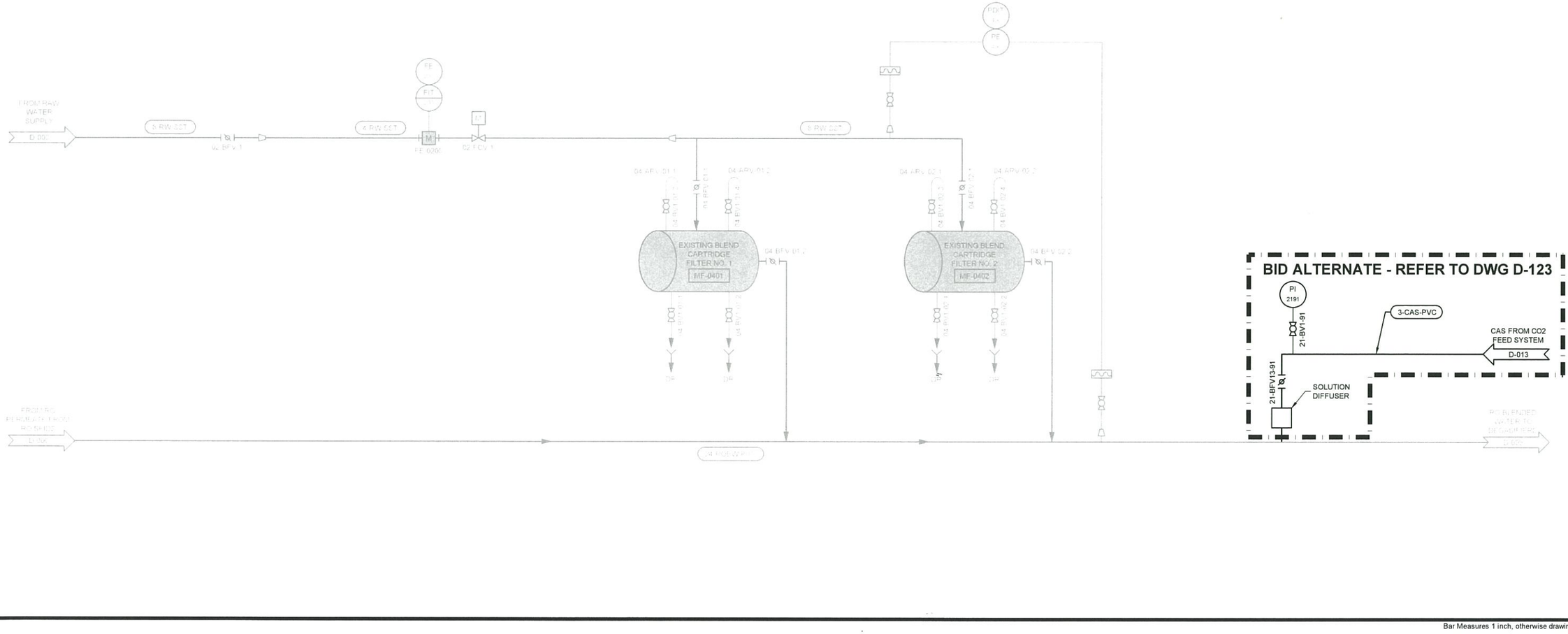
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

CARTRIDGE FILTERS PROCESS FLOW DIAGRAM

PROJ:	200-08507-19001
DESN:	ACN
DRWN:	CIS
CHKD:	JCB

D-003

Bar Measures 1 inch, otherwise drawing not to scale



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6/17/20

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

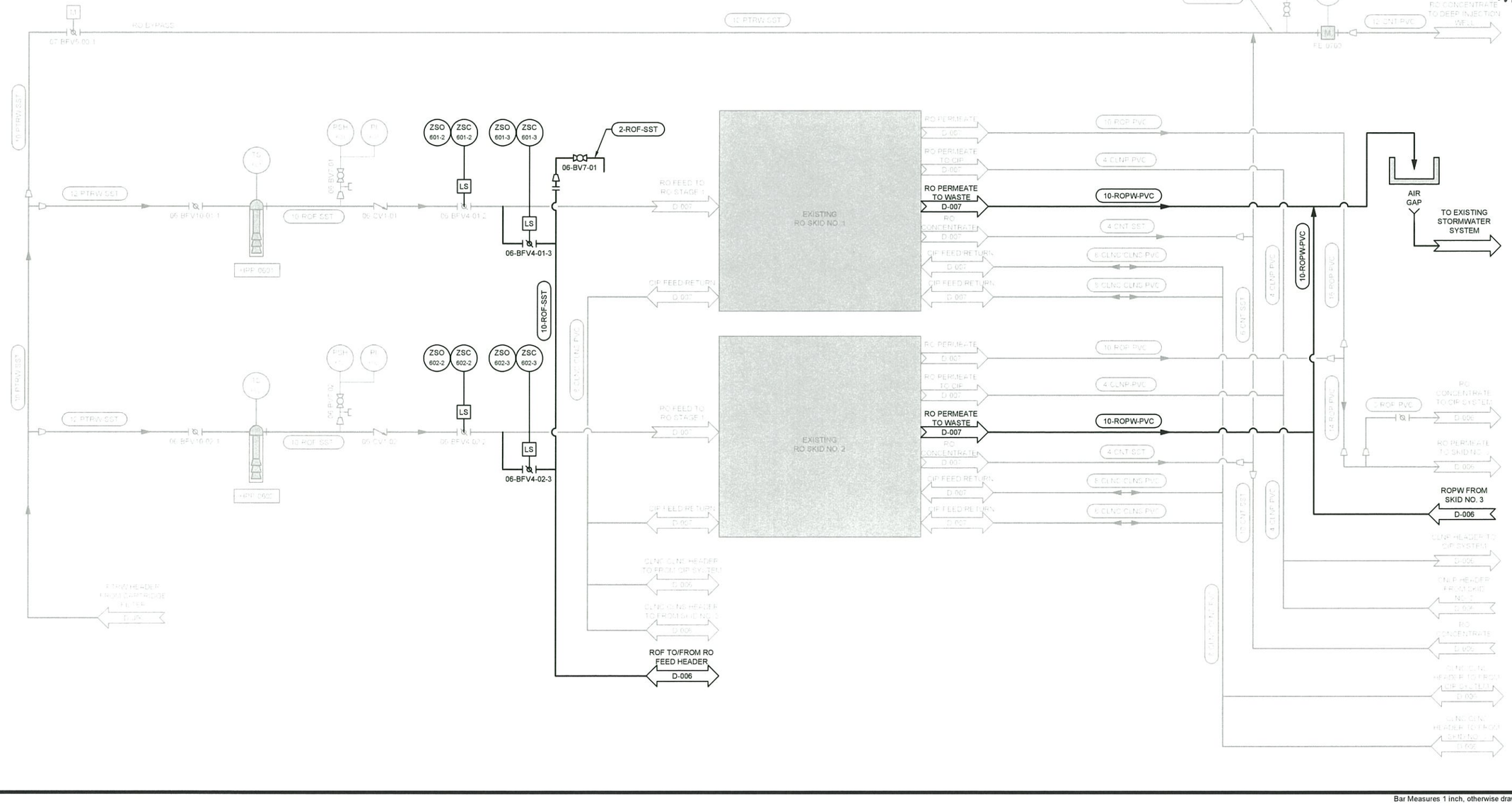
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

EXISTING BLEND CARTRIDGE FILTERS PROCESS FLOW DIAGRAM

PROJ:	200-08507-19001
DESN:	ACN
DRWN:	CIS
CHKD:	JCB

D-004

Bar Measures 1 inch, otherwise drawing not to scale



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6/19/20

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CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

RO FEED AND OVERALL SKID PROCESS FLOW DIAGRAM 1

PROJ:	200-08507-19001
DESN:	ACN
DRWN:	CIS
CHKD:	JCB

D-005

Bar Measures 1 inch, otherwise drawing not to scale

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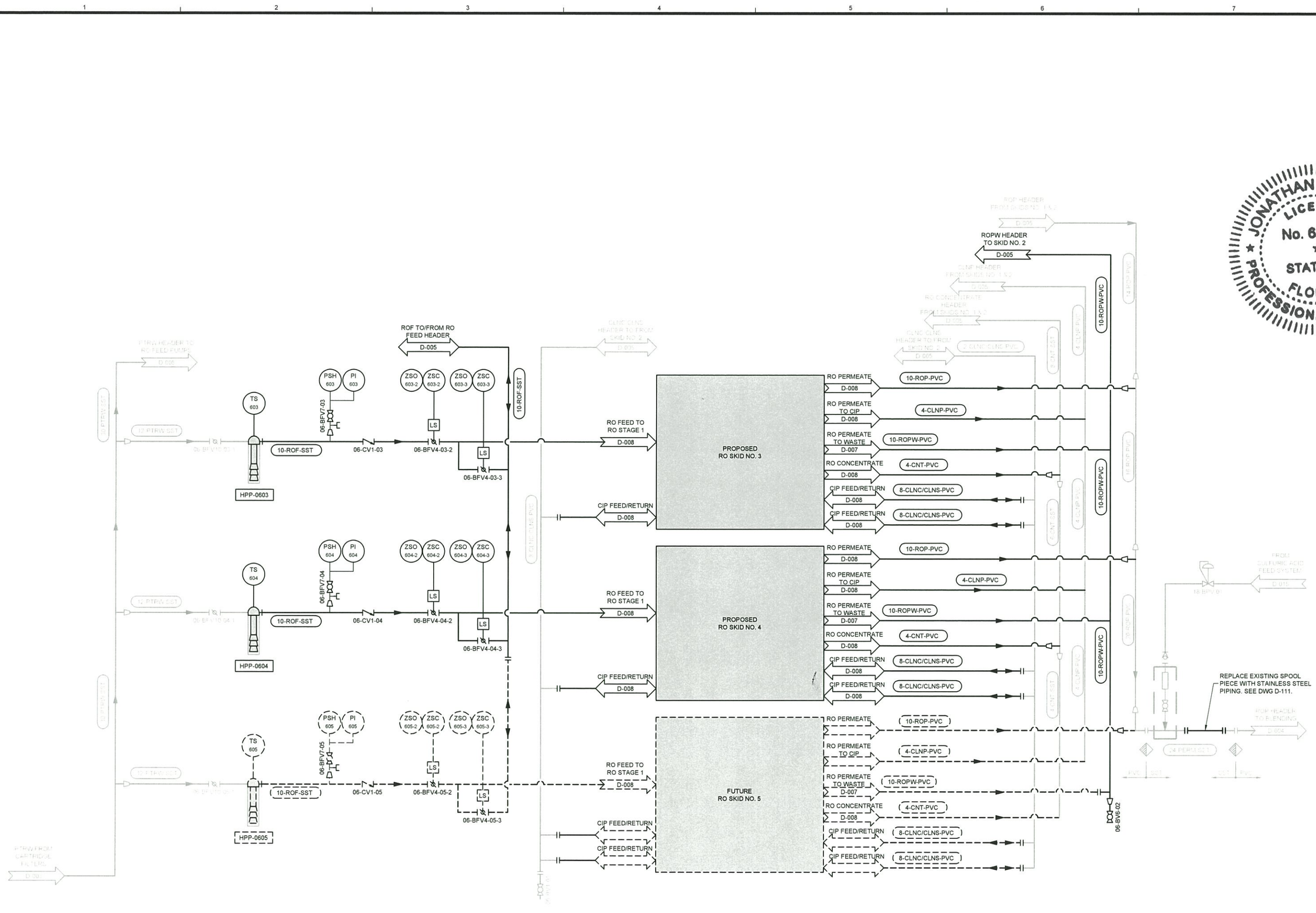

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PROFESSIONAL ENGINEER

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CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

RO FEED AND OVERALL SKID PROCESS FLOW DIAGRAM 2

PROJ:	200-08507-19001
DESN:	ACN
DRWN:	CIS
CHKD:	JCB

D-006

Bar Measures 1 inch, otherwise drawing not to scale

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EXTENTS OF EXISTING RO SKID INSTRUMENT PANEL

STAGE 1 BANK 2 12 VESSELS 7 ELEMENTS EACH

STAGE 1 BANK 1 12 VESSELS 7 ELEMENTS EACH

STAGE 2 12 VESSELS 7 ELEMENTS EACH

10-ROPW-PVC

EXISTING 4" CLNP CONNECTION TO BE MODIFIED

TOTAL PERMEATE RUPTURE DISK

RO PERMEATE TO WASTE D-005

10-ROPW-PVC

EXTENTS OF EXISTING RO SKID

NOTE:
1. "X" CORRESPONDS TO EXISTING SKID NUMBER (1 OR 2)

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MID SET

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

TYPICAL EXISTING RO SKID MODIFICATIONS PROCESS FLOW DIAGRAM

PROJ:	200-08507-19001
DESN:	ACN
DRWN:	CIS
CHKD:	JCB

D-007

Bar Measures 1 inch, otherwise drawing not to scale

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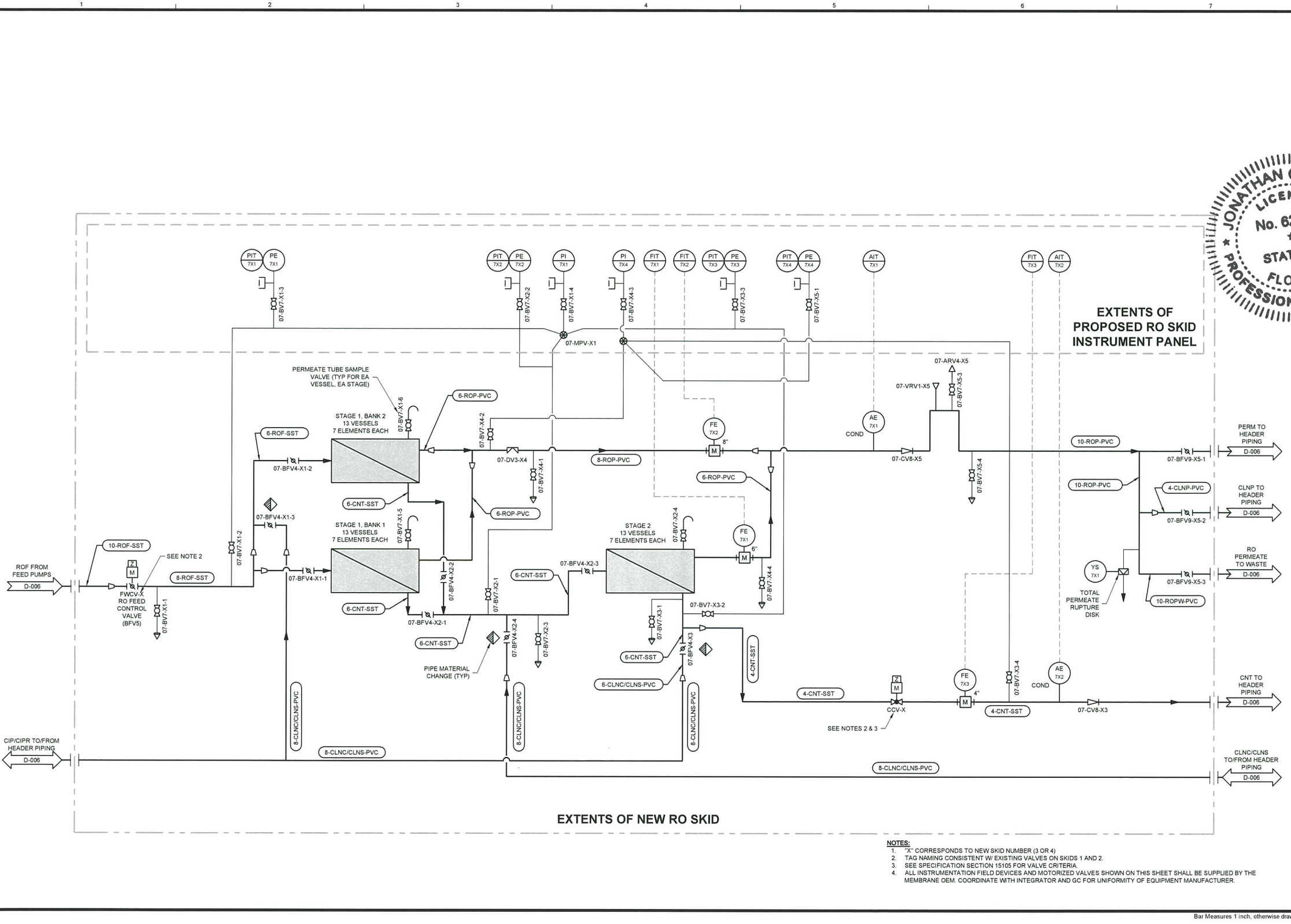

NOTES:

1. "X" CORRESPONDS TO NEW SKID NUMBER (3 OR 4)
2. TAG NAMING CONSISTENT W/ EXISTING VALVES ON SKIDS 1 AND 2.
3. SEE SPECIFICATION SECTION 15105 FOR VALVE CRITERIA.
4. ALL INSTRUMENTATION FIELD DEVICES AND MOTORIZED VALVES SHOWN ON THIS SHEET SHALL BE SUPPLIED BY THE MEMBRANE OEM. COORDINATE WITH INTEGRATOR AND GC FOR UNIFORMITY OF EQUIPMENT MANUFACTURER.

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6/17/20

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
TYPICAL PROPOSED RO SKID PROCESS FLOW DIAGRAM

PROJ:	200-08507-19001
DESN:	ACN
DRWN:	CIS
CHKD:	JCB

D-008

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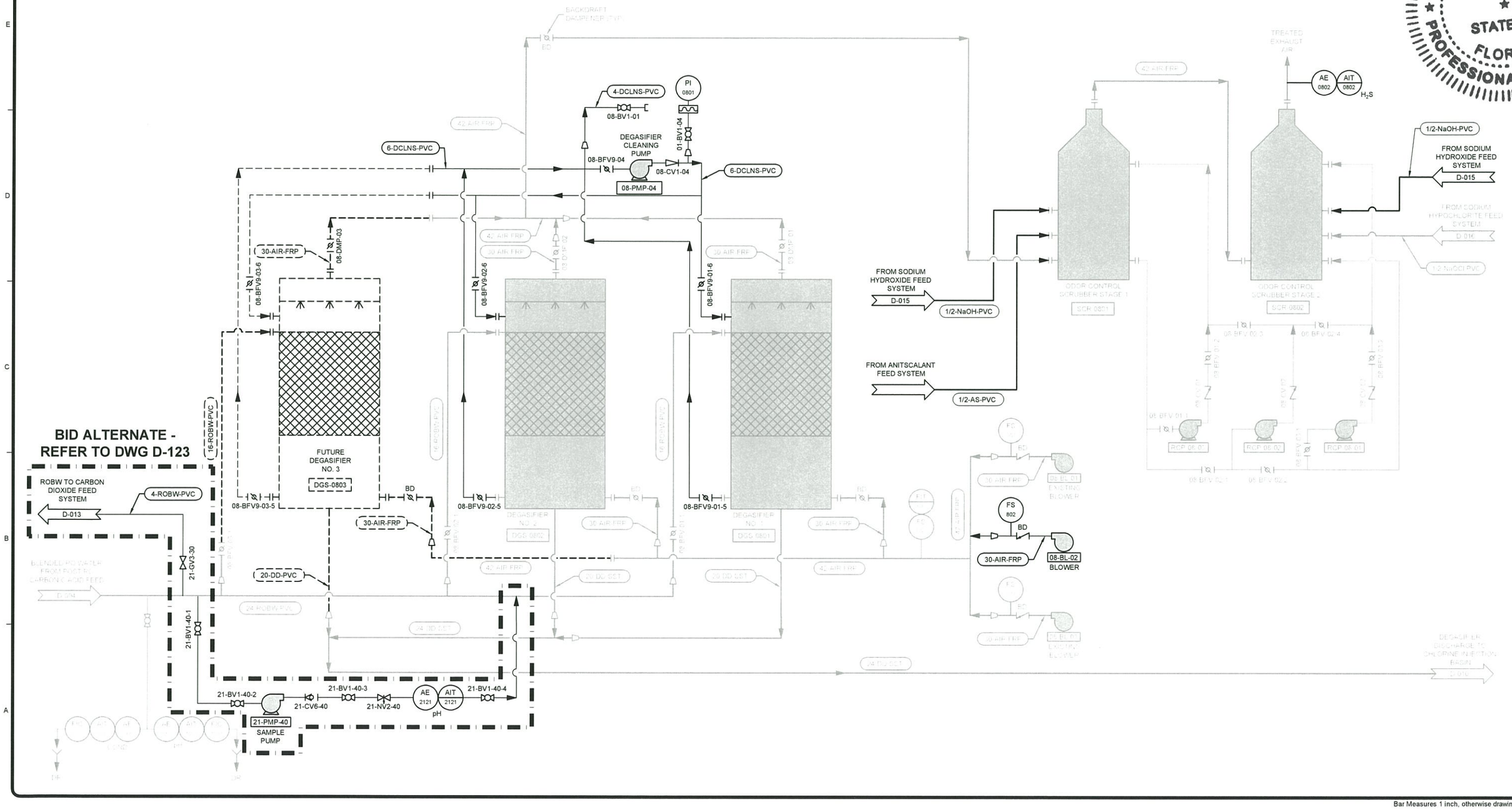
Bar Measures 1 inch, otherwise drawing not to scale



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JONATHAN C. NELSON
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PROFESSIONAL ENGINEER

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MARK	DATE	DESCRIPTION

BY

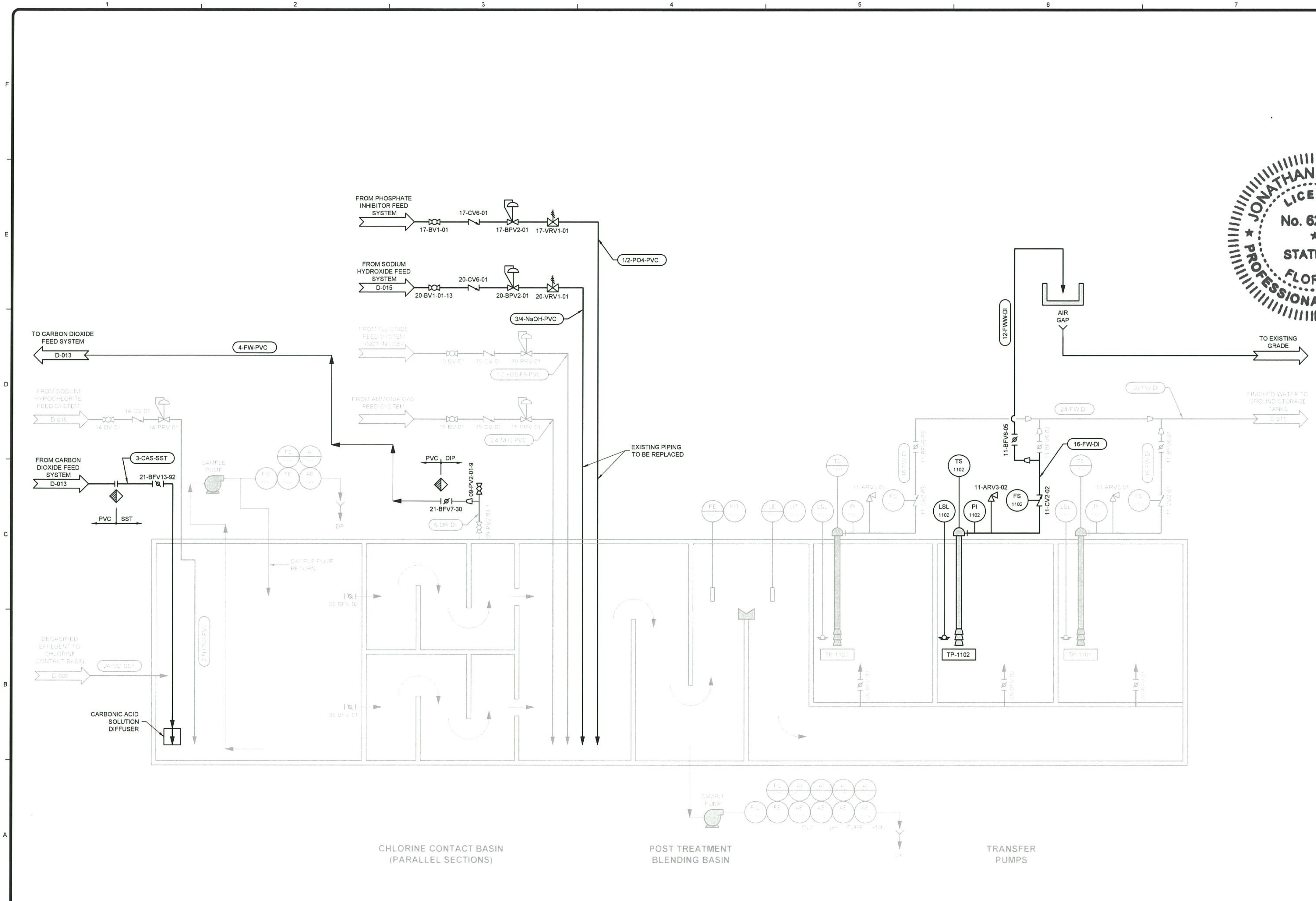
CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

EXISTING DEGASIFIER SYSTEM MODIFICATIONS PROCESS FLOW DIAGRAM

PROJ:	200-08507-19001
DESN:	ACN
DRWN:	CIS
CHKD:	JCB

D-009

Bar Measures 1 inch, otherwise drawing not to scale


FROM PHOSPHATE INHIBITOR FEED SYSTEM
17-BV1-01
17-CV6-01
17-BPV2-01
17-VRV1-01
1/2-PO4-PVC
FROM SODIUM HYDROXIDE FEED SYSTEM
D-015
20-BV1-01-13
20-CV6-01
20-BPV2-01
20-VRV1-01
3/4-NaOH-PVC
TO CARBON DIOXIDE FEED SYSTEM
D-013
4-FW-PVC
FROM CARBON DIOXIDE FEED SYSTEM
D-013
3-CAS-SST
21-BFV13-92
PVC
SST
PVC
DIP
09-PV2-01-9
21-BFV7-30
EXISTING PIPING TO BE REPLACED
CARBONIC ACID SOLUTION DIFFUSER
12-FWW-DI
AIR GAP
TO EXISTING GRADE
11-BFV6-05
16-FW-DI
TS 1102
11-ARV3-02
FS 1102
11-CV2-02
LSL 1102
PI 1102
TP-1102
CHLORINE CONTACT BASIN (PARALLEL SECTIONS)
POST TREATMENT BLENDING BASIN
TRANSFER PUMPS

JONATHAN C. BUNDY LICENSE No. 62561 STATE OF FLORIDA PROFESSIONAL ENGINEER

BID SET

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CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

CLEARWELL TRANSFER PUMPS MODIFICATIONS PROCESS FLOW DIAGRAM

PROJ:	200-08507-19001
DESN:	ACN
DRWN:	CIS
CHKD:	JCB

D-010

Bar Measures 1 inch, otherwise drawing not to scale

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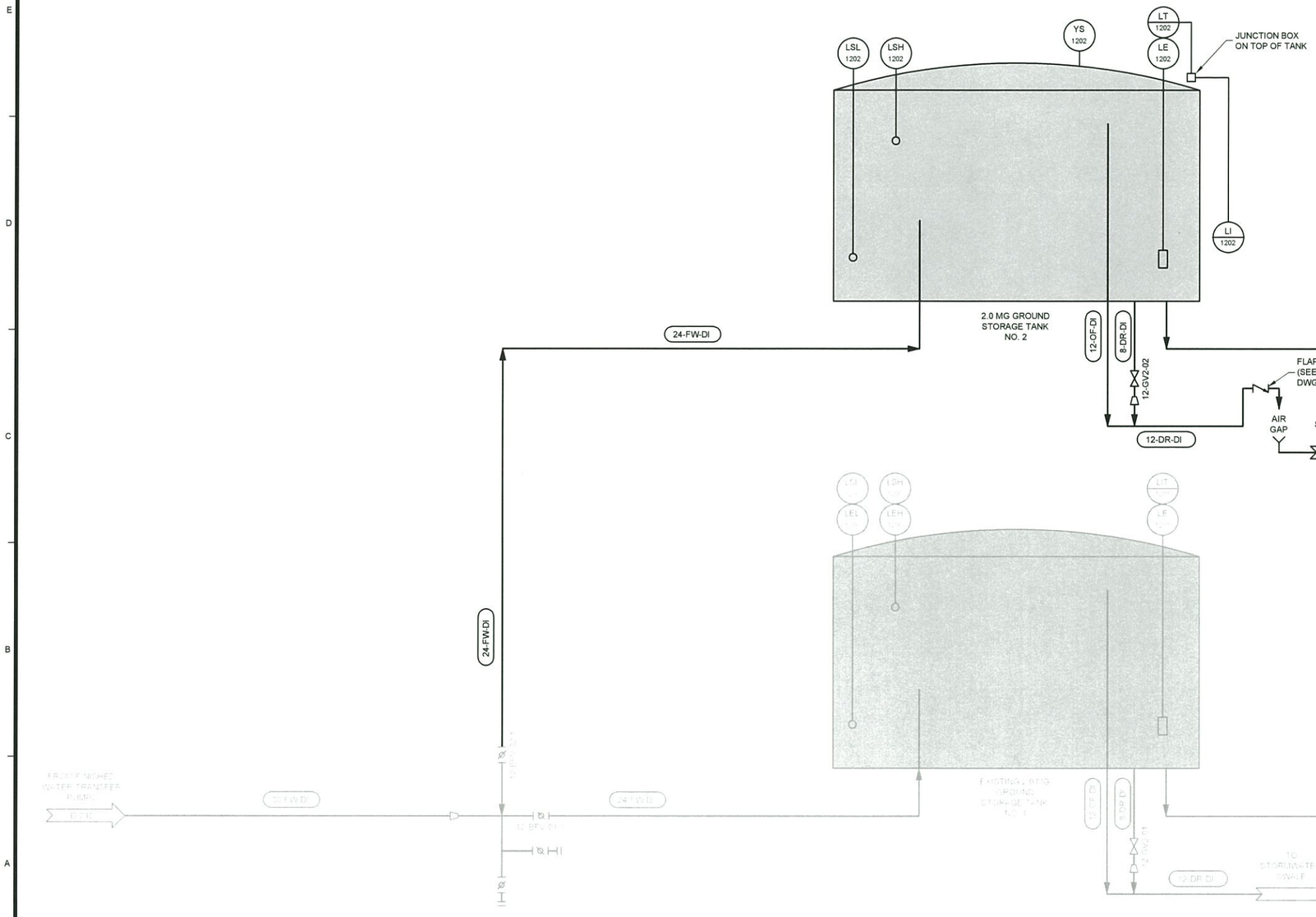

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PROFESSIONAL ENGINEER

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

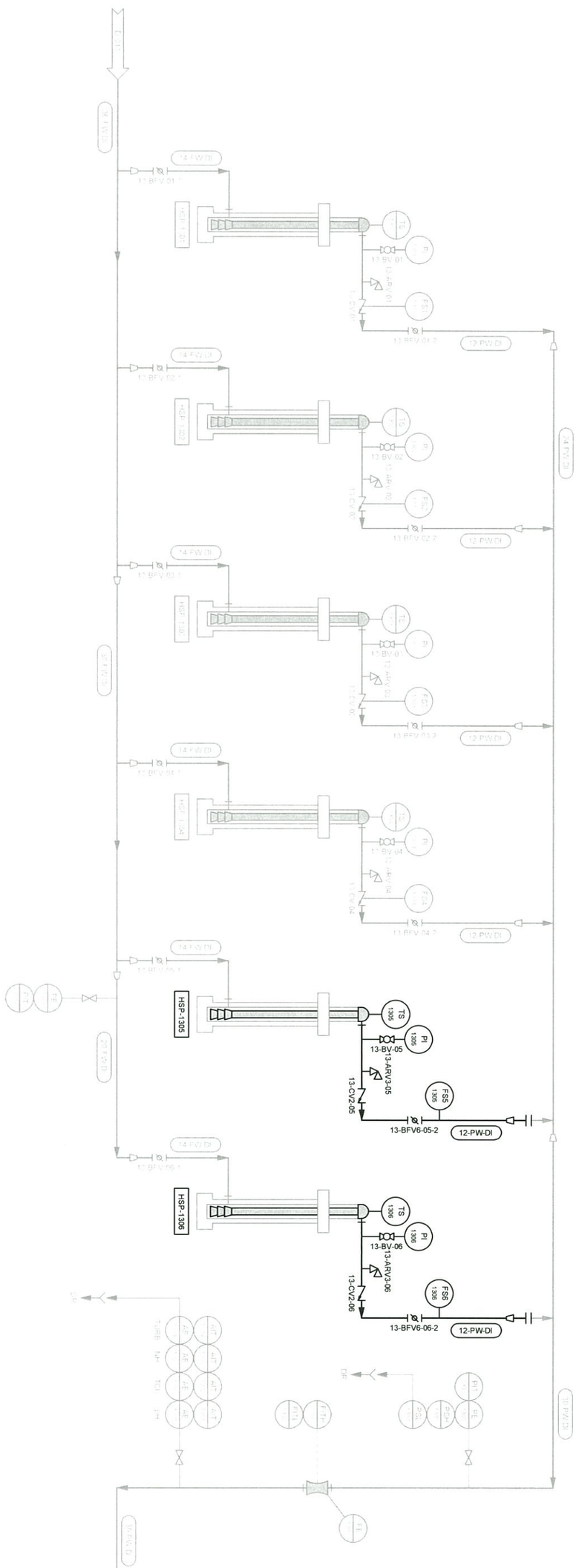
SOUTH REGIONAL WATER TREATMENT
PLANT EXPANSION - 4-MGD TO 6-MGD

GROUND STORAGE TANK PROCESS FLOW DIAGRAM

PROJ:	200-08507-19001
DESN:	ACN
DRWN:	CIS
CHKD:	JCB

D-011

Bar Measures 1 inch, otherwise drawing not to scale



Bar Measures 1 inch, otherwise drawing not to scale

D-012

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

HIGH SERVICE PUMPS MODIFICATIONS PROCESS FLOW DIAGRAM

MARK	DATE	DESCRIPTION	BY

PROJ: 200-08507-19001
DESN: ACN
DRWN: CIS
CHKD: JGF

JONATHAN C. BUSBY LICENSE No. 62561 STATE OF FLORIDA PROFESSIONAL ENGINEER

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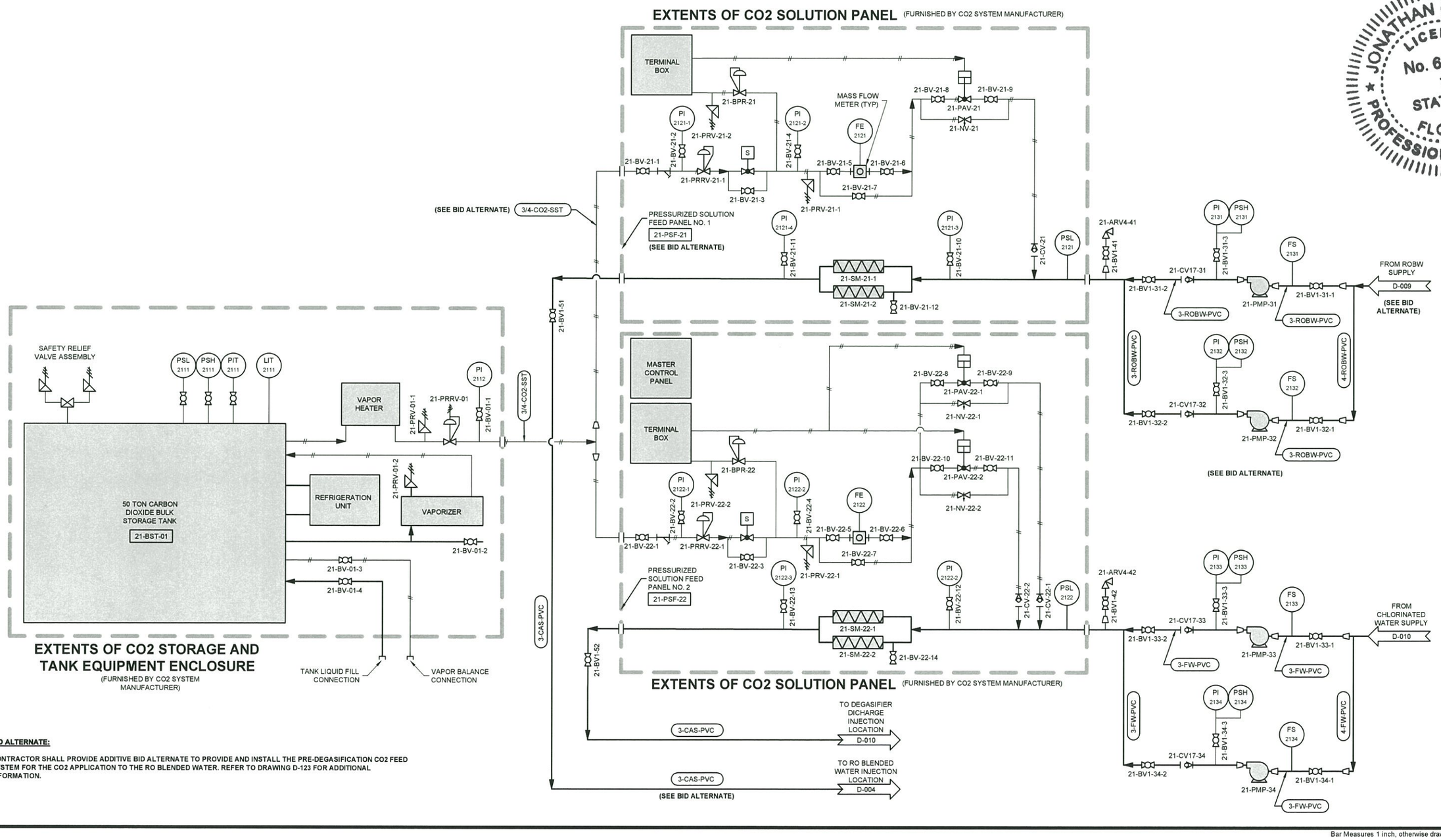

BID ALTERNATE:

CONTRACTOR SHALL PROVIDE ADDITIVE BID ALTERNATE TO PROVIDE AND INSTALL THE PRE-DEGASIFICATION CO2 FEED SYSTEM FOR THE CO2 APPLICATION TO THE RO BLENDED WATER. REFER TO DRAWING D-123 FOR ADDITIONAL INFORMATION.

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BID SET

JONATHAN C. BUNDY LICENSE No. 62561 STATE OF FLORIDA PROFESSIONAL ENGINEER 6/17/20

MARK	DATE	DESCRIPTION	BY

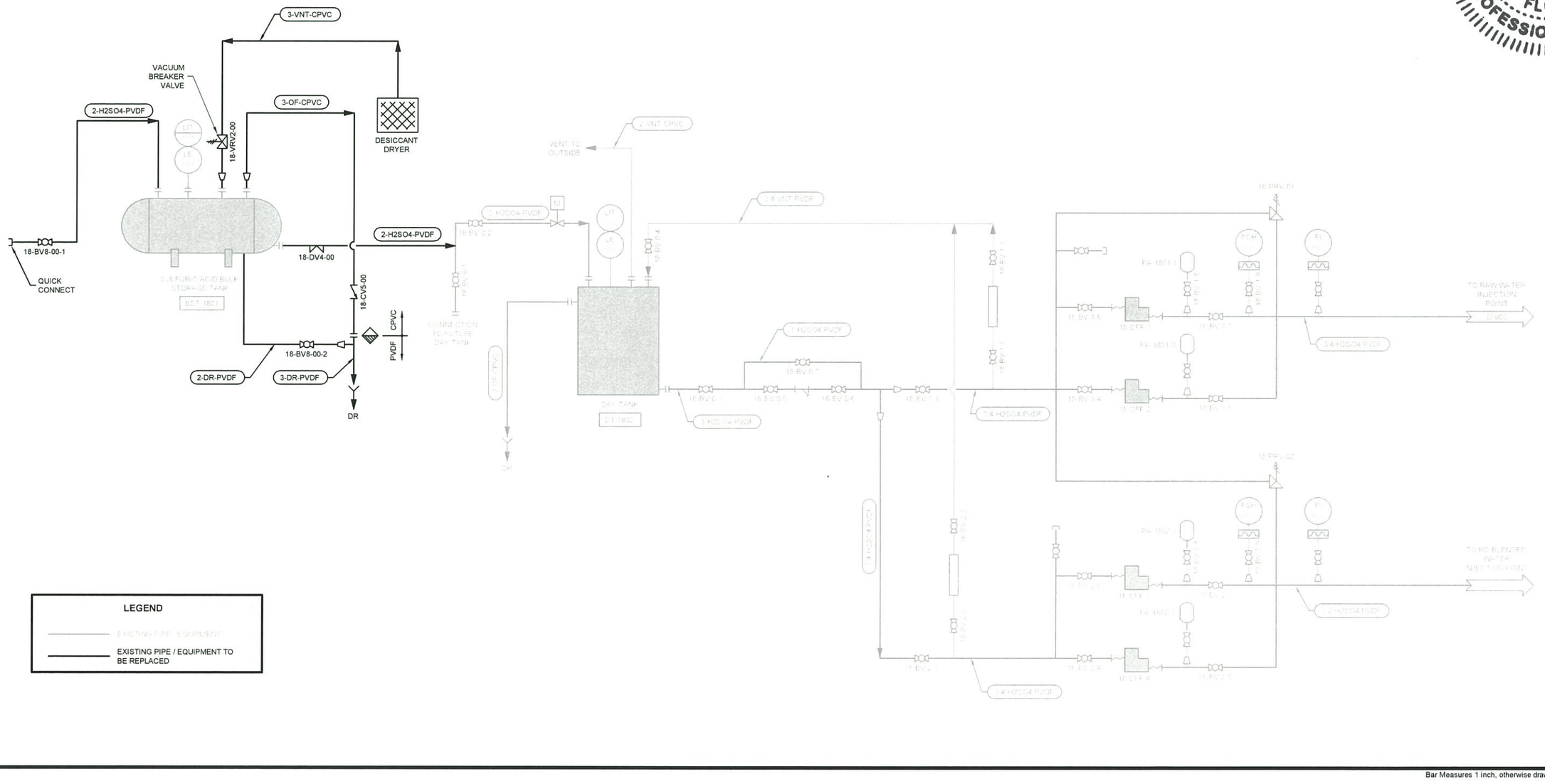
CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

CARBON DIOXIDE FEED SYSTEM PROCESS FLOW DIAGRAM

PROJ:	200-08507-19001
DESN:	ACN
DRWN:	CIS
CHKD:	JCB

D-013

Bar Measures 1 inch, otherwise drawing not to scale



LEGEND

- EXISTING PIPE / EQUIPMENT
- EXISTING PIPE / EQUIPMENT TO BE REPLACED

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JONATHAN C. BUNDY
LICENSE
No. 62561
STATE OF FLORIDA
PROFESSIONAL ENGINEER

MARK	DATE	DESCRIPTION	BY

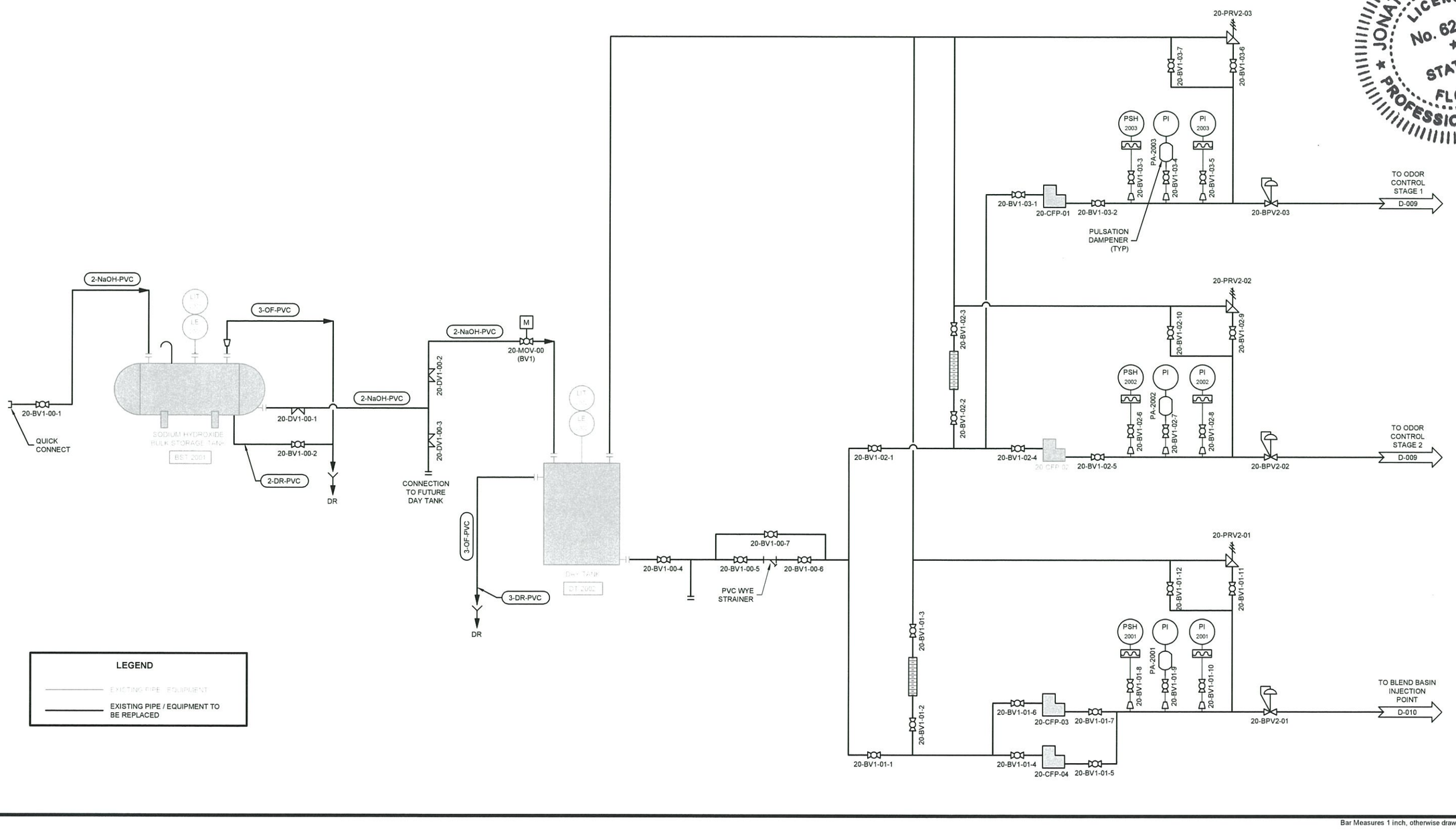
CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

SULFURIC ACID FEED SYSTEM PROCESS FLOW DIAGRAM

PROJ:	200-08507-19001
DESN:	ACN
DRWN:	CIS
CHKD:	JCB

D-014

Bar Measures 1 inch, otherwise drawing not to scale



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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

SODIUM HYDROXIDE FEED SYSTEM PROCESS FLOW DIAGRAM

PROJ:	200-08507-19001
DESN:	ACN
DRWN:	CIS
CHKD:	JCB

D-015

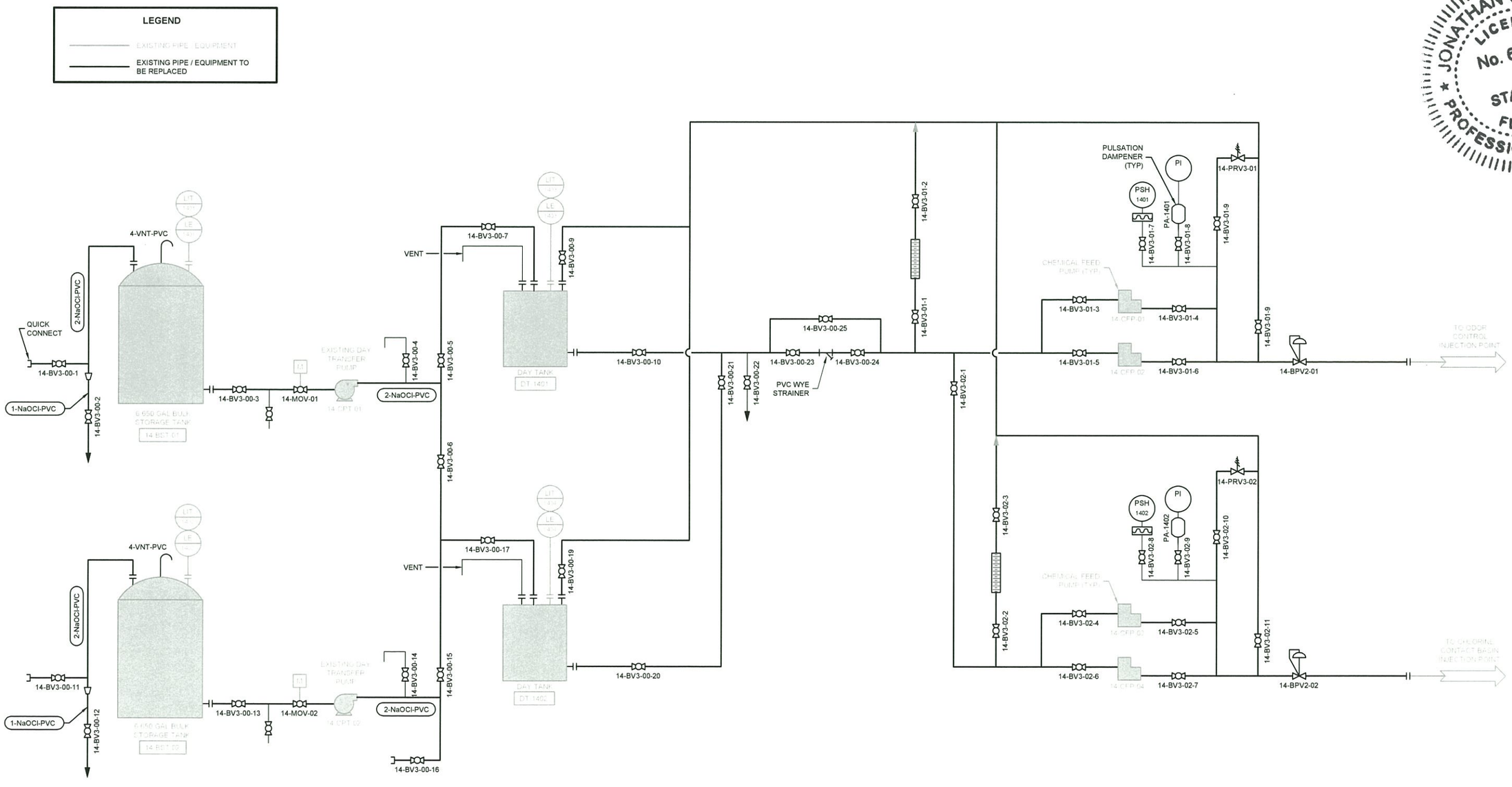
Bar Measures 1 inch, otherwise drawing not to scale

6/17/2020 3:35:36 PM - O:\PROJECTS\ORLANDO\ER\08507\200-08507-19001\CAD\SHEETFILES\D-001_00X LEGEND AND PFDS.DWG - EVANS, JON

LEGEND

EXISTING PIPE / EQUIPMENT

EXISTING PIPE / EQUIPMENT TO BE REPLACED



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BID SET

JONATHAN C. BUNDY
LICENSE
No. 62561
STATE OF FLORIDA
PROFESSIONAL ENGINEER
6/17/20

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

SODIUM HYPOCHLORITE FEED PROCESS FLOW DIAGRAM

PROJ: 200-08507-19001
DESN:
DRWN:
CHKD:

D-016

Bar Measures 1 inch, otherwise drawing not to scale

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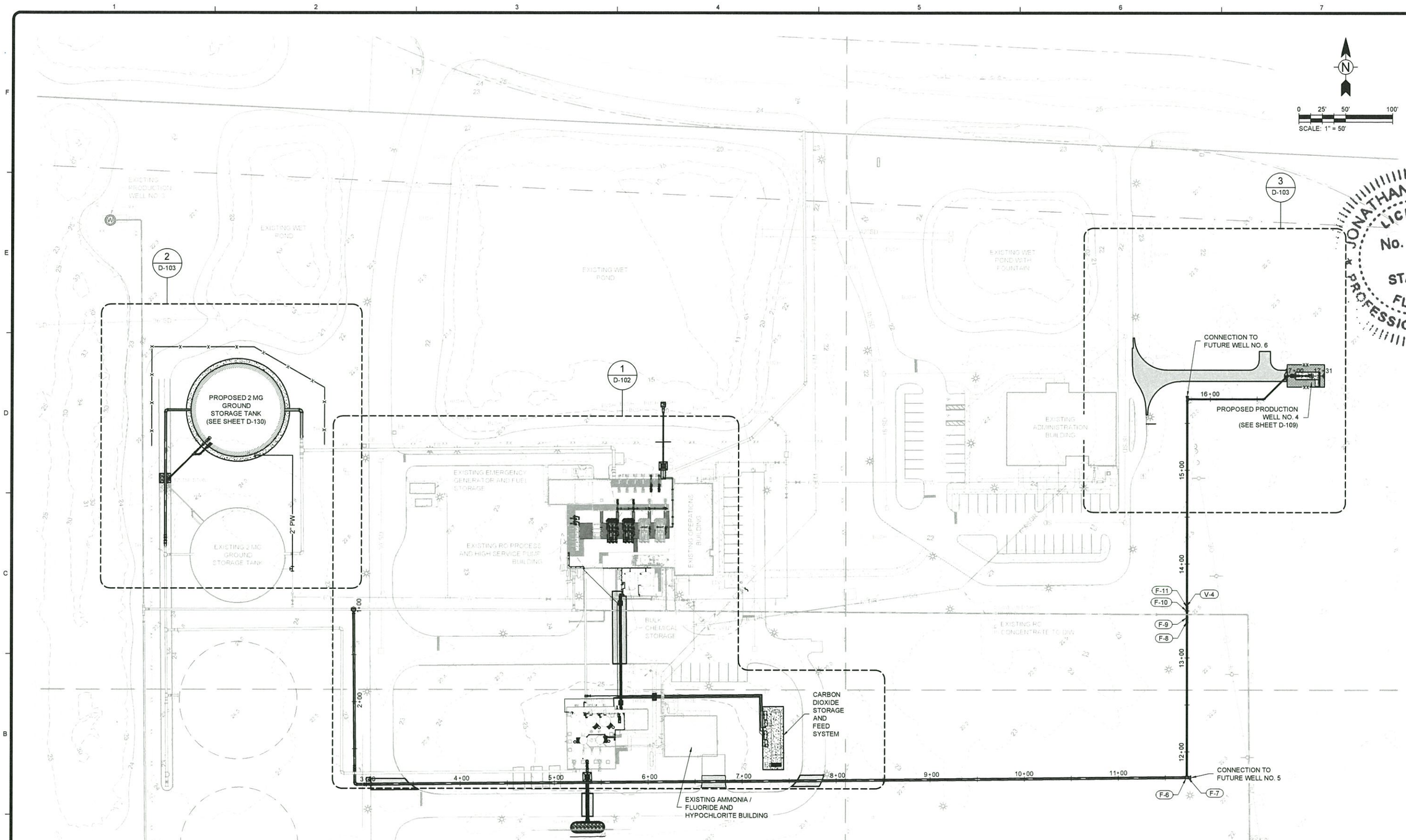

NOTES:

1. SEE SHEET D-102 FOR YARD PIPING FITTING SCHEDULES AND YARD PIPING VALVE SCHEDULE.
2. SEE SHEETS D-104 THRU D-108 FOR RAW WATER PLAN AND PROFILE.
3. CONTRACTOR SHALL FIELD VERIFY ELEVATIONS OF ALL EXISTING UTILITY CONNECTIONS AND CROSSINGS.

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JONATHAN C. BUSSEY
LICENSE
No. 62561
STATE OF FLORIDA
PROFESSIONAL ENGINEER
6/17/2020

MARK	DATE	DESCRIPTION	BY

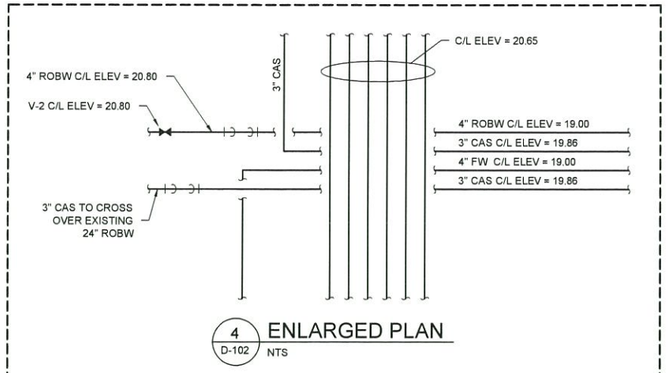
CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

OVERALL YARD PIPING PLAN

PROJ:	200-08507-19001
DESN:	
DRWN:	CIS
CHKD:	

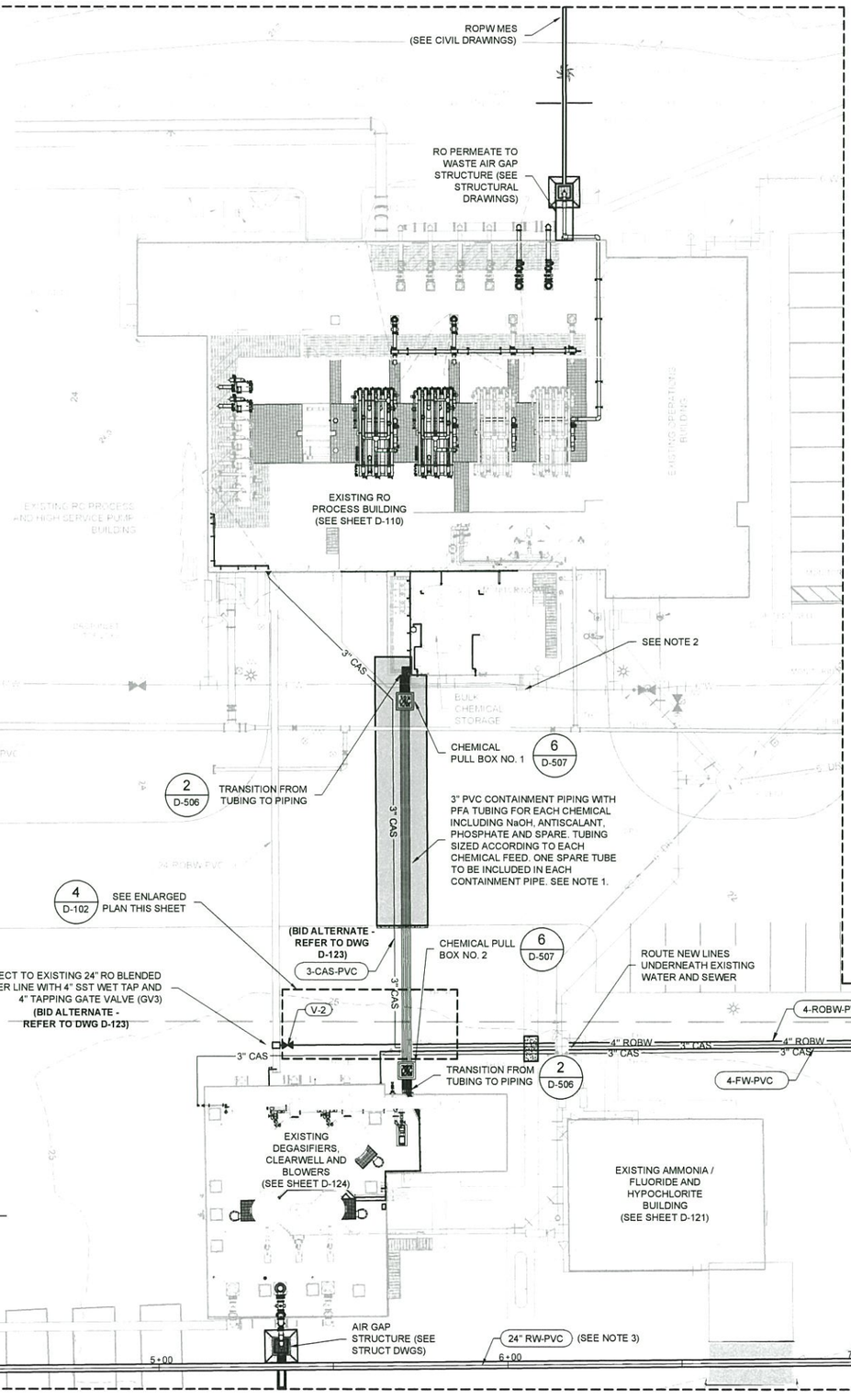
D-101

Bar Measures 1 inch, otherwise drawing not to scale



4 D-102 ENLARGED PLAN
NTS

JONATHAN C. BUNDY LICENSE No. 62561 STATE OF FLORIDA PROFESSIONAL ENGINEER



1 D-101 ENLARGED PLAN
SCALE: 1" = 20'

NOTES:

1. CHEMICAL CONTAINMENT TUBING IN 3" CONTAINMENT PIPE:

   (1) - 3/4" NaOH + SPARE
   (2) - 1/2"NaOH + SPARE
   (1) - 1/2" ANTISCALANT + SPARE
   (1) - 1/2" PHOSPHATE + SPARE
   (1) - SPARE

2. EXISTING CHEMICAL LINES TO BE DEMO'D UPON START UP AND OPERATION OF THE NEW FEED LINES. CAP AND REMOVE ABOVE GRADE PIPING. CAP AND ABANDON BELOW GRADE PIPING. LINES TO BE REMOVED AND / OR ABANDONED SHALL BE FLUSHED WITH CLEAN WATER.
3. SEE SHEETS D-104 THRU D-108 FOR RAW WATER MAIN PLAN AND PROFILE.
4. ALL PIPING JOINTS SHALL BE MECHANICALLY RESTRAINED.

N

0 10' 20' 40'
SCALE: 1" = 20'

YARD PIPING FITTING SCHEDULE

NUMBER	DIAMETER (IN)	TYPE	NORTHING	EASTING	ELEV (CENTER)
F-1	24 x 24	TAPPING SLEEVE	1,309,334.58	762,532.77	17.21
F-2	24	45° BEND (PVC)	1,309,167.73	762,534.28	17.21
F-3	24	45° BEND (PVC)	1,309,162.07	762,534.32	13.50
F-4	24	90° BEND (PVC)	1,309,148.48	762,534.45	13.50
F-4.1	24	45° BEND (PVC)	1,309,148.54	762,546.46	13.50
F-5	24	45° BEND (PVC)	1,309,148.58	762,551.40	18.48
F-6	24 x 16	TEE (PVC)	1,309,156.42	763,419.54	17.75
F-7	24	CAP (PVC)	1,309,156.43	763,420.79	17.75
F-8	16	45° BEND (PVC)	1,309,322.18	763,419.52	18.00
F-9	16	45° BEND (PVC)	1,309,326.51	763,419.52	15.00
F-10	16	45° BEND (PVC)	1,309,333.27	763,419.54	15.00
F-11	16	45° BEND (PVC)	1,309,337.61	763,419.54	18.00
F-12	16 x 12	TEE (PVC)	1,309,559.27	763,419.53	18.25
F-13	16	CAP (PVC)	1,309,560.52	763,419.53	18.25
F-14	12	45° BEND (PVC)	1,309,559.27	763,501.20	18.25
F-15	12	45° BEND (PVC)	1,309,584.27	763,526.20	18.25
F-16	30	90° BEND (MJ)	1,309,547.04	762,477.02	18.29
F-17	24	22.5° BEND (MJ)	1,309,406.19	762,332.80	19.40
F-18	24	22.5° BEND (MJ)	1,309,412.08	762,332.80	17.00
F-19	24	90° BEND (MJ)	1,309,547.04	762,332.80	17.00

YARD PIPING VALVE SHEDULE

NUMBER	DIAMETER (IN)	TYPE	NORTHING	EASTING	ELEV (CENTER)
V-1	24	GV 3	1,309,331.27	762,532.80	17.21
V-2	4	GV 3	1,309,242.59	762,783.54	20.80
V-3	2	BLOW OFF VALVE	1,309,148.60	762,553.68	19.54
V-4	2	BLOW OFF VALVE	1,309,338.80	763,419.53	18.79

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MARK	DATE	DESCRIPTION	BY

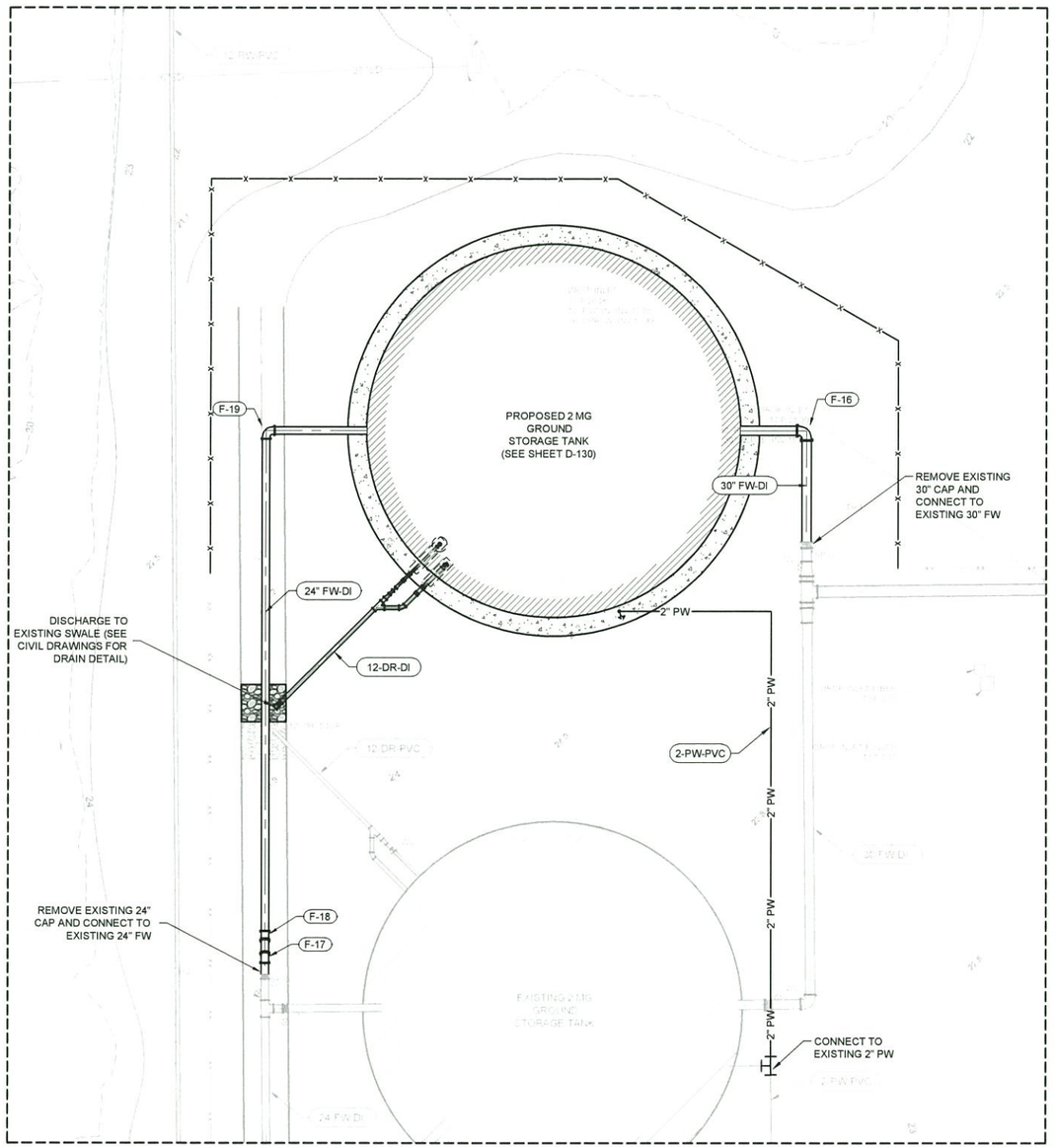
CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
ENLARGED YARD PIPING PLAN

PROJ: 200-08507-19001
DESN:
DRWN: CIS
CHKD:

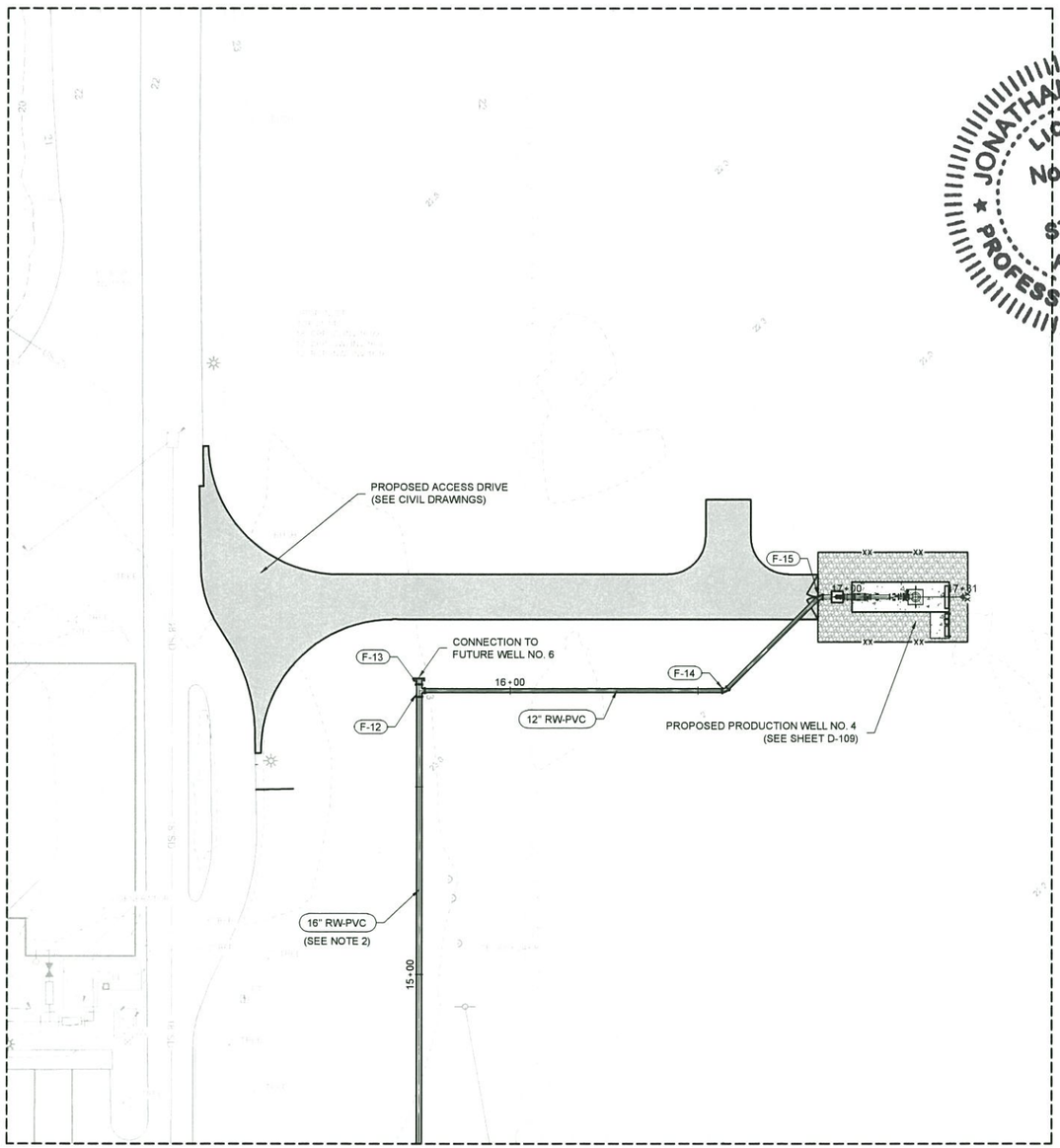
D-102

Bar Measures 1 inch, otherwise drawing not to scale

6/18/2020 9:45:54 AM - O:\PROJECTS\ORLANDO\IER\08507\200-08507-19001\CAD\SHEETFILES\D-101_103 YARD PIPING.DWG - EVANS, JON



2 D-101 ENLARGED PLAN
SCALE: 1" = 20'



3 D-101 ENLARGED PLAN
SCALE: 1" = 20'

NOTES:

1. SEE SHEET D-102 FOR YARD PIPING FITTING SCHEDULES AND YARD PIPING VALVE SCHEDULE.
2. SEE SHEETS D-104 THRU D-108 FOR RAW WATER PLAN AND PROFILE.

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SCALE: 1" = 20'

JONATHAN C. BUNDY
LICENSE
No. 62581
STATE OF FLORIDA
PROFESSIONAL ENGINEER
6/17/20

BID SET

MARK	DATE	DESCRIPTION	BY

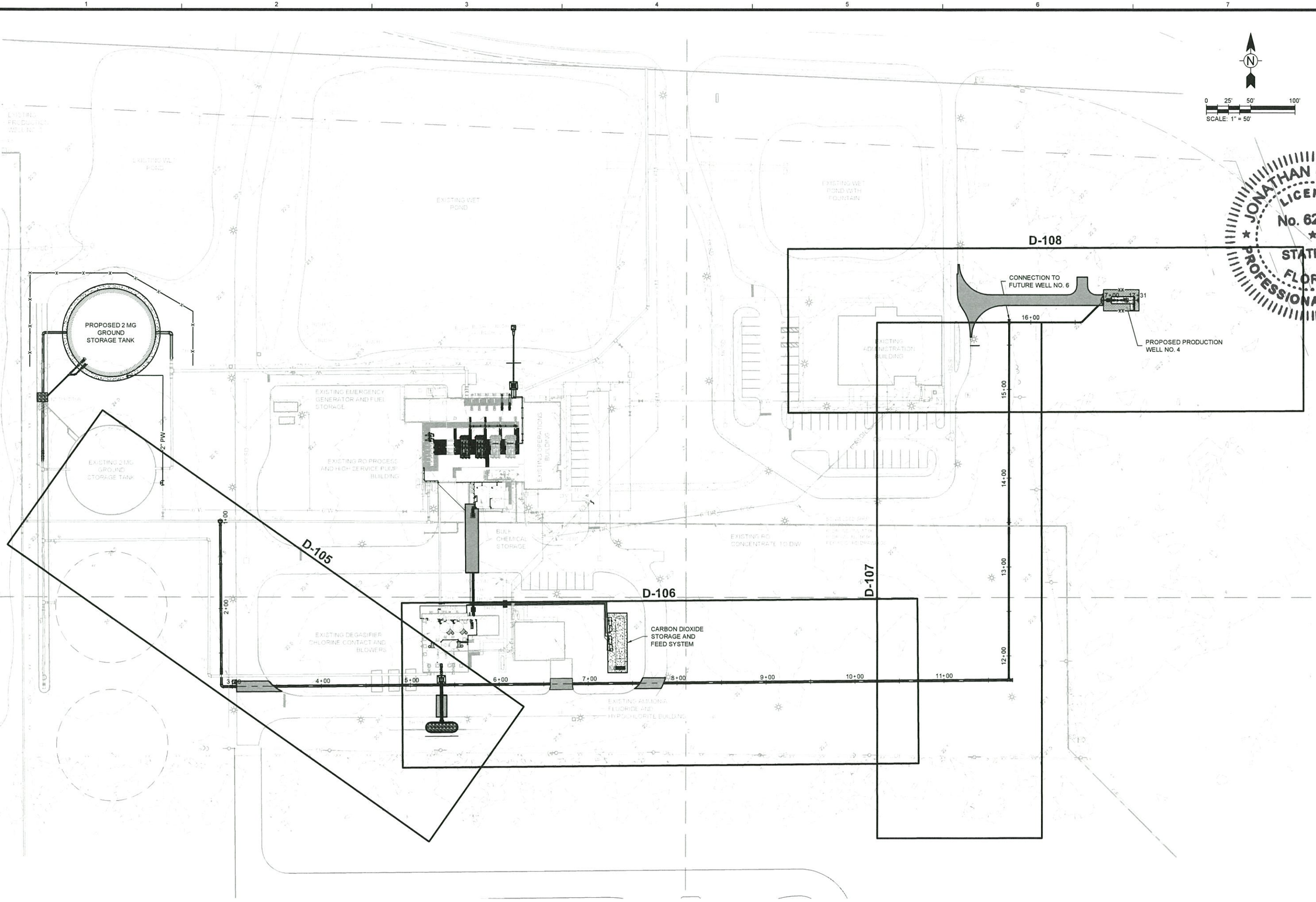
CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT
PLANT EXPANSION - 4-MGD TO 6-MGD

ENLARGED YARD PIPING PLAN

PROJ: 200-08507-19001
DESN:
DRWN: CIS
CHKD:

D-103

Bar Measures 1 inch, otherwise drawing not to scale



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JONATHAN C. BUDD
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PROFESSIONAL ENGINEER
6/19/20

MARK	DATE	DESCRIPTION

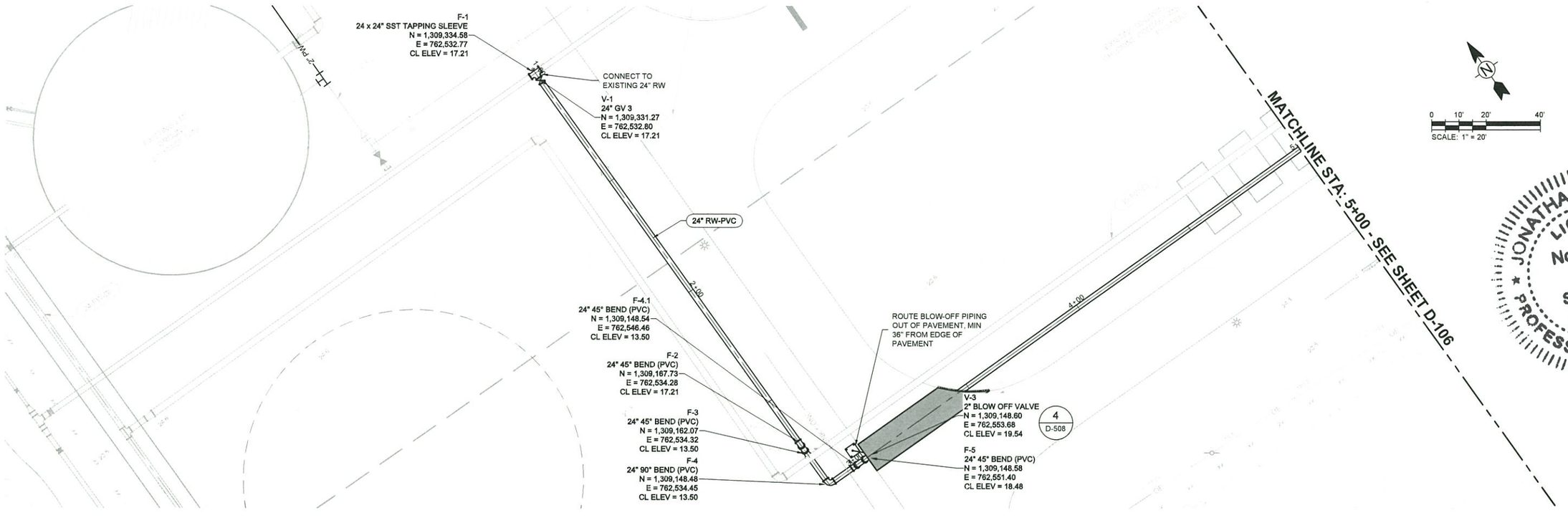
CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

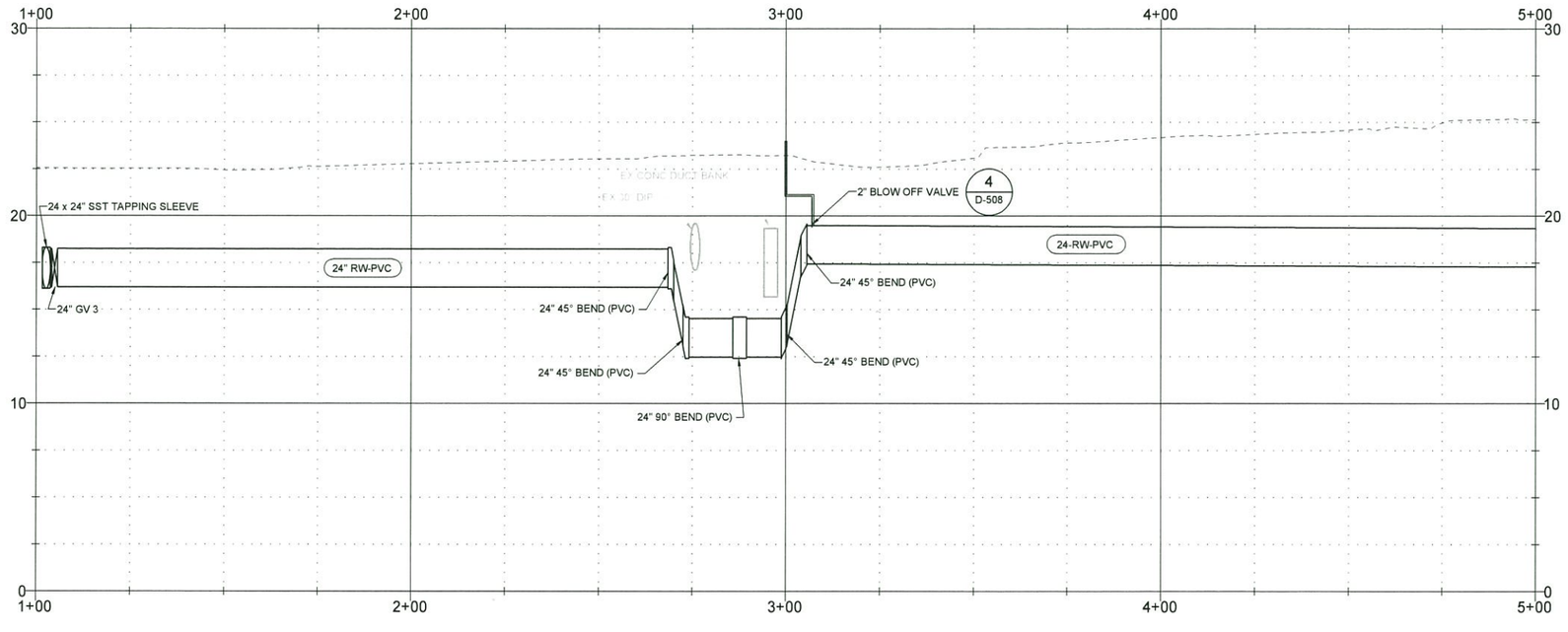
RAW WATER PLAN AND PROFILE KEY MAP

PROJ:	200-08507-19001
DESN:	
DRWN:	CIS
CHKD:	

D-104

Bar Measures 1 inch, otherwise drawing not to scale





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PROFESSIONAL ENGINEER

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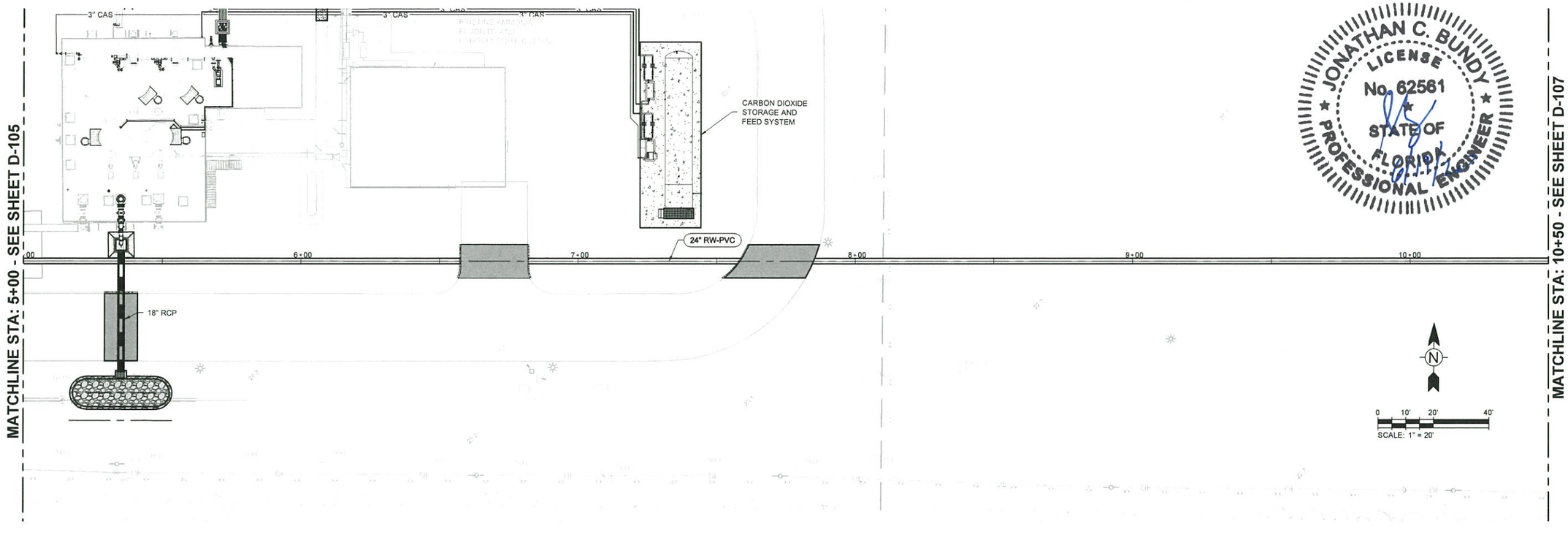
CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

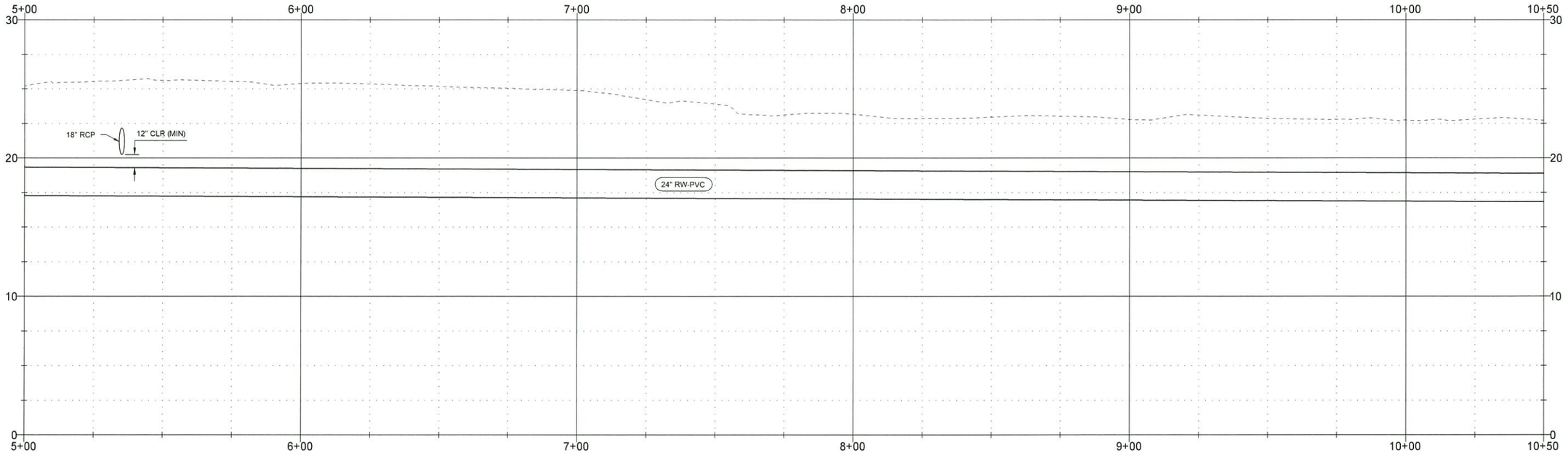
RAW WATER PLAN AND PROFILE

PROJ: 200-08507-19001
DESN:
DRWN: CIS
CHKD:

D-105

Bar Measures 1 inch, otherwise drawing not to scale





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CITY OF PALM BAY

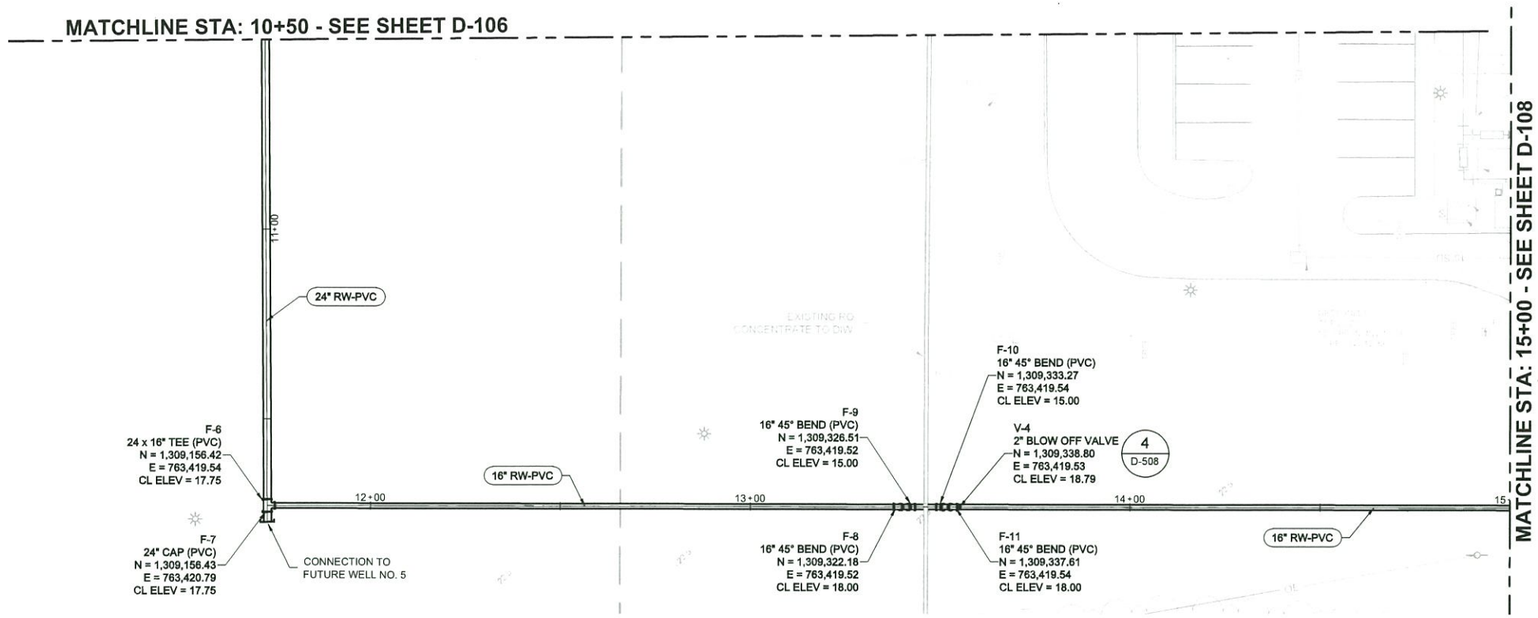
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

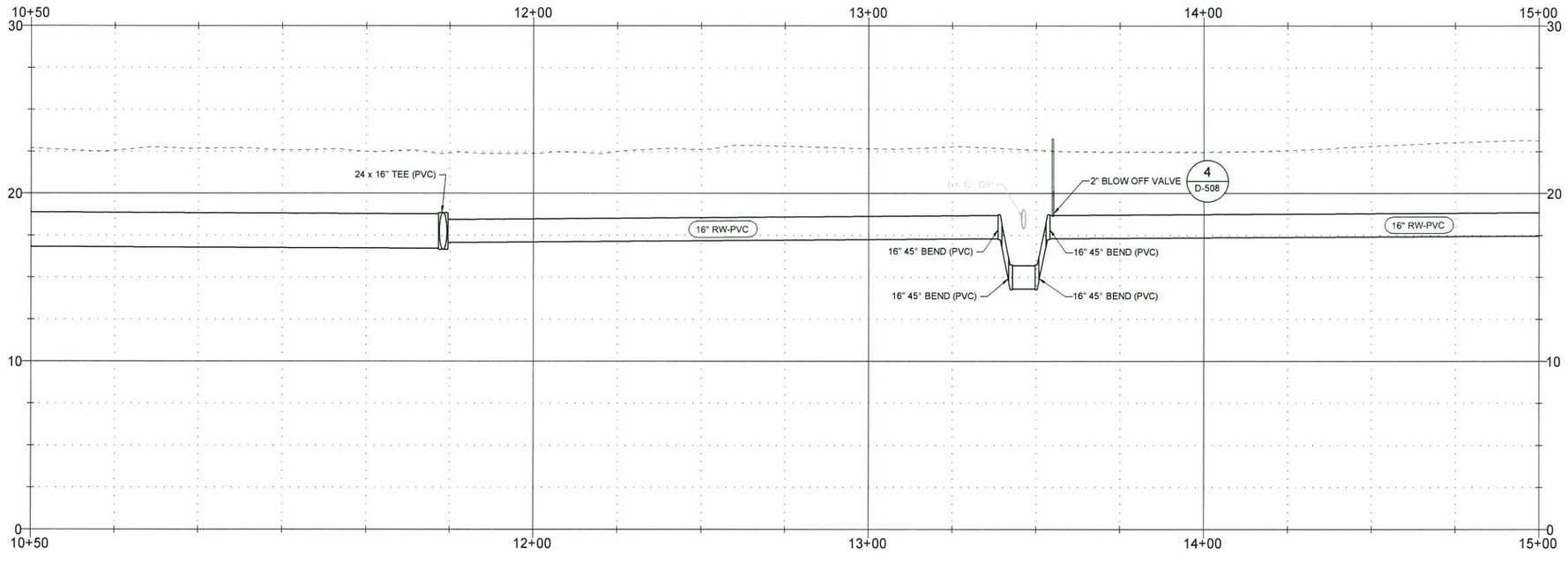
RAW WATER PLAN AND PROFILE

PROJ:	200-08507-19001
DESN:	
DRWN:	CIS
CHKD:	

D-106

Bar Measures 1 inch, otherwise drawing not to scale





0 10' 20' 40'
SCALE: 1" = 20'

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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT
PLANT EXPANSION - 4-MGD TO 6-MGD
RAW WATER
PLAN AND PROFILE

PROJ:	200-08507-19001
DESN:	
DRWN:	CIS
CHKD:	

D-107

Bar Measures 1 inch, otherwise drawing not to scale

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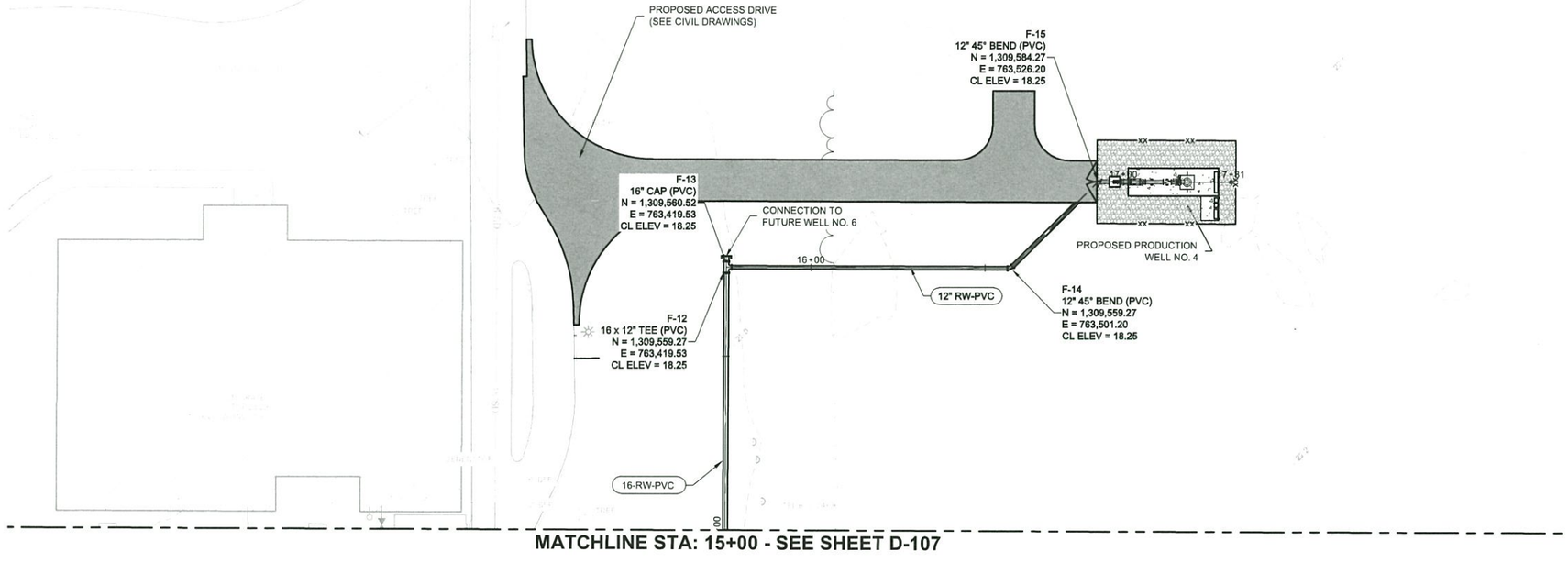
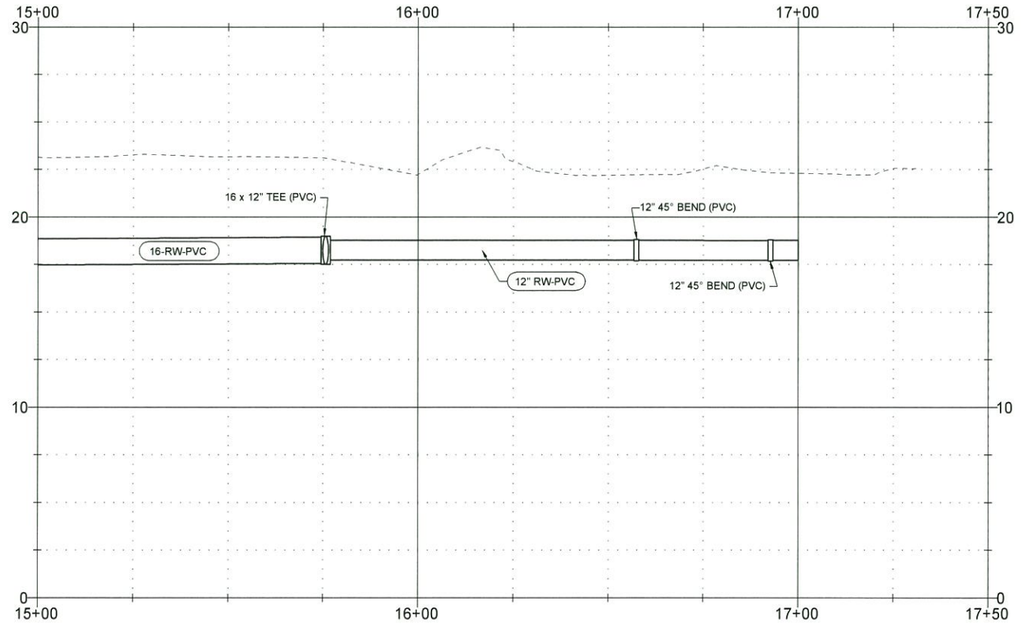
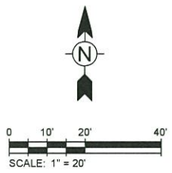


MATCHLINE STA: 15+00 - SEE SHEET D-107





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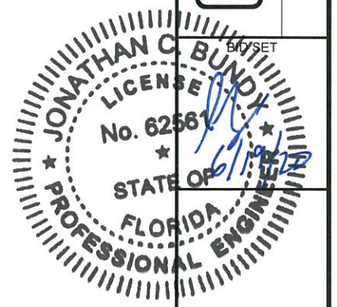

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CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT
PLANT EXPANSION - 4-MGD TO 6-MGD

RAW WATER PLAN AND PROFILE

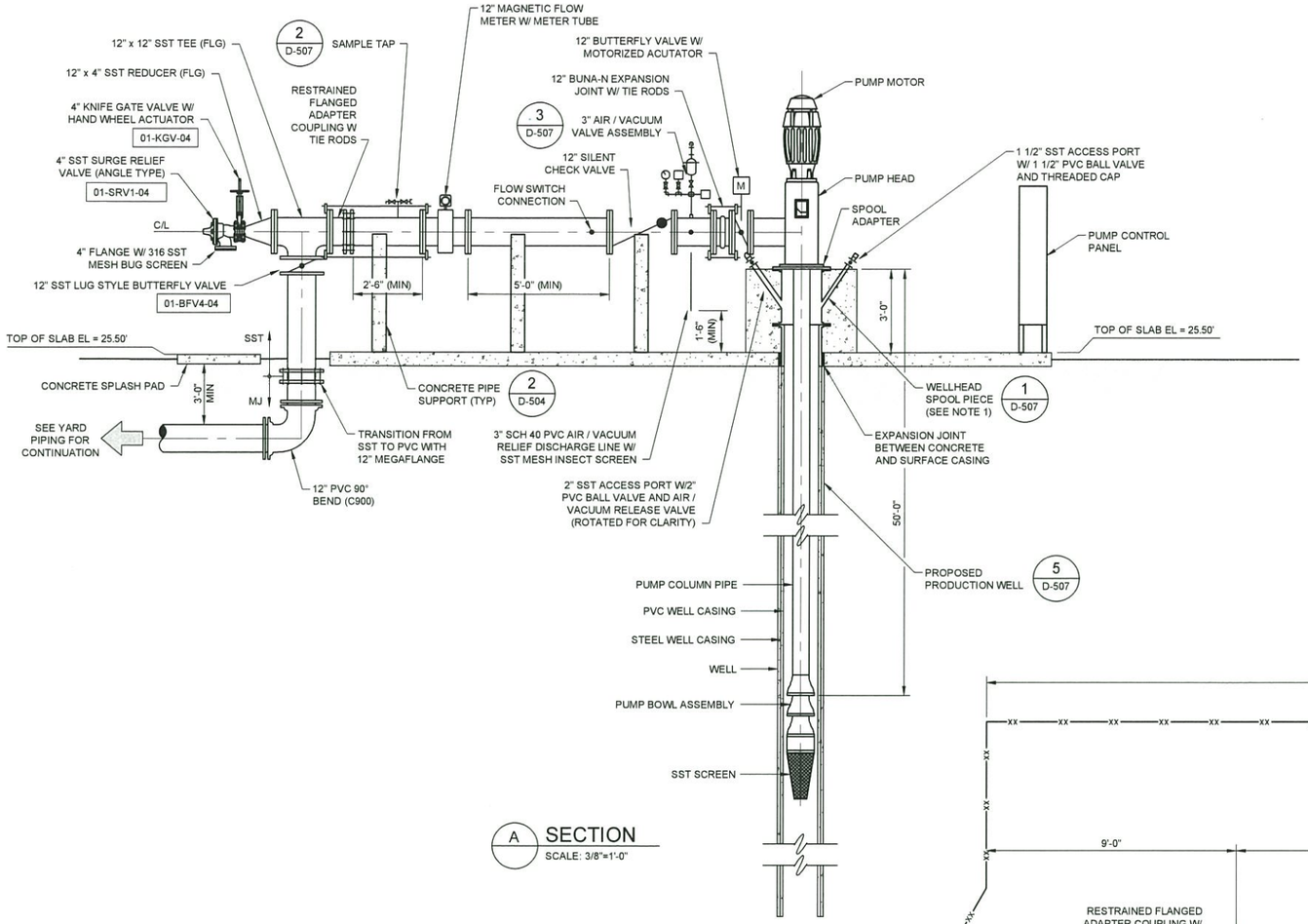
PROJ:	200-08507-19001
DESN:	
DRWN:	CIS
CHKD:	

D-108

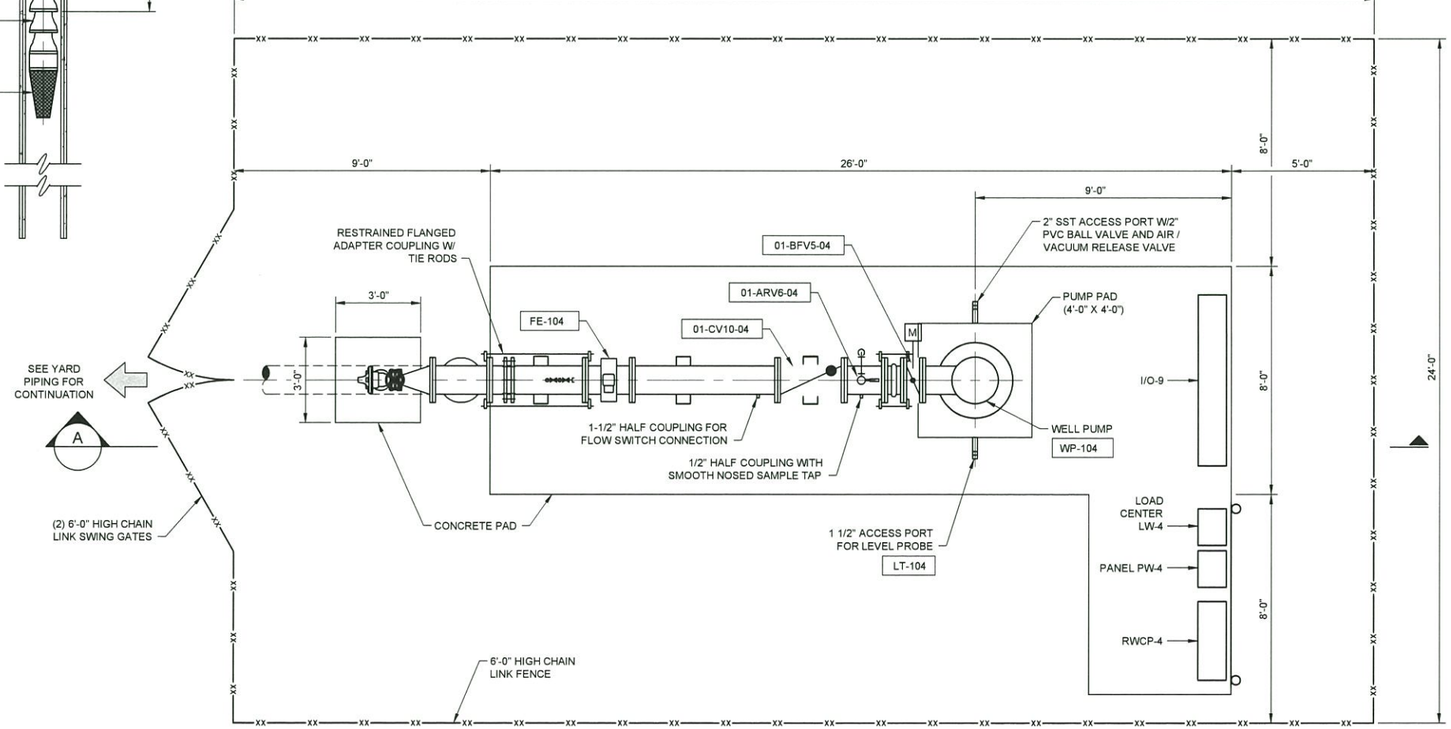
Bar Measures 1 inch, otherwise drawing not to scale

NOTES:

1. CONTRACTOR TO REMOVE EXISTING FLANGE AND INSTALL NEW FLANGE.



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



N

0 1'-4" 2'-8" 5'-4"
SCALE: 3/8" = 1'-0"

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

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LICENSE
No. 62561
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PROFESSIONAL ENGINEER

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
RAW WATER PRODUCTION WELL PLAN & SECTION

PROJ: 200-08507-19001
DESN:
DRWN:
CHKD:

D-109

Bar Measures 1 inch, otherwise drawing not to scale

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MOTOR CONTROL CENTER

HIGH SERVICE PUMP ROOM

2 D-112

OPERATIONS AREA

3 D-114

4 D-114

RO SKID AREA

1 D-111

MICRON FILTER AREA

ANTISCALANT AND PHOSPHATE FEED ROOM

SULFURIC ACID FEED ROOM

SODIUM HYDROXIDE FEED ROOM

STORAGE ROOM

5 D-118

SULFURIC ACID BULK STORAGE

SODIUM HYDROXIDE BULK STORAGE

OVERALL EQUIPMENT PLAN

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

0 4' 8' 16'

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

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PROFESSIONAL ENGINEER

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

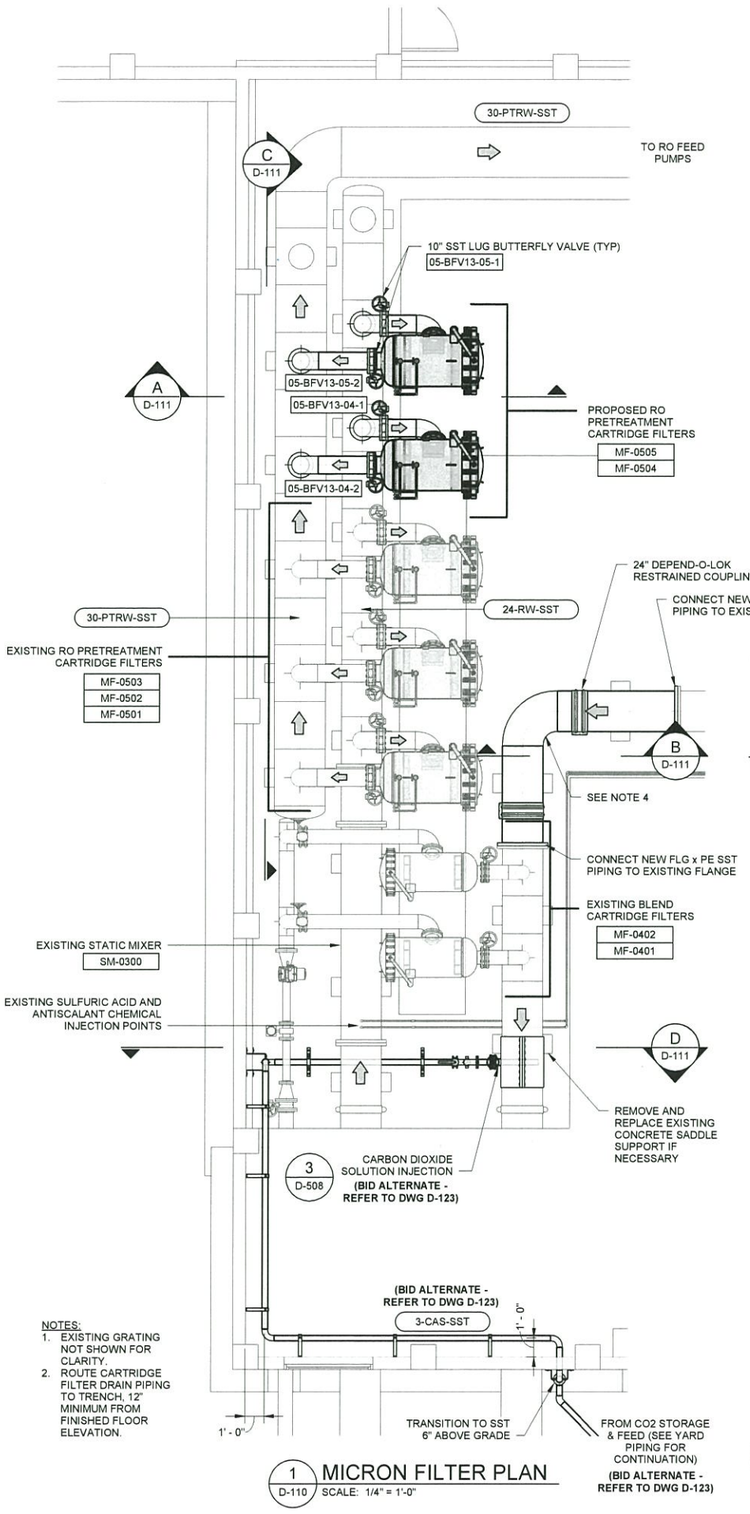
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

RO BUILDING - OVERALL EQUIPMENT PLAN

PROJ:	200-08507-18001
DESN:	JCR
DRWN:	JTE
CHKD:	JCB

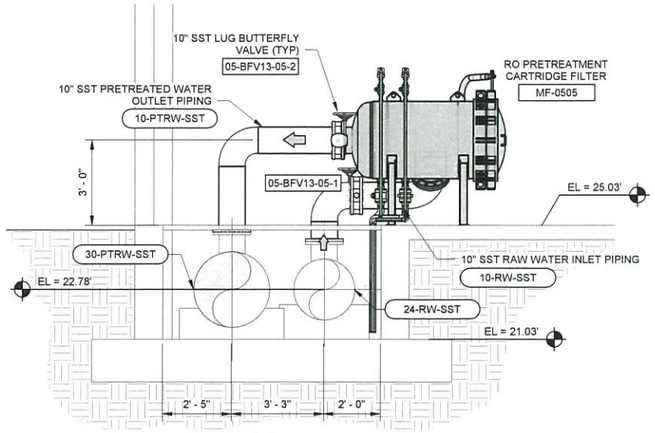
D-110

Bar measures 1 inch, otherwise drawing is not to scale

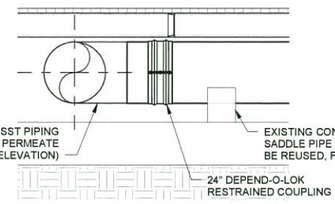


NOTES:
1. EXISTING GRATING NOT SHOWN FOR CLARITY.
2. ROUTE CARTRIDGE FILTER DRAIN PIPING TO TRENCH, 12" MINIMUM FROM FINISHED FLOOR ELEVATION.

1 D-110 **MICRON FILTER PLAN**
SCALE: 1/4" = 1'-0"

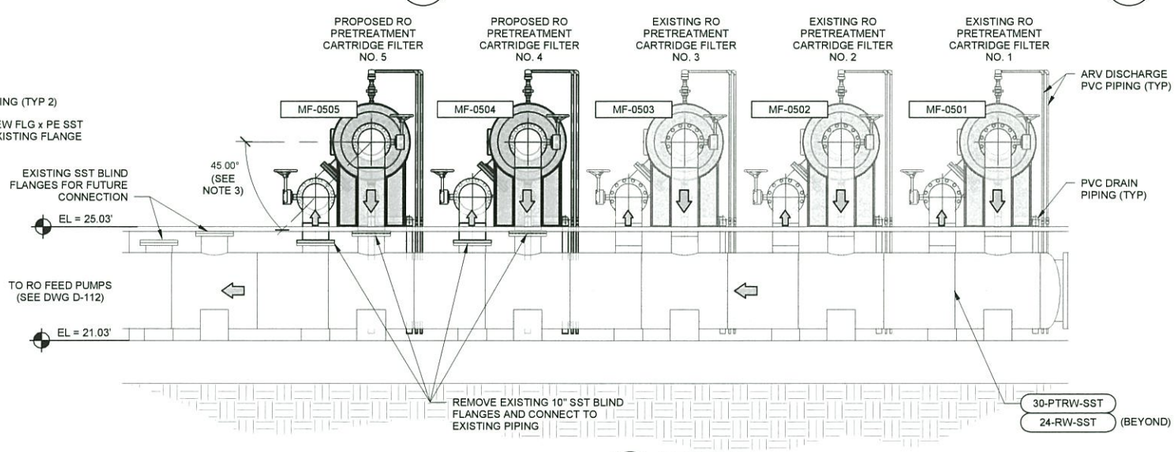


A D-111 **SECTION**
SCALE: 3/8" = 1'-0"

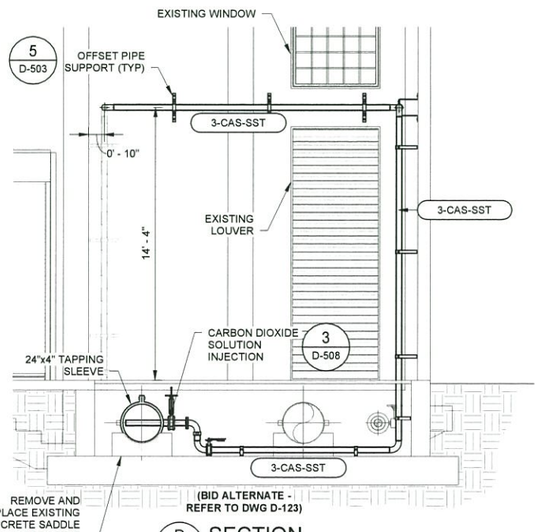


B D-111 **SECTION**
SCALE: 3/8" = 1'-0"

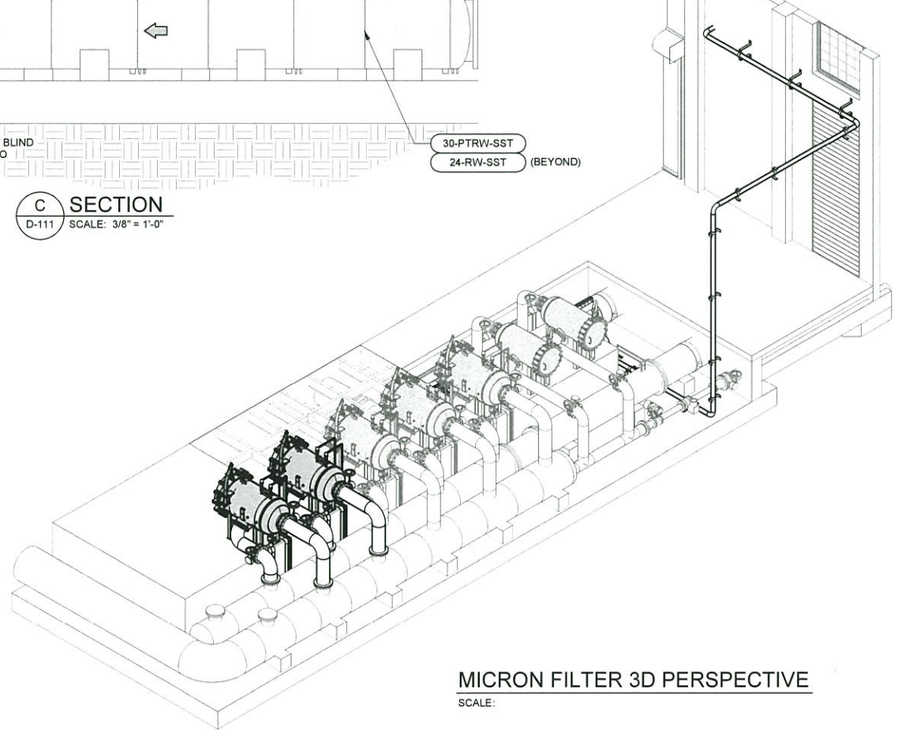
NOTES:
1. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING PIPING CONNECTION SIZES AND LOCATIONS PRIOR TO SUBMITTAL OF SHOP DRAWINGS.
2. FIELD WELDING OF STAINLESS STEEL PIPING SHALL NOT BE PERMITTED.
3. INLET NOZZLE SHALL BE INSTALLED AT A 45° ANGLE.
4. REMOVE AND REPLACE EXISTING 24-INCH PVC PIPING AND 90° ELBOW WITH A FABRICATED STAINLESS STEEL PIPE SECTION. STAINLESS STEEL SECTION SHALL MAKE REPLACEMENT OF THE 24-INCH PVC PERMEATE LINE FROM THE FLANGE OF THE CHEMICAL INJECTION SPOOL TO THE NEXT FLANGE CONNECTION LOCATED DOWNSTREAM OF THE 90° ELBOW AND SHALL CONSIST OF TWO (2) STAINLESS STEEL FLANGE BY PLAIN END SPOOL PIECES CONNECTED TO THE 90° ELBOW WITH STAINLESS STEEL DEPEND-O-LOK COUPLINGS. CONTRACTOR SHALL FIELD MEASURE ALL DIMENSIONS PRIOR TO SHOP DRAWING SUBMITTAL . CONTRACTOR SHALL MINIMIZE PLANT SHUTDOWN TIME FOR REPAIRS AND COORDINATE WITH OWNER PRIOR TO BEGINNING WORK. CONTRACTOR TO REMOVE AND REPLACE PRIOR TO INSTALLATION OF NEW GRATING.



C D-111 **SECTION**
SCALE: 3/8" = 1'-0"



D D-111 **SECTION**
SCALE: 1/4" = 1'-0"



MICRON FILTER 3D PERSPECTIVE
SCALE:

TETRA TECH
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BID SET

JONATHAN C. BUNDY
LICENSE
No. 62561
STATE OF FLORIDA
PROFESSIONAL ENGINEER

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
RO BUILDING - MICRON FILTER AREA PLAN & SECTIONS

PROJ:	200-08507-18001
DESN:	JCR
DRWN:	JTE
CHKD:	JCB

D-111

6/17/2020 3:16:28 PM BIM 360://200-08507-19001 Palm Bay RO Expansion/08507-ROBLDG-D-2019.rvt

Bar measures 1 inch, otherwise drawing is not to scale

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

36-FW-DI (EXISTING)

#57 STONE AROUND AIR GAP STRUCTURE (SEE CIVIL)

18" ADS STORM PIPING (SEE CIVIL DWGS FOR CONTINUATION)

D-113

ROPW AIR GAP STRUCTURE (SEE STRUCT DWGS)

ROPW PIPING CONC PAD (SEE STRUCT DWGS)

3' - 6" SQ

REMOVE EXISTING 12" MJ (RESTRAINED) PLUG AND CONNECT TO EXISTING TEE

A D-113

EXISTING HIGH SERVICE PUMPS

REMOVE EXISTING 12" BLIND FLANGE AND CONNECT TO EXISTING PIPING WITH SPOOL PIECE

NEW HIGH SERVICE PUMPS

CONC SADDLE PIPE SUPPORT (TYP) 2 D-504

30-PW-DI

(EXISTING VENTURI METER VAULT NOT SHOWN)

11' - 5"

12' - 0"

MASONRY WALL PENETRATION (TYP) 5 D-502

10-ROPW-PVC

1' - 0"

12" FLG 90° BEND

MASONRY WALL PENETRATION (TYP 2)

3/4" COUPLING FOR FLOW SWITCH (TYP)

13-BFV6-05-2
13-CV2-05
13-ARV3-05

13-BFV6-06-2
13-CV2-06
13-ARV3-06

1' - 0"

RELOCATED EXISTING SPARE PUMP (NOW HPP-0603)

REMOVE EXISTING PLATE CAP FOR PUMP INSTALLATION (TYP 2)

KNEE BRACE PIPE SUPPORT (TYP) 4 D-504

HSP-1301 HSP-1302 HSP-1303 HSP-1304 HSP-1305 HSP-1306

10" RO PERMEATE WASTE PIPING TO POND. SEE DWG D-114 FOR CONTINUATION

10-ROPW-PVC

EXISTING PUMP PAD FOR FUTURE RO FEED PUMP HPP-0605

HPP-0604 HPP-0603 HPP-0602 HPP-0601

NEW RO FEED PUMP

10" LUG DUAL-DISC CHECK VALVE (TYP 2)

06-CV1-04

10" LUG SST BUTTERFLY VALVES W/ OPEN/CLOSE LIMIT SWITCHES (TYP 2)

06-BFV4-04-2

06-CV1-03

06-BFV4-03-2

10-ROF-SST

10-ROF-SST

INSTALL OPEN/CLOSE LIMIT SWITCHES ON EXISTING BUTTERFLY VALVE ACTUATORS (TYP 2)

INSTALL 10" SST TEE ON EXISTING RO FEED PUMP DISCHARGE LINE (TYP 2), SEE NOTE 4.

C D-113

10" SST INTERCONNECT

10-ROF-SST

1' - 0"

MASONRY WALL PENETRATION (TYP 2)

EXISTING ELECTRICAL PANELS (TO BE RELOCATED AS NECESSARY) (TYP 2) (REFER TO ELECTRICAL DRAWINGS FOR DETAILS)

GROOVED JOINT COUPLING FOR FIELD ASSEMBLY OF PIPING (TYP 7)

B D-113

2 PUMP ROOM
2 D-110 SCALE: 1/4" = 1'-0"

NOTES:
1. CONTRACTOR TO VERIFY HIGH SERVICE PUMP CAN / DISCHARGE PIPING ALIGNMENTS WITH THE HEADER POINTS OF CONNECTION.
2. CONTRACTOR TO LOCATE AND VERIFY DEPTH AND TYPE OF CONNECTION AT HIGH SERVICE PUMP HEADER.
3. CONTRACTOR TO VERIFY EXISTING RO FEED PUMP AND HIGH SERVICE PUMP CAN DIMENSIONS AND BOLT HOLE PATTERN.
4. NO FIELD WELDING ALLOWED. REPLACE EXISTING SST SPOOL PIECE AS REQUIRED.

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BID SET

JONATHAN C. BUNDY
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No. 62561
STATE OF FLORIDA
PROFESSIONAL ENGINEER

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

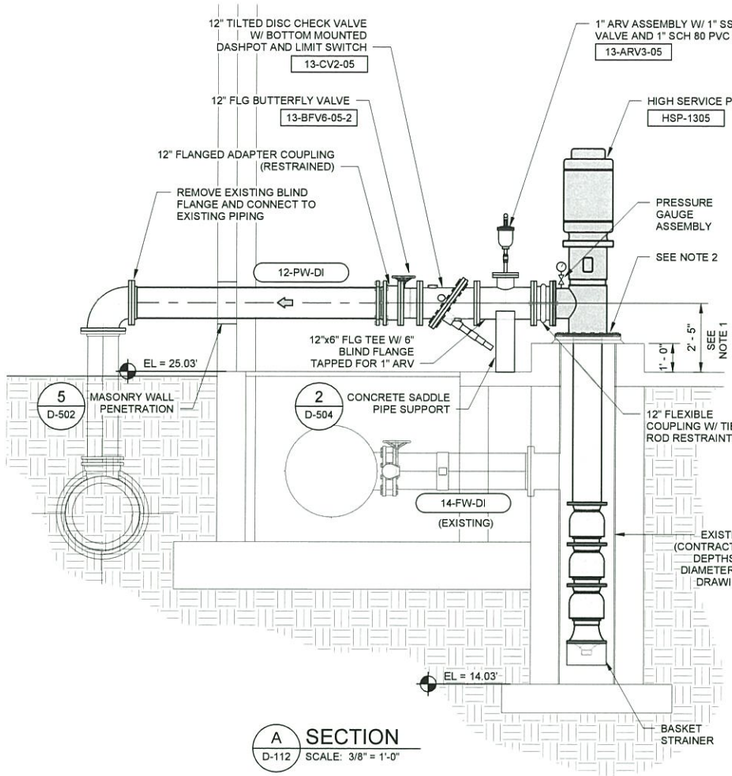
RO BUILDING - HIGH SERVICE PUMP ROOM PLAN

PROJ:	200-08507-18001
DESN:	TLM
DRWN:	JTE
CHKD:	JCB

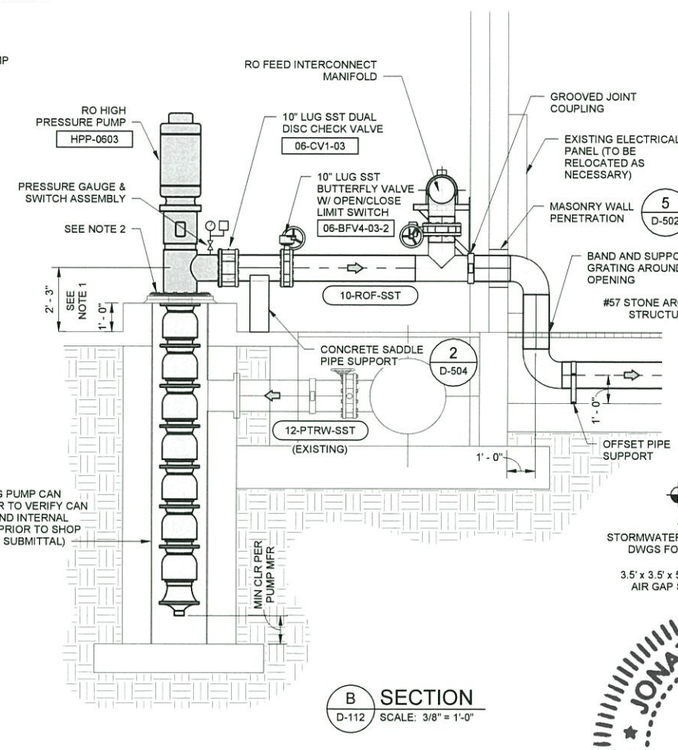
D-112

6/16/2020 11:52:06 AM BIM 360://200-08507-19001 Palm Bay RO Expansion/08507-ROBLDG-D-2019.rvt

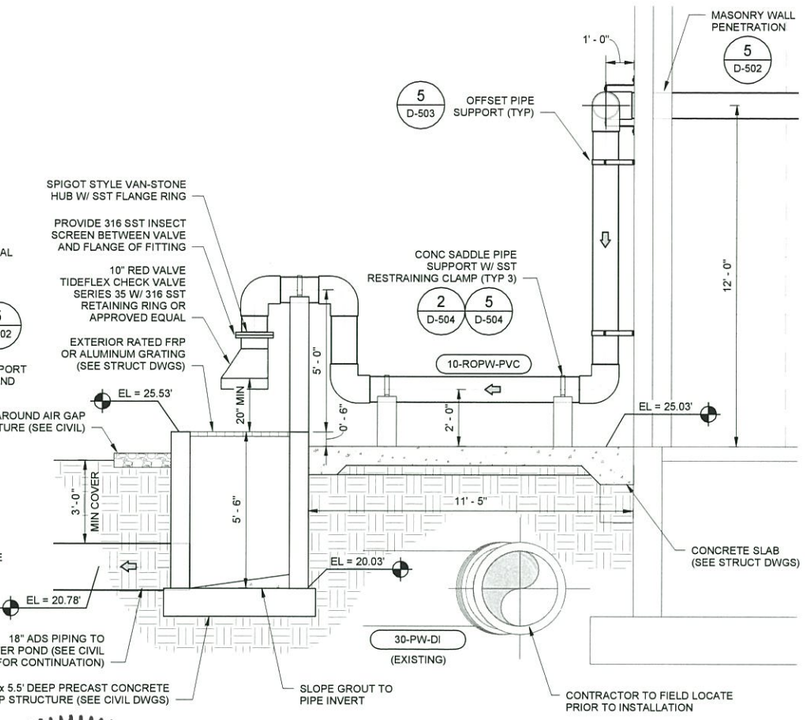
Bar measures 1 inch, otherwise drawing is not to scale



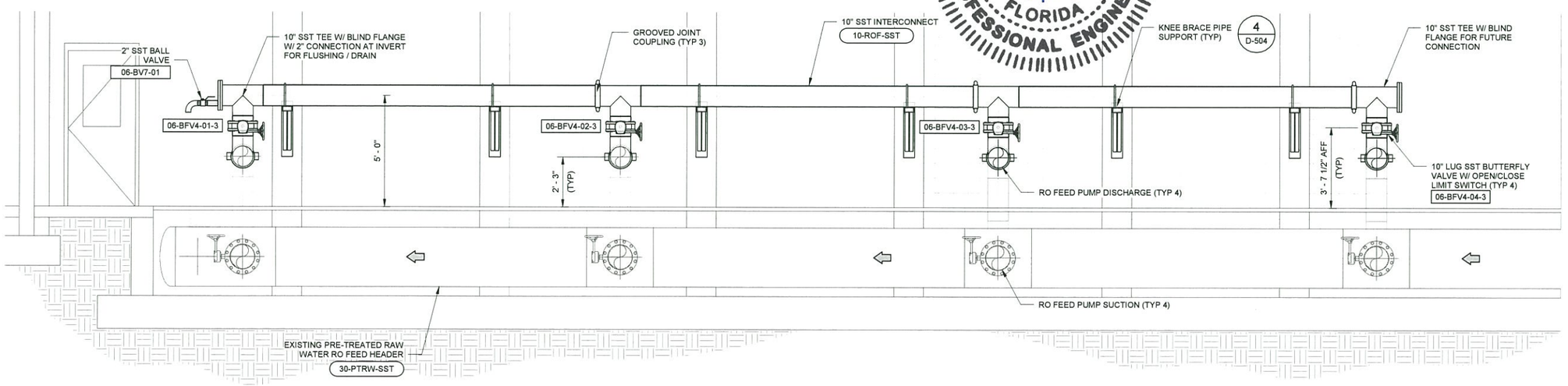
A SECTION
D-112 SCALE: 3/8" = 1'-0"



B SECTION
D-112 SCALE: 3/8" = 1'-0"



D SECTION
D-112 SCALE: 3/8" = 1'-0"



C SECTION
D-112 SCALE: 3/8" = 1'-0"

NOTES:
1. CONTRACTOR TO VERIFY HIGH SERVICE PUMP CAN / DISCHARGE PIPING ALIGNMENTS WITH THE HEADER POINTS OF CONNECTION.
2. CONTRACTOR TO VERIFY EXISTING BOLT HOLE PATTERN AND COORDINATE W/ PUMP MFR.

JONATHAN C. BUNDY LICENSE No. 62561 STATE OF FLORIDA PROFESSIONAL ENGINEER
6/19/20

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BID SET

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
RO BUILDING - HIGH SERVICE PUMP ROOM SECTIONS

PROJ:	200-08507-18001
DESN:	TLM
DRWN:	JTE
CHKD:	JCB

D-113

BIM 360://200-08507-19001 Palm Bay RO Expansion\08507-ROBLDG-D-2019.rvt
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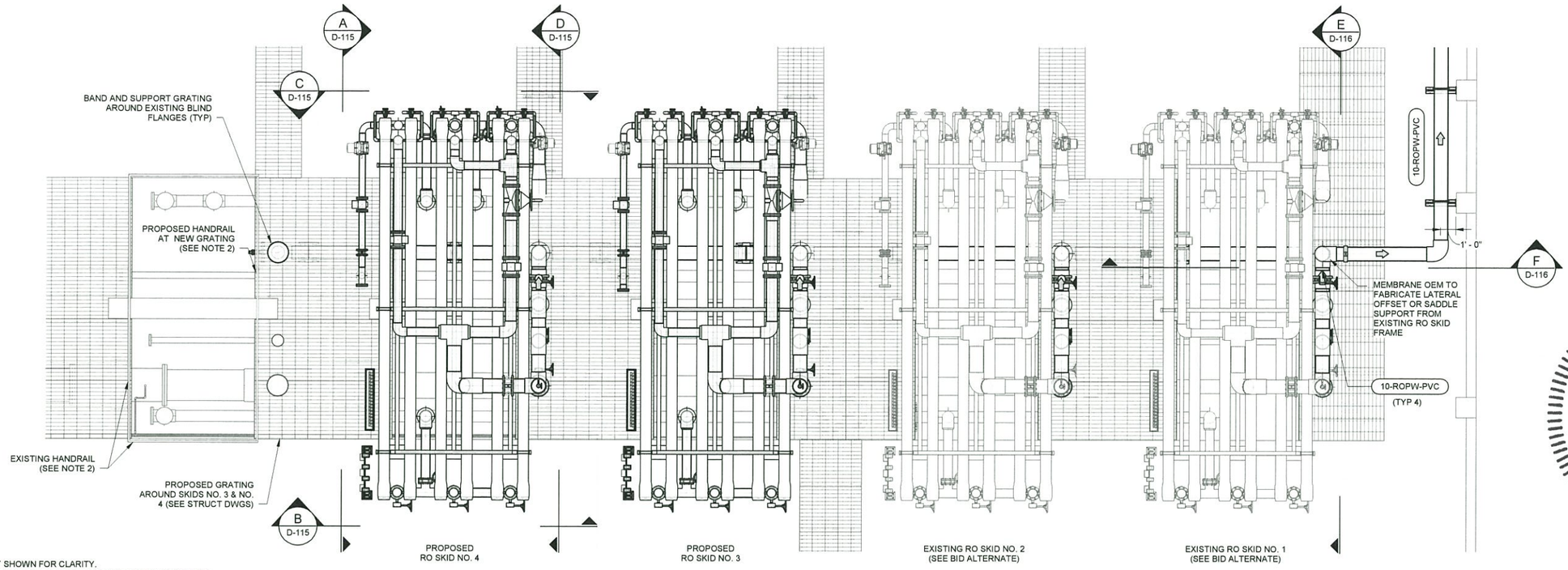
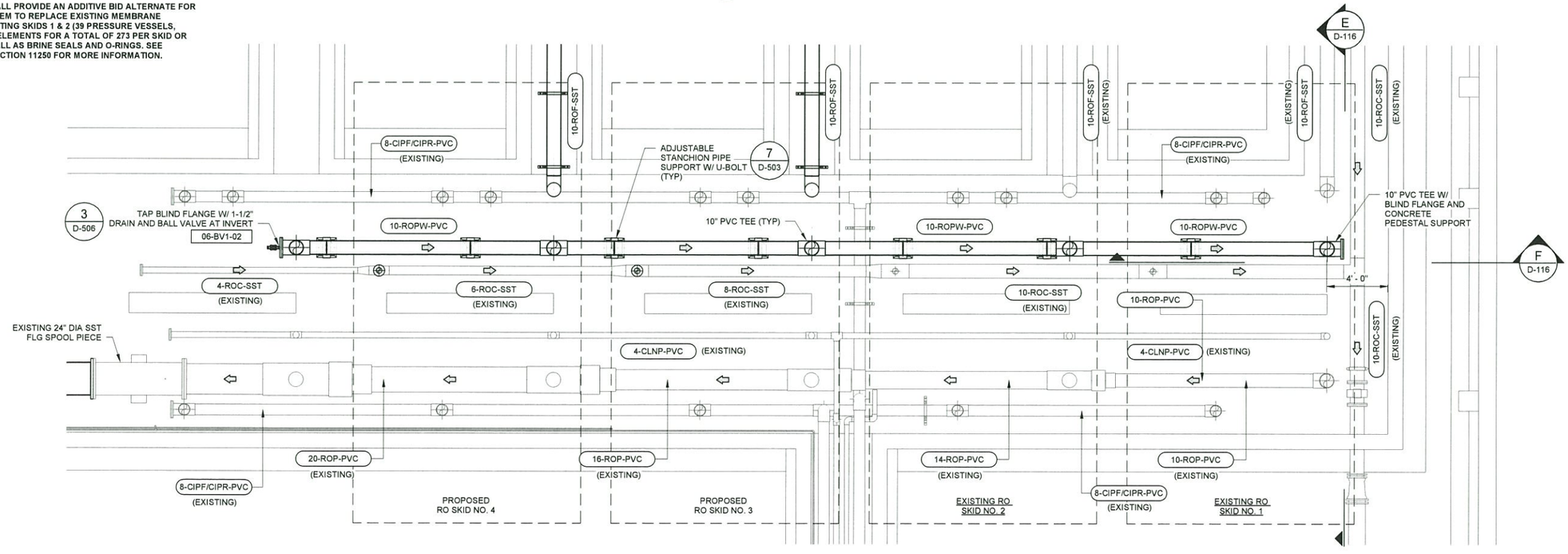
Bar measures 1 inch, otherwise drawing is not to scale



3 D-110 RO SKID AREA
SCALE: 1/4" = 1'-0"



4 D-112 RO SKID TRENCH
SCALE: 1/4" = 1'-0"

NOTE:
1. PIPE SUPPORTS NOT SHOWN FOR CLARITY.
2. SEE STRUCTURAL DRAWINGS FOR EXISTING HANDRAIL REMOVAL AND MODIFICATIONS.

BID ALTERNATE:

CONTRACTOR SHALL PROVIDE AN ADDITIVE BID ALTERNATE FOR THE MEMBRANE OEM TO REPLACE EXISTING MEMBRANE ELEMENTS IN EXISTING SKIDS 1 & 2 (39 PRESSURE VESSELS, EACH HOUSING 7 ELEMENTS FOR A TOTAL OF 273 PER SKID OR 546 TOTAL), AS WELL AS BRINE SEALS AND O-RINGS. SEE SPECIFICATION SECTION 11250 FOR MORE INFORMATION.

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BID SET

JONATHAN C. BUNDY
LICENSE
No. 62561
STATE OF FLORIDA
PROFESSIONAL ENGINEER
6/19/20

MARK	DATE	DESCRIPTION	BY

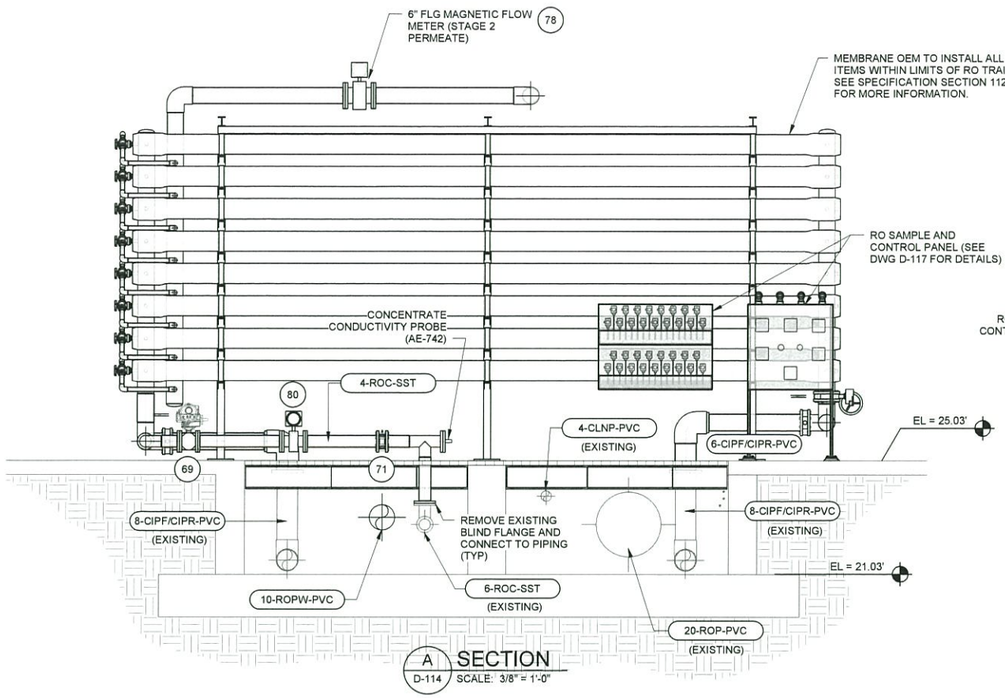
CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
RO BUILDING - RO SKID AREA PLANS

PROJ:	200-08507-18001
DESN:	JCR
DRWN:	JTE
CHKD:	JCB

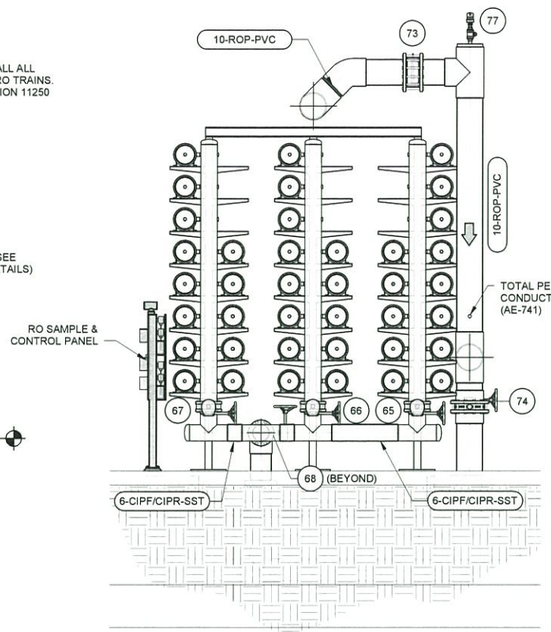
D-114

6/16/2020 11:52:22 AM BIM 360://200-08507-19001 Palm Bay RO Expansion\08507-ROBLDG-D-2019.rvt

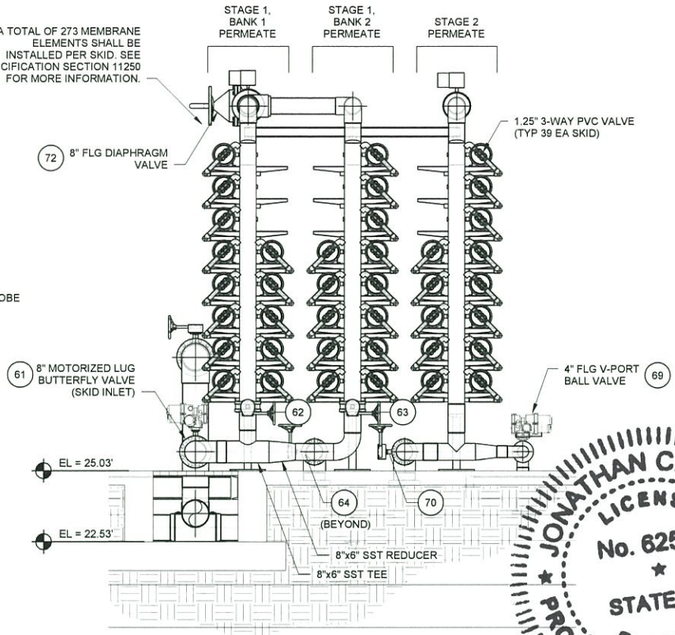
Bar measures 1 inch, otherwise drawing is not to scale



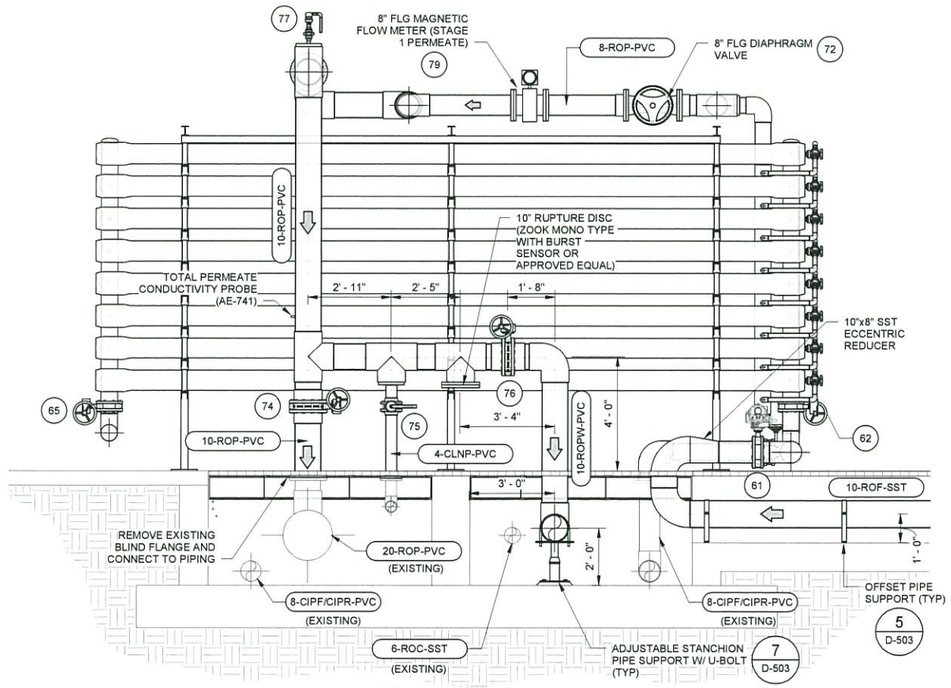
A SECTION
D-114 SCALE: 3/8" = 1'-0"



B SECTION
D-114 SCALE: 3/8" = 1'-0"



C SECTION
D-114 SCALE: 3/8" = 1'-0"



D SECTION
D-114 SCALE: 3/8" = 1'-0"

RO SKIDS VALVE & PIPE ACCESSORY TABLE

NUMBER	DESCRIPTION	COMMENTS	TAG NUMBER
1	8" LUG BUTTERFLY VALVE	RO SKID NO. 1 (EXISTING)	FWCV-1
2	6" LUG BUTTERFLY VALVE	RO SKID NO. 1 (EXISTING)	07-BFV4-11-1
3	6" LUG BUTTERFLY VALVE	RO SKID NO. 1 (EXISTING)	07-BFV4-11-2
4	6" LUG BUTTERFLY VALVE	RO SKID NO. 1 (EXISTING)	07-BFV4-11-3
5	6" LUG BUTTERFLY VALVE	RO SKID NO. 1 (EXISTING)	07-BFV4-12-1
6	6" LUG BUTTERFLY VALVE	RO SKID NO. 1 (EXISTING)	07-BFV4-12-2
7	6" LUG BUTTERFLY VALVE	RO SKID NO. 1 (EXISTING)	07-BFV4-12-3
8	6" LUG BUTTERFLY VALVE	RO SKID NO. 1 (EXISTING)	07-BFV4-12-4
9	4" FLG V-PORT BALL VALVE	RO SKID NO. 1 (EXISTING)	CCV-1
10	6" LUG BUTTERFLY VALVE	RO SKID NO. 1 (EXISTING)	07-BFV4-13
11	4" WAFER DUAL DISC CHECK VALVE	RO SKID NO. 1 (EXISTING)	07-CV8-13
12	8" FLG PVC DIAPHRAGM VALVE	RO SKID NO. 1 (EXISTING)	07-DV3-14
13	10" WAFER DUAL DISC CHECK VALVE	RO SKID NO. 1 (EXISTING)	07-CV8-15
14	1" NON-METALLIC AIR RELEASE VALVE	RO SKID NO. 1 (EXISTING)	07-ARV4-15
15	10" WAFER BUTTERFLY VALVE	RO SKID NO. 1 (EXISTING)	07-BFV9-15-1
16	4" WAFER BUTTERFLY VALVE	RO SKID NO. 1 (EXISTING)	07-BFV9-15-2
17	10" WAFER BUTTERFLY VALVE	RO SKID NO. 1	07-BFV9-15-3
18	6" FLG MAGNETIC FLOW METER	RO SKID NO. 1 (EXISTING)	FE-711
19	8" FLG MAGNETIC FLOW METER	RO SKID NO. 1 (EXISTING)	FE-712
20	4" FLG MAGNETIC FLOW METER	RO SKID NO. 1 (EXISTING)	FE-713
21	8" LUG BUTTERFLY VALVE	RO SKID NO. 2 (EXISTING)	FWCV-2
22	6" LUG BUTTERFLY VALVE	RO SKID NO. 2 (EXISTING)	07-BFV4-21-1
23	6" LUG BUTTERFLY VALVE	RO SKID NO. 2 (EXISTING)	07-BFV4-21-2
24	6" LUG BUTTERFLY VALVE	RO SKID NO. 2 (EXISTING)	07-BFV4-21-3
25	6" LUG BUTTERFLY VALVE	RO SKID NO. 2 (EXISTING)	07-BFV4-22-1
26	6" LUG BUTTERFLY VALVE	RO SKID NO. 2 (EXISTING)	07-BFV4-22-2
27	6" LUG BUTTERFLY VALVE	RO SKID NO. 2 (EXISTING)	07-BFV4-22-3
28	6" LUG BUTTERFLY VALVE	RO SKID NO. 2 (EXISTING)	07-BFV4-22-4
29	4" FLG V-PORT BALL VALVE	RO SKID NO. 2 (EXISTING)	CCV-2
30	6" LUG BUTTERFLY VALVE	RO SKID NO. 2 (EXISTING)	07-BFV4-23
31	4" WAFER DUAL DISC CHECK VALVE	RO SKID NO. 2 (EXISTING)	07-CV8-23
32	8" FLG PVC DIAPHRAGM VALVE	RO SKID NO. 2 (EXISTING)	07-DV3-24
33	10" WAFER DUAL DISC CHECK VALVE	RO SKID NO. 2 (EXISTING)	07-CV8-25
34	1" NON-METALLIC AIR RELEASE VALVE	RO SKID NO. 2 (EXISTING)	07-ARV4-25
35	10" WAFER BUTTERFLY VALVE	RO SKID NO. 2 (EXISTING)	07-BFV9-25-1
36	4" WAFER BUTTERFLY VALVE	RO SKID NO. 2 (EXISTING)	07-BFV9-25-2
37	10" WAFER BUTTERFLY VALVE	RO SKID NO. 2	07-BFV9-25-3
38	6" FLG MAGNETIC FLOW METER	RO SKID NO. 2 (EXISTING)	FE-721
39	8" FLG MAGNETIC FLOW METER	RO SKID NO. 2 (EXISTING)	FE-722
40	4" FLG MAGNETIC FLOW METER	RO SKID NO. 2 (EXISTING)	FE-723

RO SKIDS VALVE & PIPE ACCESSORY TABLE

NUMBER	DESCRIPTION	COMMENTS	TAG NUMBER
41	8" LUG BUTTERFLY VALVE	RO SKID NO. 3 (BFV5)	FWCV-3
42	6" LUG BUTTERFLY VALVE	RO SKID NO. 3	07-BFV4-31-1
43	6" LUG BUTTERFLY VALVE	RO SKID NO. 3	07-BFV4-31-2
44	6" LUG BUTTERFLY VALVE	RO SKID NO. 3	07-BFV4-31-3
45	6" LUG BUTTERFLY VALVE	RO SKID NO. 3	07-BFV4-32-1
46	6" LUG BUTTERFLY VALVE	RO SKID NO. 3	07-BFV4-32-2
47	6" LUG BUTTERFLY VALVE	RO SKID NO. 3	07-BFV4-32-3
48	6" LUG BUTTERFLY VALVE	RO SKID NO. 3	07-BFV4-32-4
49	4" FLG V-PORT BALL VALVE	RO SKID NO. 3	CCV-3
50	6" LUG BUTTERFLY VALVE	RO SKID NO. 3	07-BFV4-33
51	4" WAFER DUAL DISC CHECK VALVE	RO SKID NO. 3	07-CV8-33
52	8" FLG PVC DIAPHRAGM VALVE	RO SKID NO. 3	07-DV3-34
53	10" WAFER DUAL DISC CHECK VALVE	RO SKID NO. 3	07-CV8-35
54	10" WAFER BUTTERFLY VALVE	RO SKID NO. 3	07-BFV9-35-1
55	4" WAFER BUTTERFLY VALVE	RO SKID NO. 3	07-BFV9-35-2
56	10" WAFER BUTTERFLY VALVE	RO SKID NO. 3	07-BFV9-35-3
57	1" NON-METALLIC AIR RELEASE VALVE	RO SKID NO. 3	07-ARV4-35
58	6" FLG MAGNETIC FLOW METER	RO SKID NO. 3	FE-731
59	8" FLG MAGNETIC FLOW METER	RO SKID NO. 3	FE-732
60	4" FLG MAGNETIC FLOW METER	RO SKID NO. 3	FE-733
61	8" LUG BUTTERFLY VALVE	RO SKID NO. 4 (BFV5)	FWCV-4
62	6" LUG BUTTERFLY VALVE	RO SKID NO. 4	07-BFV4-41-1
63	6" LUG BUTTERFLY VALVE	RO SKID NO. 4	07-BFV4-41-2
64	6" LUG BUTTERFLY VALVE	RO SKID NO. 4	07-BFV4-41-3
65	6" LUG BUTTERFLY VALVE	RO SKID NO. 4	07-BFV4-42-1
66	6" LUG BUTTERFLY VALVE	RO SKID NO. 4	07-BFV4-42-2
67	6" LUG BUTTERFLY VALVE	RO SKID NO. 4	07-BFV4-42-3
68	6" LUG BUTTERFLY VALVE	RO SKID NO. 4	07-BFV4-42-4
69	4" FLG V-PORT BALL VALVE	RO SKID NO. 4	CCV-4
70	6" LUG BUTTERFLY VALVE	RO SKID NO. 4	07-BFV4-43
71	4" WAFER DUAL DISC CHECK VALVE	RO SKID NO. 4	07-CV8-43
72	8" FLG PVC DIAPHRAGM VALVE	RO SKID NO. 4	07-DV3-44
73	10" WAFER DUAL DISC CHECK VALVE	RO SKID NO. 4	07-CV8-45
74	10" WAFER BUTTERFLY VALVE	RO SKID NO. 4	07-BFV9-45-1
75	4" WAFER BUTTERFLY VALVE	RO SKID NO. 4	07-BFV9-45-2
76	10" WAFER BUTTERFLY VALVE	RO SKID NO. 4	07-BFV9-45-3
77	1" NON-METALLIC AIR RELEASE VALVE	RO SKID NO. 4	07-ARV4-45
78	6" FLG MAGNETIC FLOW METER	RO SKID NO. 4	FE-741
79	8" FLG MAGNETIC FLOW METER	RO SKID NO. 4	FE-742
80	4" FLG MAGNETIC FLOW METER	RO SKID NO. 4	FE-743

NOTES:
1. SECTIONS ON THIS DWG ARE OF RO SKID NO. 4. LOCATIONS OF VALVES AND APPURTENANCES FOR RO SKID NO. 3 ARE SIMILAR. SEE ACCESSORY TABLE AND PROCESS FLOW DIAGRAMS FOR COMPLETE SYSTEM INFORMATION.
2. OEM TO CONFIRM SUFFICIENT STRAIGHT PIPE LENGTHS ARE PROVIDED UPSTREAM AND DOWNSTREAM OF THE CONCENTRATE CONTROL VALVE AS RECOMMENDED BY THE VALVE MANUFACTURER.
3. PROVIDE MEANS OF SUPPORT FOR PREMEATE PIPING, VALVES AND FLOW METERS.
4. THE CONTRACTOR SHALL COORDINATE THE LOCATIONS OF TRENCH PIPING CONNECTIONS TO THE RO TREATMENT SKIDS WITH THE SKID DESIGN BY THE MEMBRANE OEM.
5. TERMINATE SAMPLE PANEL DRAIN LINES JUST ABOVE FLOOR DRAINS IN THE TRENCH BELOW.

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BID SET

JONATHAN C. BUNDY
LICENSE
No. 62561
STATE OF FLORIDA
PROFESSIONAL ENGINEER

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

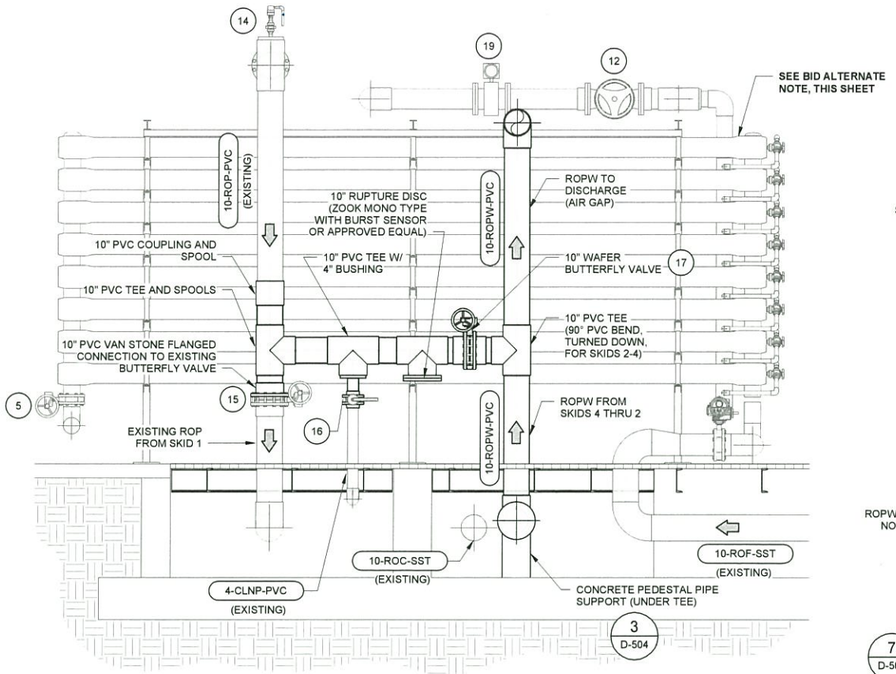
RO BUILDING - RO SKID AREA SECTIONS

PROJ: 200-08507-18001
DESN: JCR
DRWN: JTE
CHKD: JCB

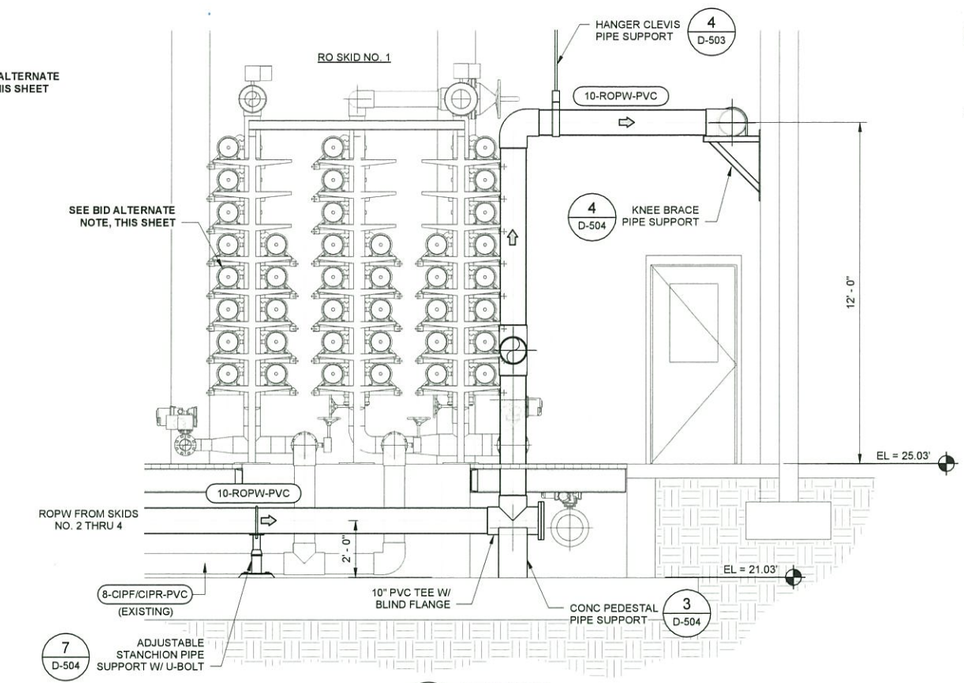
D-115

6/16/2020 11:52:30 AM BIM 360://200-08507-19001 Palm Bay RO Expansion/08507-ROBLDG-D-2019.rvt

Bar measures 1 inch, otherwise drawing is not to scale

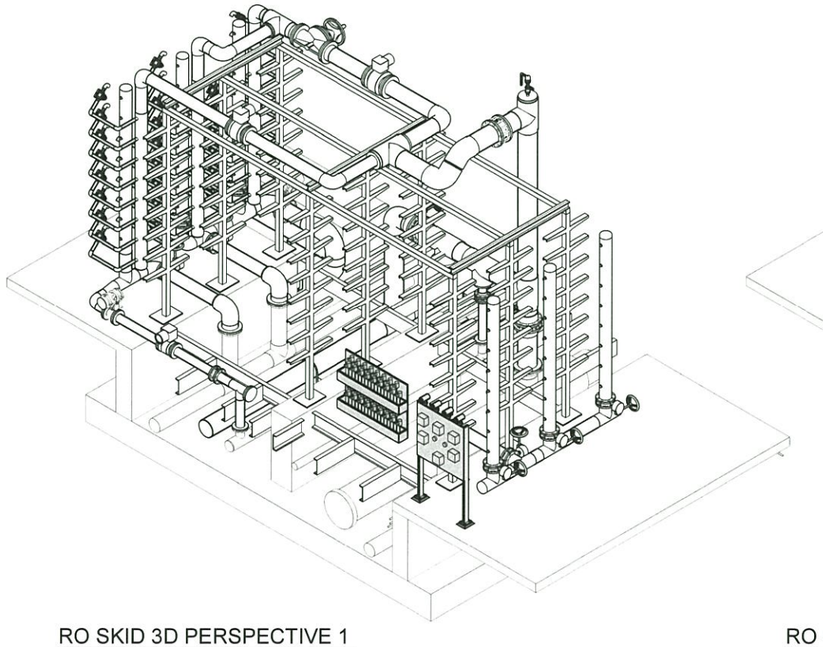


E SECTION
D-114 SCALE: 3/8" = 1'-0"

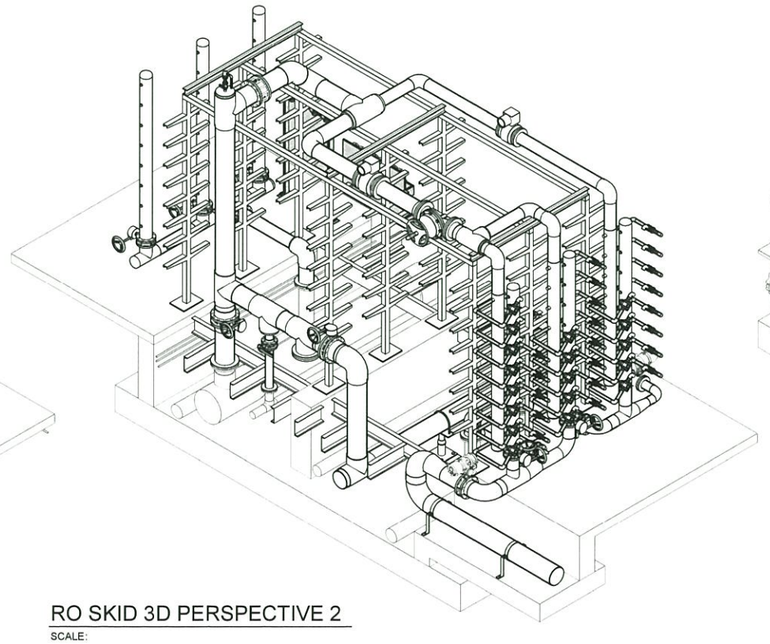


F SECTION
D-114 SCALE: 3/8" = 1'-0"

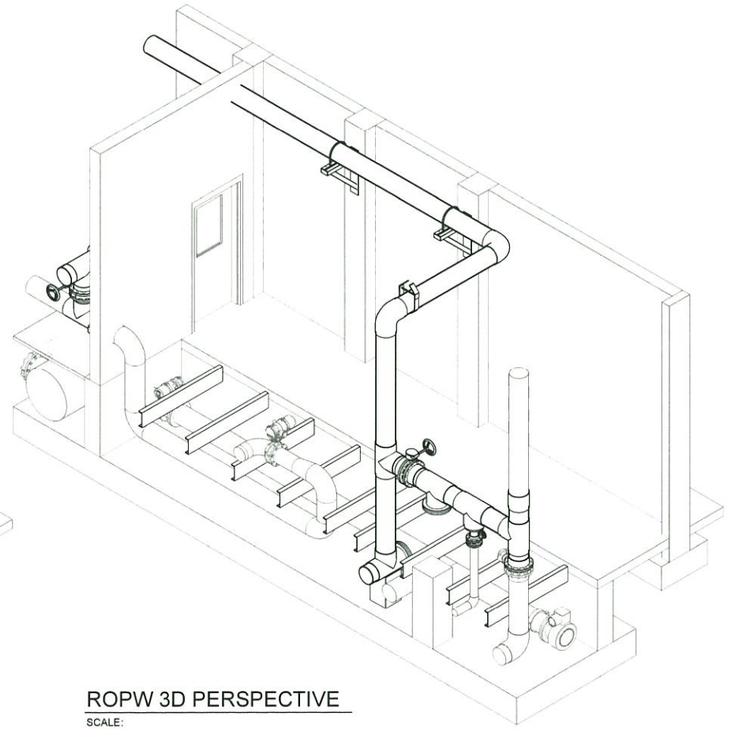
NOTES:
1. SECTIONS ON THIS DWG FOR THE EXISTING RO SKID MODIFICATIONS ARE OF RO SKID NO. 1. LOCATIONS OF PIPING, VALVES AND APPURTENANCES FOR RO SKID NO. 2 ARE SIMILAR. SEE ACCESSORY TABLE ON DWG D-115 AND PROCESS FLOW DIAGRAMS FOR COMPLETE SYSTEM MODIFICATIONS.
2. SEE DETAIL 5 / D-508 FOR INFORMATION ON SKID NO. 1 AND NO. 2 EXISTING CONDITIONS AND DEMOLITION.



RO SKID 3D PERSPECTIVE 1
SCALE:



RO SKID 3D PERSPECTIVE 2
SCALE:



ROPW 3D PERSPECTIVE
SCALE:

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MARK	DATE	DESCRIPTION	BY

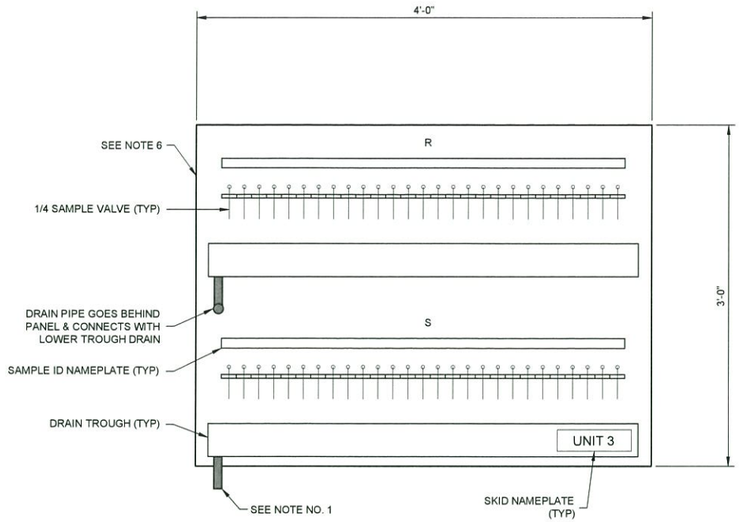
CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
RO BUILDING - RO SKID AREA SECTIONS & 3D PERSPECTIVES

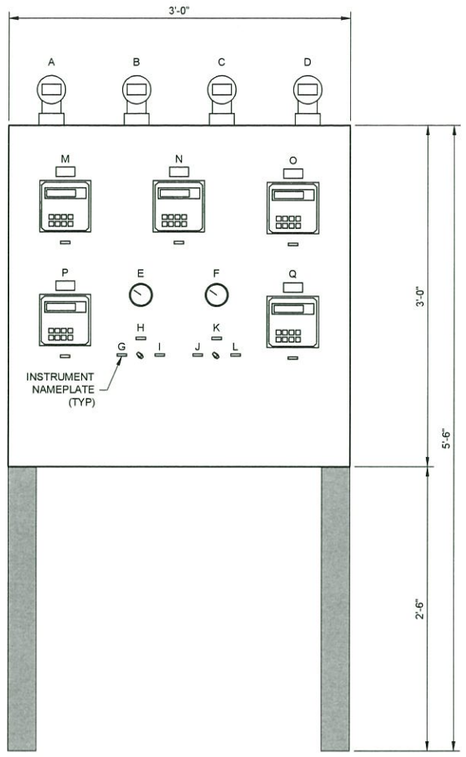
PROJ:	200-08507-18001
DESN:	JCR
DRWN:	JTE
CHKD:	JCB

D-116

6/17/2020 3:15:39 PM BIM 360://200-08507-19001 Palm Bay RO Expansion\08507-ROBLDG-D-2019.rvt

Bar measures 1 inch, otherwise drawing is not to scale





PIPE	TYPE	SERVICE	TAG #
A	PIT	FEED PRESSURE	PIT-0731
B	PIT	STAGE 2 FEED PRESSURE	PIT-0732
C	PIT	CONCENTRATE PRESSURE	PIT-0733
D	PIT	TOTAL PERMEATE PRESSURE	PIT-0734
E	PI	PRESSURE GAUGE (0-300 PSI)	PI-0731-0733
F	PI	PRESSURE GAUGE (0-100 PSI)	PI-0734-0736
G	-	FEED PRESSURE	0731
H	-	STAGE 2 FEED PRESSURE	0732
I	-	CONCENTRATE PRESSURE	0733
J	-	STAGE 1 PERMEATE PRESSURE	0734
K	-	STAGE 2 PERMEATE PRESSURE	0735
L	-	CONCENTRATE DISPOSAL PRESSURE	0736
M	FIT	STAGE 1 PERMEATE FLOW	FIT-0731
N	FIT	STAGE 2 PERMEATE FLOW	FIT-0732
O	FIT	CONCENTRATE FLOW	FIT-0733
P	AIT	TOTAL PERMEATE CONDUCTIVITY	AIT-0731
Q	AIT	CONCENTRATE CONDUCTIVITY	AIT-0732
R	-	PERMEATE SAMPLE FROM EACH PRESSURE VESSEL	
S	-	FEED / INTERSTAGE / CONCENTRATE SAMPLES	

NOTE:
1. TAG NUMBERS FOR RO SKID NO. 3 SHOWN. SKID NO. 4 TAG NUMBERS ARE SIMILAR. REFER TO INSTRUMENTATION DESIGN FOR DETAILS

1 RO SKID INSTRUMENT AND SAMPLE PANEL (TYP OF 2)
SCALE: 1 1/2"=1'-0"

NOTES:

1. 1-1/2" SCH 40 PVC DRAIN (FIELD ROUTE TO TRENCH FLOOR DRAINS).
2. PANEL DEPICTION IS FOR GENERAL ARRANGEMENT AND PRELIMINARY SIZING PURPOSES ONLY.
3. PANEL COMPONENTS AND DESIGN SHALL BE PER SECTION 11257 - REVERSE OSMOSIS PROCESS PANELS.
4. COORDINATE WITH INSTRUMENTATION AND CONTROLS DRAWINGS AND SPECIFICATIONS FOR DETAILED FIELD DEVICE REQUIREMENTS.
5. SUBMIT TWO (2) PROJECT NAMEPLATE SAMPLES FOR APPROVAL BY OWNER.
6. RO OEM TO PROVIDE SUPPORT OF SAMPLE PANEL FROM RO SKID FRAMING. SUBMIT IN SHOP DRAWING FOR APPROVAL PRIOR TO INSTALLATION.

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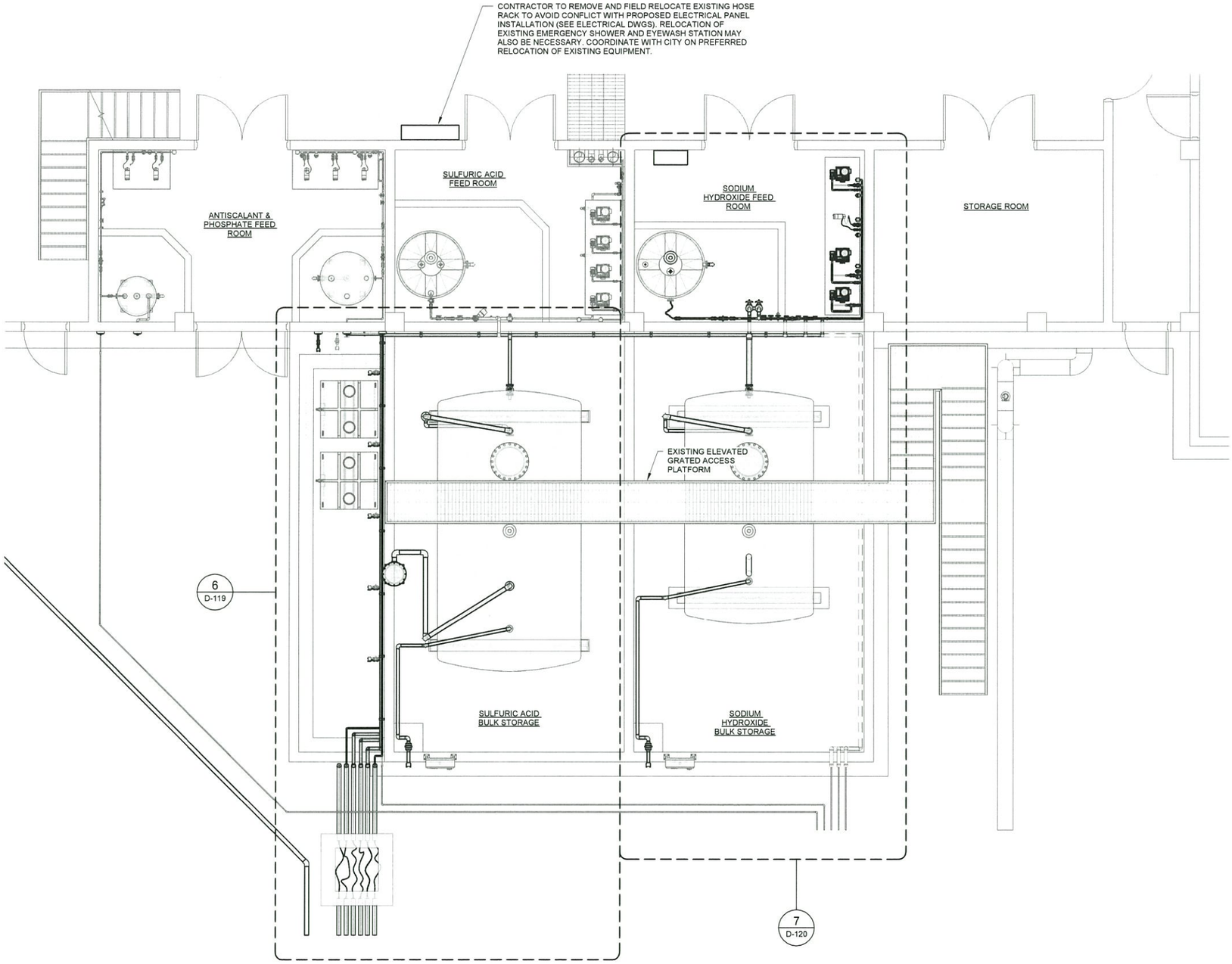
MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
RO BUILDING - RO SKID SAMPLE PANELS

PROJ:	200-08507-19001
DESN:	JCR
DRWN:	JTE
CHKD:	JCB

D-117

Bar Measures 1 inch, otherwise drawing not to scale



5 D-110 OVERALL CHEMICAL PLAN
SCALE: 1/4" = 1'-0"

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CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

RO BUILDING - OVERALL CHEMICAL EQUIPMENT PLAN

PROJ:	200-08507-18001
DESN:	JB
DRWN:	JTE
CHKD:	JCB

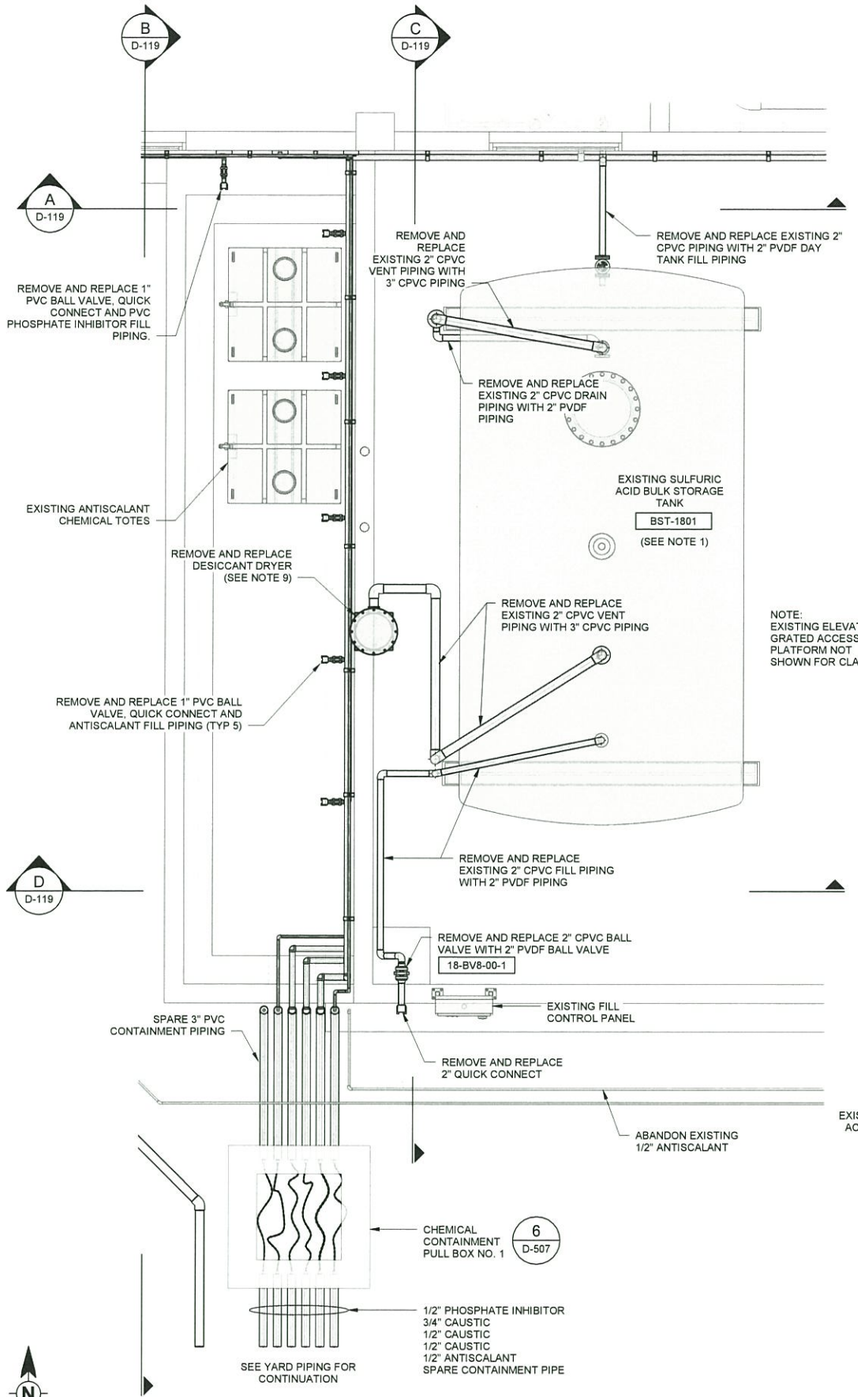
D-118

N

0 2' 4' 8'
SCALE: 1/4" = 1'-0"

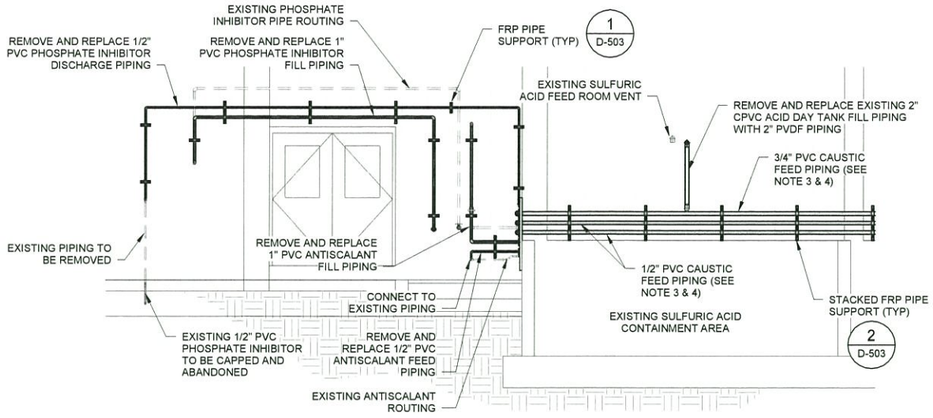
Bar measures 1 inch, otherwise drawing is not to scale

6/16/2020 11:52:44 AM BIM 360://200-08507-19001 Palm Bay RO Expansion/08507-ROBLDG-D-2019.rvt

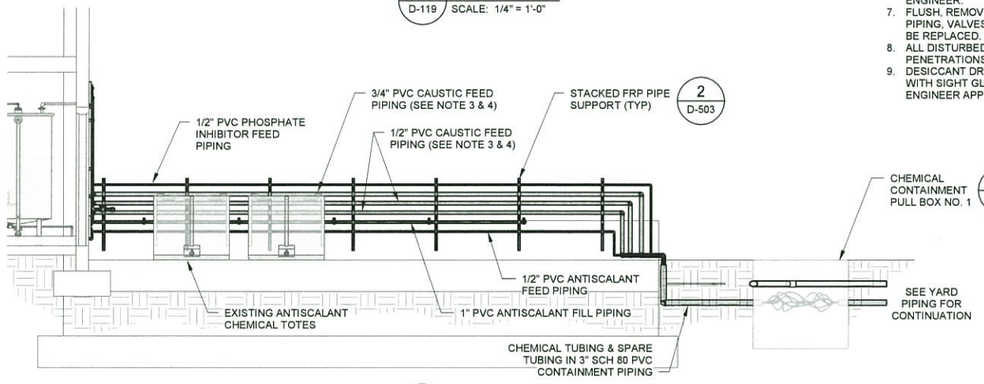


NOTE:
EXISTING ELEVATED GRATED ACCESS PLATFORM NOT SHOWN FOR CLARITY.

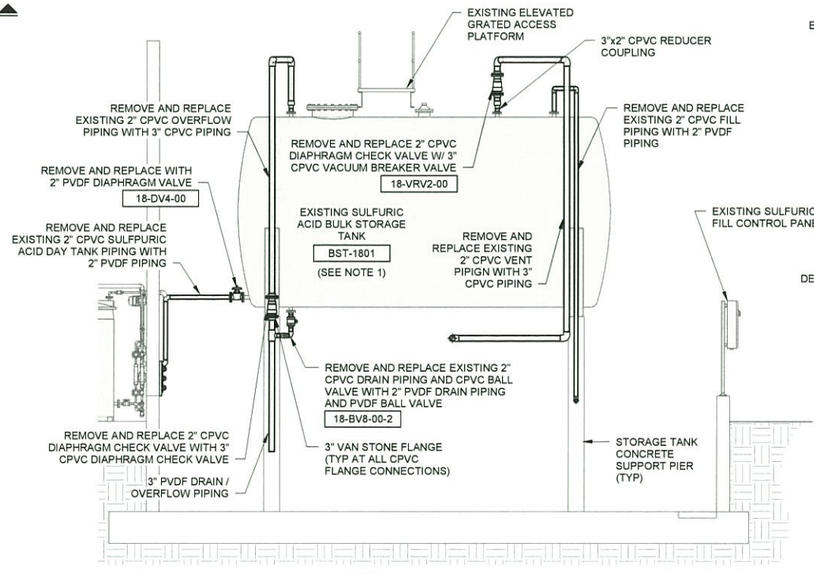
6 SULFURIC ACID PLAN
6 D-118 SCALE: 3/8" = 1'-0"



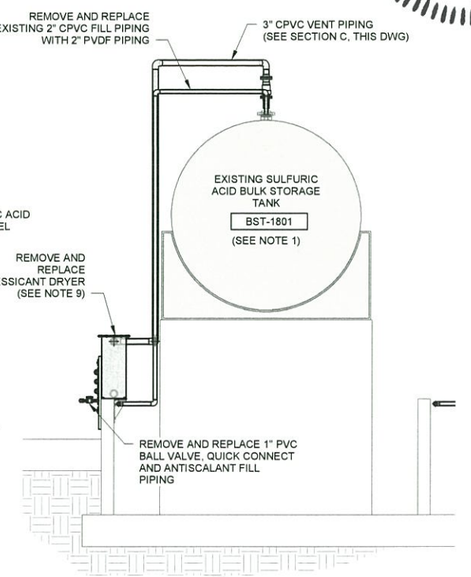
A SECTION
A D-119 SCALE: 1/4" = 1'-0"



B SECTION
B D-119 SCALE: 1/4" = 1'-0"



C SECTION
C D-119 SCALE: 1/4" = 1'-0"



D SECTION
D D-119 SCALE: 1/4" = 1'-0"

NOTES:

1. EXISTING SULFURIC ACID STEEL BULK STORAGE TANK TO BE CLEANED AND INSPECTED TO VERIFY EXISTING CONDITIONS. PROVIDE TEMPORARY STORAGE TANK, TERMPORARY PIPING AND TEMPORARY TRANSFER PUMP TO MAINTAIN PLANT OPERATIONS. PROVIDE CERTIFIED STORAGE TANK INSPECTION WITH RECOMMENDATIONS BY A QUALIFIED THIRD PARTY INSPECTOR.
2. COORDINATE SEQUENCE OF WORK WITH OWNER AS TO NOT AFFECT PLANT OPERATIONS. CONTRACTOR SHALL SUBMIT A DETAILED PLAN PROVIDING THE PROPOSED SEQUENCE FOR THE TEMPORARY TANK AND TRANSFER PROVISIONS, TANK INSPECTION AND PIPING REPLACEMENTS OUTLINING STEP-BY-STEP SEQUENCE TO DEMONSTRATE THE CAPABILITY OF MAINTAINING OPERATIONS WITHOUT DISRUPTION OF SERVICE.
3. SODIUM HYDROXIDE FEED LINES LOCATED OUTSIDE AND EXPOSED TO THE ATMOSPHERE SHALL HAVE HEAT TRACING PER SPECIFICATION SECTION 15090.
4. ALL HEAT TRACED PIPE SHALL BE INSULATED IN ACCORDANCE WITH SPECIFICATION SECTION 15127.
5. INSTALL UNIONS OR TRUE UNION BALL VALVES AS REQUIRED FOR REMOVAL OF VALVES AND APPURTENANCES.
6. NOT ALL PIPE SUPPORTS SHOWN FOR CLARITY. CONTRACTOR SHALL PROVIDE PIPE SUPPORTS PER SPECIFICATION SECTION 15126. PIPE SUPPORTS IN THE CHEMICAL SYSTEMS SHALL BE NON-METALLIC PIPE SUPPORTS. CONTRACTOR SHALL USE FRP UNISTRUT AND FRP STRUCTURAL MEMBERS AS NEEDED TO SUPPORT PIPE. EXISTING SUPPORTS SHALL NOT BE REUSED UNLESS APPROVED BY THE ENGINEER.
7. FLUSH, REMOVE AND PROPERLY DISPOSE OF ALL PIPING, VALVES AND APPURTENANCES THAT ARE TO BE REPLACED.
8. ALL DISTURBED SURFACES AND WALL PENETRATIONS SHALL BE PATCHED AND SEALED.
9. DESICCANT DRYER SHALL BE DRIERITE MODEL 1200 WITH SIGHT GLASS WINDOW AND MEDIA OR ENGINEER APPROVED EQUAL.

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BID SET

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PROFESSIONAL ENGINEER

MARK	DATE	DESCRIPTION	BY

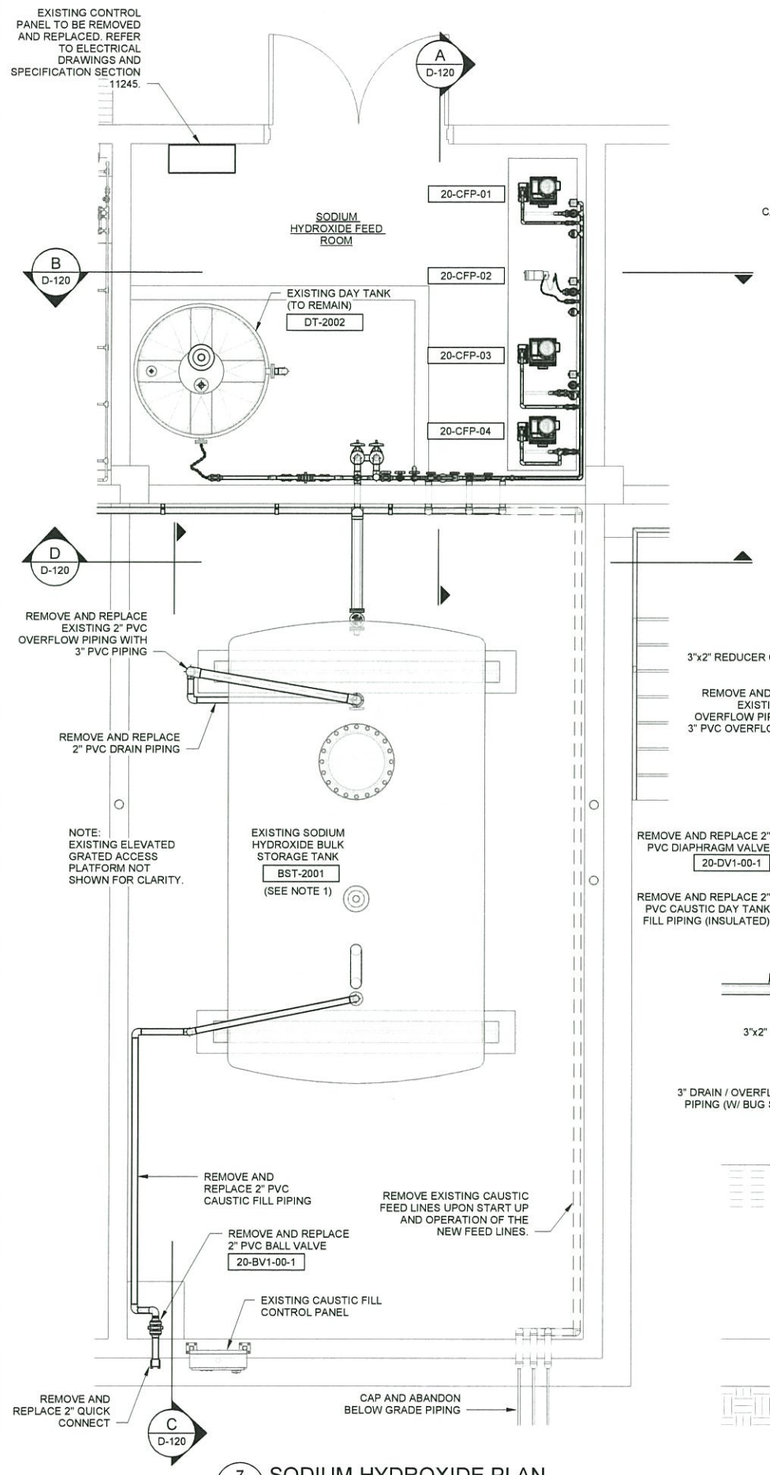
CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
RO BUILDING - SULFURIC ACID MODIFICATIONS PLAN & SECTIONS

PROJ:	200-08507-18001
DESN:	JCR
DRWN:	JTE
CHKD:	JCB

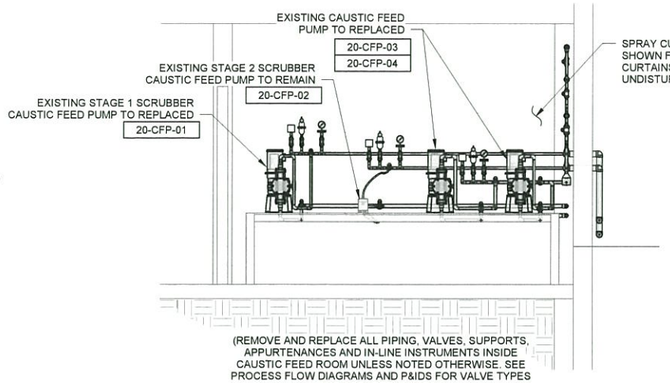
D-119

6/16/2020 11:52:50 AM BIM 360://200-08507-19001 Palm Bay RO Expansion/08507-ROBLDG-D-2019.rvt

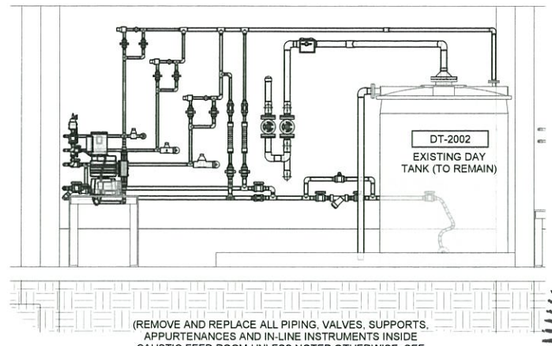
Bar measures 1 inch, otherwise drawing is not to scale



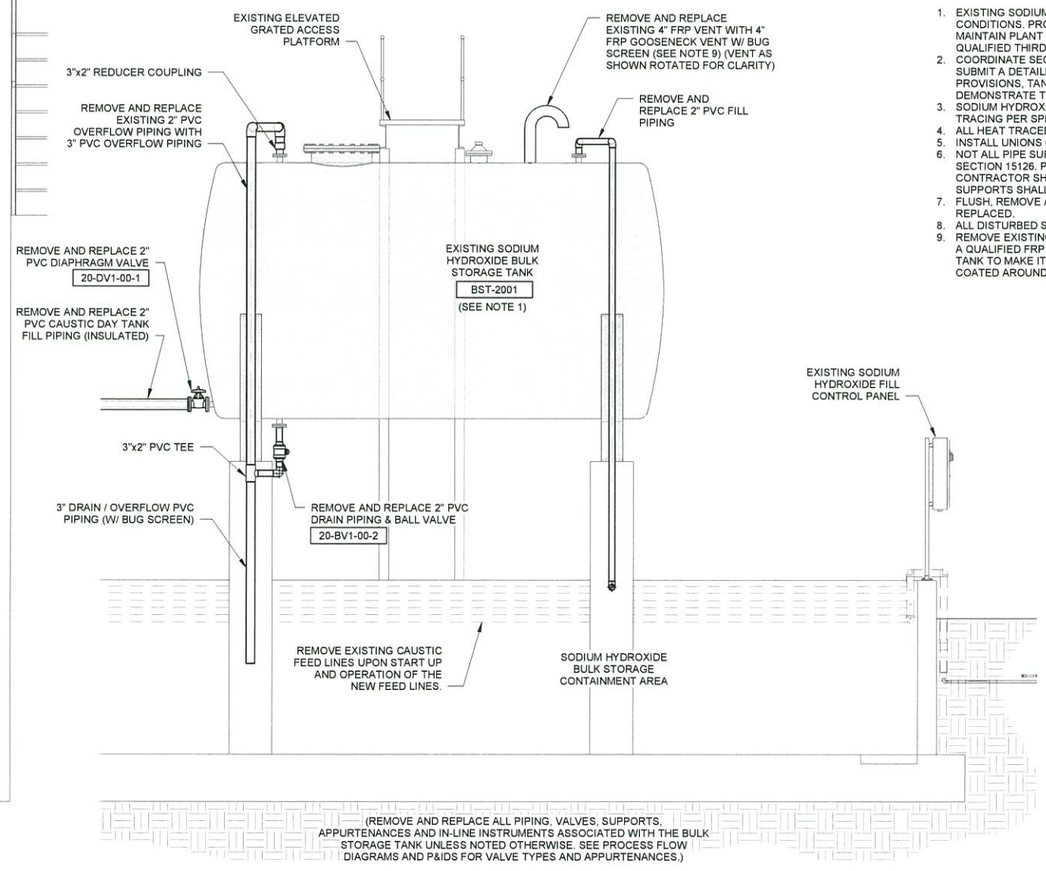
7 D-118 SODIUM HYDROXIDE PLAN
SCALE: 3/8" = 1'-0"



A D-120 SECTION
SCALE: 3/8" = 1'-0"



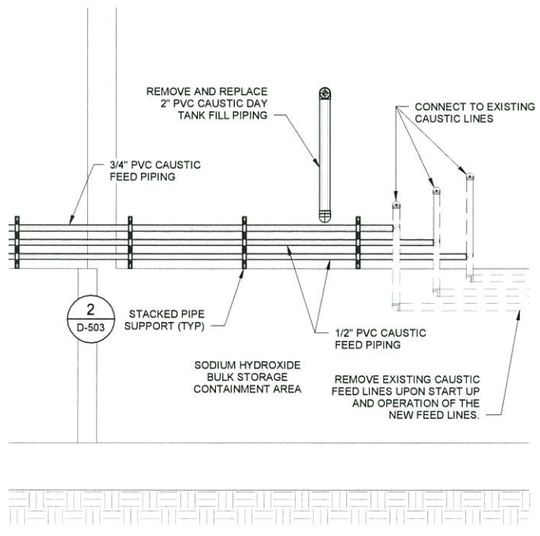
B D-120 SECTION
SCALE: 3/8" = 1'-0"



C D-120 SECTION
SCALE: 3/8" = 1'-0"

NOTES:

1. EXISTING SODIUM HYDROXIDE FRP BULK STORAGE TANK TO BE CLEANED AND INSPECTED TO VERIFY EXISTING CONDITIONS. PROVIDE TEMPORARY STORAGE TANK, TERMPORARY PIPING AND TEMPORARY TRANSFER PUMP TO MAINTAIN PLANT OPERATIONS. PROVIDE CERTIFIED STORAGE TANK INSPECTION WITH RECOMMENDATIONS BY A QUALIFIED THIRD PARTY INSPECTOR.
2. COORDINATE SEQUENCE OF WORK WITH OWNER AS TO NOT AFFECT PLANT OPERATIONS. CONTRACTOR SHALL SUBMIT A DETAILED PLAN PROVIDING THE PROPOSED SEQUENCE FOR THE TEMPORARY TANK AND TRANSFER PROVISIONS, TANK INSPECTION AND PIPING REPLACEMENTS OUTLINING STEP-BY-STEP SEQUENCE TO DEMONSTRATE THE CAPABILITY OF MAINTAINING OPERATIONS WITHOUT DISRUPTION OF SERVICE.
3. SODIUM HYDROXIDE FEED LINES LOCATED OUTSIDE AND EXPOSED TO THE ATMOSPHERE SHALL HAVE HEAT TRACING PER SPECIFICATION SECTION 15090.
4. ALL HEAT TRACED PIPE SHALL BE INSULATED IN ACCORDANCE WITH SPECIFICATION SECTION 15127.
5. INSTALL UNIONS OR TRUE UNION BALL VALVES AS REQUIRED FOR REMOVAL OF VALVES AND APPURTENANCES.
6. NOT ALL PIPE SUPPORTS SHOWN FOR CLARITY. CONTRACTOR SHALL PROVIDE PIPE SUPPORTS PER SPECIFICATION SECTION 15126. PIPE SUPPORTS IN THE CHEMICAL SYSTEMS SHALL BE NON-METALLIC PIPE SUPPORTS. CONTRACTOR SHALL USE FRP UNISTRUT AND FRP STRUCTURAL MEMBERS AS NEEDED TO SUPPORT PIPE. EXISTING SUPPORTS SHALL NOT BE REUSED UNLESS APPROVED BY THE ENGINEER.
7. FLUSH, REMOVE AND PROPERLY DISPOSE OF ALL PIPING, VALVES AND APPURTENANCES THAT ARE TO BE REPLACED.
8. ALL DISTURBED SURFACES AND WALL PENETRATIONS SHALL BE PATCHED AND SEALED.
9. REMOVE EXISTING FRP TANK VENT AND REPLACE WITH 4-INCH FRP GOOSENECK VENT. CONTRACTOR SHALL UTILIZE A QUALIFIED FRP TANK FABRICATOR TO REPLACE TANK VENT. NEW TANK VENT SHALL BE LAMINATED INTO THE TANK TO MAKE IT INTEGRAL WITH THE TANK'S SHELL AND IT'S INTERIOR CORROSION LINING. TANK SHALL BE COATED AROUND NOZZLE PER SPECIFICATION SECTION 09961 FOLLOWING NOZZLE INSTALLATION.



D D-120 SECTION
SCALE: 3/8" = 1'-0"

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PROFESSIONAL ENGINEER
6/17/20

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

RO BUILDING - SODIUM HYDROXIDE MODS PLAN & SECTIONS

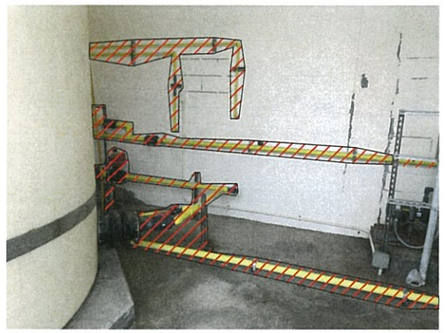
PROJ:	200-08507-18001
DESN:	JCR
DRWN:	JTE
CHKD:	JCB

D-120

6/16/2020 11:52:57 AM BIM 360://200-08507-19001 Palm Bay RO Expansion/08507-ROBLDG-D-2019.rvt

Bar measures 1 inch, otherwise drawing is not to scale

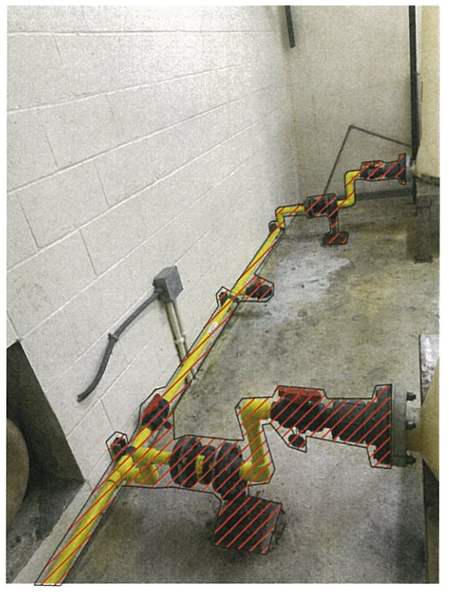
SODIUM HYPOCHLORITE BULK STORAGE


NOTES:
1. REMOVE AND REPLACE ALL PIPING, VALVES, APPURTENANCES AND INLINE INSTRUMENTS INSIDE THE SODIUM HYPOCHLORITE BULK STORAGE AND FEED ROOM UNLESS OTHERWISE NOTED. BURIED FEED LINES TO REMAIN, PROVIDE UNIONS AT POINTS OF CONNECTION. SEE PROCESS FLOW DIAGRAMS AND P&IDS FOR ADDITIONAL DETAILS.
2. COORDINATE REPLACEMENT SEQUENCE WITH OWNER AS TO NOT AFFECT PLANT OPERATIONS. CONTRACTOR SHALL SUBMIT A DETAILED REPLACEMENT PLAN PROVIDING THE SEQUENCE FOR PIPING REMOVAL AND REPLACEMENT OUTLINING STEP BY STEP SEQUENCE TO DEMONSTRATE THE CAPABILITY OF MAINTAINING OPERATION WITHOUT DISRUPTION IN SERVICE.
3. FLUSH, REMOVE AND PROPERLY DISPOSE OF ALL PIPING, VALVES, AND APPURTENANCES THAT ARE TO BE REPLACED.
4. INSTALL UNIONS OR TRUE UNION BALL VALVES AS REQUIRED FOR REMOVAL OF VALVES AND APPURTENANCES.
5. NOT ALL PIPE SUPPORTS SHOWN FOR CLARITY. CONTRACTOR SHALL PROVIDE PIPE SUPPORTS PER SPECIFICATION SECTION 15126. PIPE SUPPORTS IN THE CHEMICAL SYSTEMS SHALL BE NON-METALLIC PIPE SUPPORTS. CONTRACTOR SHALL USE FRP UNISTRUT AND FRP STRUCTURAL MEMBERS AS NEEDED TO SUPPORT PIPE. EXISTING SUPPORTS SHALL NOT BE REUSED UNLESS APPROVED BY THE ENGINEER.
6. ALL DISTURBED SURFACES AND WALL PENETRATIONS SHALL BE PATCHED AND SEALED.
7. PROVIDE PVC INSECT SCREENS ON THE VENT LINES FROM THE DAY TANKS AND THE BULK TANKS.

SODIUM HYPOCHLORITE FEED ROOM

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STATE OF FLORIDA
PROFESSIONAL ENGINEER

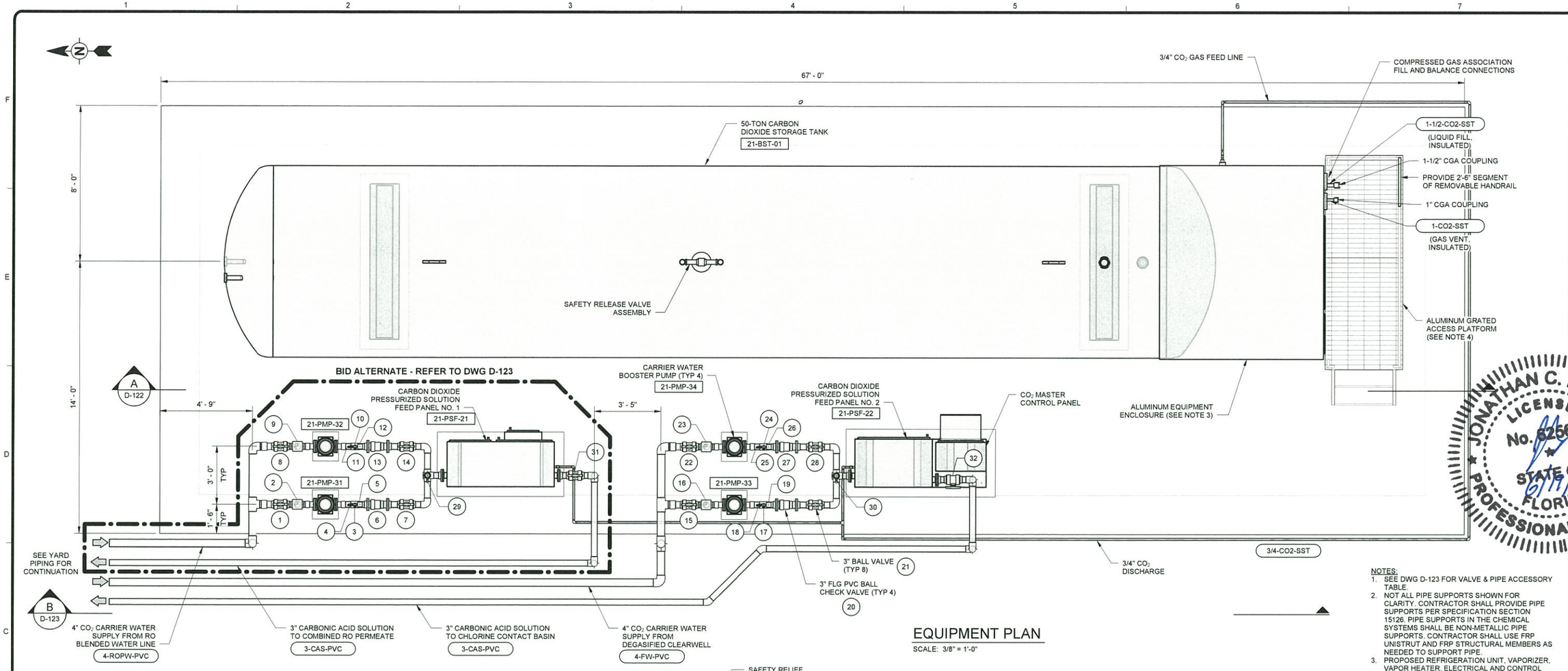
MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
SODIUM HYPOCHLORITE FEED SYSTEM MODIFICATIONS

PROJ:	200-08507-19001
DESN:	JB
DRWN:	JTE
CHKD:	JCB

D-121

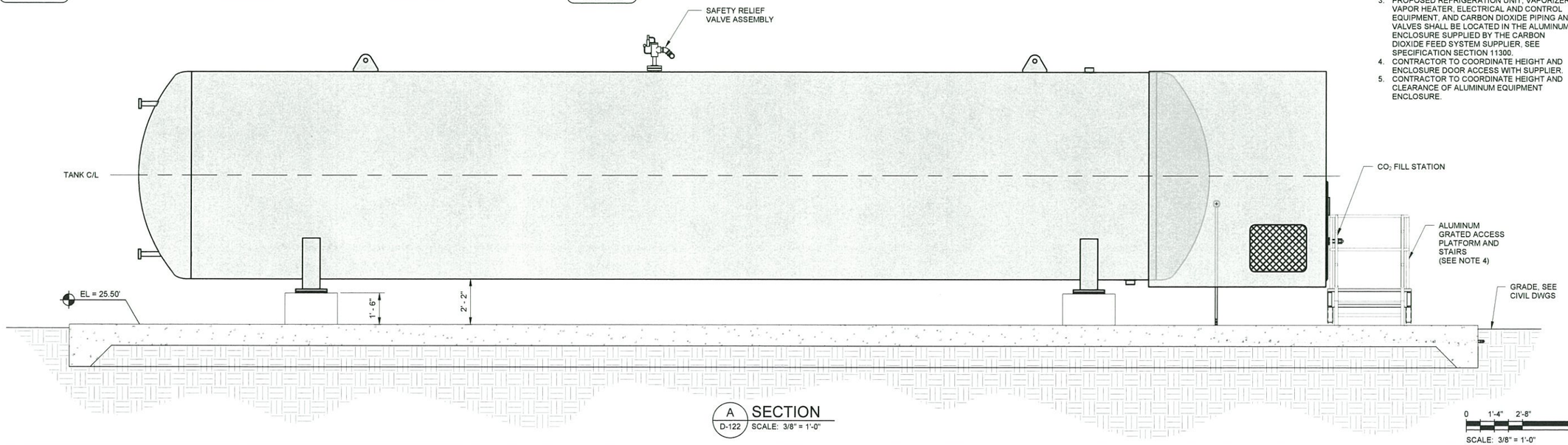
Bar Measures 1 inch, otherwise drawing not to scale



EQUIPMENT PLAN

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

NOTES:
1. SEE DWG D-123 FOR VALVE & PIPE ACCESSORY TABLE.
2. NOT ALL PIPE SUPPORTS SHOWN FOR CLARITY. CONTRACTOR SHALL PROVIDE PIPE SUPPORTS PER SPECIFICATION SECTION 15126. PIPE SUPPORTS IN THE CHEMICAL SYSTEMS SHALL BE NON-METALLIC PIPE SUPPORTS. CONTRACTOR SHALL USE FRP UNISTRUT AND FRP STRUCTURAL MEMBERS AS NEEDED TO SUPPORT PIPE.
3. PROPOSED REFRIGERATION UNIT, VAPORIZER, VAPOR HEATER, ELECTRICAL AND CONTROL EQUIPMENT, AND CARBON DIOXIDE PIPING AND VALVES SHALL BE LOCATED IN THE ALUMINUM ENCLOSURE SUPPLIED BY THE CARBON DIOXIDE FEED SYSTEM SUPPLIER, SEE SPECIFICATION SECTION 11300.
4. CONTRACTOR TO COORDINATE HEIGHT AND ENCLOSURE DOOR ACCESS WITH SUPPLIER.
5. CONTRACTOR TO COORDINATE HEIGHT AND CLEARANCE OF ALUMINUM EQUIPMENT ENCLOSURE.



A SECTION

A D-122 SCALE: 3/8" = 1'-0"

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

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BID SET

JONATHAN C. BUNDY
LICENSE
No. 82561
STATE OF FLORIDA
PROFESSIONAL ENGINEER
6/19/20

MARK	DATE	DESCRIPTION

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4 GMD TO 6-MGD

CARBON DIOXIDE STORAGE & FEED SYSTEM PLAN & SECTIONS

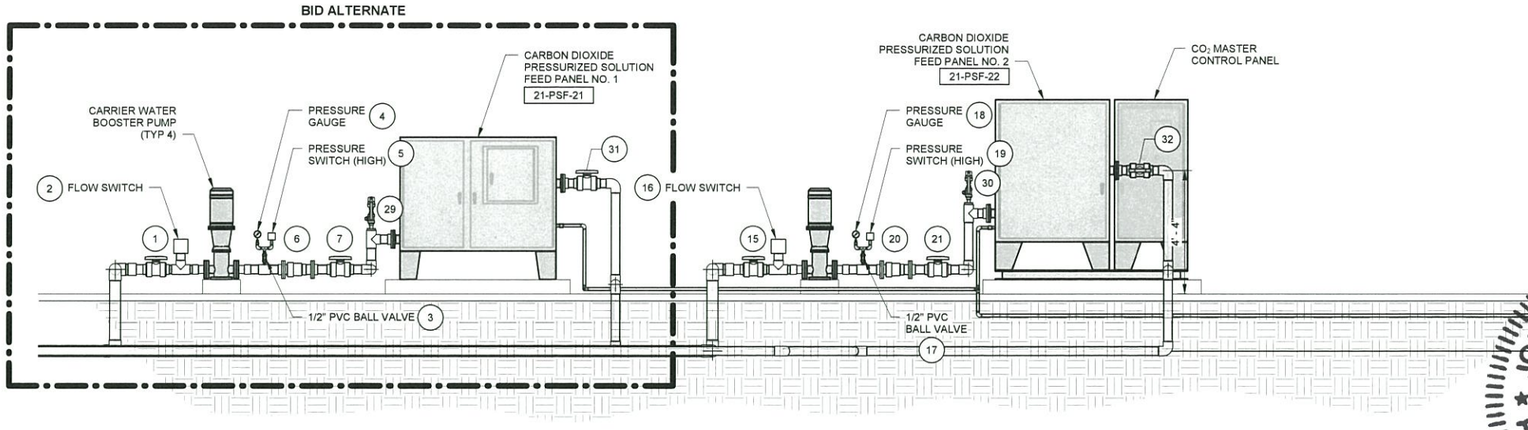
PROJ:	200-08507-18001
DESN:	ACN
DRWN:	JTE
CHKD:	JCB

D-122

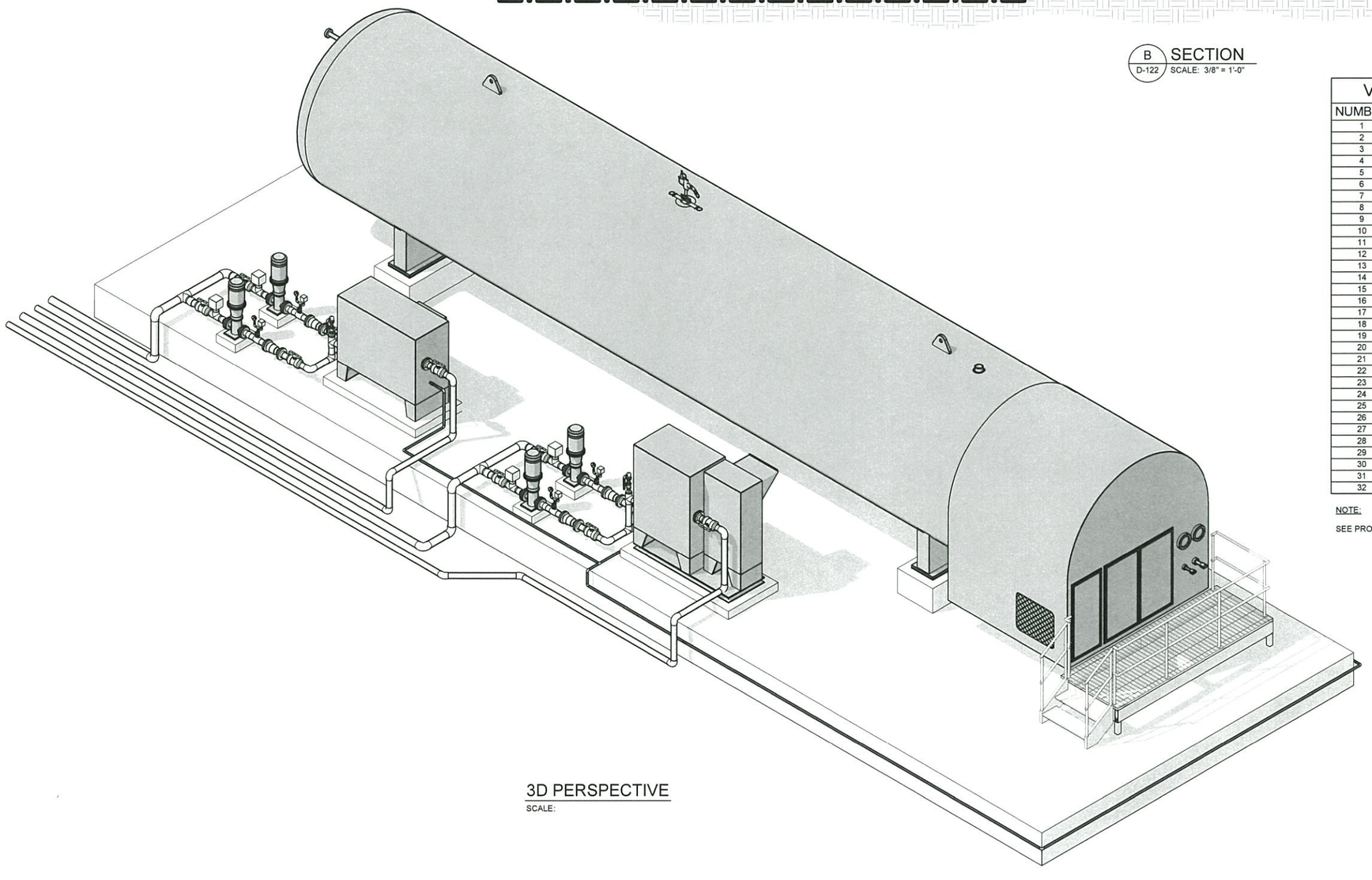
Bar measures 1 inch, otherwise drawing is not to scale

BID ALTERNATE:

CONTRACTOR SHALL PROVIDE AN ADDITIVE BID ALTERNATE TO PROVIDE AND INSTALL THE PRE-DEGASIFICATION CO2 FEED SYSTEM, INCLUDING THE CARBON DIOXIDE PRESSURIZED SOLUTION FEED PANEL NO. 1 (21-PSF-21) AND ALL ASSOCIATED EQUIPMENT, PUMPS, PROCESS YARD PIPING AND VALVES, SOLUTION DIFFUSER, AND ELECTRICAL AND INSTRUMENTATION. REFER TO SPECIFICATION SECTION 11300 FOR REQUIREMENTS FOR THE PRE-DEGASIFICATION CO2 APPLICATION.



B D-122 SECTION
SCALE: 3/8" = 1'-0"



3D PERSPECTIVE
SCALE:

VALVE & PIPE ACCESSORY SCHEDULE

NUMBER	DESCRIPTION	TAG NUMBER
1	3" PVC BALL VALVE	21-BV1-31-1
2	FLOW SWITCH	FS-2131
3	1/2" PVC BALL VALVE	21-BV1-31-3
4	PRESSURE GAUGE	PI-2131
5	PRESSURE SWITCH	PSH-2131
6	3" FLG PVC BALL CHECK VALVE	21-CV17-31
7	3" PVC BALL VALVE	21-BV1-31-2
8	3" PVC BALL VALVE	21-BV1-32-1
9	FLOW SWITCH	FS-2132
10	1/2" PVC BALL VALVE	21-BV1-32-3
11	PRESSURE GAUGE	PI-2132
12	PRESSURE SWITCH	PSH-2132
13	3" FLG PVC BALL CHECK VALVE	21-CV17-32
14	3" PVC BALL VALVE	21-BV1-32-2
15	3" PVC BALL VALVE	21-BV1-33-1
16	FLOW SWITCH	FS-2133
17	1/2" PVC BALL VALVE	21-BV1-33-3
18	PRESSURE GAUGE	PI-2133
19	FLOW SWITCH	PSH-2133
20	3" FLG PVC BALL CHECK VALVE	21-CV17-33
21	3" PVC BALL VALVE	21-BV1-33-2
22	3" PVC BALL VALVE	21-BV1-34-1
23	FLOW SWITCH	FS-2134
24	1/2" PVC BALL VALVE	21-BV1-34-3
25	PRESSURE GAUGE	PI-2134
26	FLOW SWITCH	PSH-2134
27	3" FLG PVC BALL CHECK VALVE	21-CV17-34
28	3" PVC BALL VALVE	21-BV1-34-2
29	1" NON-METALLIC AIR RELEASE VALVE	21-ARV4-41
30	1" NON-METALLIC AIR RELEASE VALVE	21-ARV4-42
31	3" PVC BALL VALVE	21-BV1-51
32	3" PVC BALL VALVE	21-BV1-52

NOTE:

SEE PROCESS FLOW DIAGRAMS FOR FULL VALVE & PIPE ACCESSORY TAGS.

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BID SET

JONATHAN C. BUNDY LICENSE No. 62561 STATE OF FLORIDA PROFESSIONAL ENGINEER
6/19/20

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-GMD TO 6-MGD

CARBON DIOXIDE STORAGE & FEED SYSTEM 3D PERSPECTIVE

PROJ:	200-08507-18001
DESN:	ACN
DRWN:	JTE
CHKD:	JCB

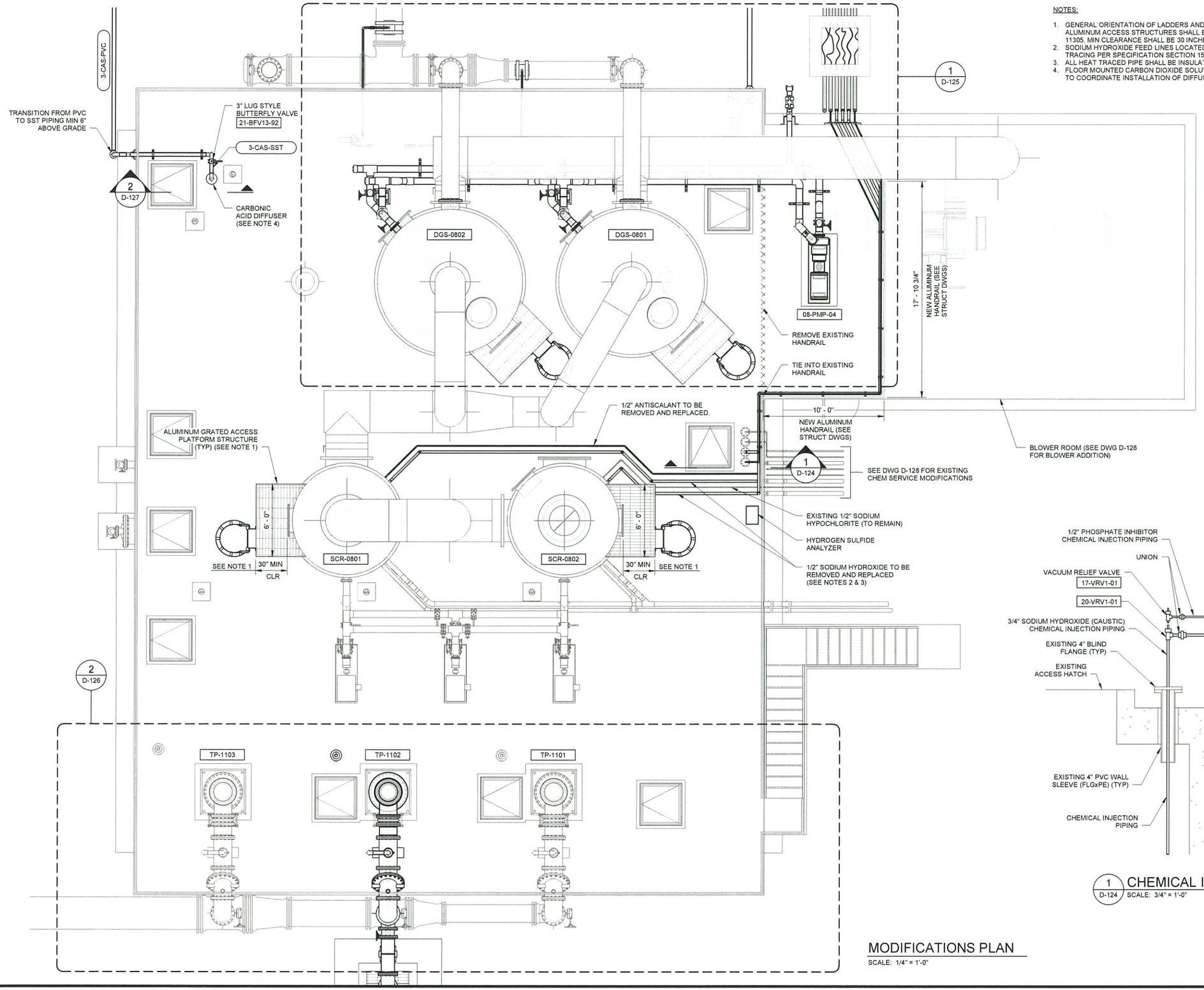
D-123

6/16/2020 12:08:00 PM BIM 360://200-08507-19001 Palm Bay RO Expansion/08507-CO2-D-2019.rvt

Bar measures 1 inch, otherwise drawing is not to scale

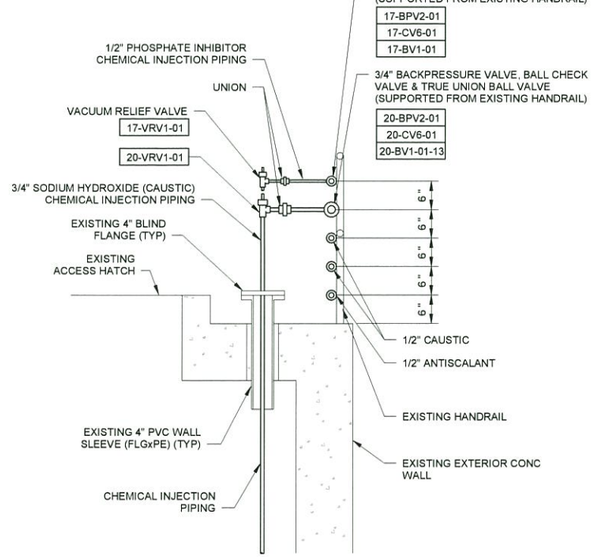
NOTES:

1. GENERAL ORIENTATION OF LADDERS AND PLATFORMS HAVE BEEN SHOWN FOR CONCEPTUAL PUPROSES. ALUMINUM ACCESS STRUCTURES SHALL BE DESIGNED BY THE SYSTEM SUPPLIER PER SPECIFICATION 11305. MIN CLEARANCE SHALL BE 30 INCHES PER OSHA STANDARDS.
2. SODIUM HYDROXIDE FEED LINES LOCATED OUTSIDE AND EXPOSED TO THE ATMOSPHERE SHALL HAVE HEAT TRACING PER SPECIFICATION SECTION 15090.
3. ALL HEAT TRACED PIPE SHALL BE INSULATED IN ACCORDANCE WITH SPECIFICATION SECTION 15127.
4. FLOOR MOUNTED CARBON DIOXIDE SOLUTION DIFFUSER AS PROVIDED BY MANUFACTURER. CONTRACTOR TO COORDINATE INSTALLATION OF DIFFUSER WITH MANUFACTURER.



MODIFICATIONS PLAN

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



1 D-124 CHEMICAL INJECTION DETAIL

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

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BID SET

JONATHAN C. BUNDY LICENSE No. 82561 STATE OF FLORIDA PROFESSIONAL ENGINEER

6/17/20

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

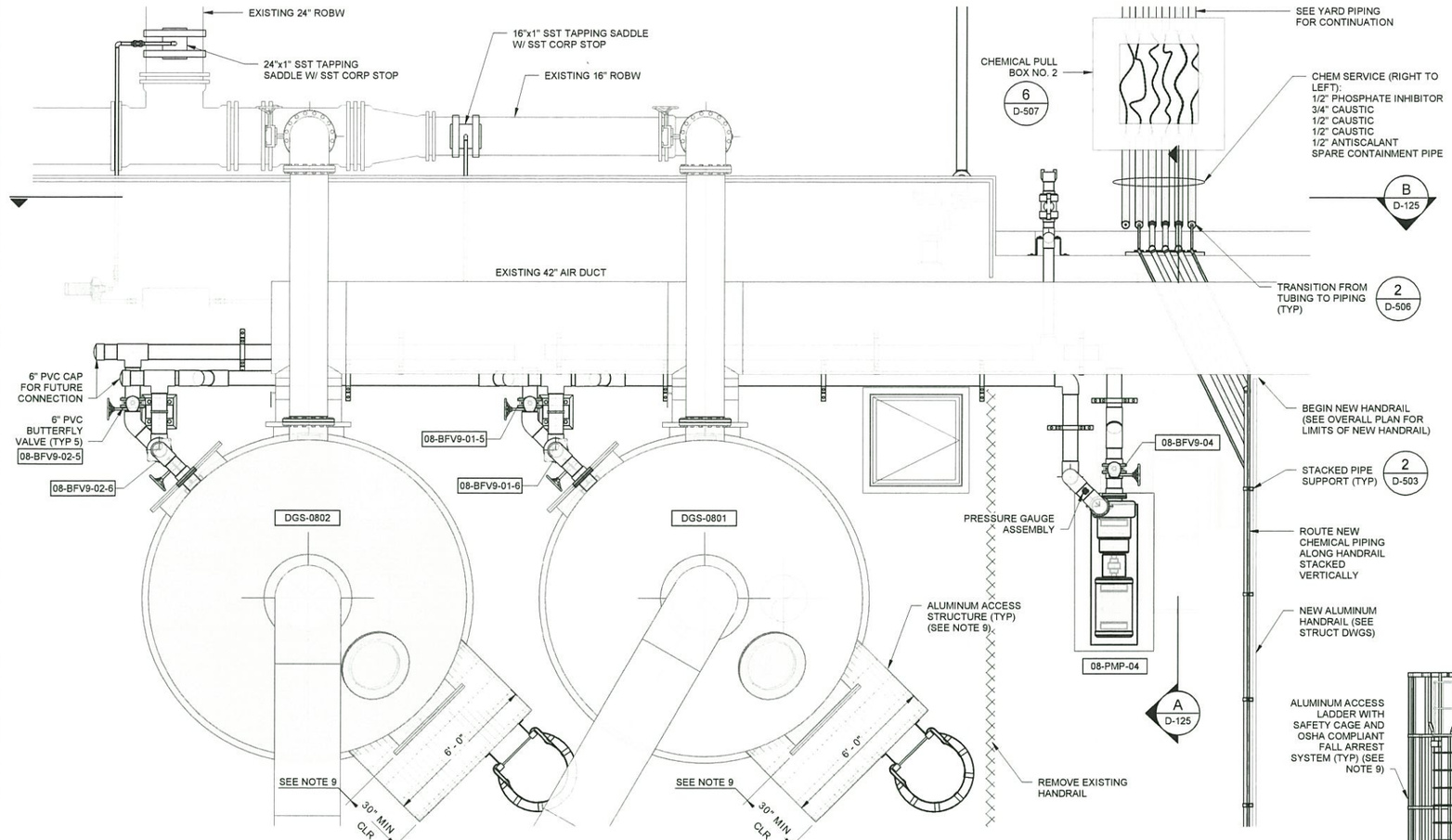
DEGASIFIERS OVERALL PLAN

PROJ:	200-08507-18001
DESN:	JAB
DRWN:	JTE
CHKD:	JCB

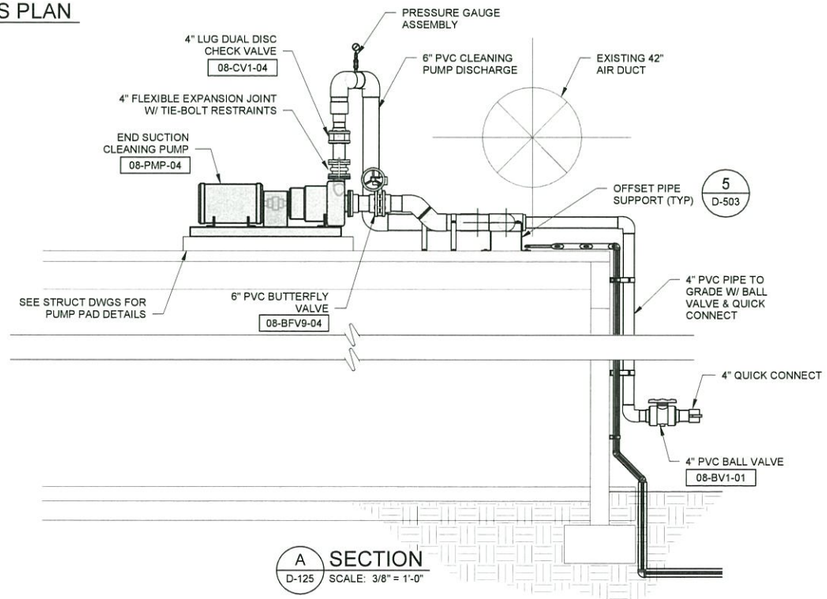
D-124

6/17/2020 3:05:07 PM BIM 360://200-08507-19001 Palm Bay RO Expansion/08507-DEGAS-D-2019.rvt

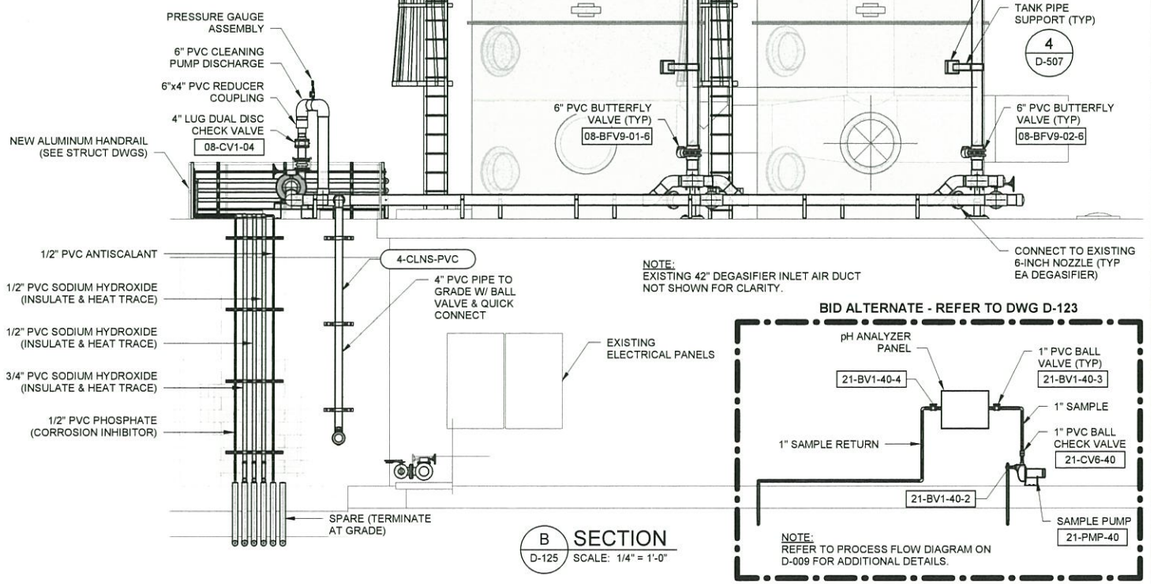
Bar measures 1 inch, otherwise drawing is not to scale



1 D-124 MODIFICATIONS PLAN
SCALE: 3/8" = 1'-0"



A D-125 SECTION
SCALE: 3/8" = 1'-0"



NOTE:
EXISTING 42" DEGASIFIER INLET AIR DUCT NOT SHOWN FOR CLARITY.

B D-125 SECTION
SCALE: 1/4" = 1'-0"

BID ALTERNATE - REFER TO DWG D-123

NOTE:
REFER TO PROCESS FLOW DIAGRAM ON D-009 FOR ADDITIONAL DETAILS.

NOTES:

1. SODIUM HYDROXIDE FEED LINES LOCATED OUTSIDE AND EXPOSED TO THE ATMOSPHERE SHALL HAVE HEAT TRACING PER SPECIFICATION SECTION 15090.
2. ALL HEAT TRACED PIPE SHALL BE INSULATED IN ACCORDANCE WITH SPECIFICATION SECTION 15127.
3. INSTALL UNIONS OR TRUE UNION BALL VALVES AS REQUIRED FOR REMOVAL OF VALVES AND APPURTENANCES.
4. NOT ALL PIPE SUPPORTS SHOWN FOR CLARITY. CONTRACTOR SHALL PROVIDE PIPE SUPPORTS PER SPECIFICATION SECTION 15126. PIPE SUPPORTS FOR CHEMICAL PIPING SHALL BE NON-METALLIC PIPE SUPPORTS. CONTRACTOR SHALL USE FRP UNISTRUT AND FRP STRUCTURAL MEMBERS AS NEEDED TO SUPPORT PIPE.
5. COORDINATE REPLACEMENT SEQUENCE WITH OWNER AS TO NOT AFFECT PLANT OPERATIONS. CONTRACTOR SHALL SUBMIT A DETAILED REPLACEMENT PLAN PROVIDING THE SEQUENCE FOR PIPING REMOVAL AND REPLACEMENT OUTLINING STEP BY STEP SEQUENCE TO DEMONSTRATE THE CAPABILITY OF MAINTAINING OPERATION WITHOUT DISRUPTION IN SERVICE.
6. FLUSH, REMOVE AND PROPERLY DISPOSE OF ALL PIPING, VALVES AND APPURTENANCES THAT ARE TO BE REPLACED.
7. ALL DISTURBED SURFACES AND WALL PENETRATIONS SHALL BE PATCHED AND SEALED.
8. TANK PIPE SUPPORT CONNECTIONS FOR ACCESS LADDERS & PLATFORMS AND CLEAN-IN-PLACE SYSTEM PIPING & SUPPORTS TO BE PROVIDED BY SYSTEM SUPPLIER PER SPECIFICATION SECTION 11305.
9. GENERAL ORIENTATION OF LADDERS AND PLATFORMS HAVE BEEN SHOWN FOR CONCEPTUAL PUPROSES. ALUMINUM ACCESS STRUCTURES SHALL BE DESIGNED BY THE SYSTEM SUPPLIER PER SPECIFICATION 11305. THE MINIMUM CLEARANCE SHALL BE 30 INCHES PER OSHA STANDARDS.

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JONATHAN C. BUNDY
LICENSE
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STATE OF FLORIDA
PROFESSIONAL ENGINEER
6/16/2020

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

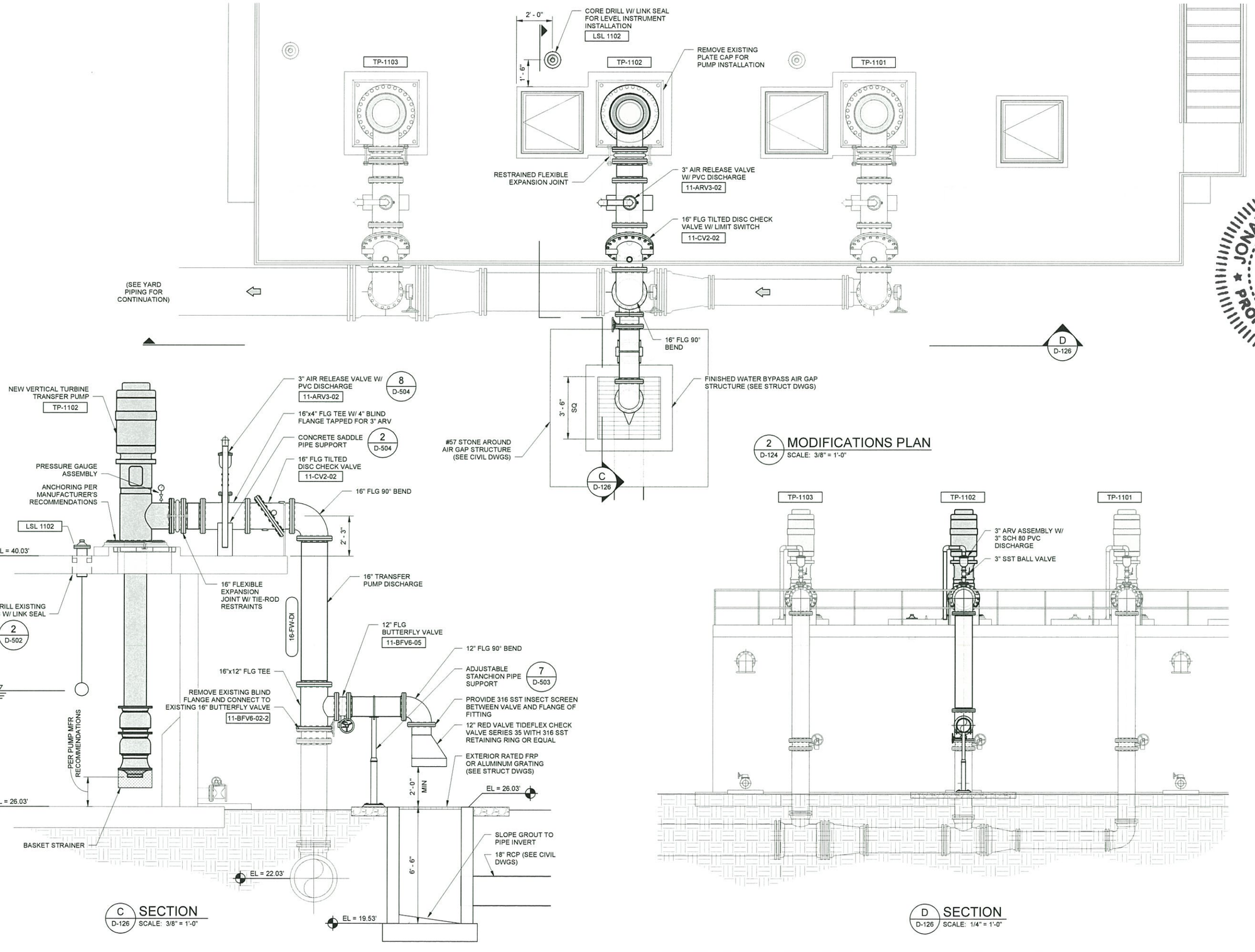
DEGASIFIERS CLEANING SYSTEM ENLARGED PLAN & SECTIONS

PROJ:	200-08507-18001
DESN:	JAB
DRWN:	JTE
CHKD:	JCB

D-125

6/16/2020 12:57:52 PM BIM 360://200-08507-19001 Palm Bay RO Expansion/08507-DEGAS-D-2019.rvt

Bar measures 1 inch, otherwise drawing is not to scale



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LICENSE
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STATE OF FLORIDA
PROFESSIONAL ENGINEER

MARK	DATE	DESCRIPTION	BY

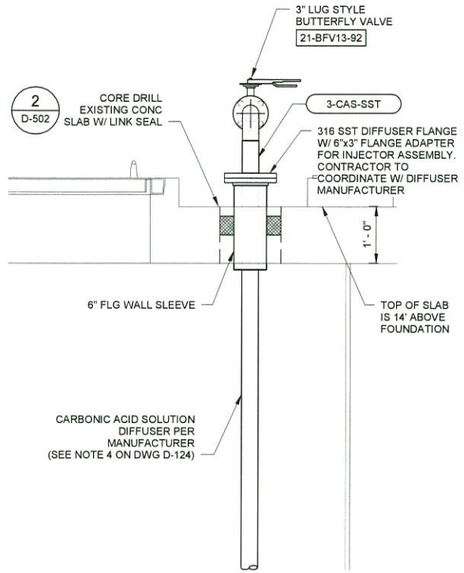
CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
DEGASIFIERS TRANSFER PUMPS MODIFICATIONS PLAN & SECTIONS

PROJ:	200-08507-18001
DESN:	TLM
DRWN:	JTE
CHKD:	JCB

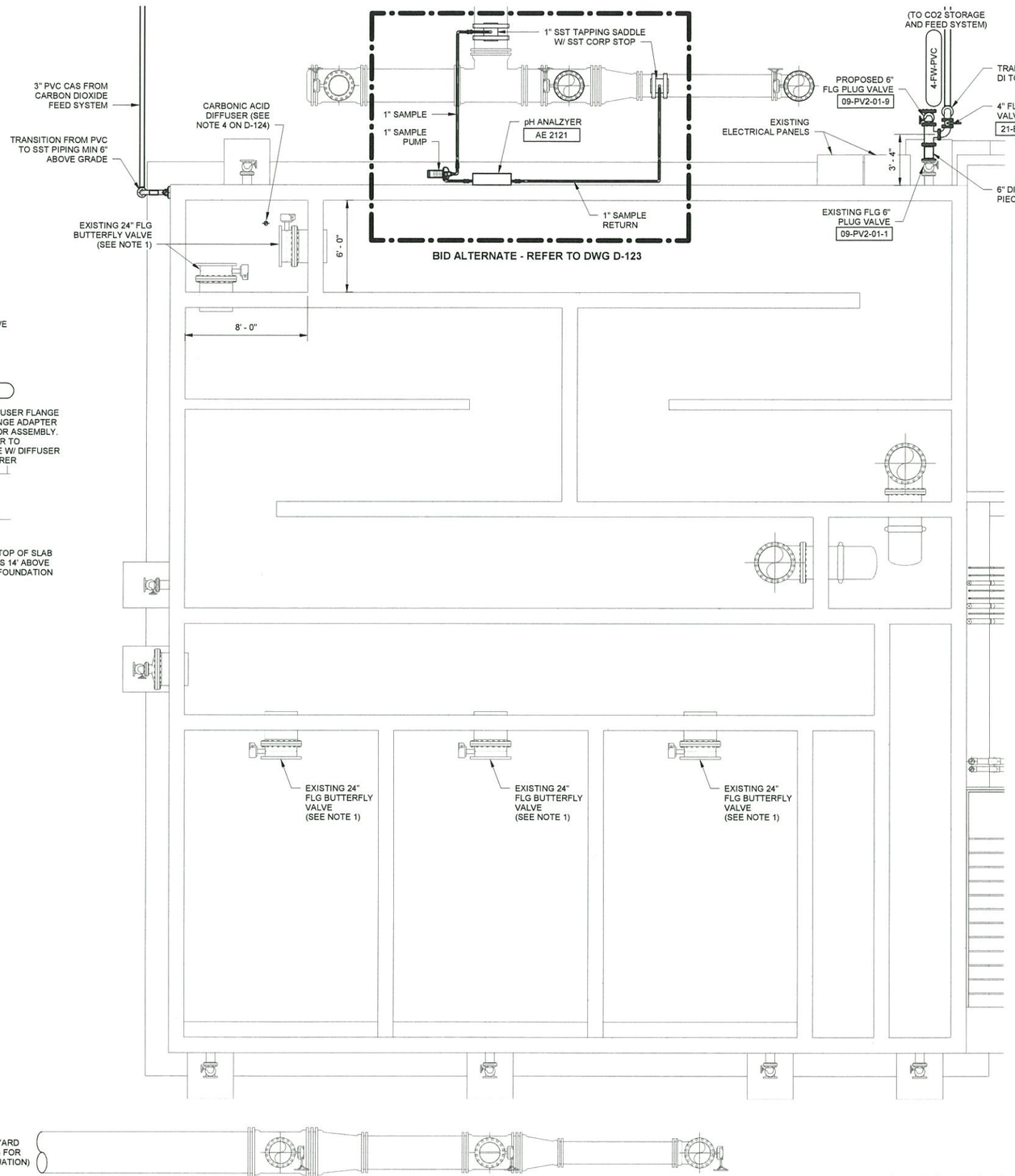
D-126

6/16/2020 1:44:42 PM BIM 360://200-08507-19001 Palm Bay RO Expansion/08507-DEGAS-D-2019.rvt

Bar measures 1 inch, otherwise drawing is not to scale



2 DETAIL
D-124 SCALE: 3/4" = 1'-0"



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

NOTES:

1. REPLACE EXISTING VALVE GEAR OPERATORS, STEM EXTENSIONS AND HARDWARE WITH 316 STAINLESS STEEL IN ACCORDANCE WITH SPECIFICATION SECTION 15101.
2. COORDINATE REPLACEMENT SEQUENCE AND TEMPORARY SHUTDOWN WITH OWNER. CONTRACTOR SHALL SUBMIT A DETAILED REPLACEMENT PLAN PROVIDING THE PROPOSED SEQUENCE FOR THE TEMPORARY SHUTDOWNS, REPLACEMENTS AND DISINFECTION OUTLINING THE STEP-BY-STEP SEQUENCE TO DEMONSTRATE THE CAPABILITY TO COMPLETE THE REPLACEMENTS WITHIN THE ALLOTTED SHUTDOWN DURATION.

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6/17/20

BID SET

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
DEGASIFIER CLEARWELL GEAR BOX REPLACEMENT PLAN

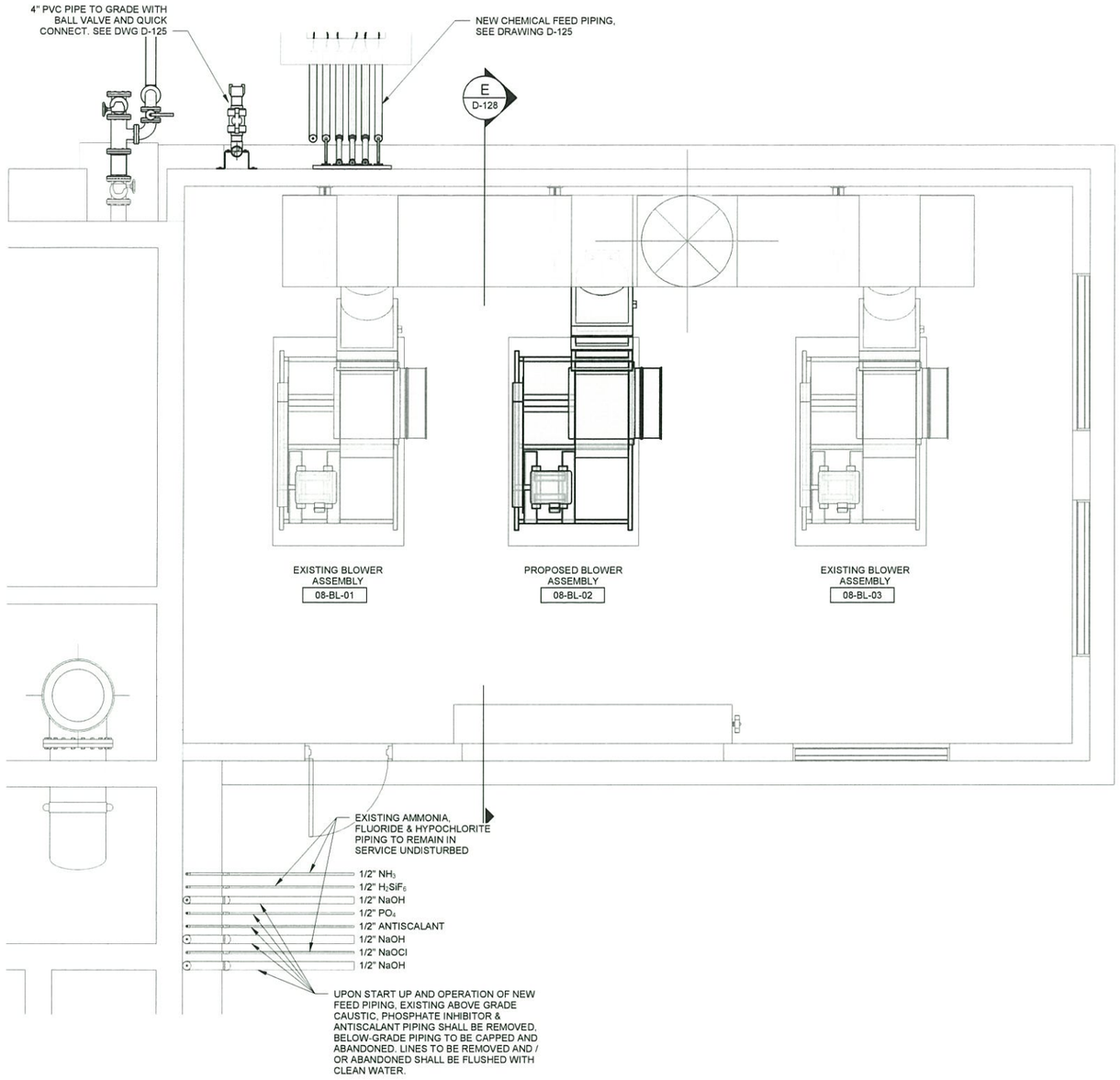
PROJ:	200-08507-18001
DESN:	JAB
DRWN:	JTE
CHKD:	JCB

D-127

N
0 2' 4' 8'
SCALE: 1/4" = 1'-0"

Bar measures 1 inch, otherwise drawing is not to scale

6/17/2020 3:06:07 PM BIM 360://200-08507-19001 Palm Bay RO Expansion/08507-DEGAS-D-2019.rvt

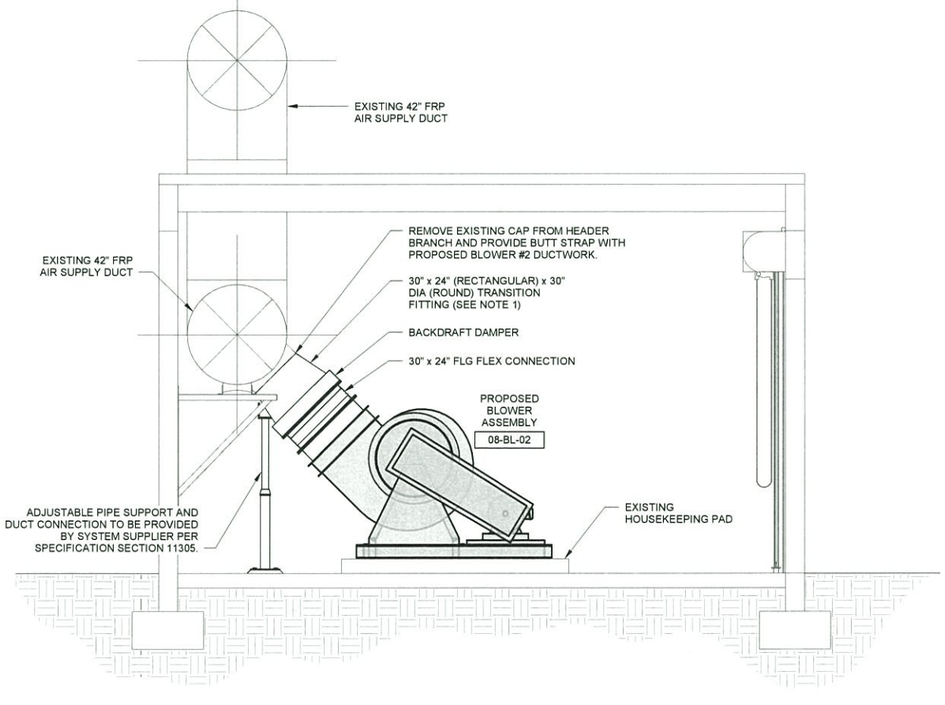


MODIFICATIONS PLAN

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

NOTES:

1. THE ACTUAL DIMENSIONS OF THE TRANSITION FITTING, DAMPER AND FLEX CONNECTION MAY VARY IN ORDER TO ACCOMMODATE THE BLOWER AND PIPING EQUIPMENT SUPPLIED. ACTUAL DIMENSIONS SHALL BE COORDINATED WITH THE BLOWER EQUIPMENT MANUFACTURERS. FABRICATOR TO INCLUDE, ONE TRANSITION FITTING, REINFORCED SUPPORT APPURTENANCE TO ACCOMMODATE PIPE SUPPORT.



E D-128 SECTION

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

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PROFESSIONAL ENGINEER

6/17/20

BID SET

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

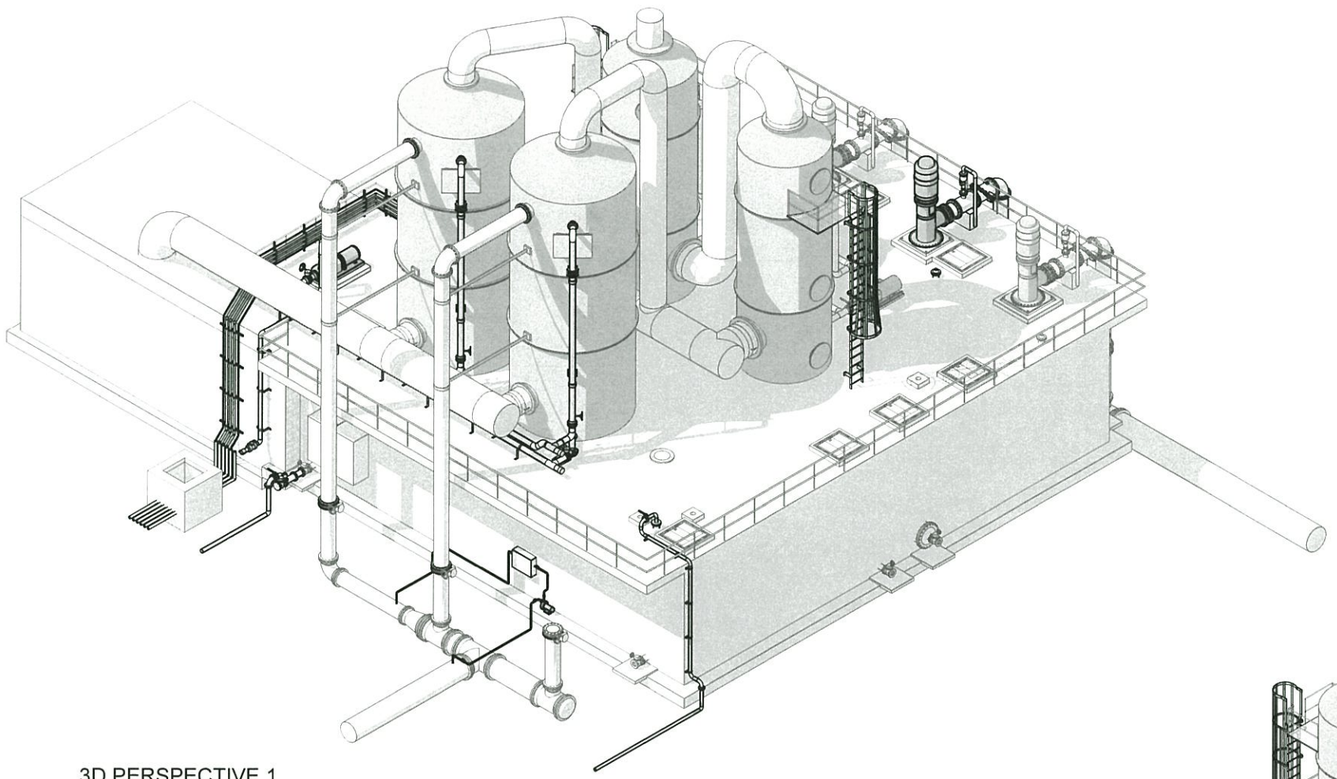
DEGASIFIER BLOWER ROOM MODIFICATIONS PLAN & SECTIONS

PROJ:	200-08507-18001
DESN:	JAB
DRWN:	JTE
CHKD:	JCB

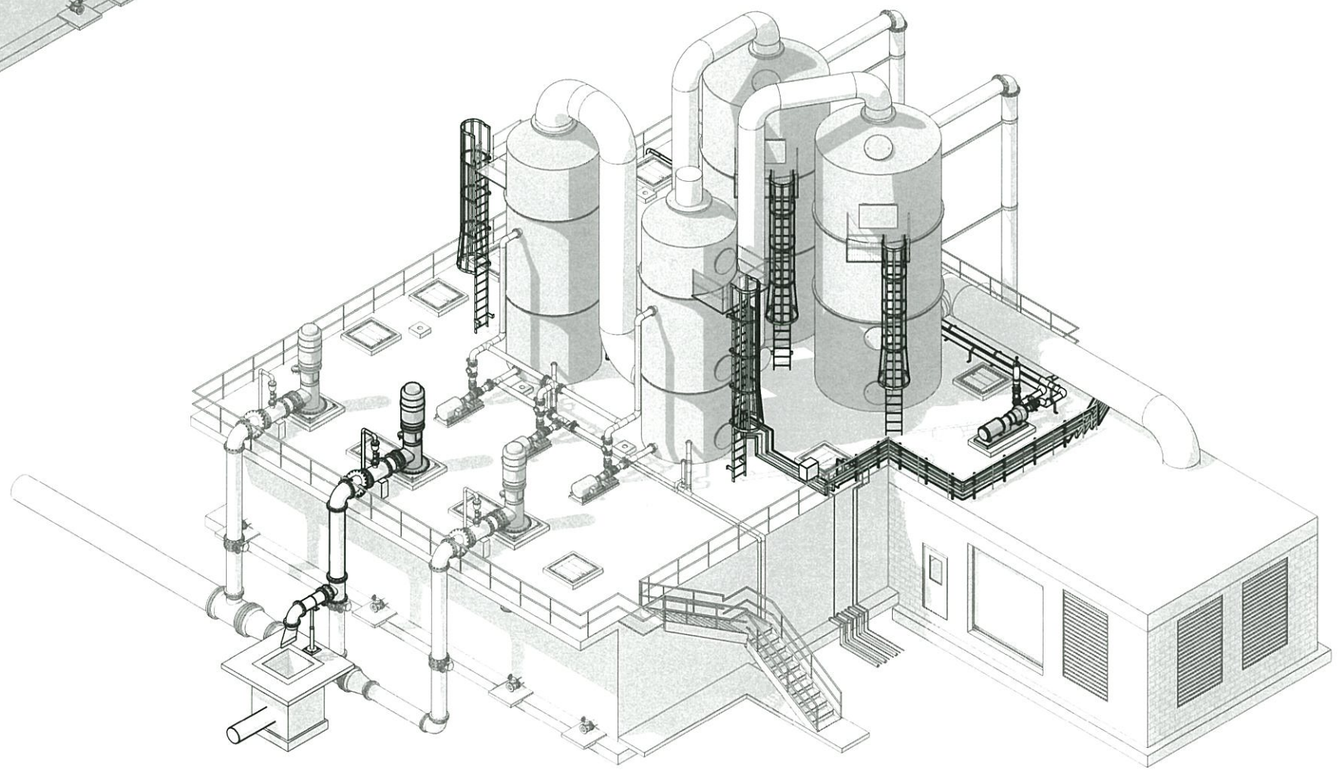
D-128

6/16/2020 12:58:12 PM BIM 360://200-08507-19001 Palm Bay RO Expansion/08507-DEGAS-D-2019.rvt

Bar measures 1 inch, otherwise drawing is not to scale



3D PERSPECTIVE 1
SCALE:



3D PERSPECTIVE 2
SCALE:

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JONATHAN C. BUNDY
LICENSE
No. 62561
STATE OF FLORIDA
PROFESSIONAL ENGINEER

BID SET

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT
PLANT EXPANSION - 4-MGD TO 6-MGD

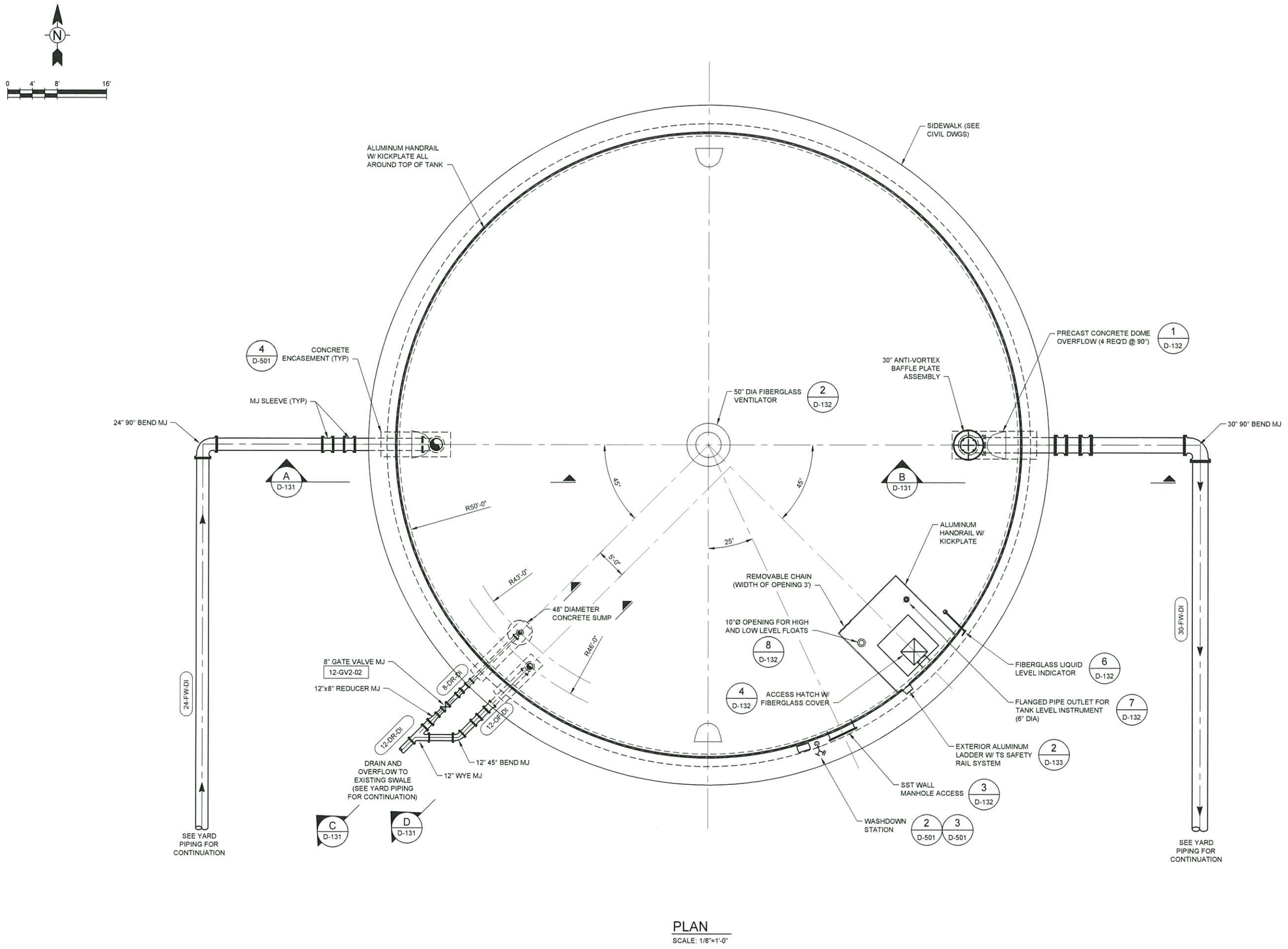
DEGASIFIER STRUCTURE
3D PERSPECTIVES

PROJ:	200-08507-18001
DESN:	JAB
DRWN:	JTE
CHKD:	JCB

D-129

6/16/2020 12:58:25 PM BIM 360://200-08507-19001 Palm Bay RO Expansion/08507-DEGAS-D-2019.rvt

Bar measures 1 inch, otherwise drawing is not to scale



PLAN

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

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BID SET

JONATHAN C. BUNDY
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No. 62561
STATE OF FLORIDA
PROFESSIONAL ENGINEER
6/18/20

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

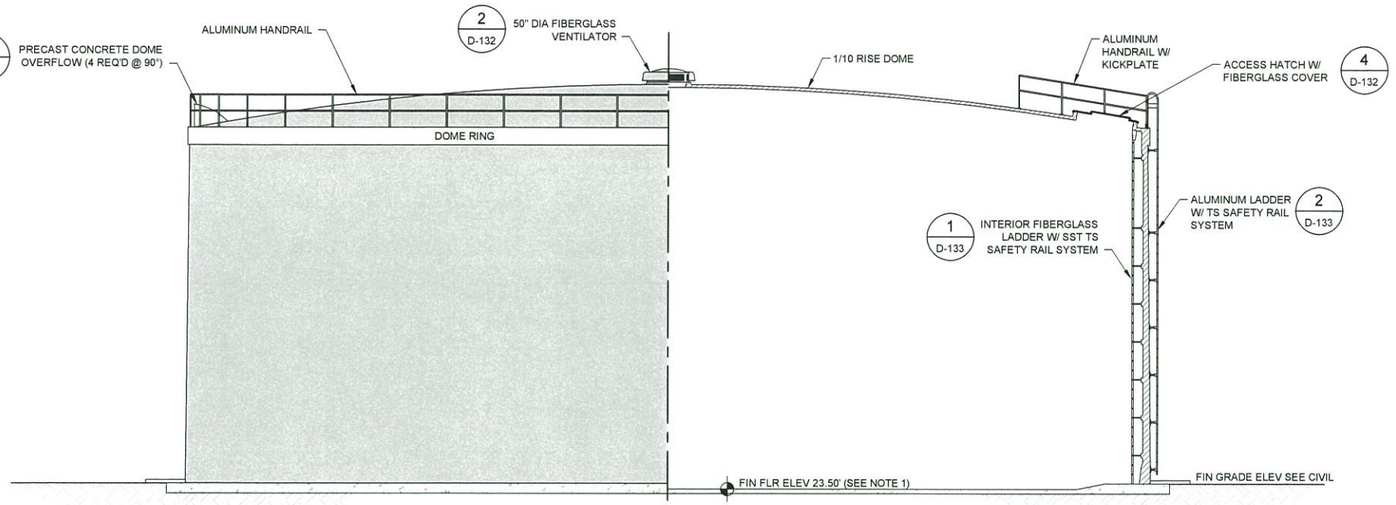
2.0 MG FINISHED WATER GROUND STORAGE TANK PLAN

PROJ:	200-08507-19001
DESN:	ACN
DRWN:	JTE
CHKD:	JCB

D-130

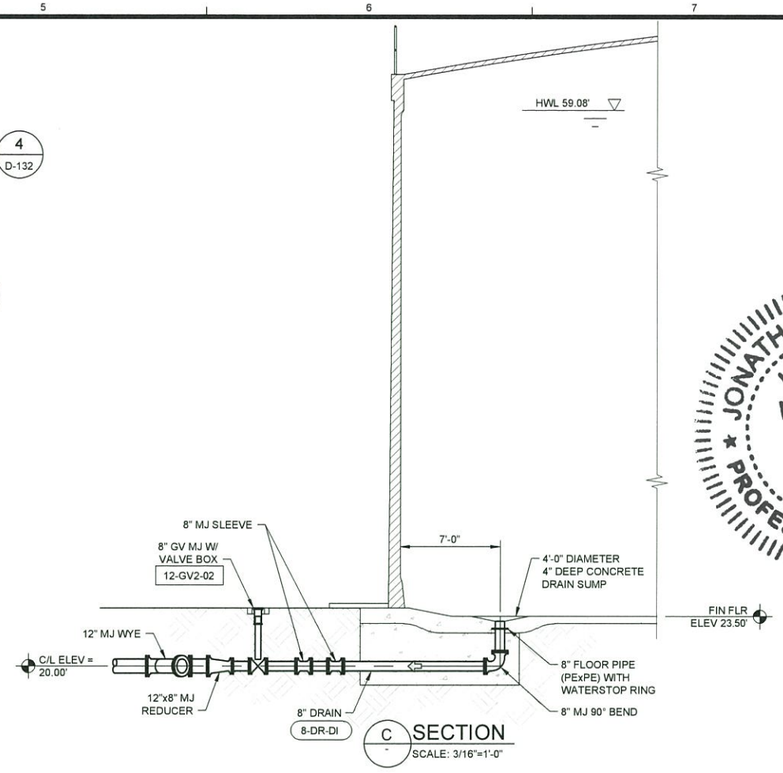
Bar Measures 1 inch, otherwise drawing not to scale

6/17/2020 8:45:34 AM - O:\PROJECTS\ORLANDO\IER\08507\200-08507-19001\CAD\SHEETFILES\D-130_133 GST.DWG - EVANS, JON



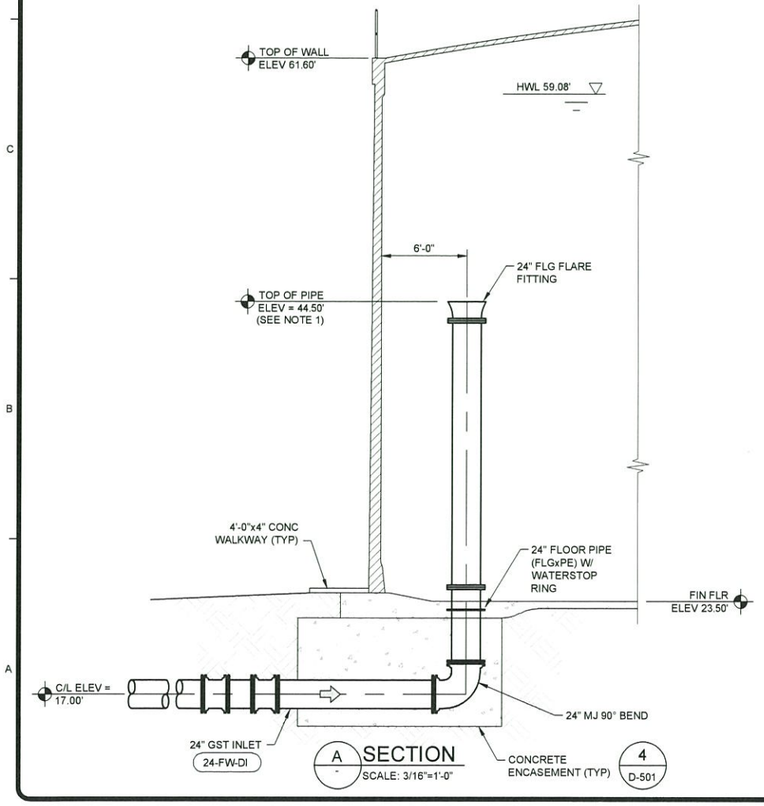
EXTERIOR / INTERIOR ELEVATION

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



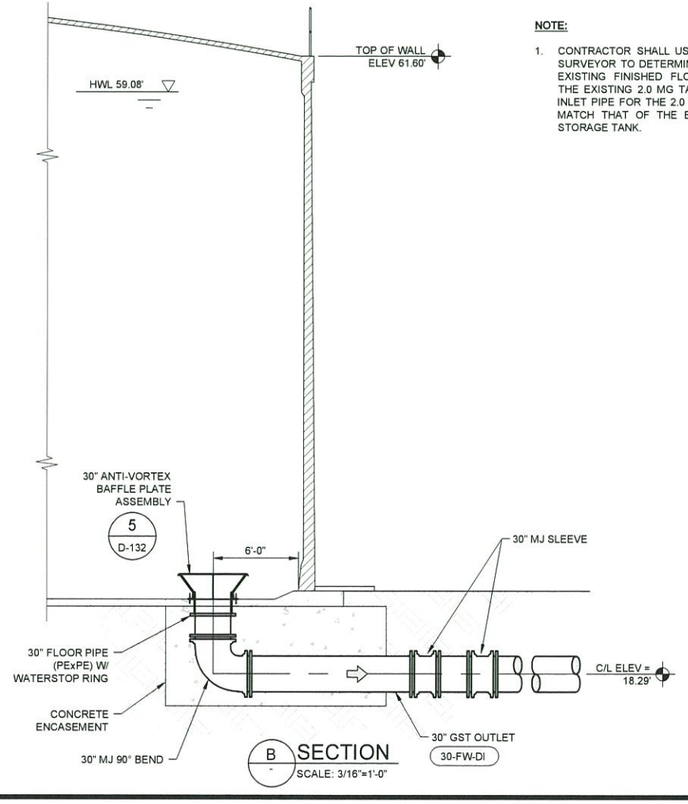
C SECTION

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



A SECTION

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

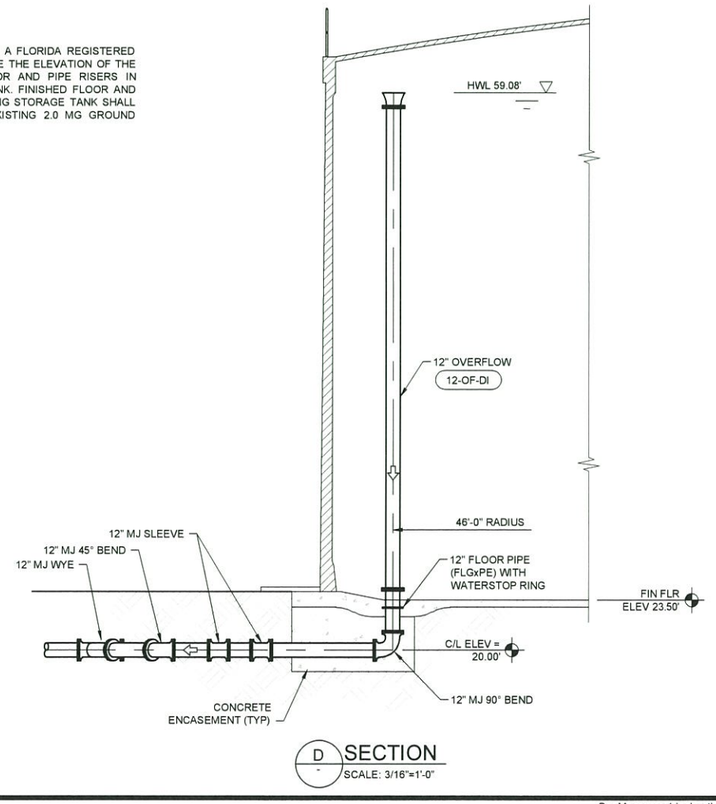


B SECTION

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

NOTE:

1. CONTRACTOR SHALL USE A FLORIDA REGISTERED SURVEYOR TO DETERMINE THE ELEVATION OF THE EXISTING FINISHED FLOOR AND PIPE RISERS IN THE EXISTING 2.0 MG TANK. FINISHED FLOOR AND INLET PIPE FOR THE 2.0 MG STORAGE TANK SHALL MATCH THAT OF THE EXISTING 2.0 MG GROUND STORAGE TANK.



D SECTION

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

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FIRST

JONATHAN C. BUNDY
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STATE OF FLORIDA
PROFESSIONAL ENGINEER
6/17/2020

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

2.0 MG FINISHED WATER GROUND STORAGE TANK SECTIONS

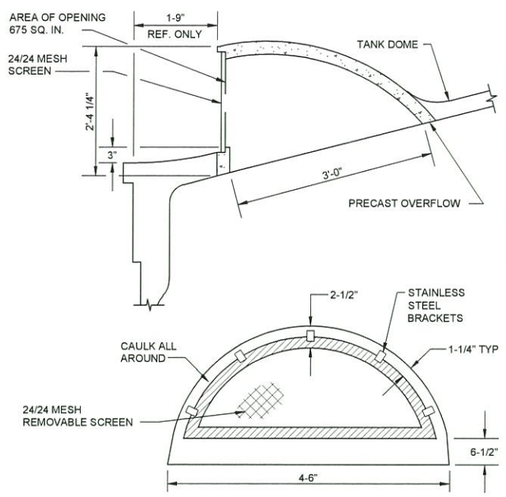
PROJ:	200-08507-19001
DESN:	ACN
DRWN:	JTE
CHKD:	JCB

D-131

Bar Measures 1 inch, otherwise drawing not to scale

1 PRECAST CONCRETE DOME OVERFLOW

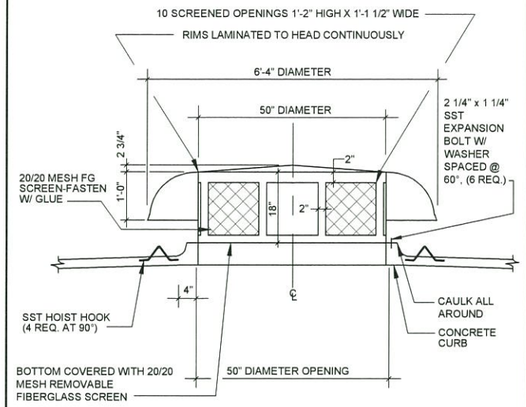
SCALE: NTS



NOTE:
KEEP SHOTCRETE REBOUND CLEANED OFF OF OVERFLOW. LEAVE PLYWOOD COVER IN PLACE UNTIL ALL SHOTCRETING IS COMPLETE.

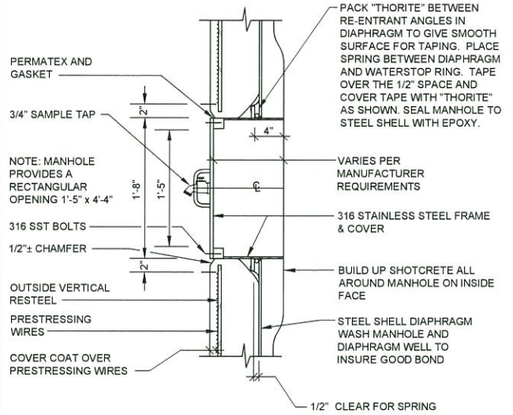
2 50" FIBERGLASS VENTILATOR

SCALE: NTS



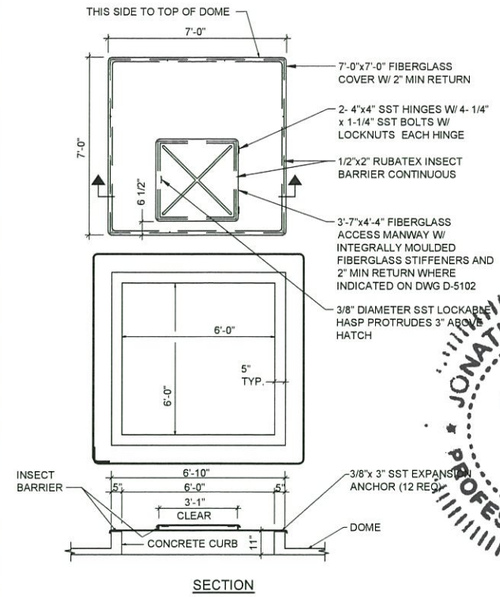
3 STAINLESS STEEL WALL MANHOLE

SCALE: NTS



4 FIBERGLASS HATCH COVER

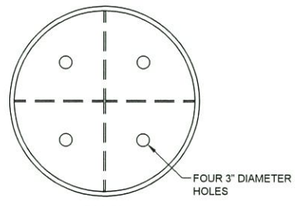
SCALE: NTS



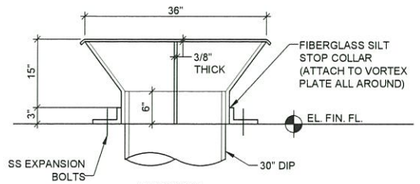
SECTION

5 FIBERGLASS VORTEX PLATE W/ FIBERGLASS SILT TOP

SCALE: NTS



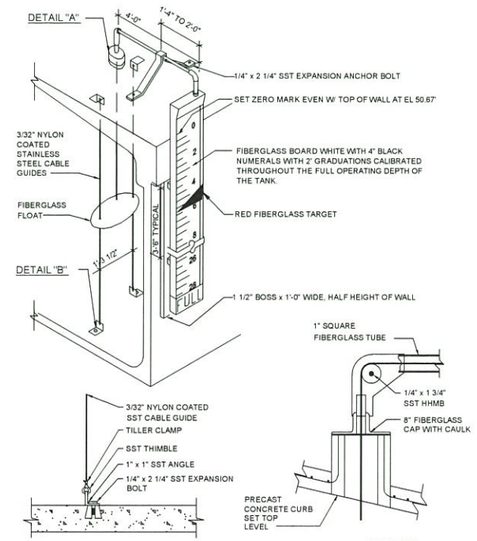
PLAN



SECTION

6 FIBERGLASS LIQUID LEVEL INDICATOR (DOMED TANK)

SCALE: NTS

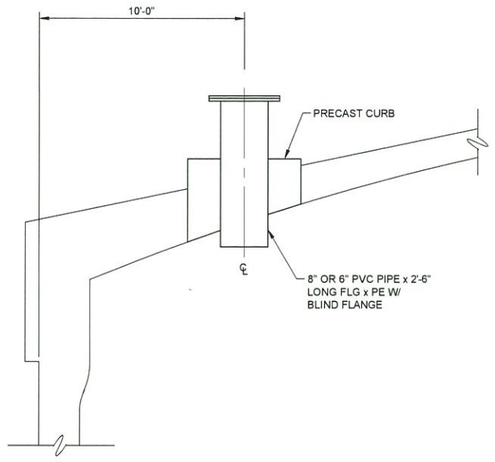


DETAIL "B" TYPICAL TOP AND BOTTOM

DETAIL "A"

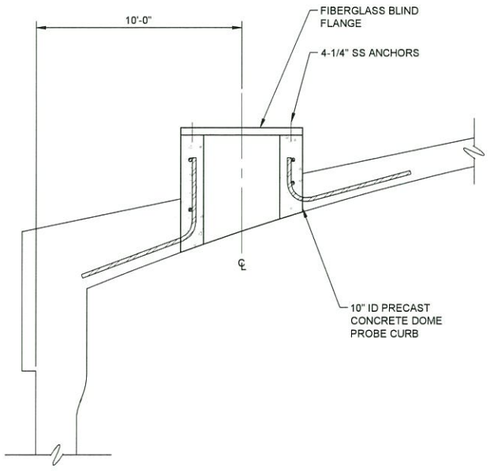
7 LIQUID LEVEL TRANSMITTER

SCALE: NTS



8 HIGH AND LOW LEVEL FLOAT DOME PROBE OPENING

SCALE: NTS



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BID SET

JONATHAN C. BUNDY
LICENSE
No. 62567
STATE OF FLORIDA
PROFESSIONAL ENGINEER
6/19/20

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT
PLANT EXPANSION - 4-MGD TO 6-MGD

2.0 MG FINISHED WATER GROUND STORAGE TANK DETAILS

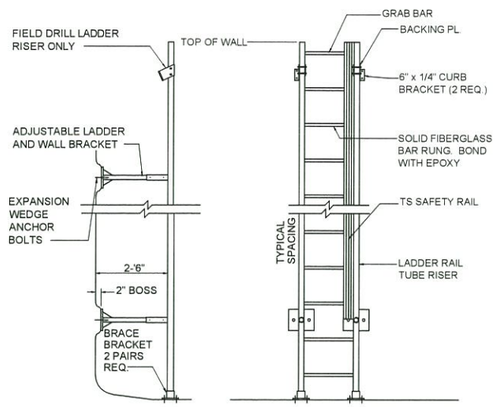
PROJ:	200-08507-19001
DESN:	ACN
DRWN:	JTE
CHKD:	JCB

D-132

Bar Measures 1 inch, otherwise drawing not to scale

1 INTERIOR FIBERGLASS LADDER W/ TS SAFETY RAIL

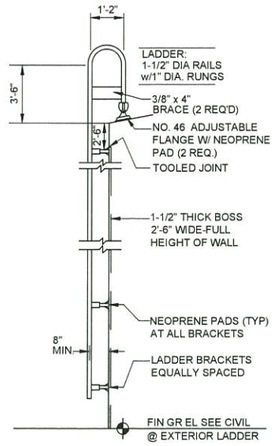
SCALE: NTS



SIDE VIEW FRONT VIEW

2 EXTERIOR ALUMINUM LADDER W/ TS RAIL

SCALE: NTS



SIDE VIEW

NOTES:

1. ALL TUBULAR MATERIAL TO BE NOMINAL DIAMETER SCHEDULE 40 ALUMINUM PIPE 6061-T6 OR 6063-T6
2. PLATES AND GUSSETS TO BE STRUCTURAL GRADE ALUMINUM 6061-T6.
3. NEOPRENE PAD REQUIRED AT ALL CONNECTIONS TO TANK.
4. USE SST EXPANSION ANCHORS.
5. PROVIDE TS RAIL SAFETY SYSTEM AS SPECIFIED IN SPECIFICATION SECTION 13205.

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JONATHAN C. DUNDY
LICENSE
No. 62561
STATE OF FLORIDA
PROFESSIONAL ENGINEER

GD SET

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

2.0 MG FINISHED WATER GROUND STORAGE TANK DETAILS

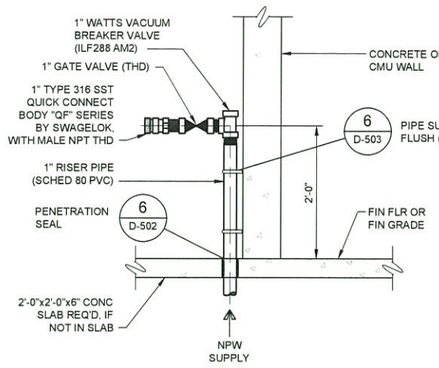
PROJ:	200-08507-19001
DESN:	ACN
DRWN:	JTE
CHKD:	JCB

D-133

Bar Measures 1 inch, otherwise drawing not to scale

1 HOSE VALVE - WALL MOUNTED

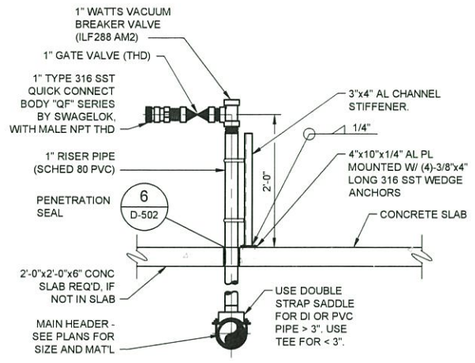
SCALE: NTS



NOTES:
PROVIDE 50' LONG, 1" DIA (0.47 LB/LF) ABRASION AND WEATHER RESISTANT EPDM RED COVER RAYON BRAIDED HOSE, AS MANUFACTURED BY AMAZON HOSE & RUBBER CO., OR EQUAL, WITH THE FOLLOWING 1" FITTINGS:
NOZZLE END: BRASS MALE HOSE BARB (NPSH THD), METAL HOSE SHUT-OFF VALVE, AND BRASS PLAIN HOSE NOZZLE (ALL FITTINGS AS MANUFACTURED BY AMAZON HOSE & RUBBER CO., OR EQUAL).
SUPPLY END: 1" 316 SST TUBE CONNECTION STEM, SERIES "QF" AS MANUFACTURED BY SWAGELOK, OR EQUAL.

2 HOSE VALVE - POST MOUNTED

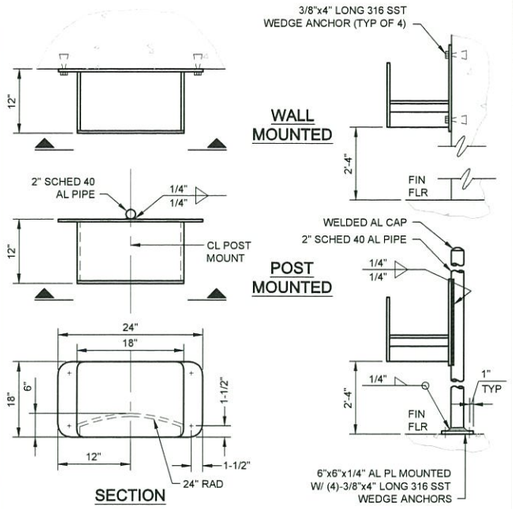
SCALE: NTS



NOTES:
PROVIDE 50' LONG, 1" DIA (0.47 LB/LF) ABRASION AND WEATHER RESISTANT EPDM RED COVER RAYON BRAIDED HOSE, AS MANUFACTURED BY AMAZON HOSE & RUBBER CO., OR EQUAL, WITH THE FOLLOWING 1" FITTINGS:
NOZZLE END: BRASS MALE HOSE BARB (NPSH THD), METAL HOSE SHUT-OFF VALVE, AND BRASS PLAIN HOSE NOZZLE (ALL FITTINGS AS MANUFACTURED BY AMAZON HOSE & RUBBER CO., OR EQUAL).
SUPPLY END: 1" 316 SST TUBE CONNECTION STEM, SERIES "QF" AS MANUFACTURED BY SWAGELOK, OR EQUAL.

3 HOSE RACK

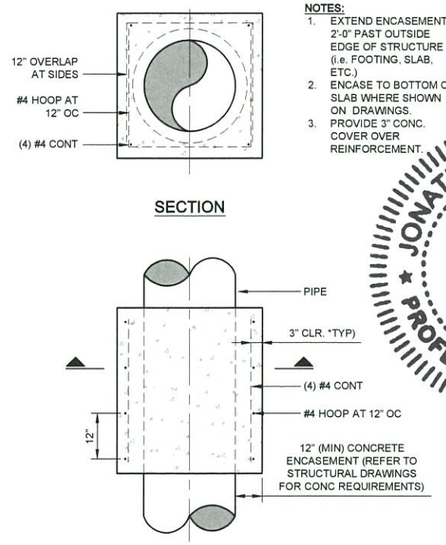
SCALE: NTS



NOTES:
1. FABRICATE UNIT FROM 1/4" 6061-T6 AL ALLOY PLATE.

4 CONCRETE ENCASEMENT

SCALE: NTS



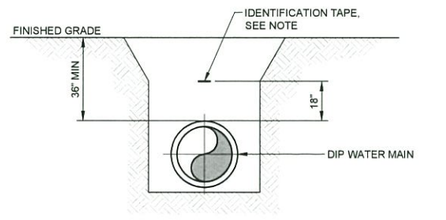
NOTES:
1. EXTEND ENCASEMENT 2'-0" PAST OUTSIDE EDGE OF STRUCTURE (i.e. FOOTING, SLAB, ETC.)
2. ENCASE TO BOTTOM OF SLAB WHERE SHOWN ON DRAWINGS.
3. PROVIDE 3" CONC. COVER OVER REINFORCEMENT.

5 NOT USED

SCALE: NTS

6 LOCATE TAPE

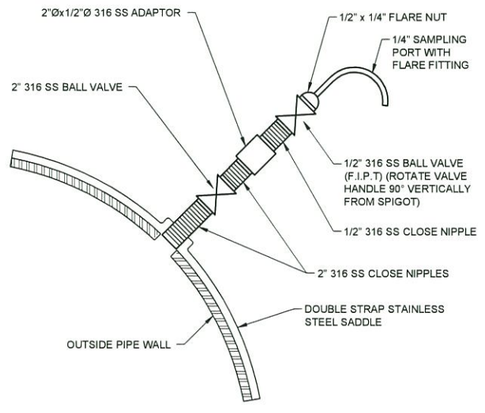
SCALE: NTS



NOTE:
DETECTABLE IDENTIFICATION TAPE SHALL BE INSTALLED DIRECTLY OVER CENTERLINE OF THE PIPE AT 18-INCHES ABOVE THE PIPE.

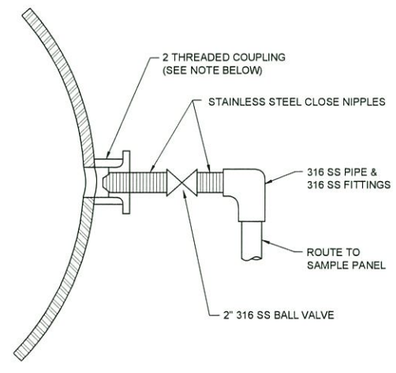
7 SAMPLE TAP

SCALE: NTS



8 SAMPLE CONNECTION TO INSTRUMENT PANEL

SCALE: NTS



NOTES:
1. BOND AND LAMINATE 2" FRP THREADED COUPLING TO FRP PIPE

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JONATHAN C. BUNDY LICENSE No. 62561 STATE OF FLORIDA PROFESSIONAL ENGINEER

BID SET

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
STANDARD PROCESS DETAILS

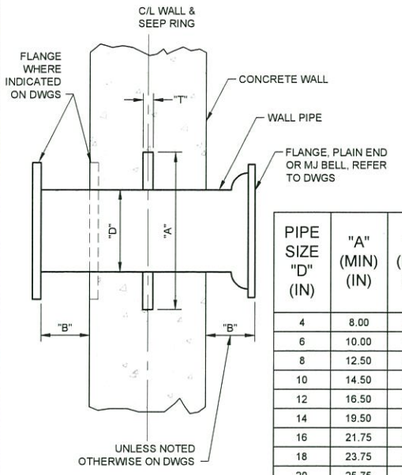
PROJ:	200-08507-19001
DESN:	JCR
DRWN:	JTE
CHKD:	JCB

D-501

Bar Measures 1 inch, otherwise drawing not to scale

1 WALL PENETRATION - WALL PIPE

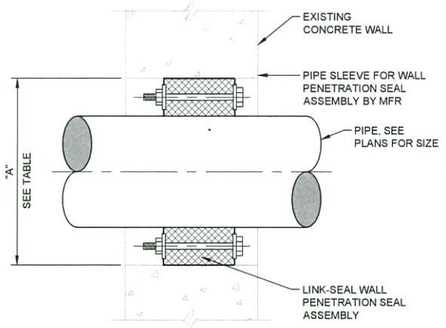
SCALE: NTS



PIPE SIZE "D" (IN)	"A" (MIN) (IN)	"B" (MIN) (IN)	"T" (MIN) (IN)
4	8.00	6.00	0.50
6	10.00	8.00	0.50
8	12.50	9.00	0.50
10	14.50	9.00	0.50
12	16.50	9.00	0.50
14	19.50	9.00	0.75
16	21.75	9.00	0.75
18	23.75	9.00	0.75
20	25.75	9.00	0.75
24	30.25	12.00	0.75
30	36.50	12.00	1.00
36	43.00	12.00	1.00
42	49.50	12.00	1.25
48	56.50	12.00	1.25

2 WALL PENETRATION - LINK SEAL (CORE-DRILLED)

SCALE: NTS

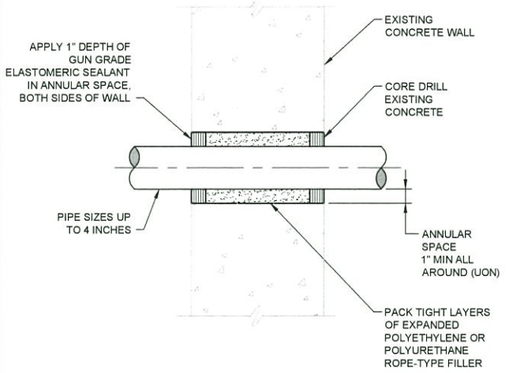


PIPE SIZE (IN)	"A" IPS (IN)	"A" DIP (IN)
1	3	-
2	4	4
2-1/2	4	-
3	5	6
4	6	8
6	10	10
8	12	12

PIPE SIZE (IN)	"A" IPS (IN)	"A" DIP (IN)
10	14	14
12	16	16
14	18	18
16	20	20
18	22	24
20	24	26
24	28	28

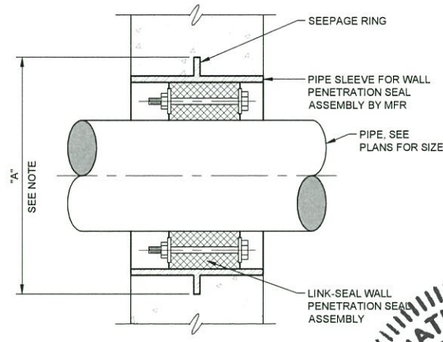
3 WALL PENETRATION - CONCRETE (SMALL DIAMETER)

SCALE: NTS



4 WALL PENETRATION - LINK SEAL (CAST)

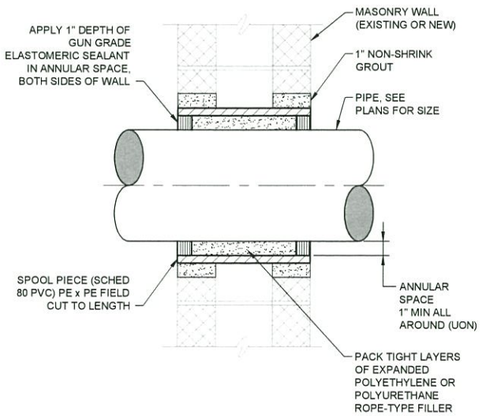
SCALE: NTS



NOTE:
SEE LINK SEAL REFERENCE TABLE (DET 8, THIS DWG) FOR SLEEVE AND SEEPAGE RING DIMENSIONS. CONTRACTOR TO CONFIRM AND COORDINATE W/ LINK SEAL MFR.

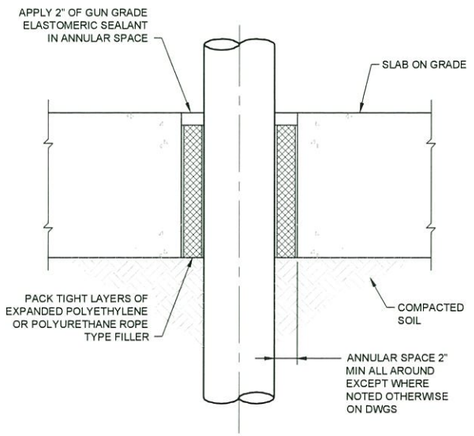
5 WALL PENETRATION - MASONRY

SCALE: NTS



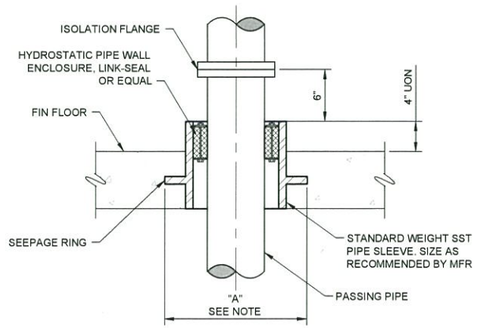
6 PIPE PENETRATION - SLAB-ON-GRADE

SCALE: NTS



7 WALL PENETRATION - CONCRETE (FLOOR)

SCALE: NTS



NOTE:
SEE LINK SEAL REFERENCE TABLE (DET 8, THIS DWG) FOR SLEEVE AND SEEPAGE RING DIMENSIONS. CONTRACTOR TO CONFIRM AND COORDINATE W/ LINK SEAL MFR.

8 LINK SEAL REFERENCE TABLE

SCALE: NTS

STEEL AND PLASTIC PIPE WITH SAME OUTSIDE DIAMETER

PIPE SIZE (IN)	NOMINAL SLEEVE DIA (IN)	"A" (IN)	PIPE SIZE (IN)	NOMINAL SLEEVE DIA (IN)	"A" (IN)
2	4	8	16	20	24
2-1/2	4	8	18	24	28
3	5	9	20	24	28
4	6	10	24	30	34
6	10	14	30	36	41
8	12	16	36	42	46
10	14	18	42	48	52
12	16	20	48	54	58
14	18	22			

DUCTILE IRON AND PVC (AWWA C-900 AND C-905) PIPE

PIPE SIZE (IN)	NOMINAL SLEEVE DIA (IN)	"A" (IN)	PIPE SIZE (IN)	NOMINAL SLEEVE DIA (IN)	"A" (IN)
2	4	8	16	22	26
2-1/2	5	9	18	24	28
3	6	10	20	27	31
4	8	12	24	30	34
6	10	14	30	38	42
8	12	16	36	44-1/2	48-1/2
10	16	20	42	50-1/2	54-1/2
12	18	22	48	57	61
14	20	24			

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BID SET

JONATHAN C. BUNDY LICENSE No. 62561 STATE OF FLORIDA PROFESSIONAL ENGINEER

MARK	DATE	DESCRIPTION

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

STANDARD PROCESS DETAILS

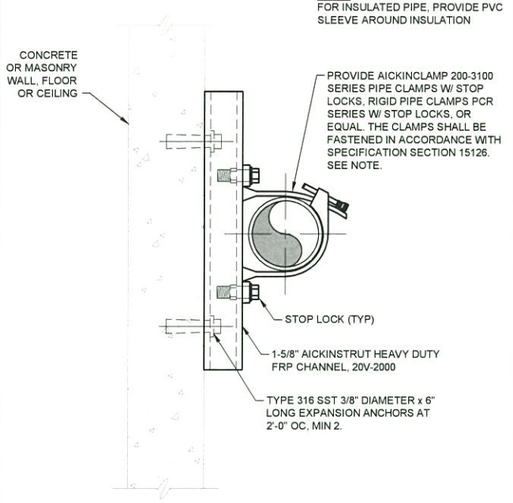
PROJ:	200-08507-19001
DESN:	JCR
DRWN:	JTE
CHKD:	JCB

D-502

Bar Measures 1 inch, otherwise drawing not to scale

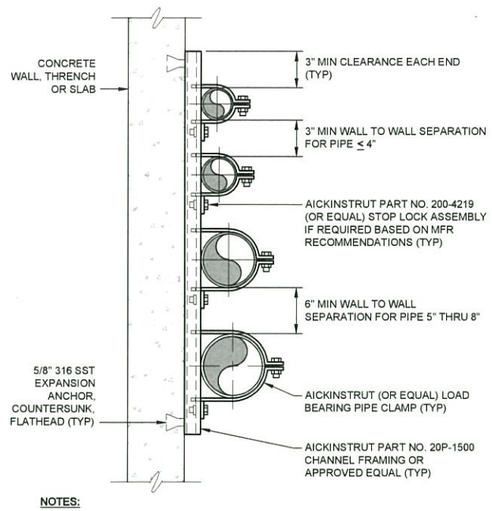
1 PIPE SUPPORT - NON-METALLIC

SCALE: NTS



2 PIPE SUPPORT - STACKED

SCALE: NTS

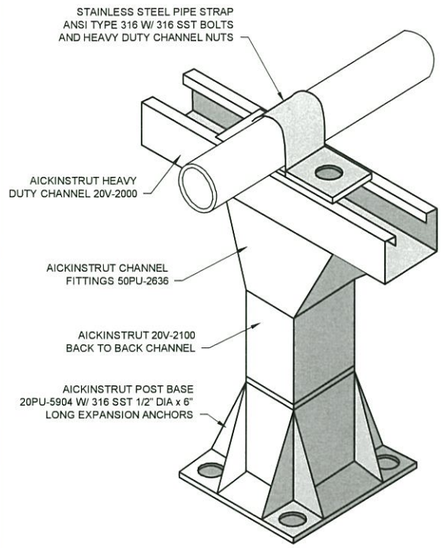


NOTES:

1. SEE DRAWINGS FOR TYPE, SIZE (MAX 8"), AND QUANTITY OF SUPPORTED PIPES.
2. ALL FRAMING AND PIPE SUPPORT MATERIALS SHALL BE EITHER FRP (INTERIOR ONLY) OR 316 SST (UNISTRUT OR EQUAL FOR EXTERIOR).

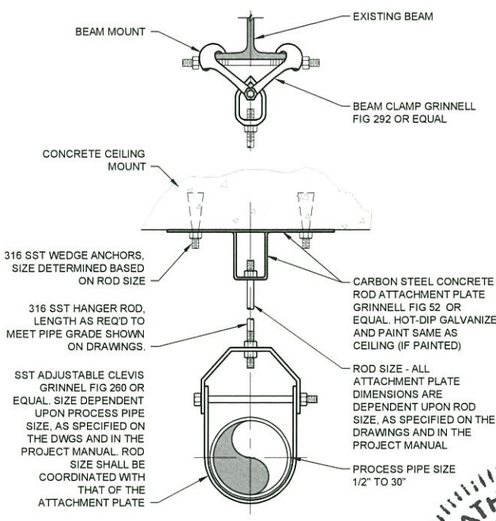
3 PIPE SUPPORT - NON-METALLIC STANCHION

SCALE: NTS



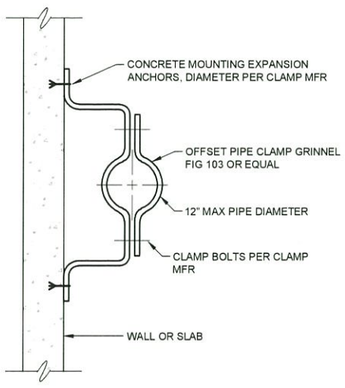
4 PIPE SUPPORT - HANGER CLEVIS AND PLATE

SCALE: NTS



5 PIPE SUPPORT - OFFSET

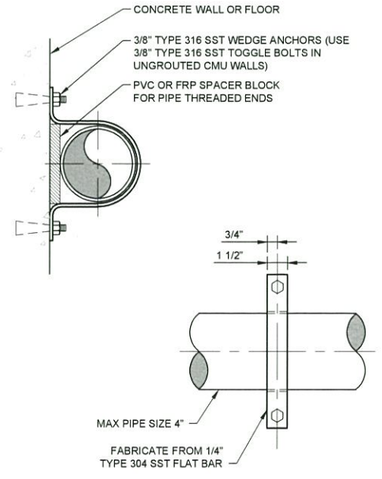
SCALE: NTS



NOTE:
ALL MATERIALS OF CONSTRUCTION SHALL BE 316 STAINLESS STEEL OR ALUMINUM. ALL MOUNTING HARDWARE SHALL BE 316 STAINLESS STEEL.

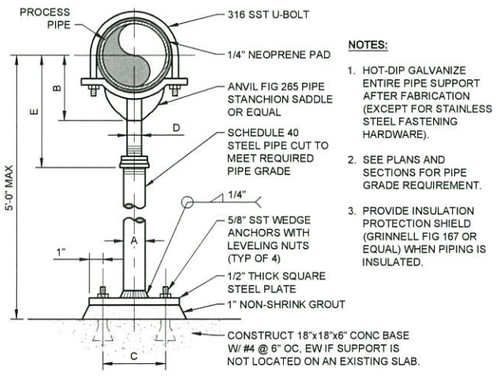
6 PIPE SUPPORT - FLUSH

SCALE: NTS



7 PIPE SUPPORT - ADJUSTABLE STANCHION W/ U-BOLT

SCALE: NTS



NOTES:

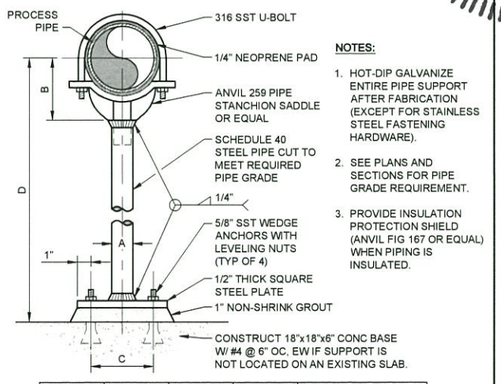
1. HOT-DIP GALVANIZE ENTIRE PIPE SUPPORT AFTER FABRICATION (EXCEPT FOR STAINLESS STEEL FASTENING HARDWARE).
2. SEE PLANS AND SECTIONS FOR PIPE GRADE REQUIREMENT.
3. PROVIDE INSULATION PROTECTION SHIELD (GRINNELL FIG 167 OR EQUAL) WHEN PIPING IS INSULATED.

PIPE SIZE	A	B	C	D	E	
					MIN	MAX
4	4	4 3/16	7	3	9 1/2	14
6	4	5 7/16	7	3	10 3/4	15 1/4
8	4	6 15/16	7	3	12 1/4	16 3/4
10	4	8 7/16	7	3	13 3/4	18 1/4
12	4	9 15/16	7	3	14 5/8	19 1/8
16	4	11 1/2	7	3	16 13/16	21 5/16
18	6	13 1/2	9	3 1/2	19 1/8	23 5/8
20	6	14 1/2	9	3 1/2	20 1/8	24 5/8
24	6	17 1/2	9	4	23 5/16	27 13/16

* ALL DIMENSIONS IN INCHES.

8 PIPE SUPPORT - STANCHION SADDLE W/ U-BOLT

SCALE: NTS



NOTES:

1. HOT-DIP GALVANIZE ENTIRE PIPE SUPPORT AFTER FABRICATION (EXCEPT FOR STAINLESS STEEL FASTENING HARDWARE).
2. SEE PLANS AND SECTIONS FOR PIPE GRADE REQUIREMENT.
3. PROVIDE INSULATION PROTECTION SHIELD (ANVIL FIG 167 OR EQUAL) WHEN PIPING IS INSULATED.

PIPE SIZE	A	B	C	D	
				MIN	MAX
4	3	4 3/16	7	6	60
6	3	5 7/16	7	8	60
8	3	6 15/16	7	8	60
10	3	8 7/16	7	10	60
12	3	9 15/16	7	12	60
16	3	11 1/2	7	20	60
18	4	13 1/2	7	28	60
20	5	14 1/2	9	36	120
24	5	17 1/2	9	40	120

* ALL DIMENSIONS IN INCHES.

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BID SET

JONATHAN C. BUNDY LICENSE No. 62561 6/19/20 STATE OF FLORIDA PROFESSIONAL ENGINEER

MARK	DATE	DESCRIPTION

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

STANDARD PROCESS DETAILS

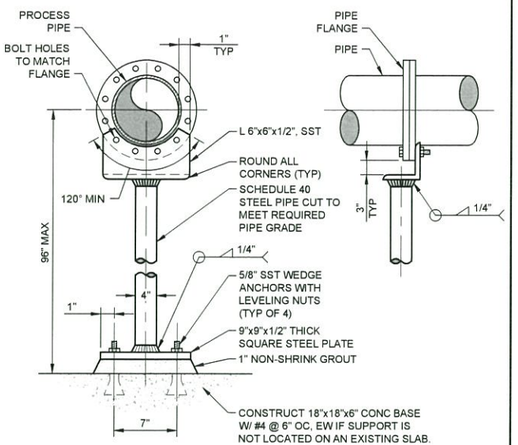
PROJ:	200-08507-19001
DESN:	JCR
DRWN:	JTE
CHKD:	JCB

D-503

Bar Measures 1 inch, otherwise drawing not to scale

1 PIPE SUPPORT - FLANGE

SCALE: NTS

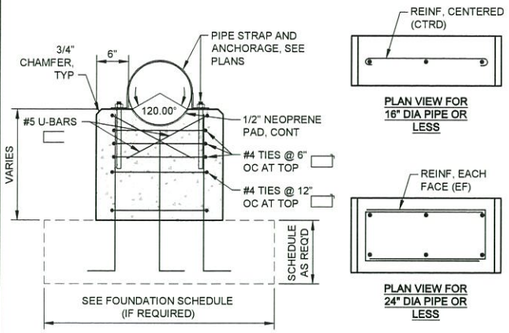


NOTES:

1. HOT-DIP GALVANIZE ENTIRE PIPE SUPPORT AFTER FABRICATION (EXCEPT FOR STAINLESS STEEL FASTENING HARDWARE).
2. SEE PLANS AND SECTIONS FOR PIPE GRADE REQUIREMENT.
3. PIPE SUPPORT SUITABLE FOR PIPE SIZES 3" THROUGH 24" DIA.

2 PIPE SUPPORT - CONCRETE SADDLE

SCALE: NTS

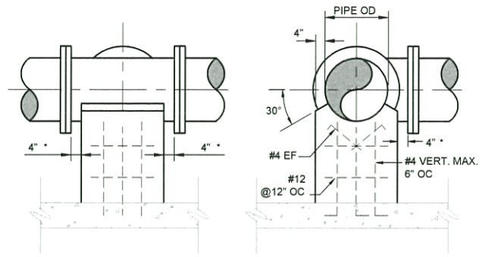


PIPE SIZE	MIN WIDTH	SADDLE REINF		FOUNDATION REINF (AS REQ'D)	
		VERTICAL	HORIZONTAL	SIZE (LxWxD)	REINF (E.W.)
12	6	#5@12" OC, CTRD	#5@12" OC, CTRD	3' x 2' x 8"	#5@12" OC, BOT
16	8	#5@12" OC, CTRD	#5@12" OC, CTRD	4' x 3' x 12"	#5@12" OC, T&B
24	12	#5@12" OC, EF	#5@12" OC, EF	5' x 3' x 12"	#5@12" OC, T&B
30 > 42	16	#5@8" OC, EF	#5@12" OC, EF	6' x 3.5 'x 16"	#5@12" OC, T&B

NOTE:
REFER TO PIPE SUPPORT FOUNDATION SCHEDULE WHERE PIPE SADDLE IS NOT SUPPORTED ON CONCRETE SLAB.

3 PIPE SUPPORT - CONCRETE SADDLE FOR VALVES & TEES

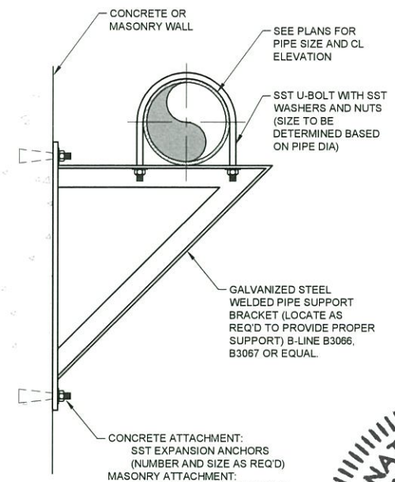
SCALE: NTS



* INCREASE 4" CLEARANCE AS REQUIRED IF BOLT HAS TO BE INSERTED FROM THE SUPPORT SIDE OF THE CONNECTION.

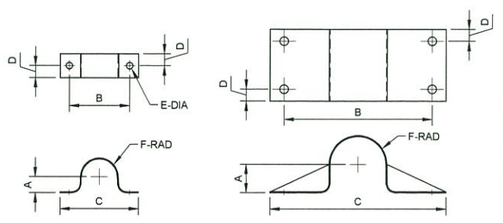
4 PIPE SUPPORT - WALL KNEE BRACE

SCALE: NTS



5 PIPE SUPPORT - ANCHOR CLAMP

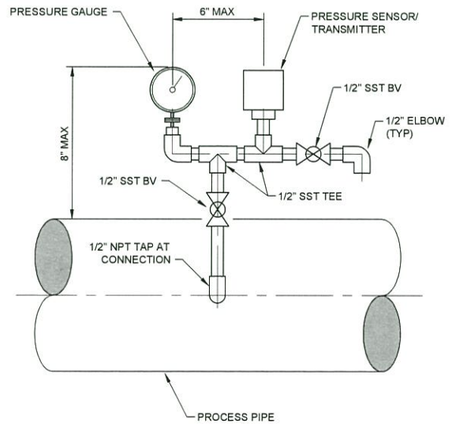
SCALE: NTS



PIPE SIZE	A	B	C	D	E	F	STOCK SIZE	APPROX WEIGHT PER 100
2	15/16	5-3/8	7-5/8	1-1/2	7/8	1-3/16	3/8 x 3	306
2-1/2	1-5/16	5-7/8	8-1/8	1-1/2	7/8	1-7/16	3/8 x 3	348
3	1-1/2	6-1/2	8-3/4	1-1/2	7/8	1-3/4	3/8 x 3	409
3-1/2	1-3/4	7	9-1/4	1-1/2	7/8	2	3/8 x 3	449
4	2	7-1/2	9-3/4	1-1/2	7/8	2-1/4	3/8 x 3	491
5	2-9/16	8-9/16	10-13/16	1-1/2	7/8	2-13/16	3/8 x 3	581
6	3-1/16	10-5/8	13-5/8	3	1	3-5/16	1/2 x 6	2000
8	4-1/16	12-5/8	15-5/8	3	1	4-5/16	1/2 x 6	2400
10	5-1/8	15-1/4	18-3/4	2-1/2	1-1/8	5-3/8	1/2 x 8	4281
12	6-1/8	17-1/4	20-3/4	2-1/2	1-1/8	6-3/8	1/2 x 8	4546
14	6-3/4	18-1/2	22	3	1-1/8	7	1/2 x 10	6800
16	7-3/4	20-1/2	24	3	1-1/8	8	1/2 x 10	7600
18	8-3/4	22-1/2	26	3-1/2	1-1/8	9	1/2 x 12	10800
20	9-3/4	24-1/2	28	3-1/2	1-1/8	10	1/2 x 12	12000
24	11-3/4	28-1/2	32	3-1/2	1-1/8	12	1/2 x 12	13900
30	14-3/4	34-1/2	38	3-1/2	1-1/8	15	1/2 x 12	16200

6 PRESSURE GAUGE AND SENSOR / TRANSMITTER

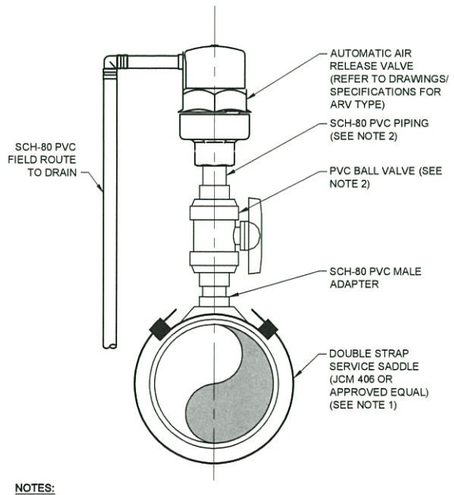
SCALE: NTS



NOTES:
1. USE 316 SST PIPE, FITTINGS AND VALVES.

7 AUTOMATIC AIR RELEASE VALVE

SCALE: NTS

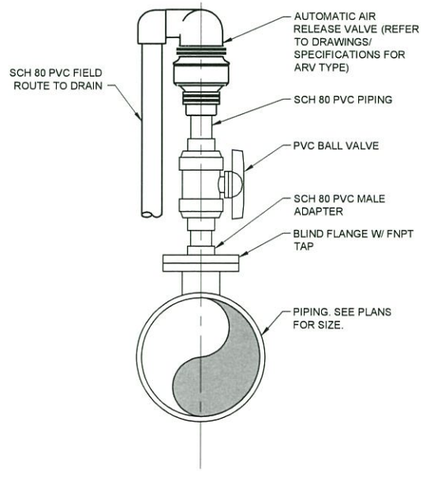


NOTES:

1. CONNECT DIRECTLY TO THREADED PORTS FOR VALVES LOCATED ON PRESSURE VESSELS.
2. FOR PRESSURE VESSELS USE REDUCED SIZE ISOLATION VALVE AND PIPING TO MATCH PORT CONNECTION.

8 AUTOMATIC RELEASE VALVE

SCALE: NTS



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BID SET

JONATHAN C. BUNDY LICENSE No. 82561 STATE OF FLORIDA PROFESSIONAL ENGINEER

MARK	DATE	DESCRIPTION

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
STANDARD PROCESS DETAILS

PROJ:	200-08507-19001
DESN:	JCR
DRWN:	JTE
CHKD:	JCB

D-504

Bar Measures 1 inch, otherwise drawing not to scale

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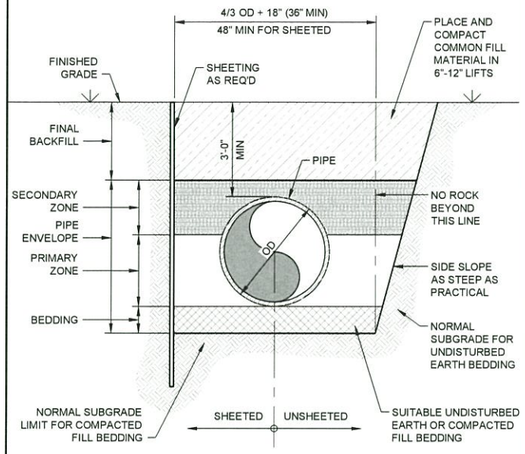
1 PIPE TRENCH

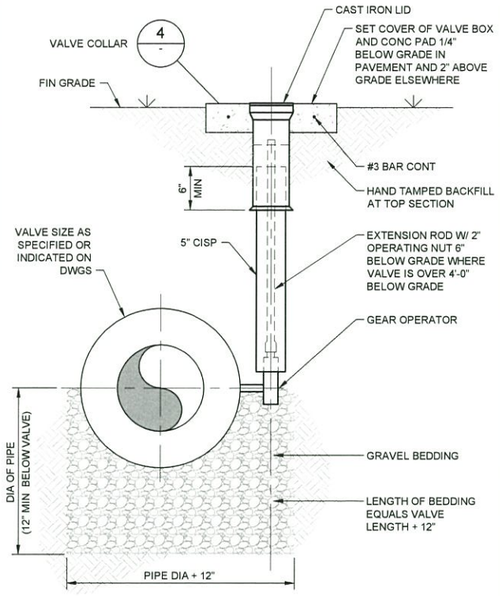
SCALE: NTS



NOTE:
SEE TECHNICAL SPECIFICATIONS FOR DEFINITION AND REQUIREMENTS FOR EACH ZONE.

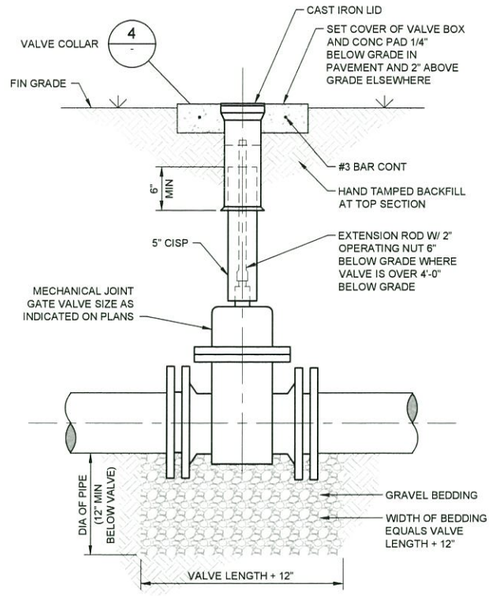
2 BURIED VALVE - BUTTERFLY OR PLUG

SCALE: NTS



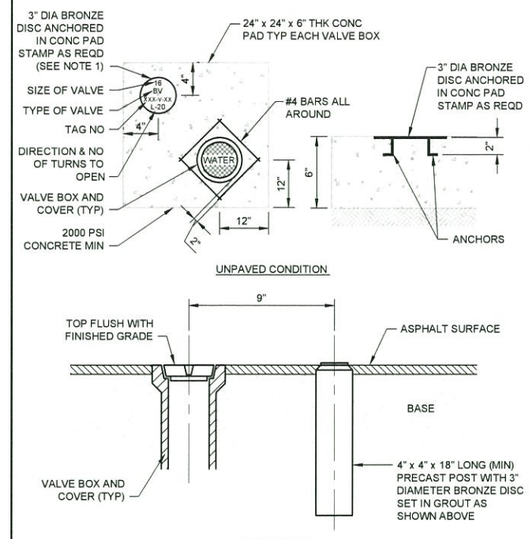
3 BURIED VALVE - GATE

SCALE: NTS



4 VALVE COLLAR

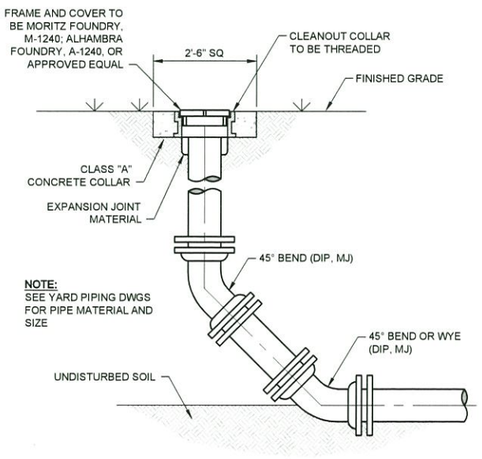
SCALE: NTS



NOTE:
1. BRONZE IDENTIFICATION DISC SHALL BE REQUIRED FOR ALL VALVES.

5 CLEANOUT - GRAVITY

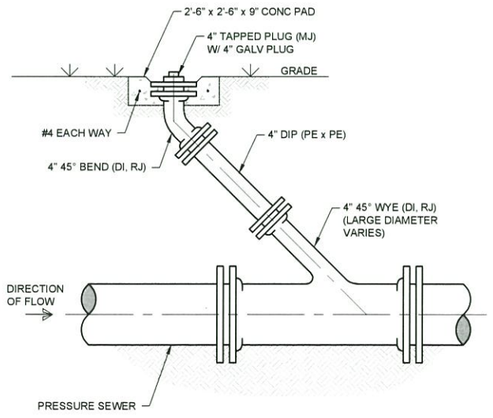
SCALE: NTS



NOTE:
SEE YARD PIPING DWGS FOR PIPE MATERIAL AND SIZE

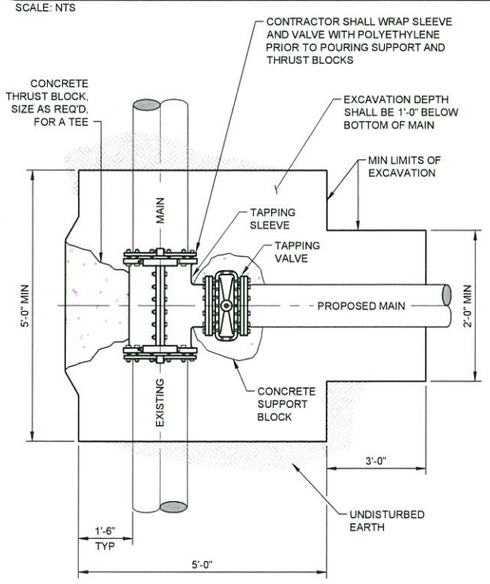
6 CLEANOUT - PRESSURE LINE

SCALE: NTS



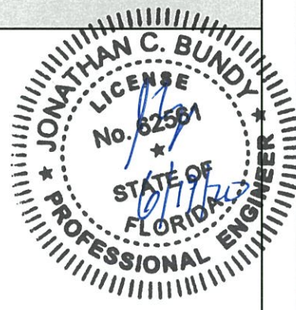
7 TAPPING SLEEVE AND VALVE

SCALE: NTS



8 NOT USED

SCALE: NTS



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BID SET

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

STANDARD PROCESS DETAILS

PROJ:	200-08507-19001
DESN:	JCR
DRWN:	JTE
CHKD:	JCB

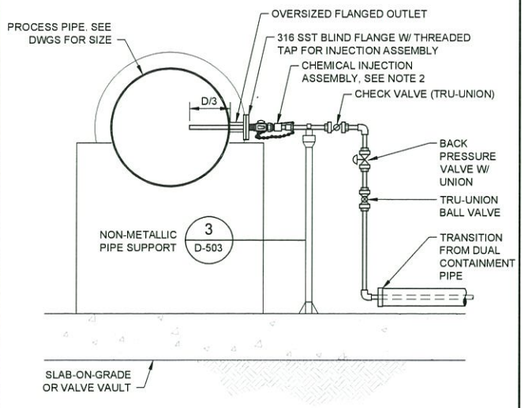
D-505

Bar Measures 1 inch, otherwise drawing not to scale

6/17/2020 3:10:51 PM - O:\PROJECTS\ORLANDO\ER\08507\200-08507-19001\CAD\SHEETFILES\D-50X PROCESS DETAILS.DWG - EVANS, JON

1 CHEMICAL INJECTION DETAIL

SCALE: NTS

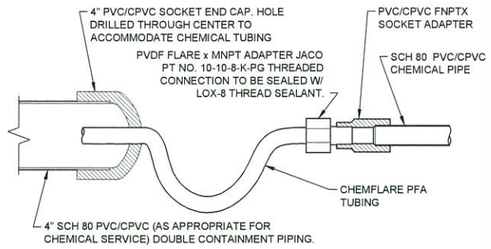


NOTES:

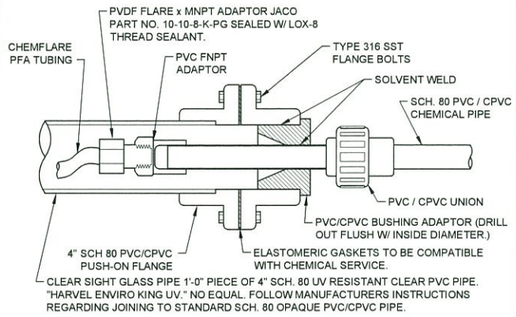
1. DETAIL DEPICTS GENERAL LAYOUT. SEE PLANS FOR PIPE SIZES AND INJECTION ORIENTATION.
2. SOLUTION DIFFUSER ASSEMBLY SHALL INCLUDE THE SOLUTION TUBE, NPT BRASS CORP STOP SIZED FOR PASSAGE OF THE SHOWN SOLUTION TUBE ADAPTER, PACKING NUT, SST SAFETY CHAIN AND RESTRAIN HOOK AND BALL CHECK VALVE. SOLUTION DIFFUSER SHALL BE RATED FOR 150 PSI AND MANUFACTURED BY SAF-T-FLO OR ENGINEERED APPROVED EQUAL. ALL COMPONENTS IN CONTACT W/ CHEMICAL SHALL BE SCHEDULE 80 PVC UNLESS ANOTHER MATERIAL IS SPECIFIED FOR THIS CHEMICAL SERVICE.
3. BACK PRESSURE VALVE NOT REQUIRED ON CHLORINE SOLUTION INJECTION.

2 CHEMICAL FEED - TUBING TO PIPING TRANSITION

SCALE: NTS



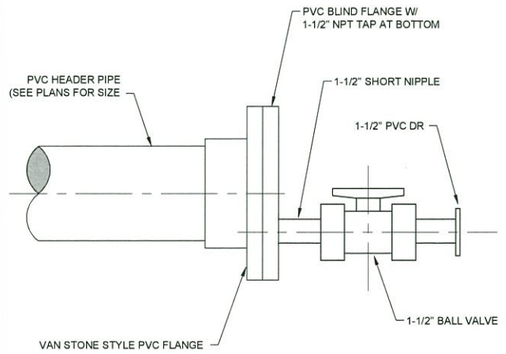
TRANSITION INTERIOR



TRANSITION EXTERIOR

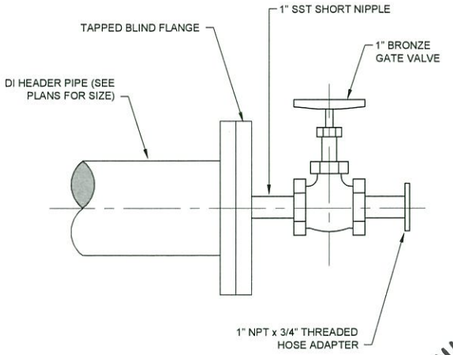
3 DRAIN CONNECTION - PVC PIPE

SCALE: NTS



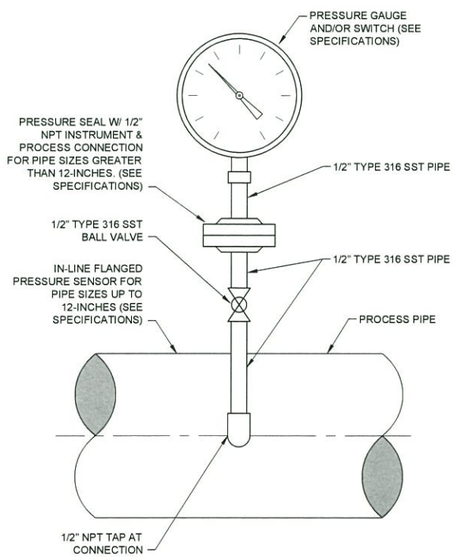
4 FLUSHING CONNECTION - DI PIPE

SCALE: NTS



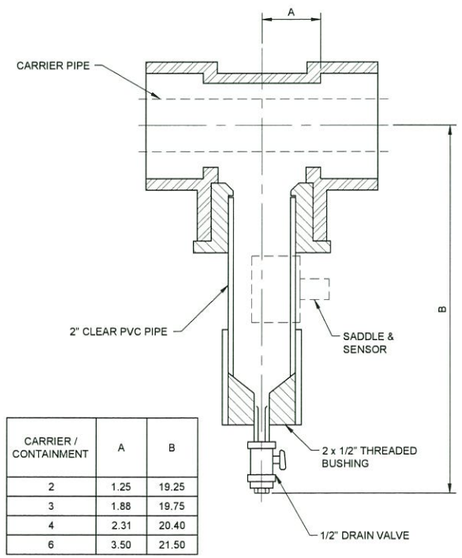
5 PRESSURE ELEMENT - DIRECT MOUNT

SCALE: NTS



6 DUAL CONTAINMENT LEAK DETECTION SENSOR & DRAIN

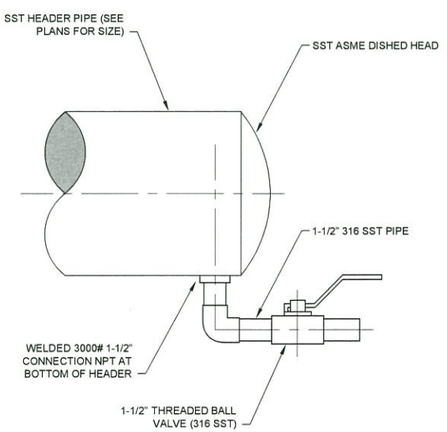
SCALE: NTS



CARRIER / CONTAINMENT	A	B
2	1.25	19.25
3	1.88	19.75
4	2.31	20.40
6	3.50	21.50

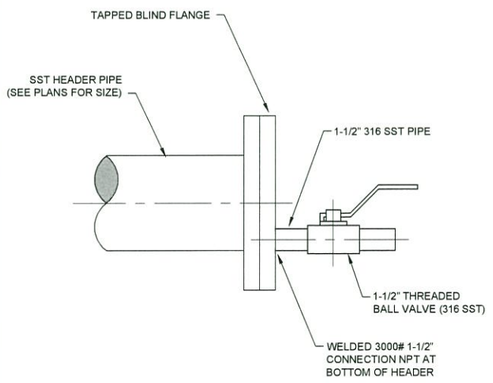
7 DRAIN CONNECTION - SST PIPE

SCALE: NTS



8 DRAIN CONNECTION - SST PIPE (ALT)

SCALE: NTS



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BID SET

JONATHAN C. BUNDY
LICENSE
No. 62581
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

MARK	DATE	DESCRIPTION

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
STANDARD PROCESS DETAILS

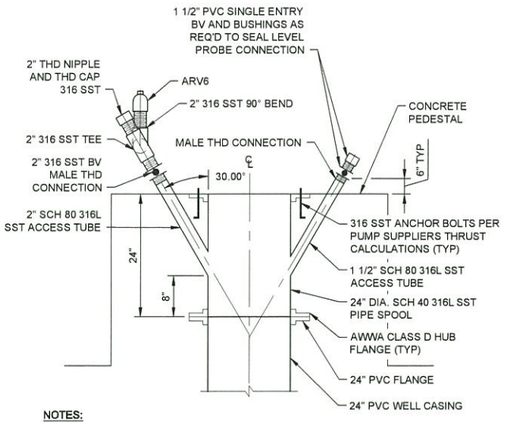
PROJ:	200-08507-19001
DESN:	JCR
DRWN:	JTE
CHKD:	JCB

D-506

Bar Measures 1 inch, otherwise drawing not to scale

1 WELLHEAD - SPOOL ADAPTER SECTION

SCALE: NTS

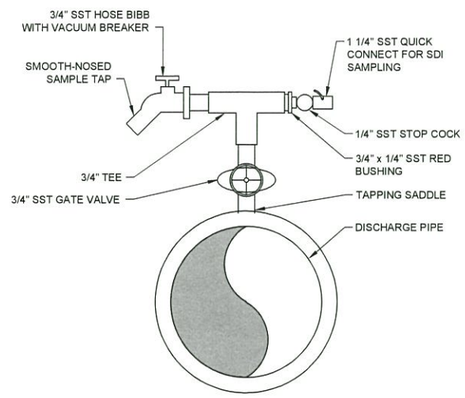


NOTES:

1) FLANGES SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM A182 FOR 316L.
2) SPOOL PIECE SHALL BE FABRICATED TO MEET THE REQUIREMENTS OF ASTM A403, CLASS WP-W.
3) THE COMPLETED SPOOL PIECE ASSEMBLY SHALL BE PICKLED AND PASSIVATED FOLLOWING FABRICATION.
4) ORIENT ACCESS TUBES AT 180°.
5) DRILL FLANGES FOR ANSI B 16.5, 150 PSI STANDARD.
6) CONTRACTOR TO REMOVE EXISTING PVC WELL FLANGE AND BLIND PLATE AND CUT WELL CASING TO PROPER HEIGHT AND INSTALL NEW 24" 100 PSI, 150 #, VAN STONE SOC FLANGE.
7) CONTRACTOR SHALL COORDINATE / VERIFY ANGLE AND SIZE OF LEVEL PROBE ACCESS TUBE WITH INSTRUMENT SUPPLIER.
8) OUTLET OF ARV SHALL BE INSTALLED IN THE DOWNWARD POSITION A MINIMUM OF 12-INCHES ABOVE THE WELL SLAB.

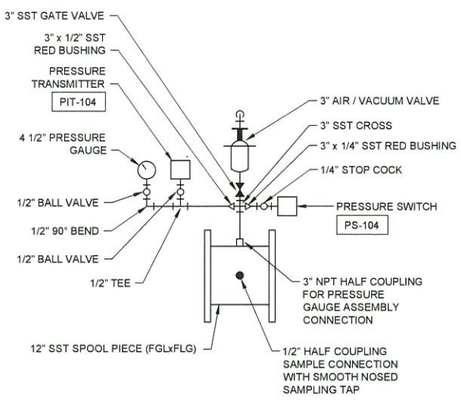
2 SAMPLE TAP

SCALE: NTS



3 PRESSURE GAUGE, A/V VALVE ASSEMBLY

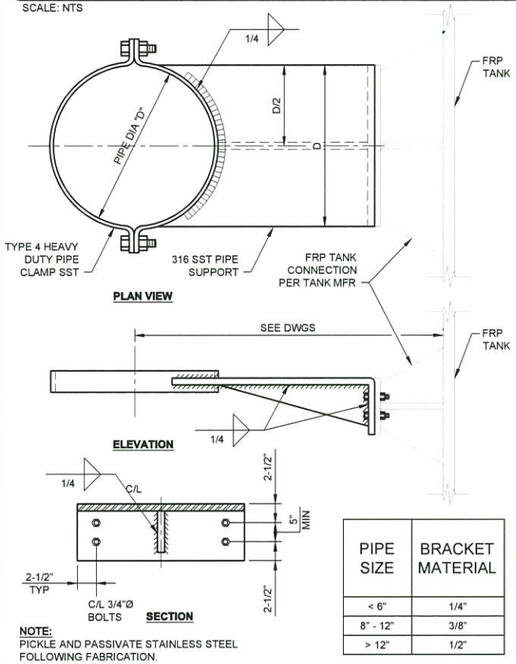
SCALE: NTS



ALL PIPE AND FITTINGS TO BE 316 SST

4 DEGASIFIER / AQC TANK PIPE SUPPORT

SCALE: NTS



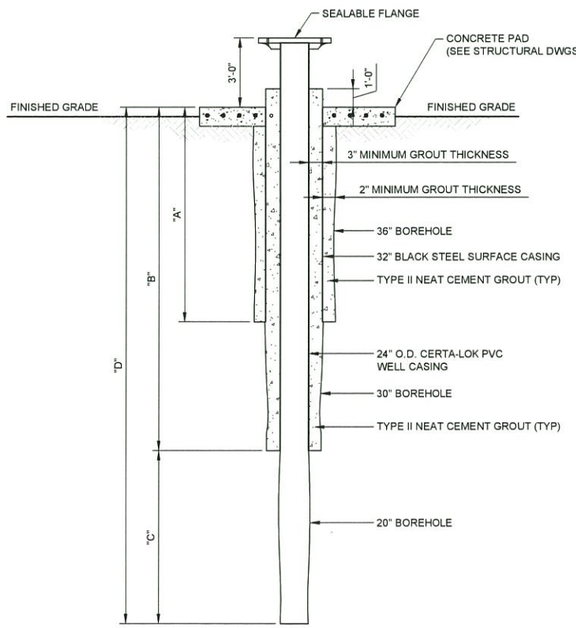
PIPE SIZE	BRACKET MATERIAL
< 6"	1/4"
8" - 12"	3/8"
> 12"	1/2"

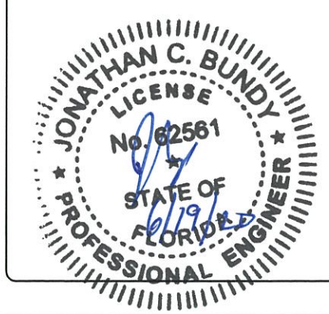
NOTE:
PICKLE AND PASSIVATE STAINLESS STEEL FOLLOWING FABRICATION.

5 PRODUCTION WELLS

SCALE: NTS

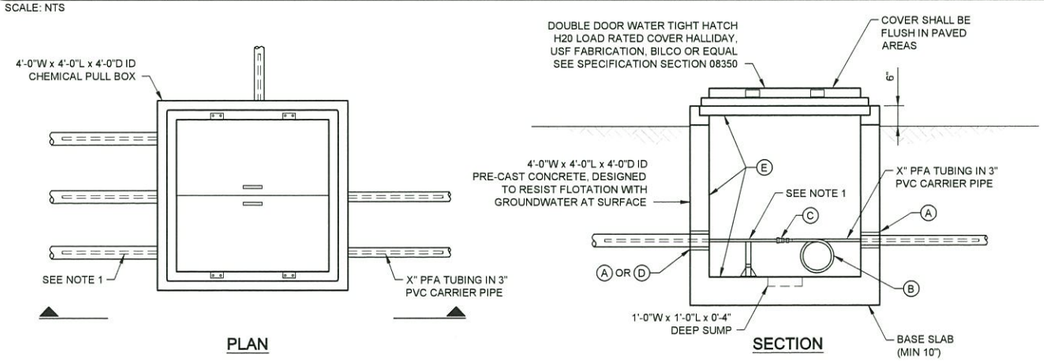
PRODUCTION WELL TABLE				
WELL	SURFACE CASING DEPTH "A"	WELL CASING DEPTH "B"	OPEN HOLE DEPTH "C"	TOTAL DEPTH "D"
PRODUCTION WELL NO. 4	120	320	530	850





6 CHEMICAL CONTAINMENT PULL BOX

SCALE: NTS



(A) 5" DIA OPENING IN CONCRETE WALL TO ACCOMMODATE 3" DIAMETER PVC CARRIER PIPE. FILL VOID USING NON-SHRINK GROUT.

(B) LOOP OR COIL TUBING USING AT LEAST 10% MORE THAN THE MINIMUM ALLOWABLE RADIUS BEND AND SUPPORT LOOP USING NON-METALLIC PIPE SUPPORTS AND PLASTIC STRAPS OR CABLE TIES. DO NOT KINK TUBING.

(C) WHEN TRANSITIONING FROM PFA TUBING TO SCHEDULE 80 PVC RIGID PIPE REFER TO DETAIL 2 / D-506.

(D) 6" DIA OPENING IN CONCRETE WALL TO ACCOMMODATE 4" DIAMETER PVC CONTAINMENT PIPE. FILL VOID USING NON-SHRINK GROUT.

(E) COAT INTERIOR CONCRETE SURFACES OF CHEMICAL PULL BOX WITH CHEMICAL RESISTANT COATING PER SECTION 09961.

NOTES:
1. FOR PULL BOXES NEAR MAIN PROCESS BUILDING TRANSITION FROM PVC PIPING TO PFA TUBING INSIDE THE PULL BOXES. PVC PIPING SHALL ENTER THE PULL BOX INSIDE A 4" CONTAINMENT PIPE AND EXIT AS PFA TUBING IN A 3" CARRIER PIPE. FOR ALL OTHER PULL BOXES PFA TUBING WILL ENTER AND EXIT THE PULL BOX IN A 3" PVC CARRIER PIPE.
2. CENTER ELEVATION OF PVC PIPING ENTERING AND LEAVING THE PULLBOX SHALL BE 20.65 FT.

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BID SET

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
STANDARD PROCESS DETAILS

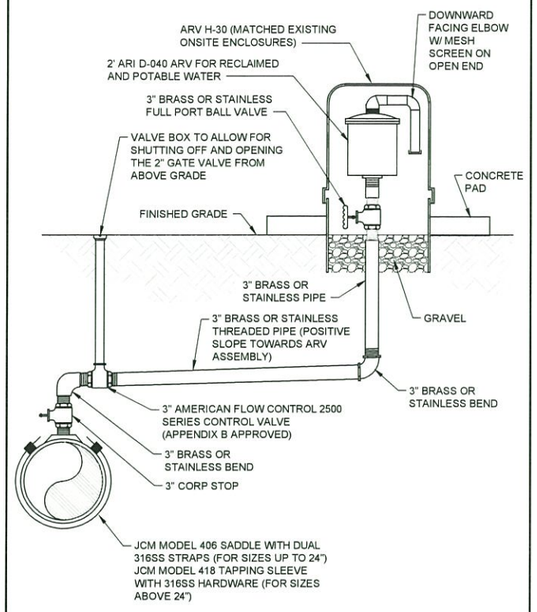
PROJ:	200-08507-19001
DESN:	JCR
DRWN:	JTE
CHKD:	JCB

D-507

Bar Measures 1 inch, otherwise drawing not to scale

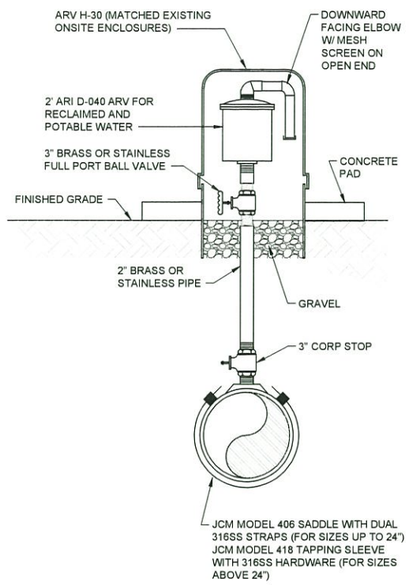
1 AIR RELEASE VALVE - OFFSET

SCALE: NTS



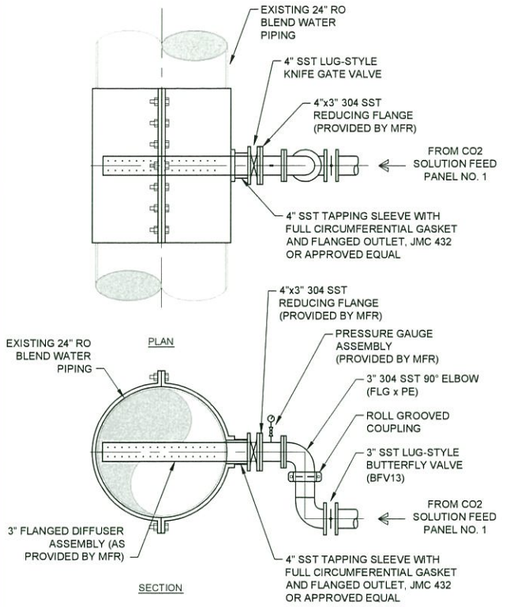
2 AIR RELEASE VALVE

SCALE: NTS



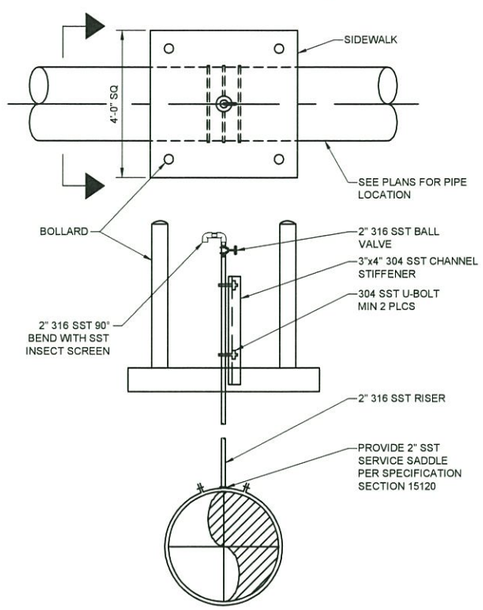
3 CO2 SOLUTION DIFFUSER ASSEMBLY

SCALE: NTS



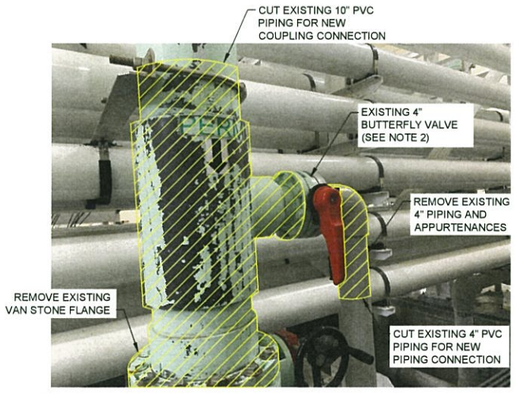
4 ABOVE GRADE AIR BLOW-OFF ASSEMBLY

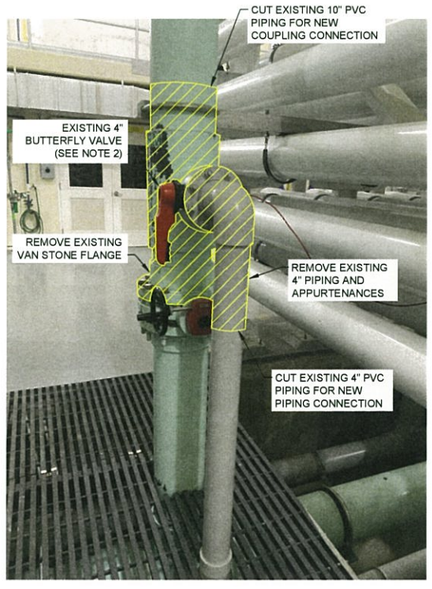
SCALE: NTS



5 RO SKID #1 AND #2 EXISTING CONDITIONS AND DEMOLITION

SCALE: NTS





NOTES:

1. REMOVE AND REPLACE ALL PIPING, FITTINGS AND APPURTENANCES AS SHOWN UNLESS OTHERWISE NOTED. SEE PROCESS FLOW DIAGRAMS AND SHEET D-116 FOR ADDITIONAL DETAILS.
2. REMOVE AND RELOCATE EXISTING 4" BUTTERFLY VALVE AS SHOWN ON SHEET D-116.
3. COORDINATE REPLACEMENT SEQUENCE WITH OWNER AS TO NOT AFFECT PLANT OPERATIONS. CONTRACTOR SHALL SUBMIT A DETAILED REPLACEMENT PLAN PROVIDING THE SEQUENCE FOR PIPING REMOVAL AND REPLACEMENT OUTLINING STEP BY STEP SEQUENCE TO DEMONSTRATE THE CAPABILITY OF MAINTAINING OPERATION WITHOUT DISRUPTION IN SERVICE.
4. FLUSH, REMOVE AND PROPERLY DISPOSE OF ALL PIPING, FITTINGS AND APPURTENANCES THAT ARE TO BE REPLACED.
5. INSTALL UNIONS OR TRUE UNION BALL VALVE AS REQUIRED FOR REMOVAL OF VALVES AND APPURTENANCES.
6. CONTRACTOR SHALL PROVIDE PIPE SUPPORTS PER SPECIFICATION SECTION 15126. EXISTING SUPPORTS SHALL NOT BE USED UNLESS APPROVED BY THE ENGINEER.
7. ALL DISTURBED SURFACES AND FLOOR PENETRATIONS SHALL BE PATCHED AND SEALED, AND RESTORED AS DETAILED IN THE STRUCTURAL DRAWINGS.

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BID SET

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

STANDARD PROCESS DETAILS

PROJ:	200-08507-19001
DESN:	JCR
DRWN:	CIS
CHKD:	JCB

D-508

Bar Measures 1 inch, otherwise drawing not to scale

SCHEMATIC SYMBOLS

CIRCUIT BREAKER

DISCONNECT SWITCH — AND

FUSE

TRANSFORMER

MOTOR STARTER COIL — MS

CONTROL RELAY COIL — CR

TIMING RELAY COIL — TR

NORMALLY-OPEN CONTACT FOR MOTOR STARTER OR RELAY

NORMALLY-CLOSED CONTACT FOR MOTOR STARTER OR RELAY

NORMALLY-OPEN CONTACT FOR ON-DELAY TIMING RELAY

NORMALLY OPEN CONTACT FOR OFF-DELAY TIMING RELAY

NORMALLY-OPEN LIMIT SWITCH

NORMALLY-OPEN PUSHBUTTON

NORMALLY-CLOSED PUSHBUTTON

TYPICAL SELECTOR SWITCH

PUSH-TO-TEST PILOT LIGHT

480 VAC 3-PHASE MOTOR

120 VAC 1-PHASE MOTOR

THERMOSTAT SWITCH

COMBINATION MOTOR STARTER WITH MOTOR CIRCUIT PROTECTION , FULL VOLTAGE, NON-REVERSING, SINGLE SPEED

EXISTING REDUCE VOLTAGE NO-REVERSING SOLID STATE WITH BY-PASS SINGLE SPEED

FIELD DEVICES

LEVEL ELEMENT — LE

LEVEL INDICATING TRANSMITTER — LIT

FLOW ELEMENT — FE

FLOW INDICATING TRANSMITTER — FIT

FLOAT SWITCH — FS

LIMIT SWITCH — ZS

SOLENOID VALVE — S

CONTROL STATION

DUPLEX RECEPTACLE

DUCT SMOKE DETECTOR — DSD

THERMOSTAT — T-STAT

MOTORIZED DAMPER — DMPR

PRESSURE SWITCH — PS

WELDER RECEPTACLE

DUPLEX RECEPTACLE — X

CIRCUIT CONTINUATION

CONDUIT STUBBED OUT AND CAPPED

CONDUIT TURNING UP

CONDUIT TURNING DOWN

HOME RUN TO PANEL, 2#12 + 1#12 GND IN 3/4"C UNLESS OTHERWISE NOTED

ABOVE GROUND CONDUIT RUN

UNDERGROUND CONDUIT RUN

GROUND CABLE

GROUND ROD

ABBREVIATIONS

CB	CIRCUIT BREAKER
CLF	CURRENT LIMITING FUSE
CR	CONTROL RELAY
DM	DEMAND METER
DP	DISTRIBUTION PANEL
EF	EXHAUST FAN
EP	EXPLOSION-PROOF (NEMA 7) CLASS 1, DIVISION 1, GROUP D
CP	CHEMICAL PUMP
DSD	DUCT SMOKE DETECTOR
ETM	ELAPSED TIME METER
EUH	ELECTRIC UNIT HEATER
EWS	EYE WASH STATION
F	FUSIBLE
FLA	FULL LOAD AMPERES
FU	FUSE
FVNR	FULL VOLTAGE NON-REVERSING
FVR	FULL VOLTAGE REVERSING
GND	GROUND
GRD	GROUND
HC	HAND CONTROL
HH	HANDHOLE
I/O	INPUT/OUTPUT (PLC)
JB	JUNCTION BOX
LP	LIGHTING PANEL
MCC	MOTOR CONTROL CENTER
MFG	MANUFACTURER
MS	MOTOR STARTER
NF	NON-FUSIBLE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PP	PROCESSOR PANEL
RVAT	REDUCED VOLTAGE AUTO TRANSFORMER
SA	SURGE ARRESTOR
SF	SUPPLY FAN
TR	TIMING RELAY
TSTAT	MOTOR THERMOSTAT
TWSP	TWISTED SHIELDED PAIR
UPS	UNINTERRUPTIBLE POWER SUPPLY
VFD	VARIABLE FREQUENCY DRIVE
WHM	WATT HOUR METER
WP	WEATHER-PROOF (NEMA 4X STAINLESS STEEL)
XFMR	TRANSFORMER
ZS	POSITION (LIMIT) SWITCH

LIGHTING

PHOTOCELL — PC

CEILING/PENDANT-MOUNTED LUMINAIRE — X, Y

WALL-MOUNTED LUMINAIRE — X, Y

CEILING/PENDANT-MOUNTED LIGHT FIXTURE — X, Y , X, Y

WALL-MOUNTED LIGHT FIXTURE — X, Y

EMERGENCY LIGHT FIXTURE — X, Y

EMERGENCY LIGHT FIXTURE — X , X

WALL MOUNTED EXIT/EMERGENCY LIGHT — X

DOUBLE-FACED CEILING OR WALL-MOUNTED EXIT LIGHT; DIRECTIONAL ARROWS (IF REQUIRED) AS INDICATED ON PLANS — X , X

SINGLE-FACED CEILING OR WALL-MOUNTED EXIT LIGHT; DIRECTIONAL ARROWS (IF REQUIRED) AS INDICATED ON PLANS — X , X

AREA OR ROADWAY LIGHT - POLE-MOUNTED — X, Y

X - INDICATES FIXTURE TYPE PER LIGHTING FIXTURE SCHEDULE OR DETAILS
Y - SWITCH CONTROL

TOGGLE SWITCH — $_X

X – INDICATES TYPE:

NONE	– SINGLE POLE
3	– THREE–WAY
4	– FOUR–WAY
HP	– HORSEPOWER RATED
K	– KEY SWITCH
P	– PILOT LIGHT
L	– LIGHTED HANDLE
TE	– MANUAL MOTOR STARTER WITH THERMAL ELEMENT
OS	– OCCUPANCY SENSOR
DM	– DIMMABLE

GENERAL ELECTRICAL NOTES

1. CONTRACTOR SHALL VISIT THE JOB SITE AND THOROUGHLY CHECK THE FIELD CONDITIONS AND EXISTING ELECTRICAL INSTALLATION AND UTILITIES (APPLY TO ALL DRAWINGS) (ELECTRICAL) PRIOR TO SUBMITTING HIS BID.
2. OTHER PROJECTS ARE, OR MAY BE, UNDER CONSTRUCTION AT THIS SITE, AND CONTRACTOR SHALL COORDINATE WITH THEM SO AS NOT TO DELAY THEIR SCHEDULES OR IMPEDE THEIR WORK.
3. COORDINATE ALL NEW ELECTRICAL UNDERGROUND WORK WITH NEW AND EXISTING UNDERGROUND UTILITIES BEFORE INSTALLATION. SEE CIVIL DRAWINGS.
4. EMPTY CONDUITS AND/OR EMPTY DUCTS IN DUCT BANKS SHALL BE PROVIDED WITH A FISH LINE.
5. UNDERGROUND CONDUITS AND/OR DUCT BANKS SHALL BE INSTALLED 24" MINIMUM BELOW GRADE (UNLESS OTHERWISE SHOWN ON PLANS) AND SHALL SLOPE (MINIMUM 3" PER 100') TO MANHOLES, HANDHOLES, CABLE VAULTS, OR OTHER STRUCTURES.
6. UNDERGROUND CONDUITS AND/OR DUCTS IN DUCT BANKS SHALL BE P.V.C., EXCEPT WHERE ENTERING MANHOLES, HANDHOLES, BUILDINGS, LIGHT POLE BASES, AND TRANSFORMER PAD. UNDERGROUND CONDUITS SHALL BE RIGID ALUMINUM.
7. PROVIDE WATERTIGHT HUBS AT CONDUIT ENTRANCES TO ALL ENCLOSURES MOUNTED OUTDOORS AND AT ALL WATERTIGHT (NEMA TYPE 4 & 4X) ENCLOSURES MOUNTED INDOORS. ALL NEMA TYPE 4 & 4X ENCLOSURES, EXCEPT THOSE IN CORROSIVE AREAS, SHALL BE EQUIPPED WITH A DRAIN/BREATHER FITTING.
8. EXPANSION OR EXPANSION/DEFLECTION FITTINGS SHALL BE PROVIDED FOR ALL CONDUITS CROSSING BUILDING EXPANSION JOINTS.
9. POWER FEEDERS SHALL BE RUN IN INDIVIDUAL CONDUITS, FROM SOURCE TO LOAD, AS INDICATED IN SCHEDULES, WIRING DIAGRAMS, OR BY HOME RUNS ON THE PLANS.
10. FOR CONDUIT PENETRATION OF BUILDING WALLS REFER TO THE WRITTEN SPECIFICATIONS.
11. CONDUITS SHALL BE ROUTED TO AVOID OPENINGS IN FLOORS, ROOFS, AND WALLS. LADDERS UP WALLS SHALL NOT BE CROSSED BY EXPOSED CONDUIT RUNS. PROVIDE THE MINIMUM CLEAR SPACE REQUIRED BY ALL GOVERNING CODES BETWEEN HANDRAILS AND ALL ELECTRICAL ENCLOSURES AND RACEWAYS, WHICH IN NO CASE SHALL BE LESS THAN 1-1/2" CLEAR.
12. ALL ELECTRICAL FLOOR MOUNTED EQUIPMENT SUCH AS MOTORS, CONTROL PANELS, AND METALLIC SUPPORT RACKS SHALL HAVE A #2 (UNLESS OTHERWISE NOTED) BARE GROUND CONDUCTOR TIE BETWEEN THE MOTOR FRAME, ENCLOSURE, OR SUPPORT LEG AND THE BUILDING GROUND SYSTEM.
13. GROUND CONDUCTOR SPLICING AND BONDING SHALL BE ACCOMPLISHED BY THE USE OF EXOTHERMIC WELDING.
14. PROVIDE A GREEN GROUND CONDUCTOR IN ALL SYSTEMS CONDUITS, EXCEPT INSTRUMENT SIGNAL AND ALARM CONDUITS, INCLUDING BRANCH CIRCUIT CONDUITS FOR LIGHTING AND RECEPTACLES. GROUND CONDUCTOR SIZING SHALL BE PER N.E.C. TABLE 250-122 (MINIMUM) WHERE NOT SIZED ON THE DRAWINGS.
15. ALL THREADED MECHANICAL CONNECTIONS ON ELECTRICAL EQUIPMENT (CONDUIT, COUPLINGS, JUNCTION BOXES, ETC.) INSTALLED WITHIN WET AREAS, HAZARDOUS AREAS, OR OUTDOORS SHALL BE COATED WITH ANTI-SEIZE COMPOUND PRIOR TO INSTALLATION.
16. ALL WALL AND RACK MOUNTED CONTROL STATIONS, RECEPTACLES, AND LIGHTING SWITCHES SHALL BE 4'-0" A.F.F./ A.F.G., UNLESS NOTED OTHERWISE ON THE PLANS.
17. ALL WALL AND RACK MOUNTED DISCONNECT SWITCHES, CONTROL PANELS, AND LIGHTING PANELS SHALL BE 5'-6" TO TOP, ABOVE FINISHED FLOOR.
18. ALL WEATHERPROOF (W.P.) DUPLEX RECEPTACLES SHALL BE INSTALLED SUCH THAT COVER DOORS OPEN UPWARD.
19. ALL EXPOSED METALLIC ELECTRICAL EQUIPMENT, PULL BOXES, JUNCTION BOXES, CONDUITS, SUPPORTS, BRACKETS, HANGERS, NUTS, BOLTS, ETC. LOCATED WITHIN HAZARDOUS OR CORROSIVE AREAS, SHALL BE ALUMINUM COATED WITH 40 MILS (MIN.) COVERING. WHERE FACTORY COATING IS NOT AVAILABLE, FACTORY OR FIELD COATING WITH A CORROSION RESISTANT, EPOXY PAINT SHALL BE PROVIDED.
20. ALL PENETRATIONS OF FIRE WALLS OR FLOORS SHALL BE SEALED AFTER INSTALLATION OF CONDUIT WITH A FIRE RETARDANT SEALANT THAT IS RATED THE SAME AS THE FIRE WALL OR FLOOR.
21. ALL CONDUITS AND/OR SLEEVES THAT PASS THROUGH WALLS OR FLOORS SEPARATING HAZARDOUS AREAS FROM NON-HAZARDOUS AREAS SHALL BE SEALED GAS TIGHT WITH NON-METALLIC, NON-SHRINK GROUT AFTER CONDUIT IS INSTALLED.
22. ALL WALL MOUNTED ELECTRICAL EQUIPMENT SHALL HAVE A 1/2" (MINIMUM) AIR SPACE BETWEEN WALL AND EQUIPMENT (PROVIDE NON-CORROSIVE SPACERS OR BRACKETS AS REQUIRED).
23. FOR ALL WALL MOUNTED EQUIPMENT WITHIN HAZARDOUS OR CORROSIVE AREAS USE STAINLESS STEEL ANCHORS AND 1/2" STAINLESS STEEL SPACERS ON STAINLESS STEEL ANCHOR BOLTS TO PROVIDE A 1/2" AIR SPACE BETWEEN THE EQUIPMENT AND THE WALL.
24. ALL FLOOR OR PAD MOUNTED ELECTRICAL ENCLOSURES SHALL BE SPACED 1" OUT FROM EXTERIOR WALLS (MINIMUM).
25. FOR ALL 120 VAC LIGHTING AND RECEPTACLE CIRCUITS, RUN 2-#12 (MINIMUM) + #12 GRD., 3/4"C. TO THE LIGHTING PANELBOARD INDICATED, UNLESS NOTED OTHERWISE. SEE THE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS FOR BRANCH CIRCUIT WIRING.
28. 4-20 MA, INSTRUMENT SIGNAL AND DC TOTALIZED PULSE CABLES, MAY BE RUN WITH OTHER INSTRUMENT SIGNAL CABLES IN THE INSTRUMENT CONDUIT SYSTEM. INSTRUMENT SIGNALS SHALL NOT BE RUN IN THE SAME CONDUIT WITH ANY OTHER TYPE OF ALARM, CONTROL AND/OR POWER WIRING.
29. DC ALARM WIRING SHALL BE #14 AWG AND MAY BE RUN WITH OTHER ALARM WIRING IN THE ALARM CONDUIT SYSTEM. ALARM WIRING SHALL NOT BE RUN IN THE SAME CONDUIT WITH ANY OTHER TYPE INSTRUMENT SIGNAL, CONTROL, OR POWER WIRING, UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
30. 120 VAC CONTROL SHALL BE #14 AWG MINIMUM AND MAY BE RUN IN THE SAME CONDUIT WITH ASSOCIATED POWER WIRING. 120VAC CONTROL AND GRAPHIC WIRING SHALL NOT BE RUN IN THE SAME CONDUIT WITH ANY OTHER TYPE INSTRUMENT SIGNAL, ALARM, OR UNASSOCIATED CONTROL OR POWER WIRING, UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
31. IN AREAS WHERE ELECTRICAL WORK DISTURBS EXISTING SOD, GROUND SHALL BE REGRADED AS REQUIRED AND SOD SHALL BE REPAIRED OR REPLACED, AS REQUIRED, TO RETURN THE SITE TO A CONDITION MEETING OR EXCEEDING THAT PRIOR TO THE BEGINNING OF WORK.
32. ALL SALVAGED MATERIALS SHALL BE TURNED OVER TO OWNER OR DISPOSED OF AS DIRECTED BY OWNER.
33. FOR SPARE WIRES: COIL WIRES IN PANEL AND INDIVIDUALLY TAG EACH WIRE AS "SPARE."
34. FOR ANY CONDUCTORS, FUSES, CIRCUIT BREAKERS AND CONTROL TRANSFORMERS THAT ARE NOT SIZED ON THE DRAWINGS, CONTRACTOR SHALL SIZE THESE DEVICES APPROPRIATELY FOR PROPER OPERATION OF THE CONNECTED EQUIPMENT.

NOTES:

1. PLEASE BE ADVISED OF THE FOLLOWING NEMA CLASSIFICATIONS FOR THE VARIOUS AREAS AS LISTED BELOW. EQUIPMENT LOCATED IN ALL AREAS SHALL CONFORM TO THESE CLASSIFICATIONS UNLESS SPECIFICALLY NOTED OTHERWISE.

NEMA 4X (WEATHER/CORROSION PROOF):	OUTDOOR LOCATIONS RO SKID ROOM PUMP AND BLOWER ROOMS CHEMICAL ROOMS
NEMA 1 (DUST PROOF) OR NEMA 12 (DUST PROOF, OIL-TIGHT):	ELECTRICAL ROOMS

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6-18-2020
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Certificate of Authorization No.: 3952

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

LEGEND

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

E-001

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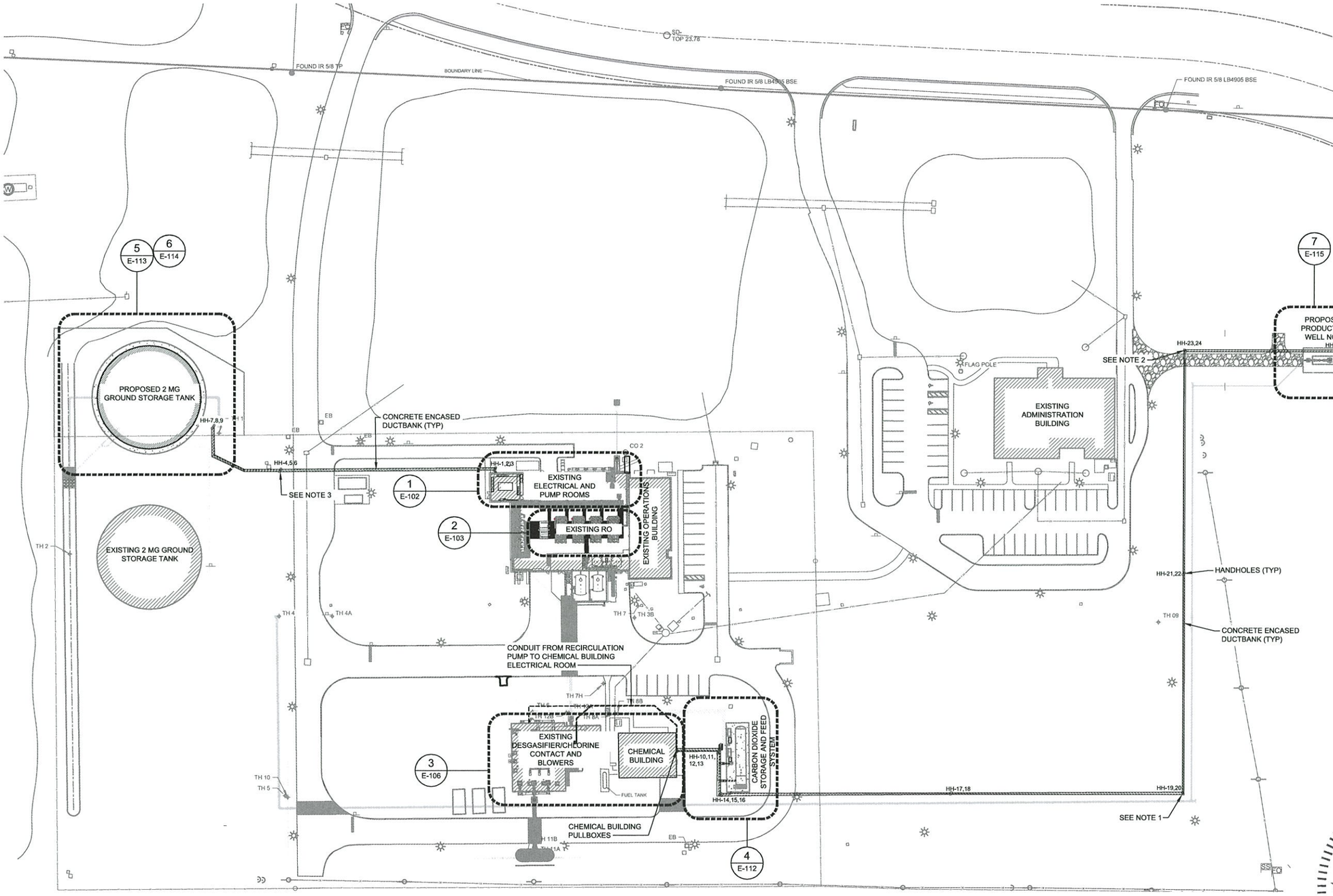
Bar Measures 1 inch, otherwise drawing not to scale



NOTES:

1. PROVIDE (2) 2" SPARE CONDUITS FROM CHEMICAL BUILDING PULLBOX TO EACH HANDHOLE, HH-19,20. CAP CONDUITS AT THE HANDHOLES LOCATION SHOWN. PROVIDE PULL STRINGS.
2. PROVIDE (2) 2" SPARE CONDUITS FROM CHEMICAL BUILDING PULLBOX TO EACH HANDHOLE, HH-23,24. CAP CONDUITS AT THE HANDHOLES LOCATION SHOWN. PROVIDE PULL STRINGS.
3. PROVIDE (2) 2" SPARE CONDUITS FROM PROCESS AND HSP BUILDING PULLBOXES TO EACH HANDHOLE, HH-4,5,6. CAP CONDUITS AT THE HANDHOLES LOCATION SHOWN. PROVIDE PULL STRINGS.

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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

OVERALL SITE PLAN

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

E-101

Bar Measures 1 inch, otherwise drawing not to scale

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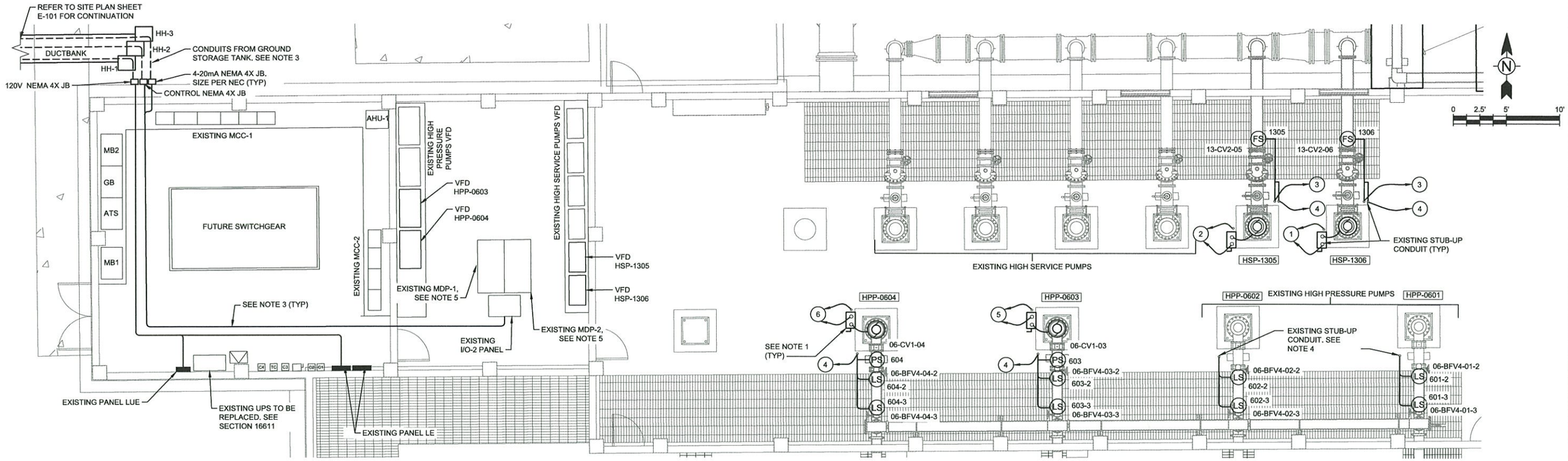

1 E-101 **ENLARGED PLAN**
SCALE: 1"=5'

2 **EXISTING HSP & HPP ROOM**
SCALE: NONE

NOTES:

1. INSTALL NEW DISCONNECT SWITCHES AT EACH OF THE LOCATIONS SHOWN. REUSE EXISTING CONDUIT AND PULL NEW WIRES.
2. REFER TO ONE LINE DIAGRAM ON SHEET E-118 FOR HPS AND HSP CABLE AND CONDUIT SIZES.
3. REFER TO ONE LINE DIAGRAM ON SHEET E-113 FOR GROUND STORAGE TANK CABLE AND CONDUIT SIZES.
4. PULL BACK EXISTING 2#14 WIRES FROM EXISTING I/O-2 PANEL TO EXISTING PRESSURE SWITCH. PROVIDE NEW 2#14 WIRES FOR PS AND RE-RUN WIRES TOGETHER WITH NEW LS CONTROL WIRES.
5. SEE MDP-1 & MDP-2 MODIFICATIONS ON SHEET E-102A.

KEYED NOTES

1. TO VFD HSP-1305, SEE NOTE 2
2. TO VFD HSP-1306, SEE NOTE 2
3. TO LUE, SEE NOTE 2
4. TO I/O- 2, SEE NOTE 2
5. TO VFD HPP-0603, SEE NOTE 2
6. TO VFD HPP-0603, SEE NOTE 2

ALAN M. SCHWAB LICENSE No. 61313 6-18-2020 STATE OF FLORIDA PROFESSIONAL ENGINEER

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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

HIGH PRESSURE AND HIGH SERVICE PUMP PLAN MODIFICATIONS (1 OF 2)

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

E-102

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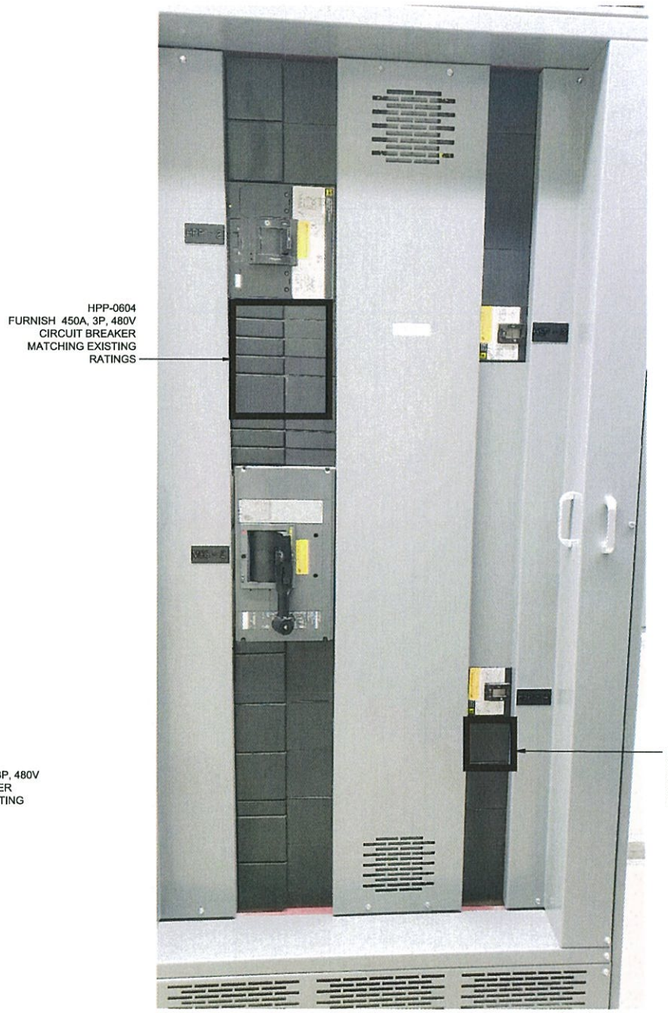
Bar Measures 1 inch, otherwise drawing not to scale

1 EXISTING MDP-1
SCALE: NONE



2 EXISTING MDP-2
SCALE: NONE

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CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT
PLANT EXPANSION - 4-MGD TO 6-MGD

HIGH PRESSURE AND HIGH SERVICE PUMP PLAN MODIFICATIONS (2 OF 2)

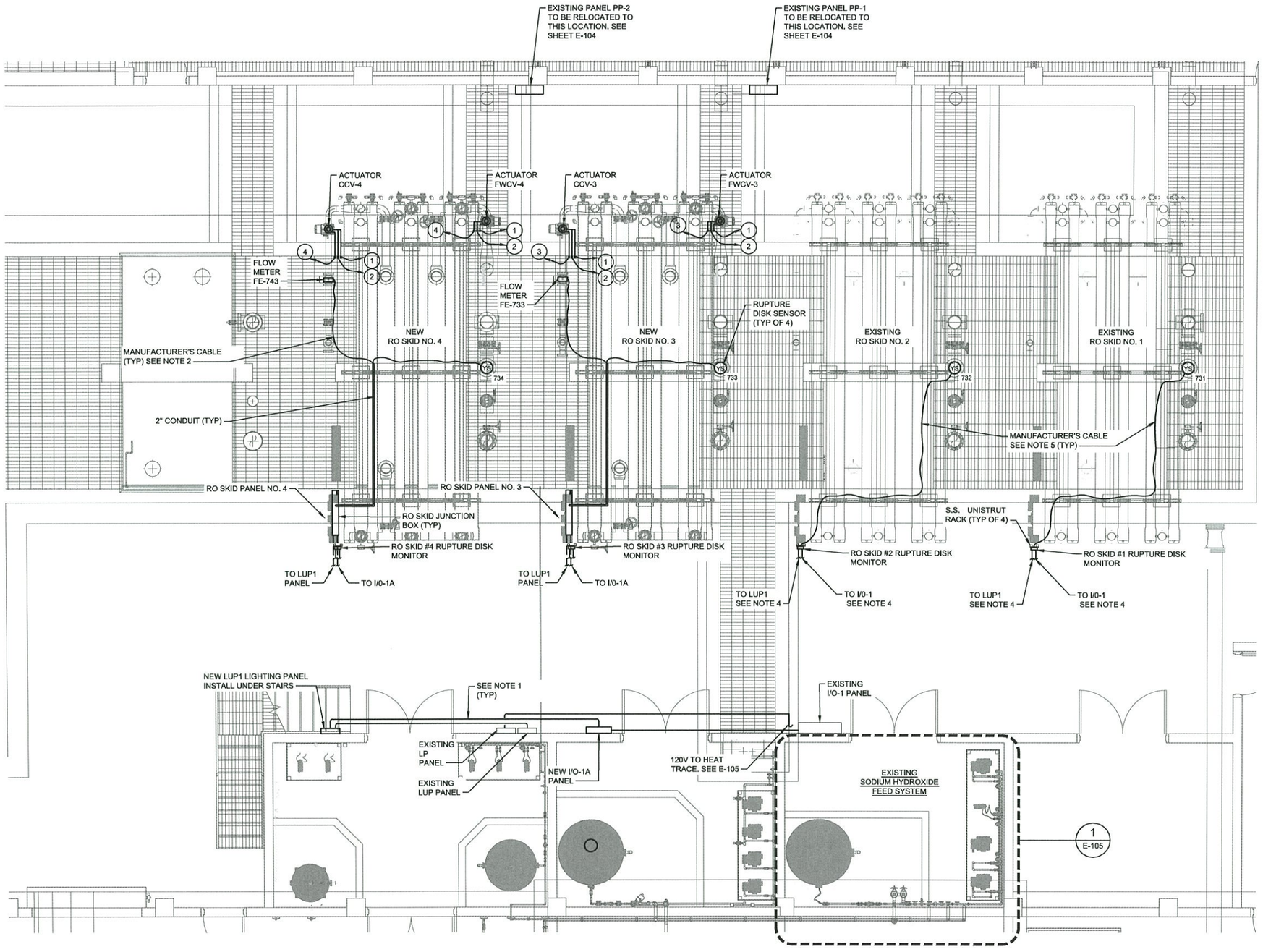
ALAN M. SCHWAB
LICENSE
No. 61313
6-18-2022
STATE OF FLORIDA
PROFESSIONAL ENGINEER

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

E-102A

Bar Measures 1 inch, otherwise drawing not to scale

6/18/2020 10:42:55 AM - C:\PW_WORK\OWESTHOFF\D0093959\1E-102A HSP HPP MODIF 2.DWG - WESTHOFF, ONEIDA



NOTES:

1. REFER TO ONE LINE DIAGRAM ON SHEET E-121 FOR CABLE AND CONDUIT SIZES.
2. REFER TO P&ID DRAWINGS FOR COMPLETE RO SKID SYSTEM INSTRUMENTS.
3. ADD JUNCTION BOX AT EXISTING RO SKID #3&4 STUB-UP CONDUITS AND RE-ROUTE CONDUITS TO I/O-1.
4. ROUTE CONDUIT OVERHEAD FROM RO SKID RUPTURE DISK MONITOR TO I/O-1 & LUP1 PANELS. PROVIDE SUPPORTS AS REQUIRED.
5. PROVIDE CABLE SUPPORT AS REQUIRED.
6. REFER TO SHEET E-104A FOR LPU-1 LIGHTING PANEL SCHEDULE AND LUP LIGTING PANEL MODIFICATIONS.

KEYED NOTES

1. 120V CONTROL TO I/O-1A, SEE NOTE 1
2. 4-20MA TO I/O-1A, SEE NOTE 1
3. 480V TO PP-1, SEE NOTE 1
4. 480V TO PP-2, SEE NOTE 1

2 E-101 ENLARGED PLAN
SCALE: 1/4"=1'-0'

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Certificate of Authorization No.: 3962

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

RO BUILDING PLAN

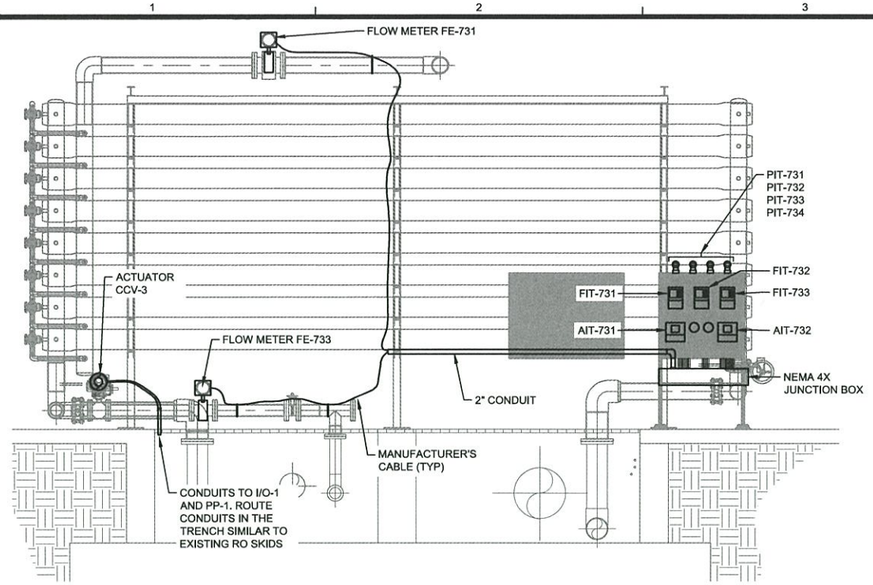
ALAN M. SCHWAB LICENSE No. 61313 STATE OF FLORIDA PROFESSIONAL ENGINEER
6-18-2020

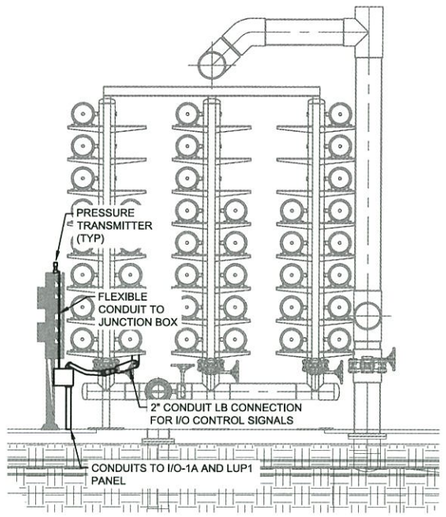
PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

E-103

Bar Measures 1 inch, otherwise drawing not to scale

6/18/2020 10:44:06 AM - C:\PW_WORK\OWESTHOFF\D0939591\E-103 RO BLDG.DWG - WESTHOFF, ONEIDA - XXXXXXXXXX

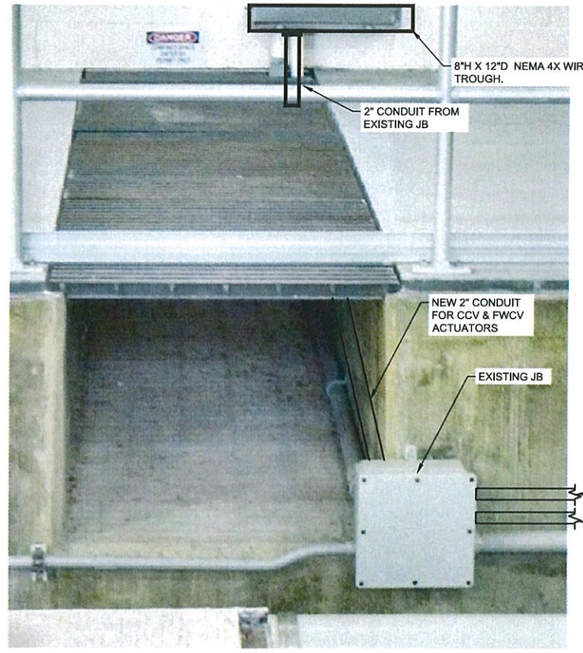




1 RO SKID #3 SECTION VIEWS (TYP FOR RO SKID #4)
SCALE: 3/8"=1'-0'

NOTES:

1. SECTION VIEWS FOR RO SKID NO. 3 SHOWN; RO SKID NO. 4 IS SIMILAR. REFER TO P&ID DRAWINGS FOR COMPLETE RO SKID SYSTEM INSTRUMENTS.
2. REFER TO SHEET E-104A FOR PP1 AND PP2 PANEL SCHEDULES.

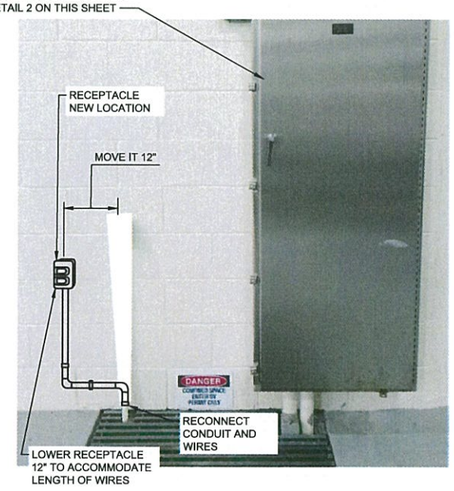


4 TYPICAL CONDUIT ROUTING TO PP1/PP-2
SCALE: NONE

PP PANEL DEMOLITION

PP PANEL RELOCATION

2 PP PANEL MODIFICATIONS (TYPICAL FOR PP-1 AND PP-2)
SCALE: NONE



3 PP-1 RECEPTACLE MODIFICATIONS
SCALE: NONE

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Certificate of Authorization No.: 3952

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
RO SKID SECTIONS AND MODIFICATIONS

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

E-104

Bar Measures 1 inch, otherwise drawing not to scale

EXISITNG PANEL "PP-1"

BUS: 100A BUS MATERIAL: COPPER VOLTAGE: 480VAC PHASE: 3 WIRE: 3 MAIN: 100A KEY ON MB
MOUNTING: SURFACE LOCATION: RO AREA NEMA RATING: NEMA 4X SS S.C. RMS: 22KA

CKT NO.	LOAD DESCRIPTION	VOLT AMPS (VA) ΦA	ΦB	ΦC	BRK AMP	POLE	A	B	C	POLE	BRK AMP	VOLT AMPS (VA) ΦA	ΦB	ΦC	LOAD DESCRIPTION	CKT NO.
1		-													SPACE	2
3	TVSS		-		20	3									SPACE	4
5				-											SPACE	6
7															SPACE	8
9	SPARE				20	3									SPACE	10
11															SPACE	12
13		300										300				14
15	CCV-1		300		20	3				3	20		300		FWCV-1	16
17				300										300		18
19	SPACE											300				20
21	SPACE									3	20		300		BYPASS VALVE	22
23	SPACE													300		24
25	SPACE											300				26
27	SPACE									3	20		300		FWCV-3 ← SEE NOTE 1	28
29	SPACE													300		30
31		300														32
33	BLENDWATER CV		300		20	3				3	20				SPARE	34
35				300												36
37		300														38
39	CCV-3 ← SEE NOTE 1		300		20	3				3	20				SPARE	40
41				300												42
	TOTAL	900	900	900								900	900	900	TOTAL CONNECTED LOAD (KVA)	5.40
												ΦA	ΦB	ΦC	TOTAL EST. DEMAND LOAD (KVA)	5.40
	GRAND TOTAL											1800	1800	1800	DEMAND LOAD FACTOR	1.00

EXISITNG PANEL "PP-2"

BUS: 100A BUS MATERIAL: COPPER VOLTAGE: 480VAC PHASE: 3 WIRE: 3 MAIN: 100A KEY ON MB
MOUNTING: SURFACE LOCATION: RO AREA NEMA RATING: NEMA 4X SS S.C. RMS: 22KA

CKT NO.	LOAD DESCRIPTION	VOLT AMPS (VA) ΦA	ΦB	ΦC	BRK AMP	POLE	A	B	C	POLE	BRK AMP	VOLT AMPS (VA) ΦA	ΦB	ΦC	LOAD DESCRIPTION	CKT NO.
1		-													SPACE	2
3	TVSS		-		20	3									SPACE	4
5				-											1SPACE	6
7		300													SPACE	8
9	CCV-2		300		20	3									SPACE	10
11				300											SPACE	12
13		832													SPACE	14
15	UNIT HEATER-1 CAUSTIC FEED ROOM		832		20	3									SPACE	16
17				832											SPACE	18
19	SPACE											300				20
21	SPACE									3	20		300		FWCV-2	22
23	SPACE													300		24
25	SPACE											300				26
27	SPACE									3	20		300		FWCV-4 ← SEE NOTE 1	28
29	SPACE													300		30
31	SPACE															32
33	SPACE									3	20				SPARE	34
35	SPACE															36
37		300														38
39	CCV-4 ← SEE NOTE 1		300		20	3				3	20				SPARE	40
41				300												42
	TOTAL	1432	1432	1432								600	600	600	TOTAL CONNECTED LOAD (KVA)	6.10
												ΦA	ΦB	ΦC	TOTAL EST. DEMAND LOAD (KVA)	6.10
	GRAND TOTAL											2032	2032	2032	DEMAND LOAD FACTOR	1.00

1 EXISTING PP1 & PP2 PANEL MODIFICATIONS
SCALE: NONE

SEE NOTE 2

PANEL NAME: LUP MOUNTING: SURFACE INTERRUPTING RATING: 10,000 AIC
TOTAL LOAD: - VOLTAGE: 120/208V,3Ø,4W MAIN BREAKER: 60A, 3P BUS: 100A
LOCATION: PROCESS AREA MFR: REMARKS: NEMA 4X SS, UPS

LOAD SERVED	AMPS ØA	ØB	ØC	BKR SIZE	POLE	CKT NO.	ØA ØB ØC	CKT NO.	BKR SIZE	POLE	AMPS ØA	ØB	ØC	LOAD SERVED
I/O-1	5	X	X	20	1	1		2	20	1	1	X	X	PHOSPHATE FLOW
SKID #1 PANEL	X	-	X	20	1	3		4	20	1	X	1	X	SKID #2 PANEL
RAW WATER pH METER	X	X	1	20	1	5		6	20	1	X	X	1	RAW WATER TURBIDITY METER
PHOSPHATE DAY TANK	1	X	X	20	1	7		8	20	1	1	X	X	ANTI DAY TANK
CAUSTIC DAY TANK	X	1	X	20	1	9		10	20	1	X	1	X	ACID DAY TANK
ACID BULK TANK	X	X	1	20	1	11		12	20	1	X	X	1	CAUSTIC BULK TANK
CLEAN FLOW	1	X	X	20	1	13		14	20	1	1	X	X	BLEND FLOW
RAW FLOW	X	1	X	20	1	15		16	20	1	X	1	X	RAW CONDUCTIVITY
BLEND CONDUCTIVITY	X	X	1	20	1	17		18	20	1	X	X	1	BLEND/TAFF pH
ANTISCALANT FLOW METER	1	X	X	20	1	19		20	20	1	1	X	X	TRAP PRIMER
CONCENTRATE FLOW METER	X	1	X	20	1	21		22	20	1	1.5	X	X	SUMP PUMP RECEPT RW FM VAULT
SPACE						23		24						SPACE
TOTALS	8	2	3				TOTAL AMPS THIS PANEL ØA 11				3	3	3	TOTALS

REMARKS:

SEE NOTE 2

2 EXISTING LUP LIGHTING PANEL MODIFICATIONS
SCALE: NONE

PANEL "LUP1"

BUS: 100A BUS MATERIAL: COPPER VOLTAGE: 120/208VAC PHASE: 3 WIRE: 4 MAIN: 30A
MOUNTING: SURFACE LOCATION: WALL NEMA RATING: NEMA 4X S.C. RMS: 22KA

CKT NO.	LOAD DESCRIPTION	VOLT AMPS (VA) ΦA	ΦB	ΦC	BRK AMP	POLE	A	B	C	POLE	BRK AMP	VOLT AMPS (VA) ΦA	ΦB	ΦC	LOAD DESCRIPTION	CKT NO.
1	RO SKID #3	200			20	1				1	20	100			RUPTURE DISK, YS-731	2
3	RO SKID #4		200		20	1				1	20		100		RUPTURE DISK, YS-732	4
5	I/O-1A PANEL			800	20	1				1	20			100	RUPTURE DISK, YS-733	6
7	TRAP PRIMER	120			20	1				1	20	100			RUPTURE DISK, YS-734	8
9	SUMP PUMP RECPT RW FLOW METER VAULT		180		20	1				1	20				SPARE	10
11	SPARE				20	1				1	20				SPARE	12
13										1	20				SPARE	14
15	SPD				20	3									SPACE	16
17															SPACE	18
	TOTAL	320	380	800								200	100	100	TOTAL CONNECTED LOAD (KVA)	1.90
												ΦA	ΦB	ΦC	TOTAL EST. DEMAND LOAD (KVA)	1.90
	GRAND TOTAL											520	480	900	DEMAND LOAD FACTOR	1.00

3 NEW LUP1 LIGHTING PANEL
SCALE: NONE

NOTES:

1. EXISTING 20A SPARE CIRCUIT BREAKER TO BE UTILIZED FOR NEW VALVE AS INDICATED.
2. CIRCUITS #20 & #22 TO BE RELOCATED TO LIGHTING PANEL LPU1. REMOVE (2) EXISTING CIRCUIT BREAKERS AND RETURN TO CLIENT. FURNISH (1) 30A, 3 POLE, 208V CIRCUIT BREAKER TO FEED NEW LIGHTING PANEL LPU1.
3. REVISE PANEL SCHEDULES ACCORDINGLY.

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ALAN M. SCHWAB LICENSE No. 61313 6-18-2020 STATE OF FLORIDA PROFESSIONAL ENGINEER

MARK	DATE	DESCRIPTION	BY

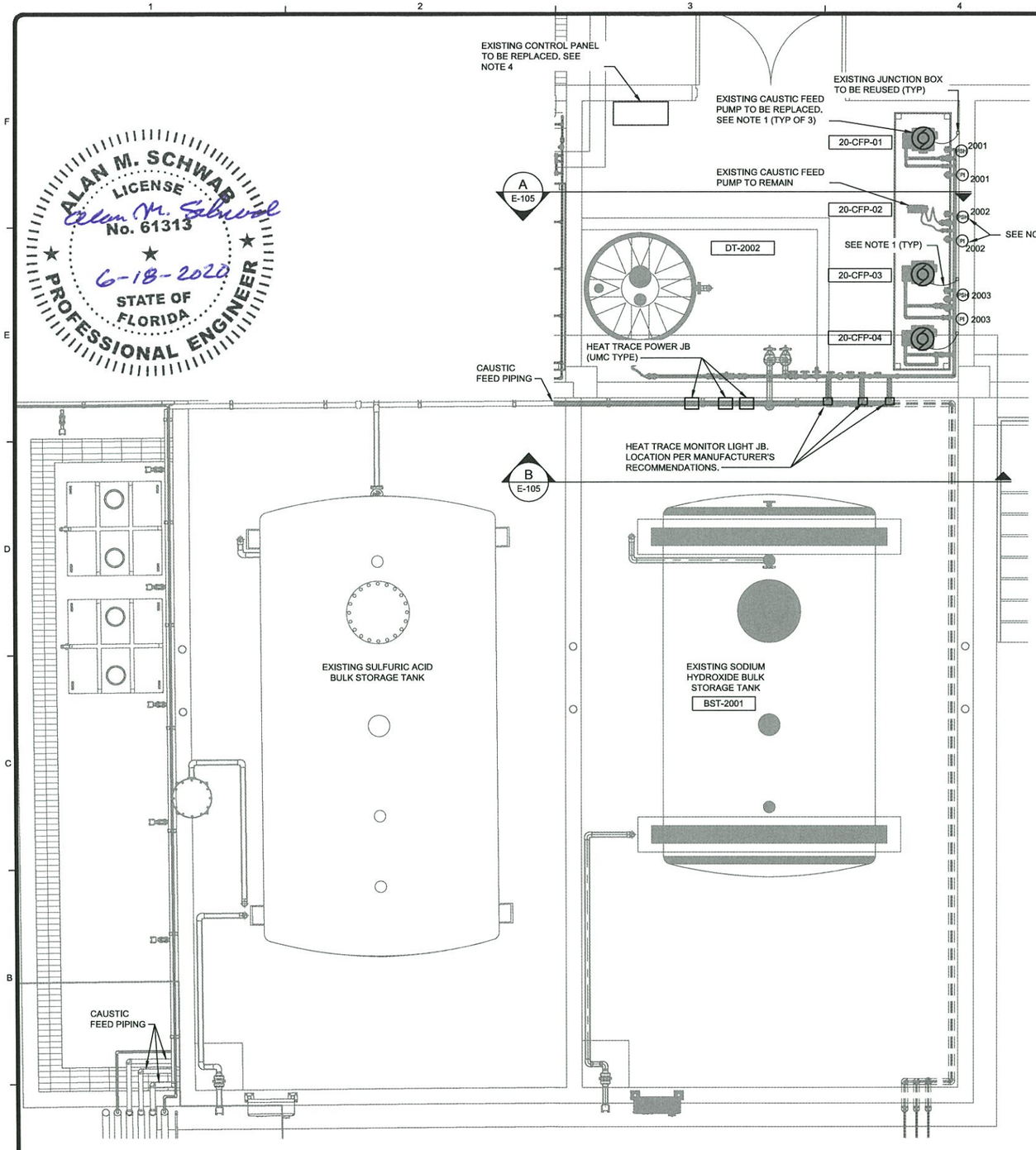
CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

PANEL SCHEDULES

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

E-104A

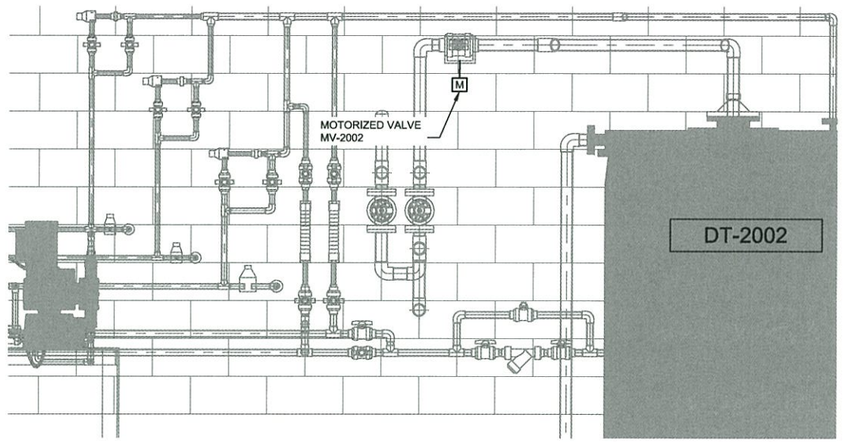
Bar Measures 1 inch, otherwise drawing not to scale



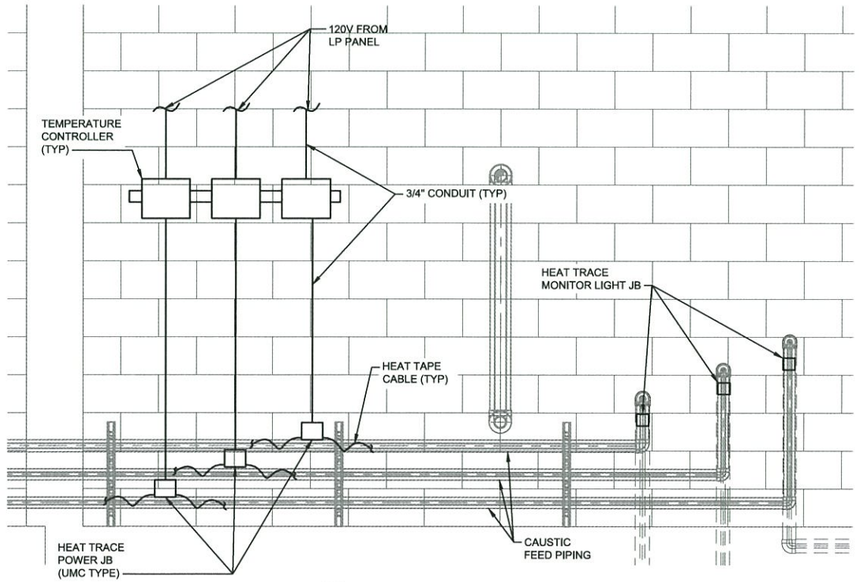
1 E-104 SODIUM HYDROXIDE FLOOR PLAN
SCALE: 3/4"=1'-0"

NOTES:

1. CAUSTIC FEED PUMPS TO BE REPLACED IN KIND. DISCONNECT POWER AND CONTROL. REPLACE FEED PUMP AND RECONNECT CONDUIT AND WIRES. PROVIDE ALL ANCILLARY MATERIALS TO RECONNECT PROPERLY THE FEED PUMPS.
2. DISCONNECT POWER AND CONTROL TO PSH INSTRUMENT. REPLACE INSTRUMENTS AND RECONNECT CONDUIT AND WIRES. PROVIDE ALL ANCILLARY MATERIALS TO RECONNECT INSTRUMENTS.
3. REFER TO PROCESS DRAWINGS FOR EXACT LOCATION OF EQUIPMENT.
4. LABEL WIRES/CONDUITS BEFORE DISCONNECTING THE CONTROL PANEL. REPLACE AND RECONNECT WIRES/CONDUITS. PROVIDE ANY ANCILLARY MATERIALS FOR FULL OPERATION OF CONTROL PANEL.
5. HEAT TRACE: CONTRACTOR TO PROVIDE ALL ANCILLARY MATERIALS PER SECTION 15090 AND MANUFACTURER'S RECOMMENDATIONS. REFER TO SHEETS D-119 & D-120 FOR PIPING RUN.



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



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

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MARK	DATE	DESCRIPTION

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

SODIUM HYDROXIDE FEED SYSTEM

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

E-105

Bar Measures 1 inch, otherwise drawing not to scale

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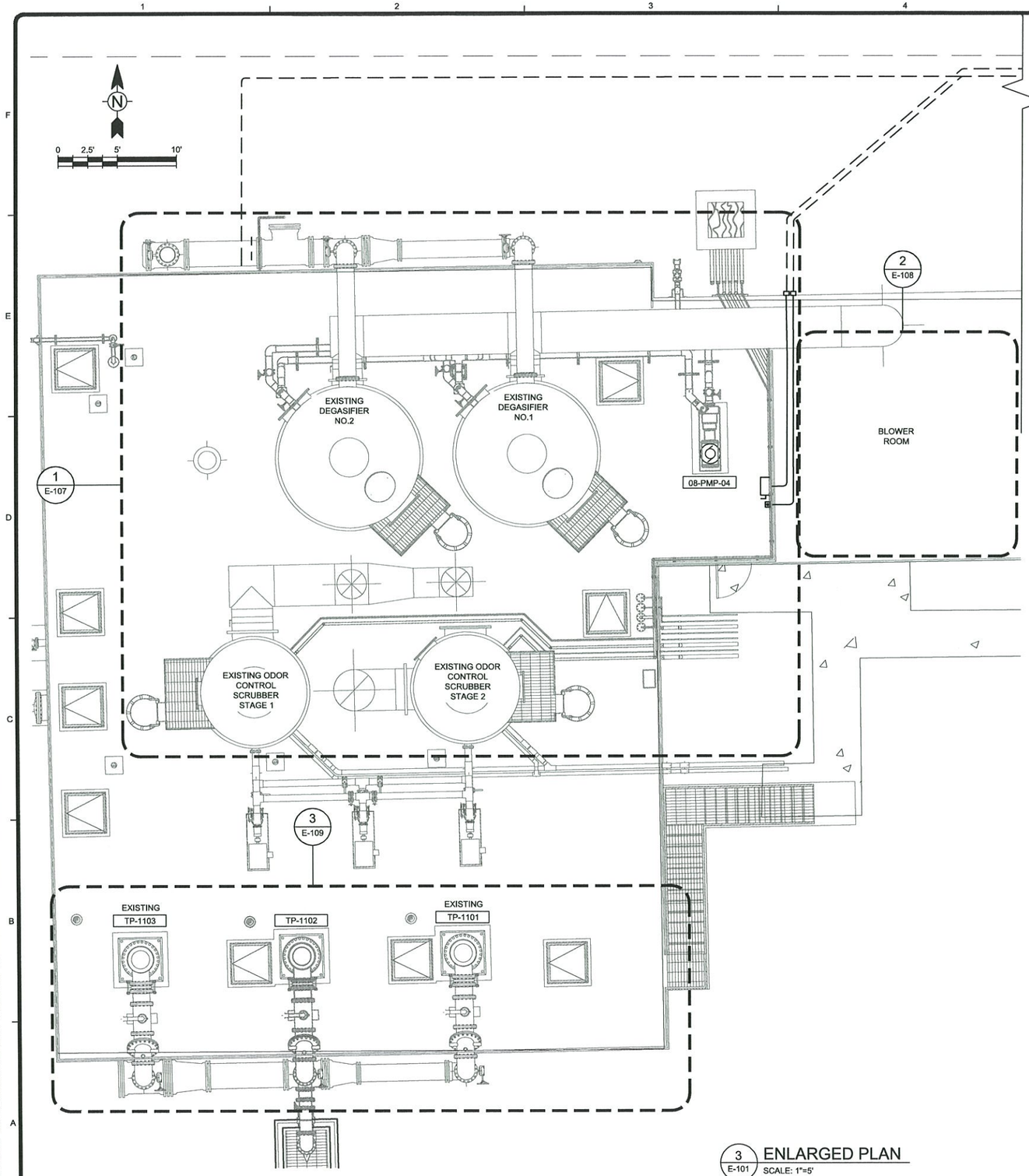

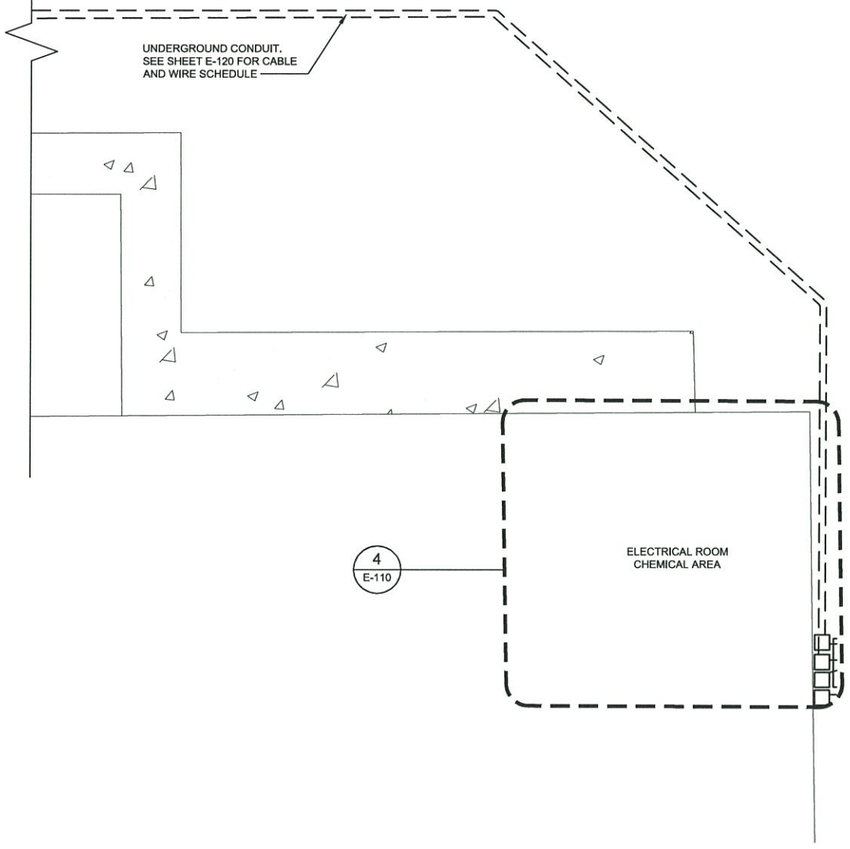

3 E-101 ENLARGED PLAN
SCALE: 1"=5'

ALAN M. SCHWAB LICENSE No. 61313 6-18-2020 STATE OF FLORIDA PROFESSIONAL ENGINEER

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CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
DEGASIFIER- CHLORINE CONTACT AND BLOWERS PLAN

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

E-106

Bar Measures 1 inch, otherwise drawing not to scale

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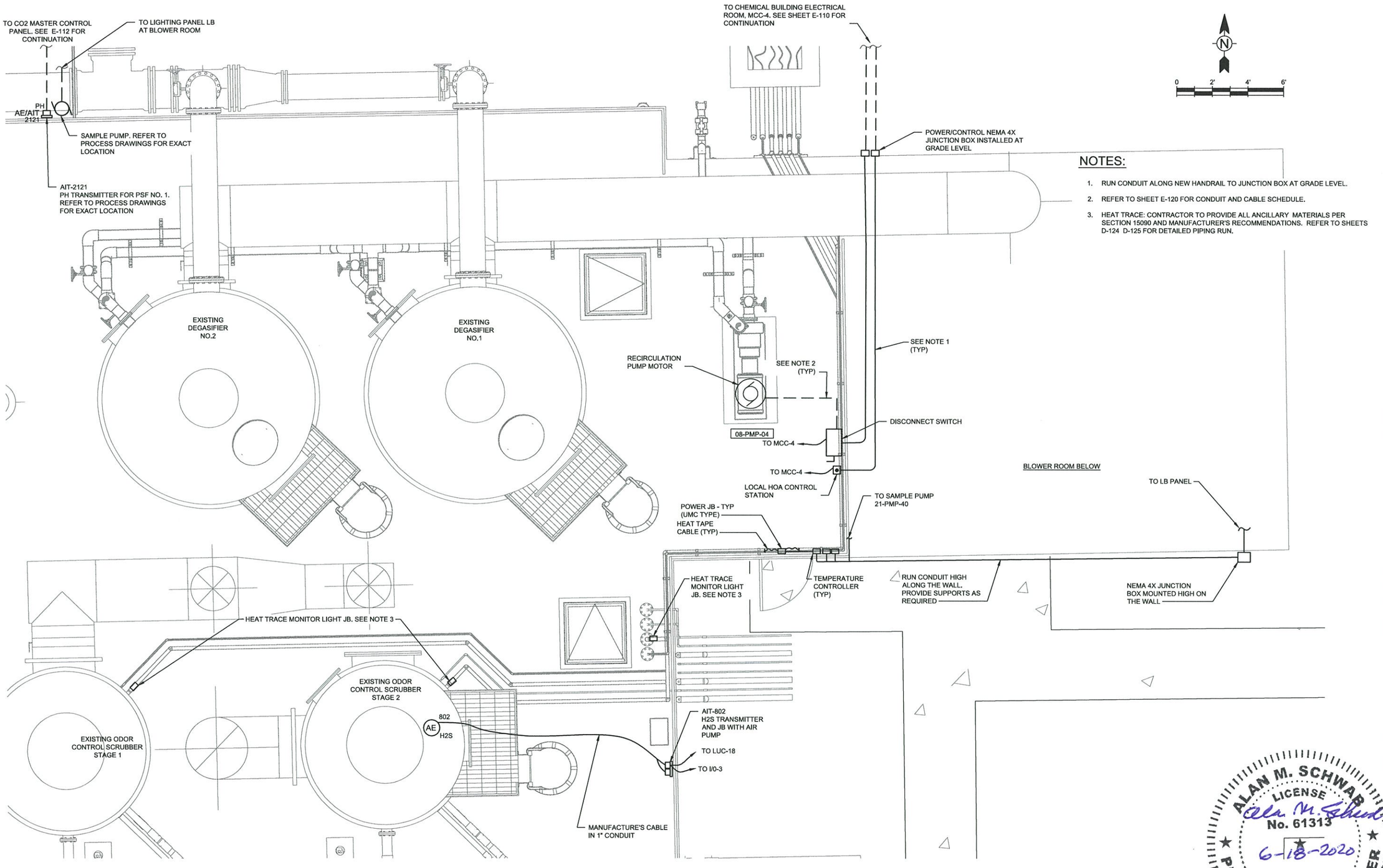

NOTES:

1. RUN CONDUIT ALONG NEW HANDRAIL TO JUNCTION BOX AT GRADE LEVEL.
2. REFER TO SHEET E-120 FOR CONDUIT AND CABLE SCHEDULE.
3. HEAT TRACE: CONTRACTOR TO PROVIDE ALL ANCILLARY MATERIALS PER SECTION 15090 AND MANUFACTURER'S RECOMMENDATIONS. REFER TO SHEETS D-124 D-125 FOR DETAILED PIPING RUN.

1 E-106 ENLARGED PLAN
SCALE: 3/8"=1'-0"

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CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
DESGASIFIER CLEANING SYSTEM

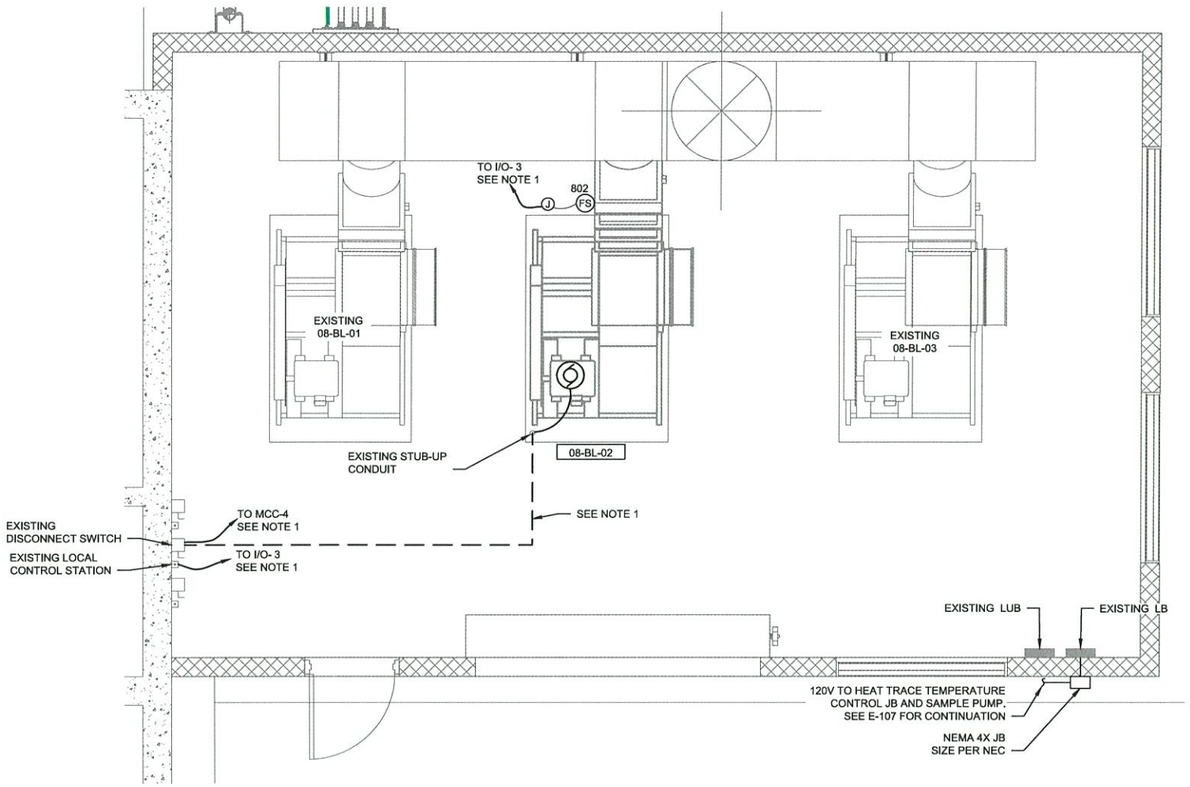
PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

E-107

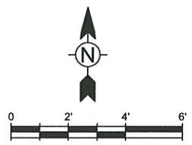
ALAN M. SCHWAB LICENSE No. 61313 6-18-2020 STATE OF FLORIDA PROFESSIONAL ENGINEER

Bar Measures 1 inch, otherwise drawing not to scale

6/18/2020 10:47:00 AM - C:\PW_WORKO\WESTHOFFD\0939591\E-107 DEGASIFIER CLEANING SYSTEM.DWG - WESTHOFF, ONEIDA

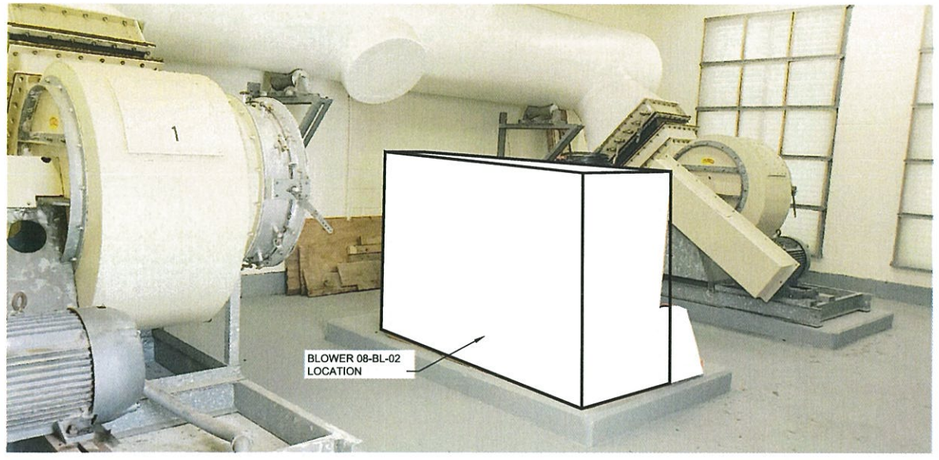


2 E-106 ENLARGED PLAN
SCALE: 3/8"=1'-0"

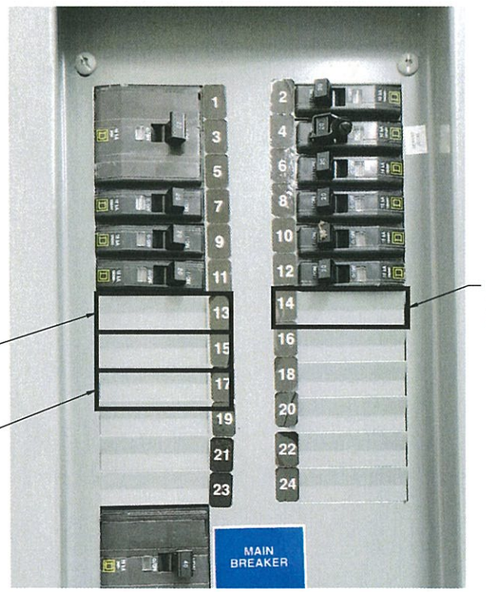


NOTES:

1. REUSE EXISTING CONDUIT AND PULL NEW WIRES PER CONDUIT AND WIRE SCHEDULE ON SHEET E-119 AND E-120.



3 LOCATION OF NEW BLOWER
SCALE: NONE



5 EXISTING LIGHTING PANEL LB MODIFICATIONS
SCALE: NONE

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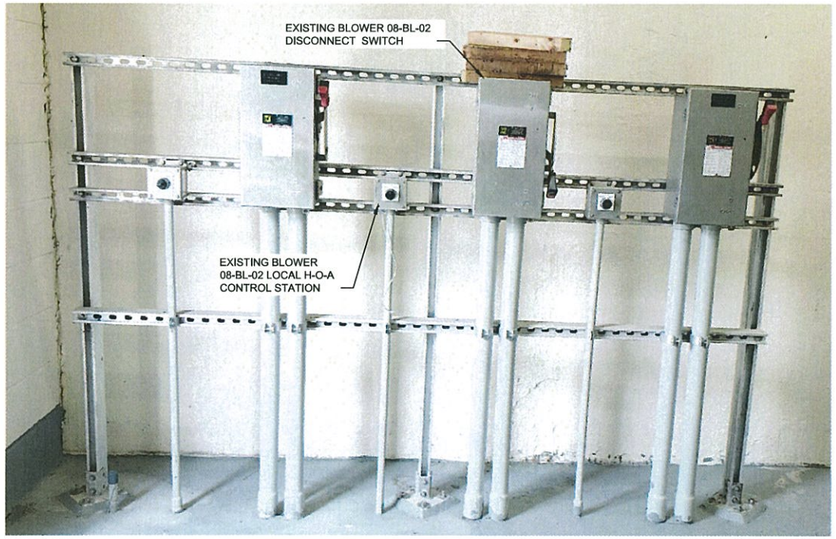
6-18-2020
STATE OF FLORIDA
PROFESSIONAL ENGINEER



4 EXISTING BLOWERS ELECTRICAL RACK
SCALE: NONE

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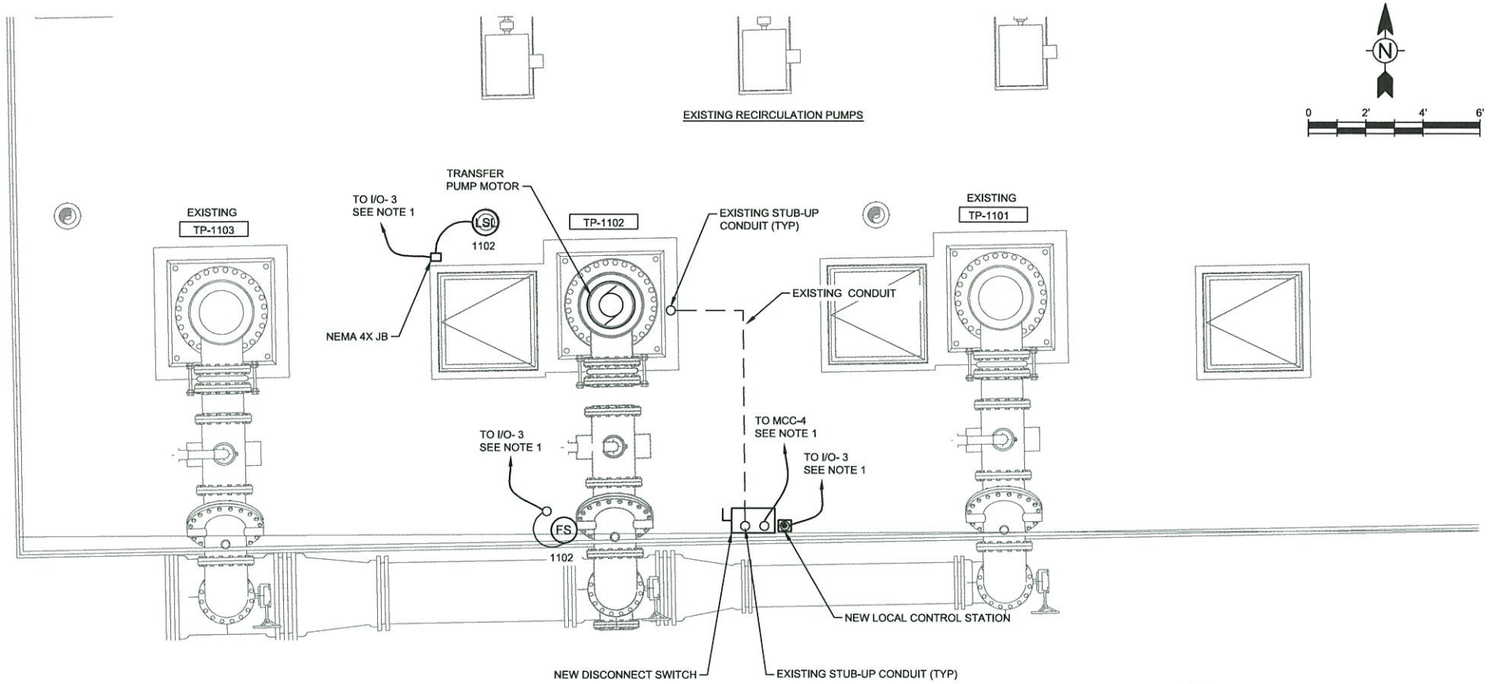
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
BLOWER ROOM

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

E-108

Bar Measures 1 inch, otherwise drawing not to scale

6/18/2020 10:47:10 AM - C:\PW_WORK\OWESTHOFF\D0093959\1E-108 BLOWER ROOM.DWG - WESTHOFF, ONEIDA



3 E-106 ENLARGED PLAN

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

LOCATION OF NEW TP-1102

TYPICAL ELECTRICAL RACK (TP-1103 SHOWN)

4 EXISTING SITE

SCALE: NONE

NOTES:

1. REUSE EXISTING CONDUIT AND PULL NEW WIRES PER CONDUIT AND WIRE SCHEDULE ON SHEET E-119.

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321.728.3389
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Certificate of Authorization No.: 3952

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

DESGASIFIER TRANSFER PUMP

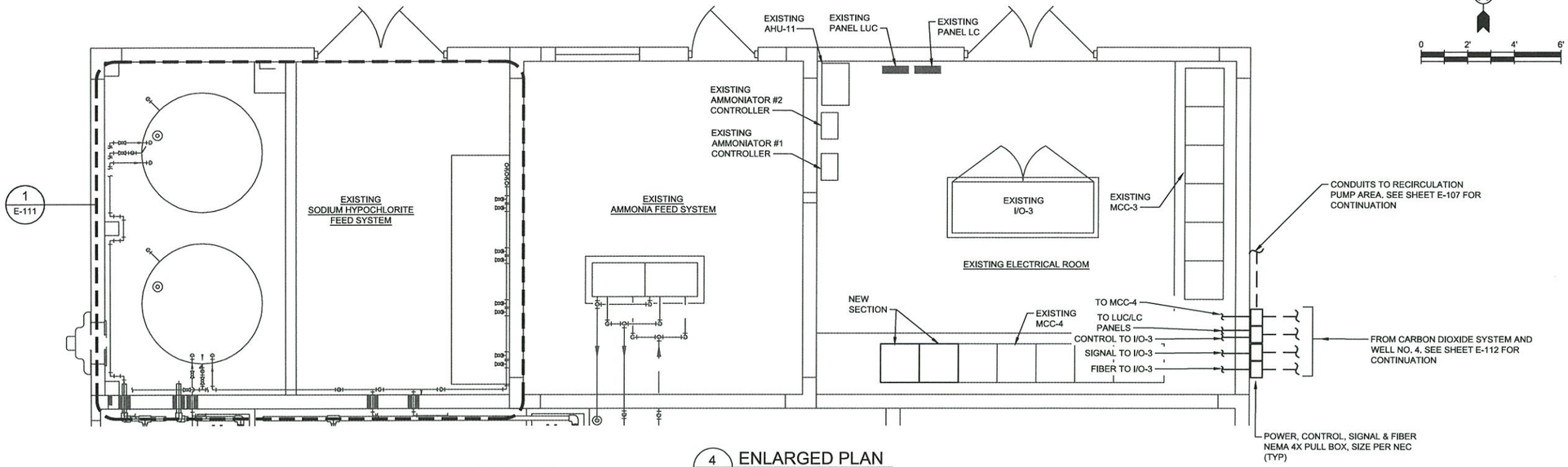
ALAN M. SCHWAB
LICENSE
No. 61313
6-18-2020
STATE OF FLORIDA
PROFESSIONAL ENGINEER

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

E-109

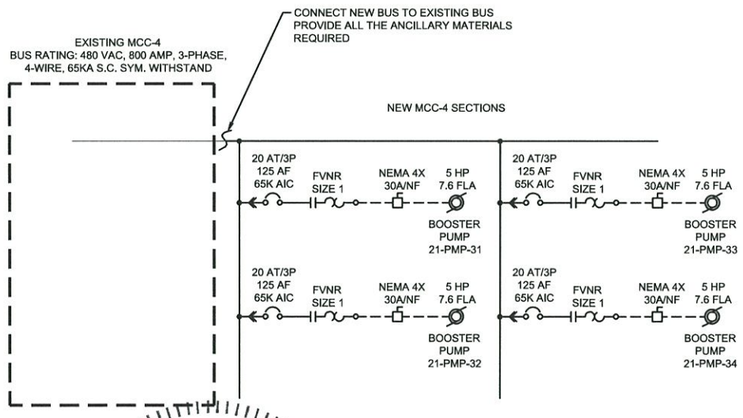
Bar Measures 1 inch, otherwise drawing not to scale

6/18/2020 10:47:38 AM - C:\PW_WORK\OWESTHOFF\D0939591\E-109 DESGASIFIER TRANSFER PUMP.DWG - WESTHOFF, ONEIDA

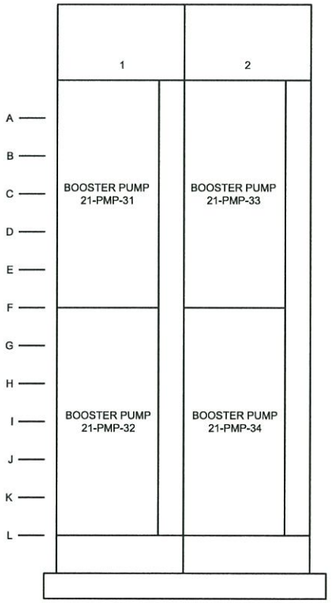


4 E-106 ENLARGED PLAN
SCALE: 3/8"=1'-0"

5 EXISTING MCC-4
SCALE: NONE



6 EXISTING MCC-4 MODIFICATIONS
SCALE: NONE



KEYED NOTES

1. TRANSFER PUMP, TP-1102, BUCKET. FURNISH SIZE 3 MOTOR STARTER AND 100A CIRCUIT BREAKER MATCHING RATING OF EXISTING MCC. REFER TO SHEET E-119 FOR CABLE SCHEDULE.
2. BLOWER NO. 3, 08-BL-02, BUCKET. REUSE BUCKET AND CONNECT WIRING PER CABLE SCHEDULE ON SHEET E-119.
3. RECIRCULATION PUMP, 08-PMP-4, BUCKET. REUSE BUCKET AND CONNECT WIRING PER CABLE SCHEDULE ON SHEET E-120.
4. 24" SPACE TO BE REPLACED AS FOLLOW:
   A. FURNISH AND INSTALL 18" BUCKET FOR WELL NO. 4 225A, 3 POLE CIRCUIT BREAKER, MATCHING EXISTING MCC RATING. REFER TO SHEET E-115 FOR CABLE SCHEDULE.
   B. FURNISH AND INSTALL 6" BUCKET FOR CO2 STORAGE TANK PANEL 30A, 3 POLE CIRCUIT BREAKER, MATCHING EXISTING MCC RATING. REFER TO SHEET E-122 FOR CABLE SCHEDULE.
6. NEW MCC VERTICAL SECTION MATCHING EXISTING MCC RATING FOR BOOSTER PUMPS 21-PMP-31 & 21-PMP-32. REFER TO SHEET E-122 FOR CABLE SCHEDULE.
7. NEW MCC VERTICAL SECTION MATCHING EXISTING MCC RATING FOR BOOSTER PUMPS 21-PMP-33 & 21-PMP-34. REFER TO SHEET E-122 FOR CABLE SCHEDULE.

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6-18-2020

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MARK	DATE	DESCRIPTION	BY

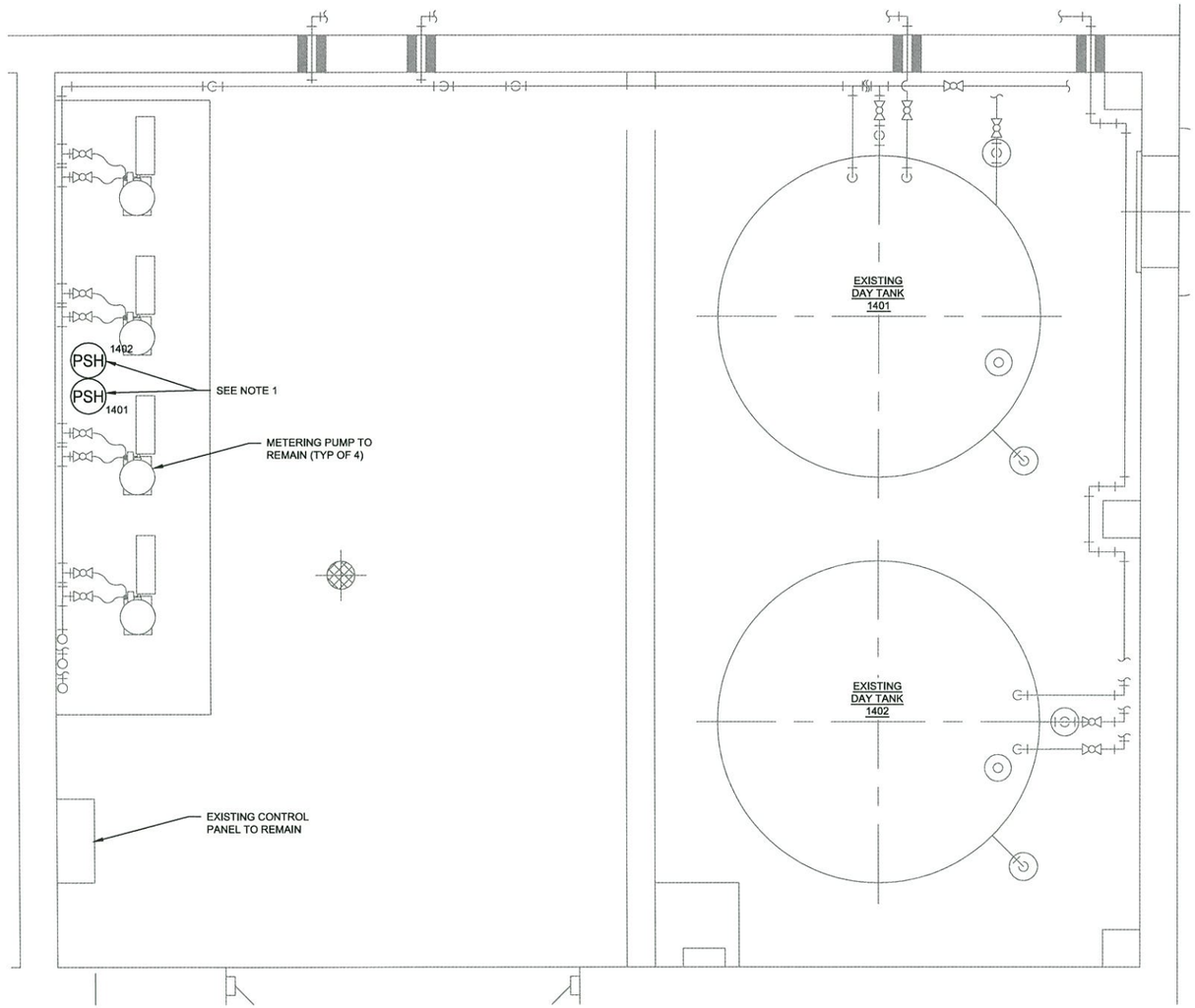
CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
ELECTRICAL ROOM CHEMICAL AREA

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

E-110

Bar Measures 1 inch, otherwise drawing not to scale

6/18/2020 10:47:48 AM - C:\PW_WORK\OWESTHOFF\D0939591\E-110 ELECTRICAL ROOM CHEMICAL AREA.DWG - WESTHOFF, ONEIDA



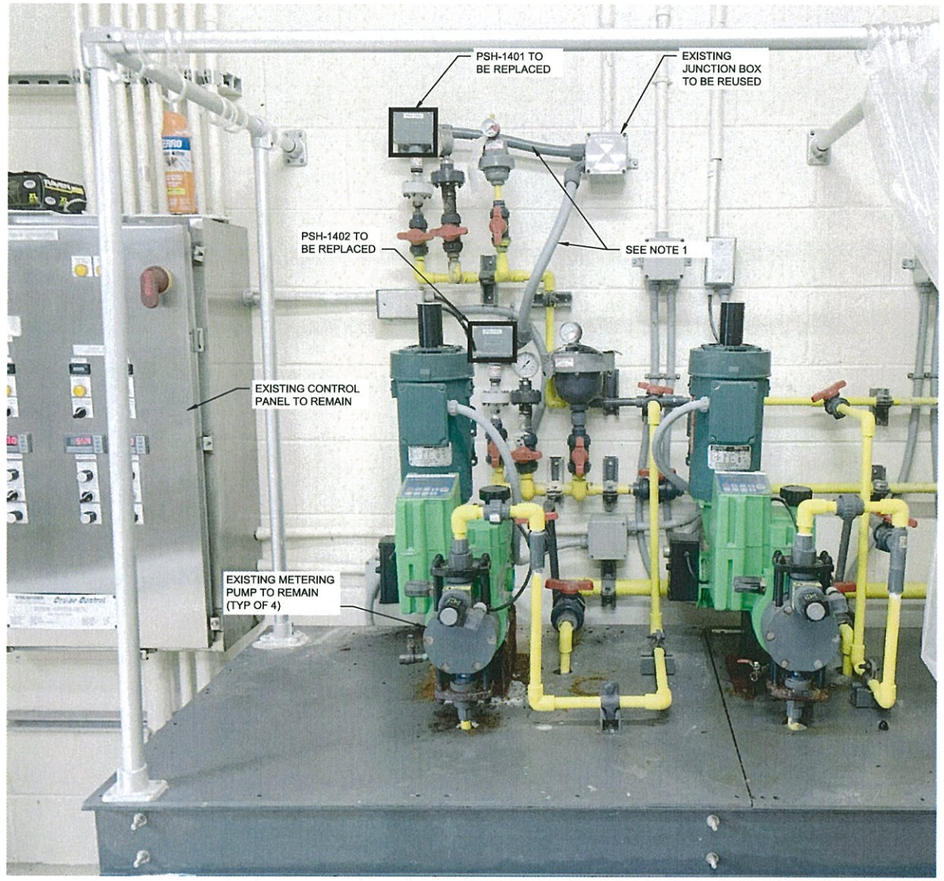
1 E-110 SODIUM HYPOCHLORITE FLOOR PLAN
SCALE: 3/4"=1'-0"

N

0 1' 2' 4'

NOTES:

1. DISCONNECT POWER AND CONTROL TO PSH INSTRUMENT. REPLACE INSTRUMENT IN-KIND AND RECONNECT CONDUIT AND WIRES. PROVIDE ALL ANCILLARY MATERIALS TO RECONNECT INSTRUMENT.
2. REFER TO PROCESS DRAWINGS FOR PIPING MODIFICATIONS.



2 SCALE: NONE PSH-1401 AND PSH-1402 MODIFICATIONS

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MARK	DATE	DESCRIPTION	BY

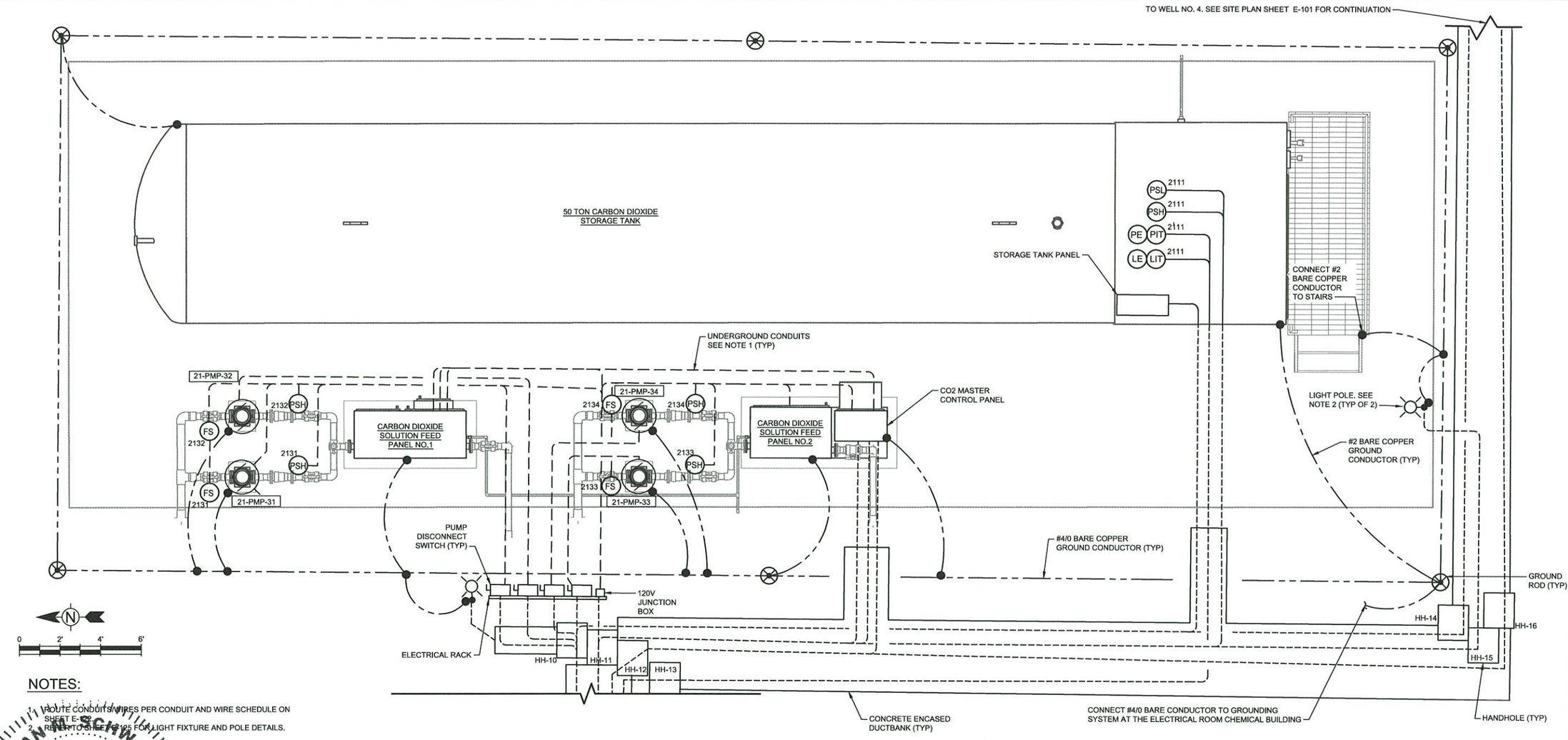
CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
SODIUM HYPOCHLORITE FEED SYSTEM

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

E-111

Bar Measures 1 inch, otherwise drawing not to scale

6/18/2020 10:47:59 AM - C:\PW_WORK\OWESTHOFF\D0939591\E-111 SODIUM HYPOCHLORITE.DWG - WESTHOFF, ONEIDA



NOTES:

1. ROUTE CONDUITS/WIRES PER CONDUIT AND WIRE SCHEDULE ON SHEET E-112
2. REFER TO SHEET E-105 FOR LIGHT FIXTURE AND POLE DETAILS.

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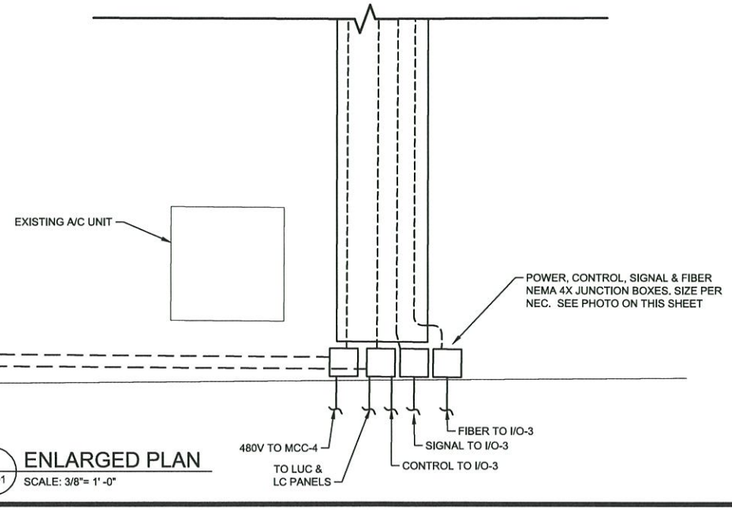
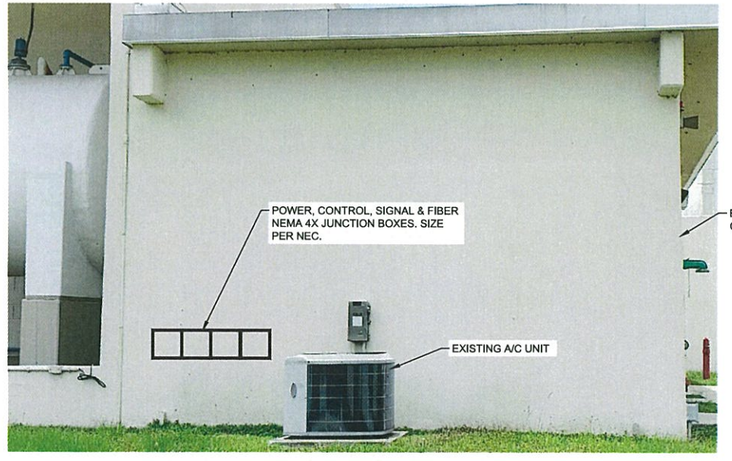
6-18-2020



4 E-101 ENLARGED PLAN
SCALE: 3/8"= 1' -0"



PROPOSED LOCATION OF NEW JUNCTION BOXES
N.T.S

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Certificate of Authorization No.: 3952

MARK	DATE	DESCRIPTION	BY

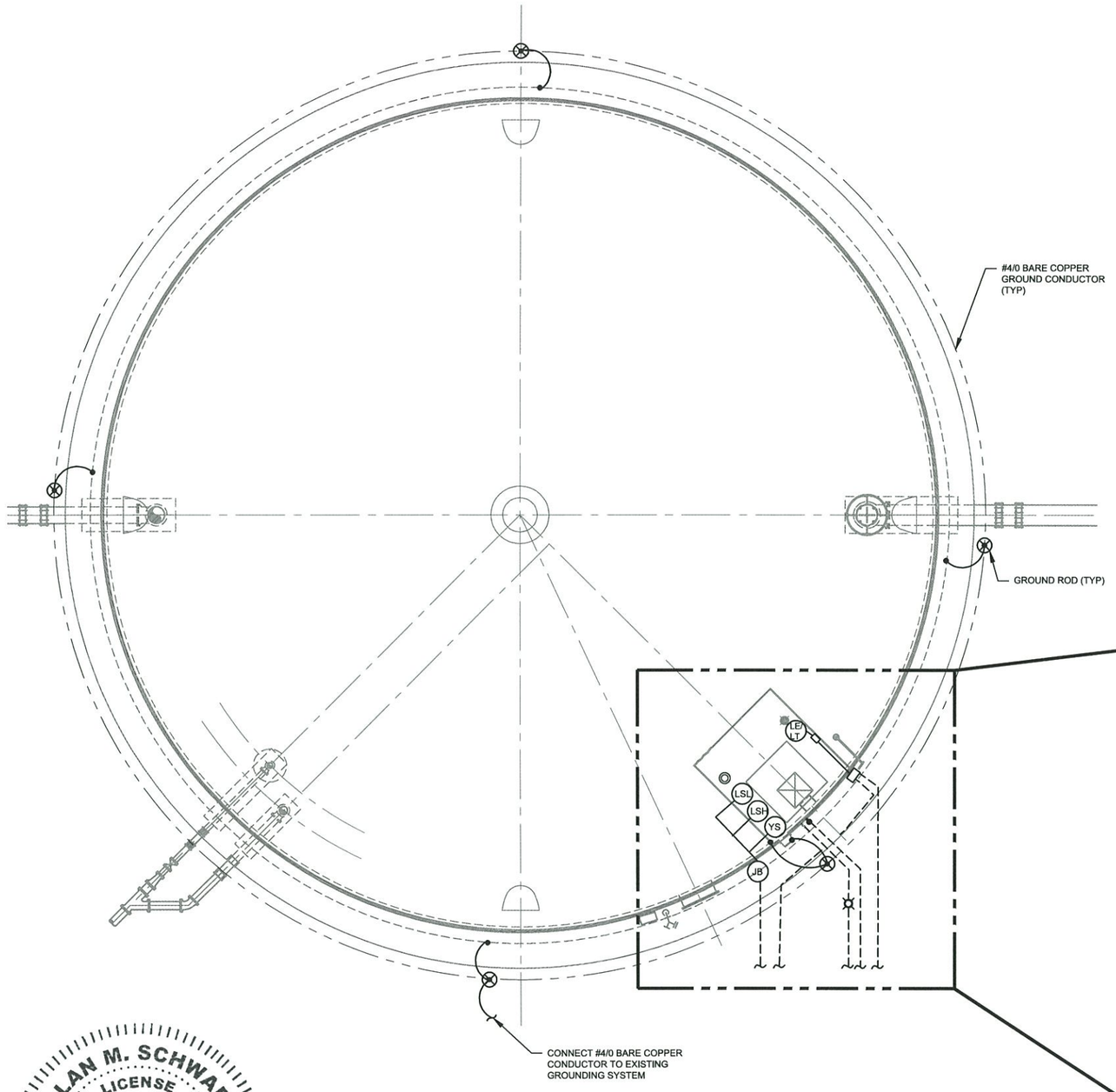
CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
CARBON DIOXIDE STORAGE AND FEED SYSTEM PLAN

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

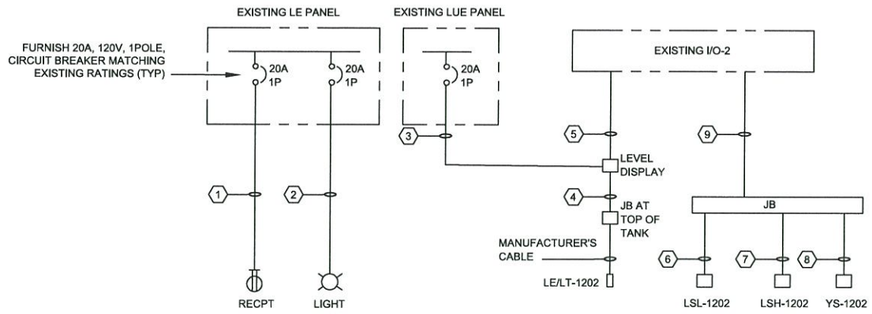
E-112

6/18/2020 10:48:32 AM - C:\PW_WORK\OWESTHOFF\D0939591\E-112 CARBON DIOXIDE AREA.DWG - WESTHOFF, ONEIDA

Bar Measures 1 inch, otherwise drawing not to scale



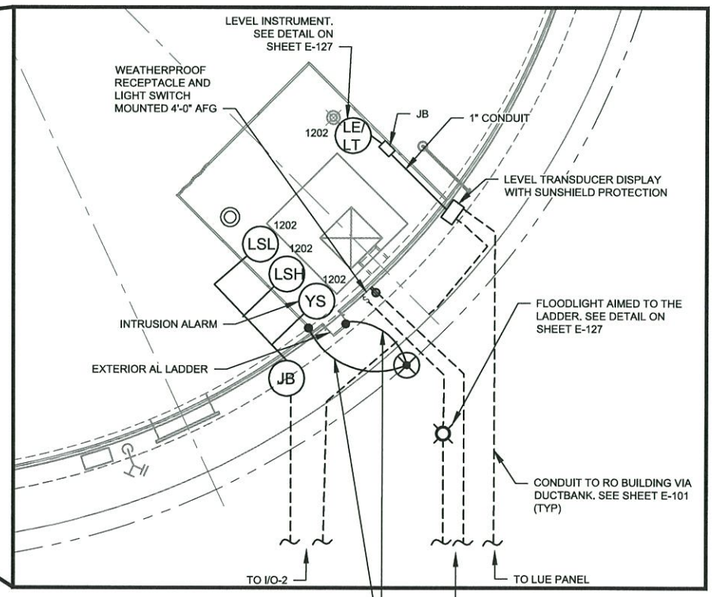
5 E-101 ENLARGED PLAN
SCALE: 1/8"= 1' -0"



RISER DIAGRAM

CABLE SCHEDULE

				CONDUIT		CABLE			
NO.	CONDUIT LABEL	FROM	TO	SIZE	TYPE	QTY. AND SIZE	VOLT	TYPE	COMMENTS
1	RCPT-PWR-1	LE	RECEPT.	3/4"	AL/PVC	2#12 + 1#12 GND	600	THWN-2	
2	LTE-PWR-1	LE	LIGHT	3/4"	AL/PVC	2#12 + 1#12 GND	600	THWN-2	
3	LT-PWR-1	LUE	LEVEL DISPLAY	3/4"	AL/PVC	2#12 + 1#12 GND	600	THWN-2	
4	LT-CTRL-1	LEVEL DISPLAY	JB BOX	1"	AL/PVC	1-2/C # 16 TWSP	300	PVC	
5	LT-CTRL-2	I/O-2	LEVEL DISPLAY	1"	AL/PVC	1-2/C # 16 TWSP	300	PVC	
6	LSL-CTRL-1	LSL-1202	JB	3/4"	AL/PVC	MANUFACTURER'S CABLE	-	-	
7	LSH-CTRL-1	LSH-1202	JB	3/4"	AL/PVC	MANUFACTURER'S CABLE	-	-	
8	LS-CTR-1	INTRUS. ALARM	JB	3/4"	AL/PVC	2#14 + 1#14 GND	600	THWN-2	INTRUSION ALARM
9	IO2-CTR-1	JB	I/O-2	3/4"	AL/PVC	6#14 + 1#14 GND	600	THWN-2	



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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
GROUND STORAGE TANK

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

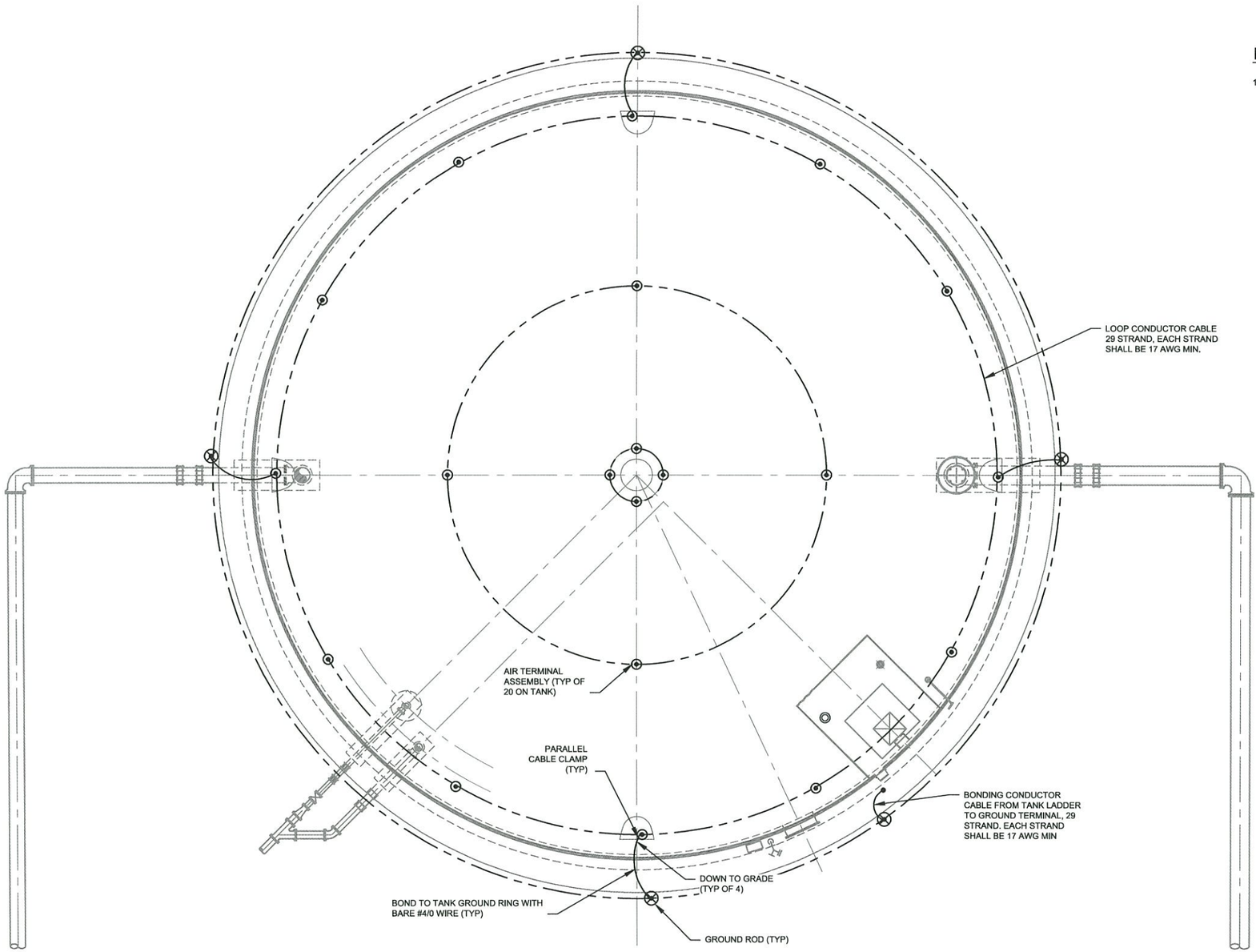
E-113

6/18/2020 10:48:42 AM - C:\PW_WORK\OWESTHOFF\D0939591\E-113 GROUND STORAGE TANK.DWG - WESTHOFF, ONEIDA

Bar Measures 1 inch, otherwise drawing not to scale

NOTES:

1. REFER TO SHEET E-126 FOR LIGHTNING PROTECTION DETAILS.



6 E-101 ENLARGED PLAN
SCALE: 1/8"= 1' -0"

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BID SET

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3760 Dixie Highway NE, Suite D
Palm Bay, FL 32905
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Certificate of Authorization No.: 3952

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

GROUND STORAGE TANK LIGHTNING PROTECTION

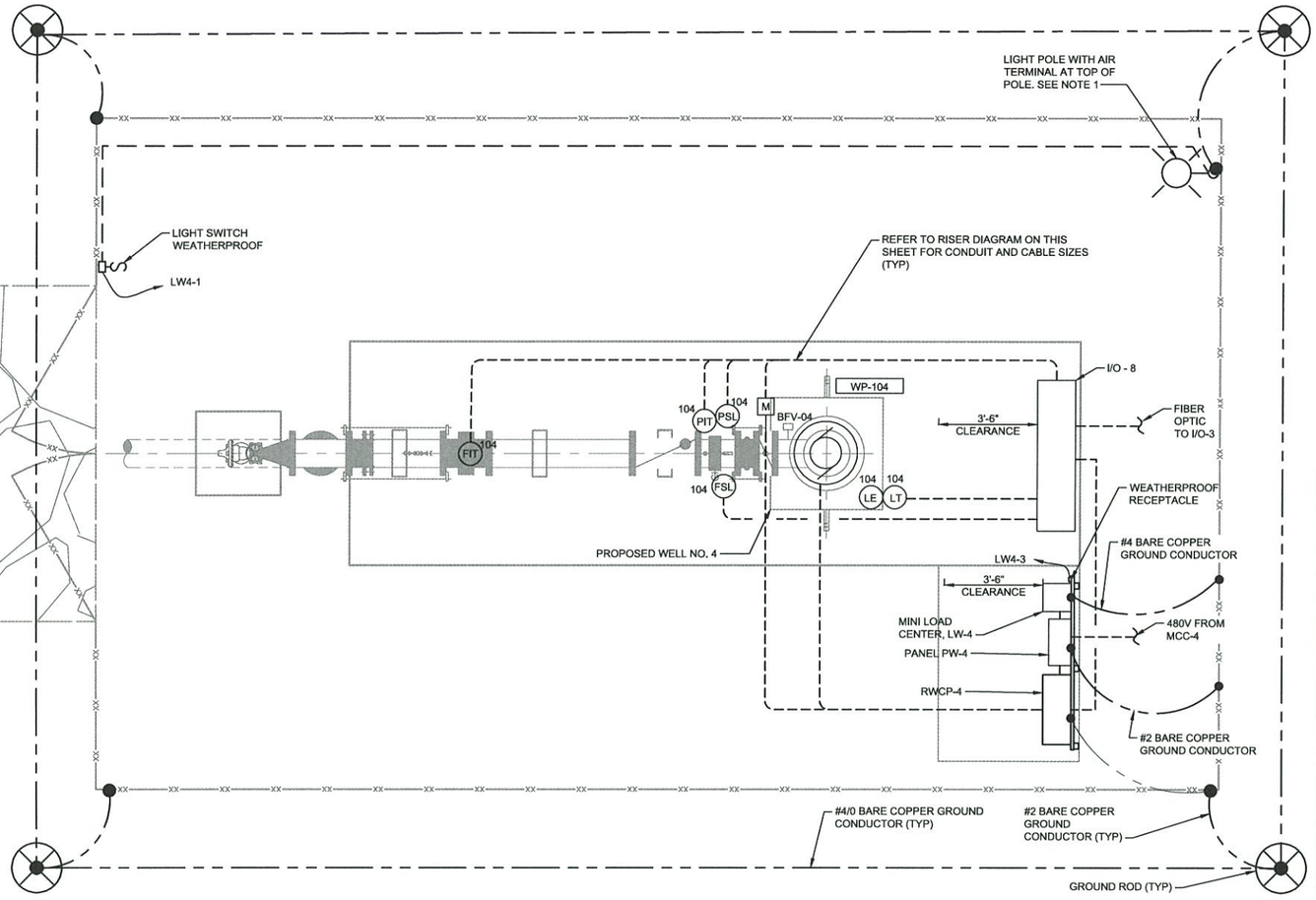
ALAN M. SCHWAB
LICENSE
No. 61313
6-18-2020
STATE OF FLORIDA
PROFESSIONAL ENGINEER

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

E-114

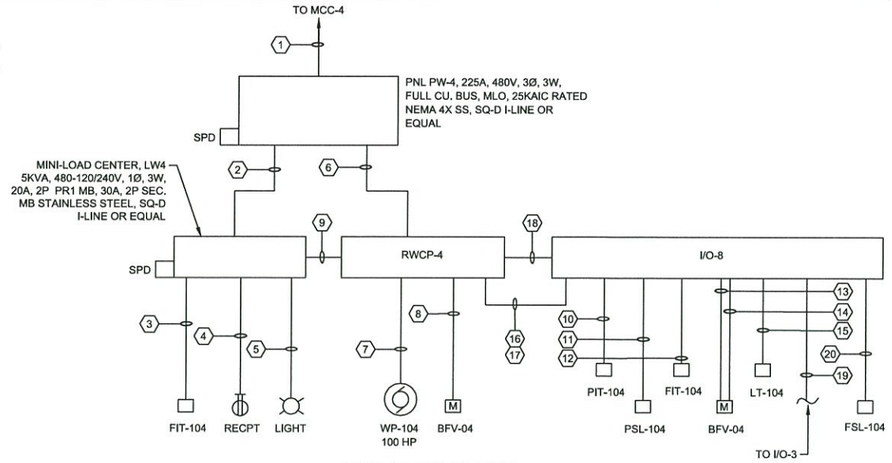
Bar Measures 1 inch, otherwise drawing not to scale

6/18/2020 10:48:52 AM - C:\PW_WORK\OWESTHOFF\D0093959\1E-114 GROUND STORAGE TANK 2.DWG - WESTHOFF, ONEIDA



7 E-101 ENLARGED PLAN

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



RISER DIAGRAM

NOTES:

1. REFER TO SHEET E-125 FOR LIGHT FIXTURE AND POLE DETAILS.

CABLE SCHEDULE

NO.	CONDUIT LABEL	FROM	TO	CONDUIT SIZE	CONDUIT TYPE	CABLE QTY. AND SIZE	CABLE VOLT	CABLE TYPE	COMMENTS
1	WELL4-PWR-1	MCC-4	PW-4	2(3")	PVC/AL	2 (3#250 KCMIL + 1#4 GND)	600	THWN-2	
2	LW4-PWR-1	PW-4	LW-4	3/4"	AL	3#12 + 1#12 GND	600	THWN-2	
3	LW4-PWR-2	LW-4	FIT-104	3/4"	AL/PVC	2#12 + 1#12 GND	600	THWN-2	
4	LW4-PWR-3	LW-4	RECPT	3/4"	AL/PVC	2#12 + 1#12 GND	600	THWN-2	
5	LW4-PWR-4	LW-4	LIGHT	3/4"	AL/PVC	2#12 + 1#12 GND	600	THWN-2	
6	RW4-PWR-1	PW-4	RWCP-4	2"	AL/PVC	3#2/0 + 1#4 GND	600	THWN-2	
7	RW4-PWR-2	RWCP-4	MOTOR	2"	AL/PVC	3#2/0 + 4#14 + 1#4 GND	600	THWN-2	
8	RW4-PWR-3	RWCP-4	BFV-4	3/4"	AL/PVC	3#12 + 1#12 GND	600	THWN-2	
9	RW4-PWR-4	LW-4	RWCP-4	3/4"	AL/PVC	2#12 + 1#12 GND	600	THWN-2	120V FOR I/O-8
10	IO8-CTRL-1	I/O-8	PIT-104	3/4"	AL/PVC	1-2/C #16 TWSP	300	PVC	
11	IO8-CTRL-2	I/O-8	PSL-104	3/4"	AL/PVC	2#14 + 1#14 GND	600	THWN-2	
12	IO8-CTRL-3	I/O-8	FIT-104	3/4"	AL/PVC	1-2/C #16 TWSP	300	PVC	
13	IO8-CTRL-4	I/O-8	BFV-04	3/4"	AL/PVC	2-2/C #16 TWSP	300	PVC	
14	IO8-CTRL-5	I/O-8	BFV-04	3/4"	AL/PVC	10#14 + 1#14 GND	600	THWN-2	
15	IO8-CTRL-6	I/O-8	LT-104	3/4"	AL/PVC	1-2/C #16 TWSP	300	PVC	
16	RW4-CTRL-5	I/O-8	RWCP-4	3/4"	AL/PVC	14#14	600	THWN-2	
17	RW4-CTRL-6	I/O-8	RWCP-4	3/4"	AL/PVC	2-2/C #16 TWSP	300	PVC	
18	IO8-PWR-1	RWCP-4	I/O-8	3/4"	AL/PVC	2#12 + 1#12 GND	600	THWN-2	120V FOR I/O-8
19	IO8-CTRL-7	I/O-8	I/O-3	(2) 2"	AL/PVC	(2) FIBER OPTIC	300	PVC	
20	FSL-CTRL-1	I/O-8	FSL-104	3/4"	AL/PVC	2#14 + 1#14 GND	600	THWN-2	THERMAL FLOW SWITCH

PANEL "PW-4"

BUS: MLO BUS MATERIAL: COPPER VOLTAGE: 480VAC PHASE: 3 WIRE: 3 MAIN: 225A
MOUNTING: SURFACE LOCATION: RACK NEMA RATING: NEMA 4X S.C. RMS: 30KAIC

CKT NO.	LOAD DESCRIPTION	VOLT AMPS (VA) ΦA	ΦB	ΦC	BRK AMP	POLE	A	B	C	POLE	BRK AMP	VOLT AMPS (VA) ΦA	ΦB	ΦC	LOAD DESCRIPTION	CKT NO.
1		34000										1000				2
3	RWCP-4		34000		200	3				2	20		1000		MINI LOAD CENTER, LW-4	4
5				34000											SPACE	6
7		100													SPACE	8
9	SPD		100		20	3									SPACE	10
11				100											SPACE	12
	TOTAL	34100	34100	34100								1000	1000	0	TOTAL CONNECTED LOAD (KVA)	104.30
												ΦA	ΦB	ΦC	TOTAL EST. DEMAND LOAD (KVA)	104.30
	GRAND TOTAL											35100	35100	34100	DEMAND LOAD FACTOR	1.00

PANEL "LW4"

BUS: 100A BUS MATERIAL: COPPER VOLTAGE: 120/240VAC PHASE: 1 WIRE: 3 MAIN: 30A
MOUNTING: SURFACE LOCATION: MPC NEMA RATING: NEMA 12 S.C. RMS: 18KA

CKT NO.	LOAD DESCRIPTION	VOLT AMPS (VA) ΦA	ΦB	BRK AMP	POLE	X	Y	POLE	BRK AMP	VOLT AMPS (VA) ΦA	ΦB	LOAD DESCRIPTION	CKT NO.
1	LIGHT POLE	250		20	1			1	20	120		FLOW METER	2
3	RECEPTACLE		180	20	1			1	20			SPARE	4
5	SPARE			20	1			1	20			SPARE	6
7	SPD	100		20	2			1	20			SPARE	8
9			100					1	20			SPARE	10
	TOTAL	350	280							120	0	TOTAL CONNECTED LOAD (KVA)	0.75
										ΦA	ΦB	TOTAL EST. DEMAND LOAD (KVA)	0.75
	GRAND TOTAL									470	280	DEMAND LOAD FACTOR	1.00

ALAN M. SCHWAB LICENSE No. 61313 6-18-2020 STATE OF FLORIDA PROFESSIONAL ENGINEER

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Certificate of Authorization No.: 3962

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
PROPOSED PRODUCTION WELL NO. 4

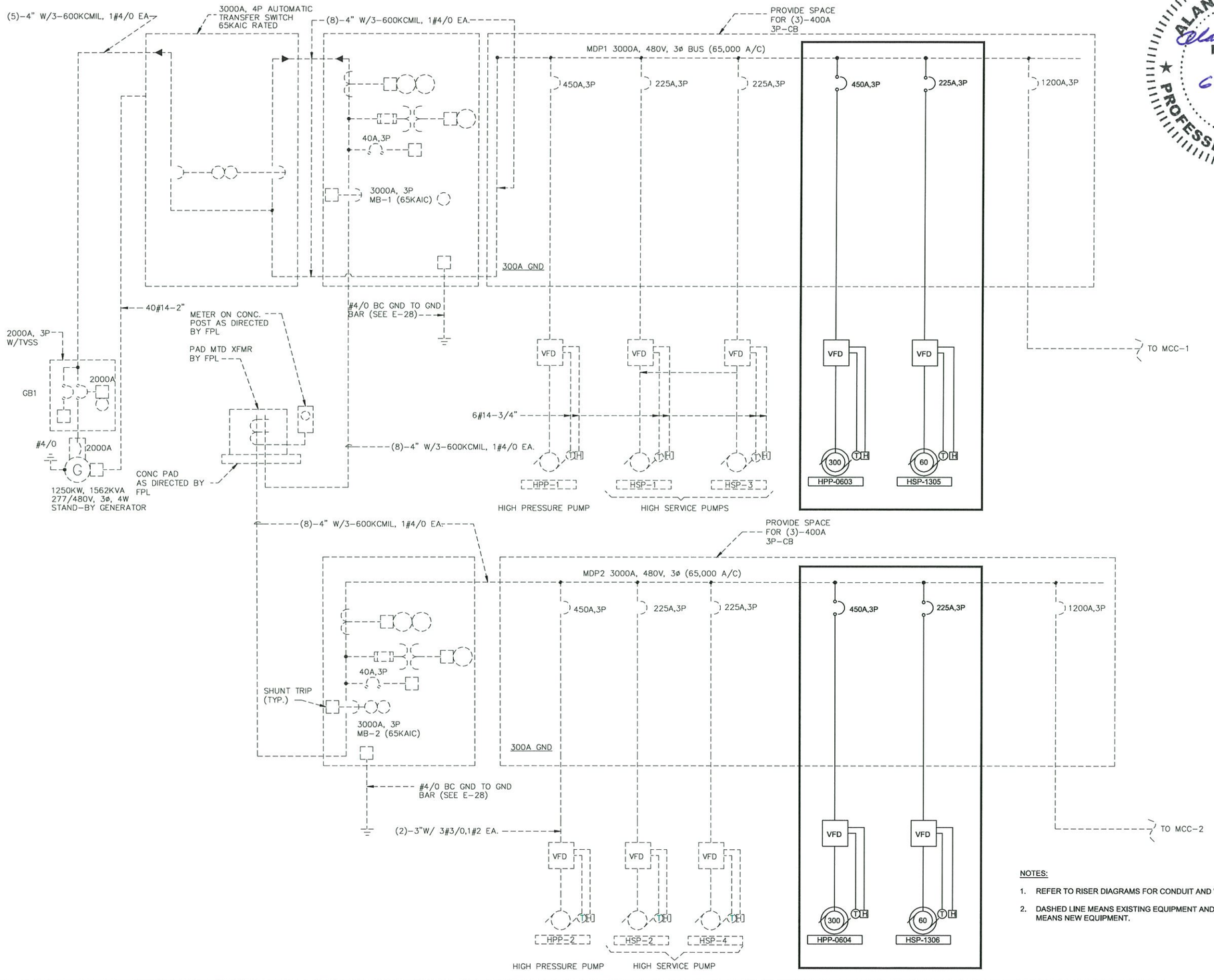
PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

E-115

Coordinate Terra Tech

6/18/2020 10:49:07 AM - C:\PW_WORKGROUP\WESTHOFF\D0939591\E-115 WELL NO 4.DWG - WESTHOFF, ONEIDA

Bar Measures 1 inch, otherwise drawing not to scale



NOTES:

1. REFER TO RISER DIAGRAMS FOR CONDUIT AND WIRES SIZES.
2. DASHED LINE MEANS EXISTING EQUIPMENT AND BOLD LINE MEANS NEW EQUIPMENT.

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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

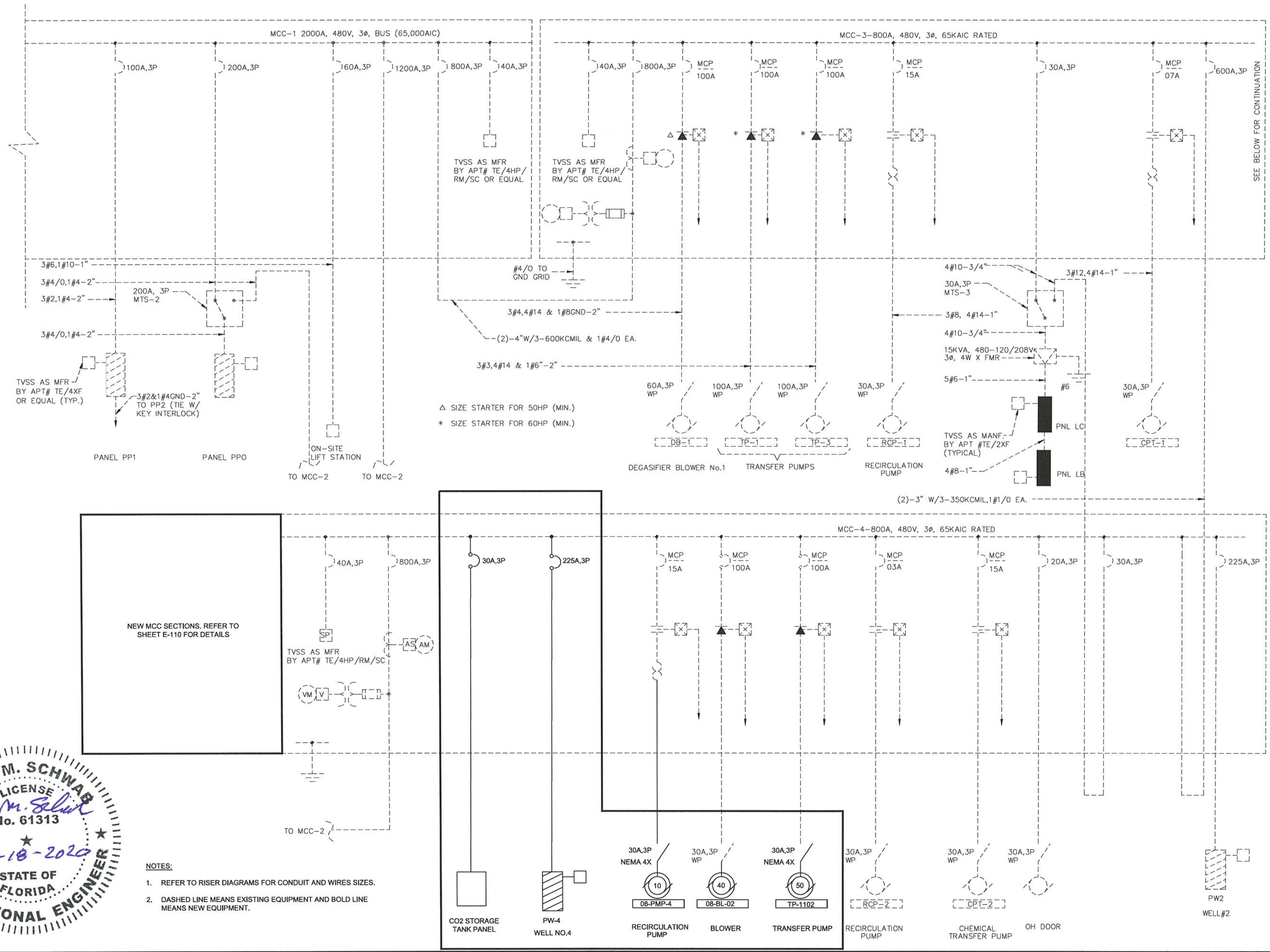
OVERALL ONE LINE MODIFICATIONS (1 OF 2)

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

E-116

Bar Measures 1 inch, otherwise drawing not to scale

6/18/2020 10:49:19 AM - C:\PW_WORK\OWESTHOFF\D0939691\E-116 OVERALL ONE LINE MODIFICATIONS (1 OF 1).DWG - WESTHOFF, ONEIDA



ALAN M. SCHWAB
LICENSE
No. 61313
6-18-2020
STATE OF FLORIDA
PROFESSIONAL ENGINEER

NOTES:

1. REFER TO RISER DIAGRAMS FOR CONDUIT AND WIRES SIZES.
2. DASHED LINE MEANS EXISTING EQUIPMENT AND BOLD LINE MEANS NEW EQUIPMENT.

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TEL: (407) 839-3955 FAX: (407) 839-3790

BID SET

WADE TRIM

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

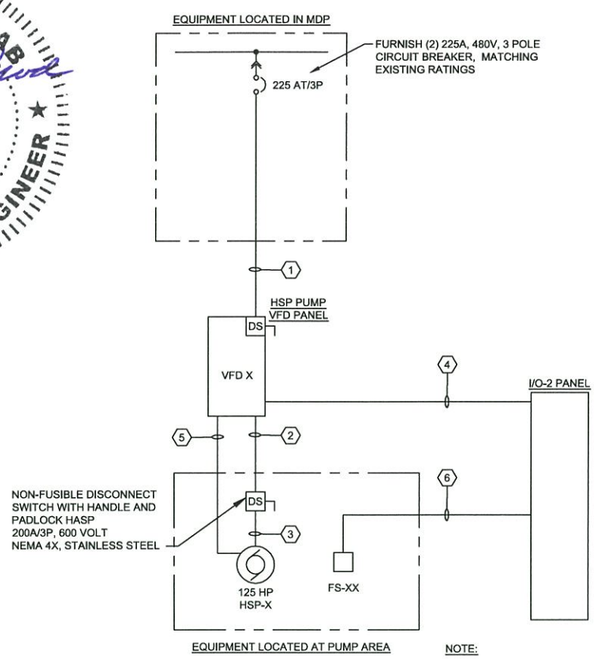
OVERALL ONE LINE MODIFICATIONS (2 OF 2)

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

E-117

Bar Measures 1 inch, otherwise drawing not to scale

6/18/2020 10:49:30 AM - C:\PW_WORK\OWESTHOFF\D0939591\E-117 OVERALL ONE LINE MODIFICATIONS (1 OF 2).DWG - WESTHOFF, ONEIDA



NOTE:

1. REPLACE "X" OR "XX" WITH EACH EQUIPMENT LABEL INDICATED IN TABLE "EQUIPMENT SPECIFIC LABEL TABLE" ON THIS SHEET (E.G. "HSP-X" WILL BE "HSP-1305" AND "HSP-1306")

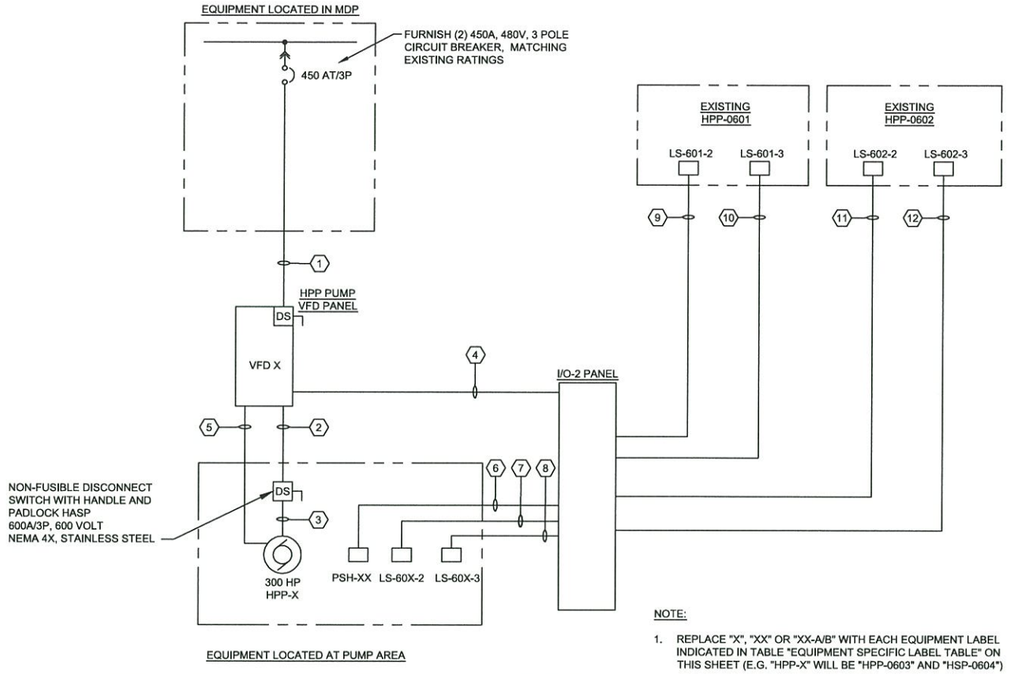
CABLE SCHEDULE

NO.	CONDUIT LABEL	FROM	TO	CONDUIT SIZE	CONDUIT TYPE	CABLE QTY. AND SIZE	CABLE VOLT	CABLE TYPE	COMMENTS
1	HSPX-PWR-1	MDP	VFD X PANEL	-	-	3#4/0 + 1#2 GND	600	THWN-2	REUSE EXISTING 480V STUB-UP CONDUIT. CONNECT TO NEW DISCONNECT SWITCH AND MOTOR.
2	HSPX-PWR-1	VFD X PANEL	DISC. SWITCH X	-	-	3#4/0 + 1#2 GND	600	THWN-2	REUSE EXISTING 480V STUB-UP CONDUIT. CONNECT TO NEW DISCONNECT SWITCH AND MOTOR.
3	HSPX-PWR-2	DISC. SWITCH X	PUMP MOTOR X	3"	LFMC	3#4/0 + 1#2 GND	600	THWN-2	REUSE EXISTING 480V STUB-UP CONDUIT. CONNECT TO NEW DISCONNECT SWITCH AND MOTOR.
4	HSPX-CTRL-2	VFD X PANEL	I/0-2 PANEL	1"	PVC	ETHERNET CABLE	N/A	N/A	REUSE EXISTING STUB-UP CONDUIT.
5	HSPX-CTRL-3	VFD X PANEL	PUMP MOTOR X	3/4"	PVC/LFMC	6#14	600	THWN-2	REUSE EXISTING 120V STUB-UP CONDUIT.
6	HSPX-CTRL-4	FS-XX	I/O-2	3/4"	PVC/AL	2#14	600	THWN-2	REUSE EXISTING 120V STUB-UP CONDUIT.

EQUIPMENT SPECIFIC LABEL TABLE

	EQUIPMENT	GENERIC LABEL	SPECIFIC LABEL	COMMENTS
FOR	HSP PUMP NO. 1305	REPLACE " X " WITH	1305	VFD, DISCONNECT SWITCH, MOTOR, CONTROLS
	HSP PUMP NO. 1306		1306	
	FS-1305	REPLACE " XX " WITH	1305	
	FS-1306		1306	

HIGH SERVICE PUMP RISER DIAGRAM



NOTE:

1. REPLACE "X", "XX" OR "XX-A/B" WITH EACH EQUIPMENT LABEL INDICATED IN TABLE "EQUIPMENT SPECIFIC LABEL TABLE" ON THIS SHEET (E.G. "HPP-X" WILL BE "HPP-0603" AND "HSP-0604")

CABLE SCHEDULE

NO.	CONDUIT LABEL	FROM	TO	CONDUIT SIZE	CONDUIT TYPE	CABLE QTY. AND SIZE	CABLE VOLT	CABLE TYPE	COMMENTS
1	HPPX-PWR-1	MDP	DISC. SWITCH X	2(3")	PVC/LFMC	(2)3#4/0 + 1#2 GND	600	THWN-2	REUSE EXISTING 480V STUB-UP CONDUIT. CONNECT TO NEW DISCONNECT SWITCH AND MOTOR.
2	HPPX-PWR-2	VFD X PANEL	DISC. SWITCH X	2(3")	PVC/LFMC	(2)3#4/0 + 1#2 GND	600	THWN-2	REUSE EXISTING 480V STUB-UP CONDUIT. CONNECT TO NEW DISCONNECT SWITCH AND MOTOR.
3	HPPX-PWR-3	DISC. SWITCH X	PUMP MOTOR X	2(3")	LFMC	(2)3#4/0 + 1#2 GND	600	THWN-2	REUSE EXISTING 480V STUB-UP CONDUIT. CONNECT TO NEW DISCONNECT SWITCH AND MOTOR.
4	HPPX-CTRL-2	VFD X PANEL	I/0-2 PANEL	1"	PVC	ETHERNET CABLE	N/A	N/A	REUSE EXISTING STUB-UP CONDUIT.
5	HPPX-CTRL-3	VFD X PANEL	PUMP MOTOR X	3/4"	PVC/LFMC	6#14	600	THWN-2	REUSE EXISTING 120V STUB-UP CONDUIT.
6	HPPX-CTRL-4	PSH-XX	I/O-2	3/4"	PVC/AL	2#14	600	THWN-2	REUSE EXISTING 120V STUB-UP CONDUIT.
7	HPPX-CTRL-5	LS-60X-2	I/O-1	3/4"	PVC/AL	2#14	600	THWN-2	
8	HPPX-CTRL-6	LS-60X-3	I/O-1	3/4"	PVC/AL	2#14	600	THWN-2	
9	HPP1-CTRL-7	LS-601-2	I/O-1	3/4"	PVC/AL	2#14	600	THWN-2	
10	HPP1-CTRL-8	LS-601-3	I/O-1	3/4"	PVC/AL	2#14	600	THWN-2	
11	HPP2-CTRL-9	LS-602-2	I/O-1	3/4"	PVC/AL	2#14	600	THWN-2	
12	HPP2-CTRL-10	LS-602-3	I/O-1	3/4"	PVC/AL	2#14	600	THWN-2	

EQUIPMENT SPECIFIC LABEL TABLE

	EQUIPMENT	GENERIC LABEL	SPECIFIC LABEL	COMMENTS
FOR	HPP PUMP NO. 0603	REPLACE "X" WITH	0603	VFD, DISCONNECT SWITCH, MOTOR, CONTROL
	HPP PUMP NO. 0604		0604	
	PSH-603	REPLACE "XX" WITH	603	
	PSH-604		604	
	LS-603-2	REPLACE "60X-2" WITH	603-2	
	LS-604-2		604-2	
	LS-603-3	REPLACE "60X-3" WITH	603-3	
	LS-604-3		604-3	

HIGH PRESSURE PUMP RISER DIAGRAM

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BID SET

WADE TRIM
3760 Dixie Highway NE, Suite D
Palm Bay, FL 32905
321.728.3389
www.wadetrim.com
Certificate of Authorization No. 3962

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

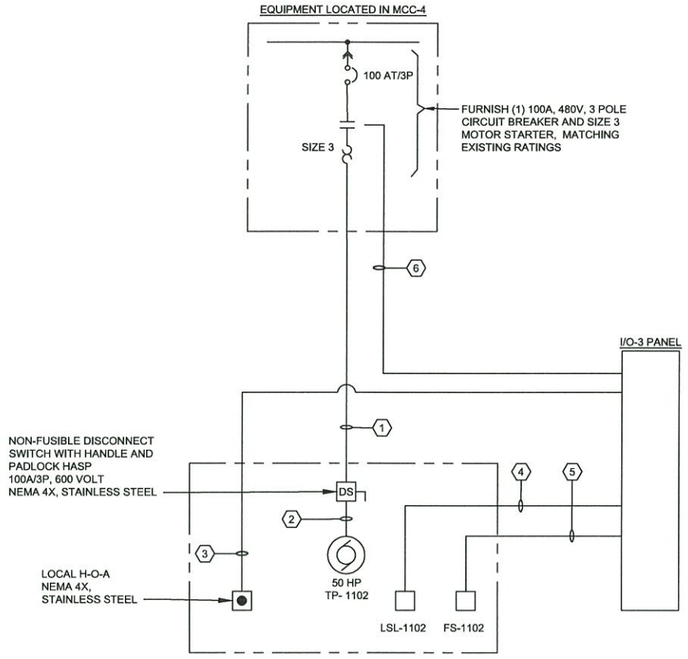
RISER DIAGRAMS (1 OF 5)

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

E-118

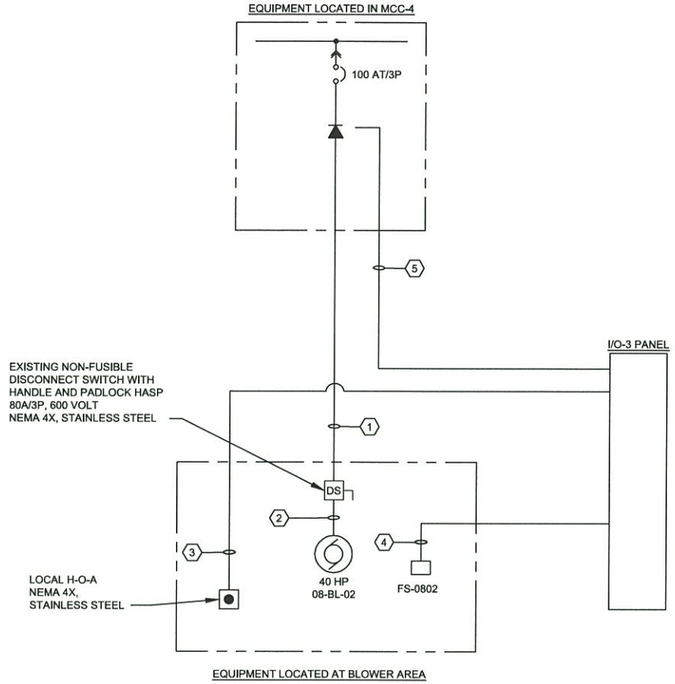
6/18/2020 10:49:42 AM - C:\PW_WORK\OWESTHOFF\D0939591\E-118 RISER DIAGRAM 1.DWG - WESTHOFF, ONEIDA

Bar Measures 1 inch, otherwise drawing not to scale



CABLE SCHEDULE									
				CONDUIT		CABLE			
NO.	CONDUIT LABEL	FROM	TO	SIZE	TYPE	QTY. AND SIZE	VOLT	TYPE	COMMENTS
1	TP1102-PWR-1	MCC-4	DISC. SWITCH	2"	PVC/AL	3#3 + 4#14 +1#6 GND	600	THWN-2	REUSE EXISTING 480V STUB-UP CONDUIT. CONNECT TO NEW DISCONNECT SWITCH AND MOTOR.
2	TP1102-PWR-2	DISC. SWITCH	MOTOR	2"	LFMC	3#4 + 4#14 +1#8 GND	600	THWN-2	REUSE EXISTING 480V STUB-UP CONDUIT. NEW LFMC TO MOTOR.
3	TP1102-CTRL-1	CONTROL STATION	I/O-3	3/4"	PVC/AL	8#14	600	THWN-2	REUSE EXISTING STUB-UP CONDUIT.
4	LSL1102-CTRL-2	LSL-1102	I/O-3	3/4"	PVC/AL	2#14	600	THWN-2	REUSE EXISTING STUB-UP CONDUIT.
5	FS1102-CTRL-2	FS-1102	I/O-3	3/4"	PVC/AL	2#14	600	THWN-2	REUSE EXISTING STUB-UP CONDUIT.
6	TP1102-CTRL-2	I/O-3	MCC-4	3/4"	PVC/AL	8#14	600	THWN-2	

TRANSFER PUMP RISER DIAGRAM



CABLE SCHEDULE									
				CONDUIT		CABLE			
NO.	CONDUIT LABEL	FROM	TO	SIZE	TYPE	QTY. AND SIZE	VOLT	TYPE	COMMENTS
1	8BL2-PWR-1	MCC-4	DISC. SWITCH	2"	PVC/AL	3#4 + 4#14 +1#8 GND	600	THWN-2	REUSE EXISTING 480V STUB-UP CONDUIT, NEW WIRES.
2	8BL2-PWR-2	DISC. SWITCH	MOTOR	2"	LFMC	3#4 + 4#14 +1#8 GND	600	THWN-2	REUSE EXISTING 480V STUB-UP CONDUIT, NEW LFMC FROM STUP-UP TO MOTOR. NEW WIRES.
3	8BL2-CTRL-1	CONTROL STATION	I/O-3	3/4"	PVC/AL	8#14	600	THWN-2	REUSE EXISTING 120V STUB-UP CONDUIT, NEW WIRES.
4	FS802-CTRL-1	FS-0802	I/O-3	3/4"	PVC/AL	2#14	600	THWN-2	REUSE EXISTING 120V STUB-UP CONDUIT, NEW WIRES.
5	8BL2-CTRL-2	I/O-3	MCC-4	3/4"	PVC/AL	8#14	600	THWN-2	

BLOWER RISER DIAGRAM

ALAN M. SCHWAB LICENSE No. 61313 6-18-2020 STATE OF FLORIDA PROFESSIONAL ENGINEER

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Certificate of Authorization No.: 3952

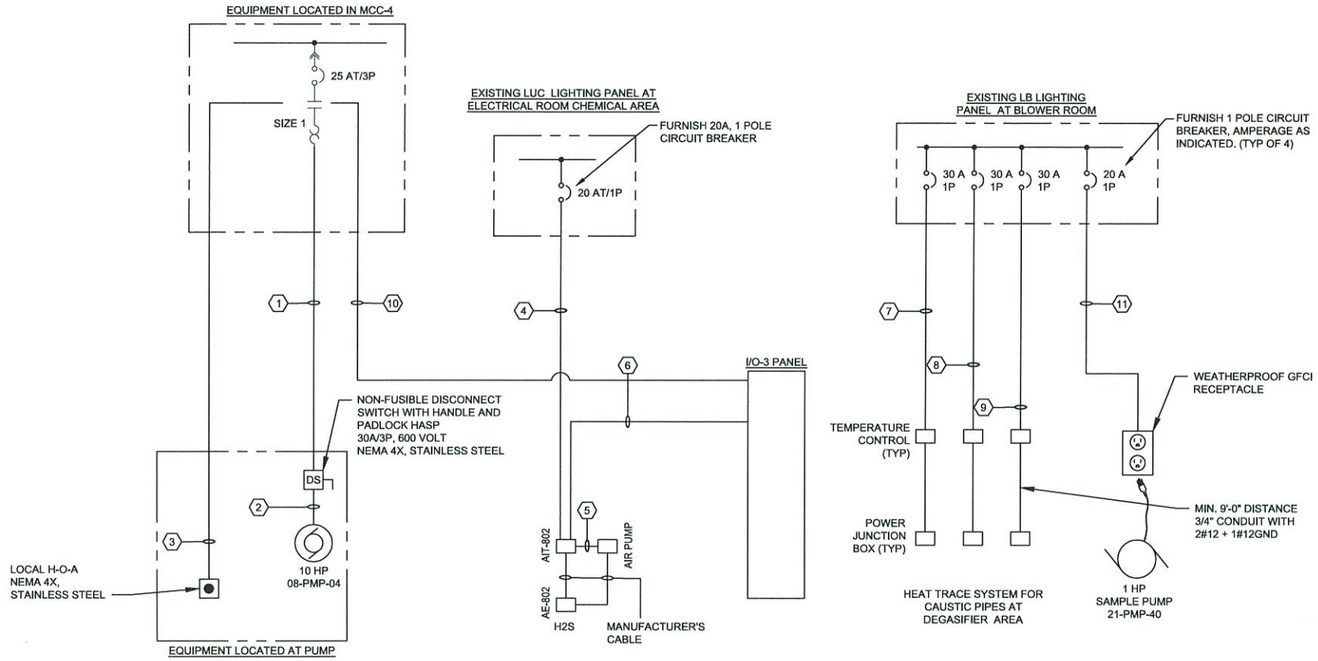
MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
RISER DIAGRAM (2 OF 5)

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

E-119

Bar Measures 1 inch, otherwise drawing not to scale



CABLE SCHEDULE

				CONDUIT		CABLE			
NO.	CONDUIT LABEL	FROM	TO	SIZE	TYPE	QTY. AND SIZE	VOLT	TYPE	COMMENTS
1	RCP4-PWR-1	MCC-4	DISC. SWITCH	1"	PVC/AL	3#8 + 4#14 +1#8 GND	600	THWN-2	
2	RCP4-PWR-2	DISC. SWITCH	MOTOR	1"	LFMC	3#8 + 4#14 +1#8 GND	600	THWN-2	
3	RCP4-CTRL-1	CONTROL STATION	I/O-3	3/4"	PVC/AL	8#14	600	THWN-2	
4	AIT802-PWR-1	LUC-21	AIT-0802	3/4"	PVC/AL	2#12 + 1#12 GND	600	THWN-2	
5	AIT802-PWR-2	AIT-802	AIR PUMP	3/4"	AL	2#12 + 1#12 GND	600	THWN-2	
6	AIT802-CTRL-1	AIT-802	I/O-3	3/4"	AL	1-2/C #16 TWSP	300	PVC	
7	HEAT-PWR-1	LB-13	HEAT TRACE	3/4"	AL	2#10 + 1#10 GND	600	THWN-2	
8	HEAT-PWR-2	LB-15	HEAT TRACE	3/4"	AL	2#10 + 1#10 GND	600	THWN-2	
9	HEAT-PWR-3	LB-17	HEAT TRACE	3/4"	AL	2#10 + 1#10 GND	600	THWN-2	
10	RCP4-CTRL-2	I/O-3	MCC-4	3/4"	PVC/AL	8#14	600	THWN-2	
11	SAMP-PWR-3	LB-14	SAMPLE PMP	3/4"	PVC/AL	2#10 + 1#10 GND	600	THWN-2	

RECIRCULATION PUMP RISER DIAGRAM

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www.wadetrim.com
Certificate of Authorization No.: 3962

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

RISER DIAGRAMS (3 OF 5)

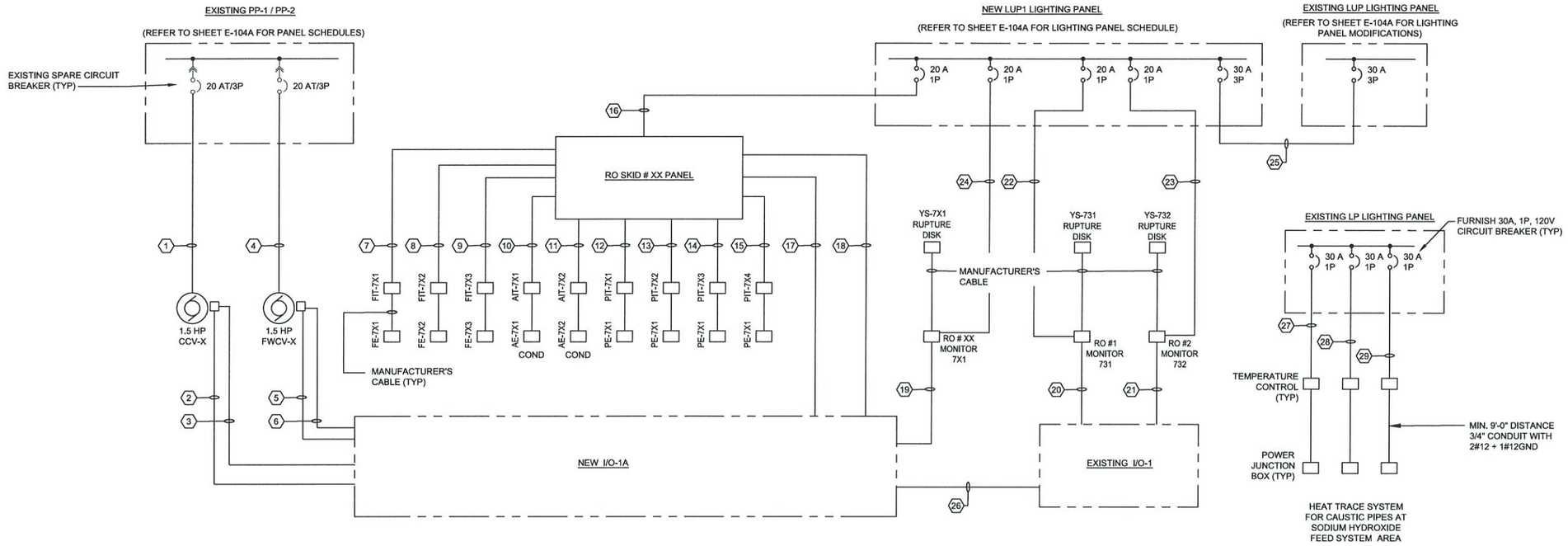
ALAN M. SCHWAB
LICENSE
No. 61313
6-18-2020
STATE OF FLORIDA
PROFESSIONAL ENGINEER

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

E-120

6/18/2020 10:50:06 AM - C:\PW_WORK\OWESTHOFF\D0939591\E-120 RISER DIAGRAM 3.DWG - WESTHOFF, ONEIDA

Bar Measures 1 inch, otherwise drawing not to scale



CABLE SCHEDULE

NO.	CONDUIT LABEL	FROM	TO	CONDUIT SIZE	CONDUIT TYPE	CABLE QTY. AND SIZE	CABLE VOLT	CABLE TYPE	COMMENTS
1	CCVX-PWR-1	PP	CCV-X	3/4"	PVC/AL	3#12 + 1#12 GND	600	THWN-2	
2	CCVX-CTRL-1	CCV-X	I/O-1A	3/4"	PVC/AL	12#14	600	THWN-2	
3	CCVX-CTRL-2	CCV-X	I/O-1A	3/4"	PVC/AL	2-2/C#16 TWSP	300	PVC	
4	FWCVX-PWR-1	PP	FWCV-X	3/4"	PVC/AL	3#12 + 1#12 GND	600	THWN-2	
5	FWCVX-CTRL-1	FWCV-X	I/O-1A	3/4"	PVC/AL	12#14	600	THWN-2	
6	FWCVX-CTRL-2	FWCV-X	I/O-1A	3/4"	PVC/AL	2-2/C#16 TWSP	300	PVC	
7	FIT7X1-PWR-1	FIT-7X1	I/O-1A	3/4"	PVC/AL	2#14 + 1#14 GND	600	THWN-2	
	FIT7X1-CTRL-1	FIT-7X1	I/O-1A	3/4"	PVC/AL	1-2/C#16 TWSP	300	PVC	
8	FIT7X2-PWR-1	FIT-7X2	I/O-1A	3/4"	PVC/AL	2#14 + 1#14 GND	600	THWN-2	
	FIT7X2-CTRL-1	FIT-7X2	I/O-1A	3/4"	PVC/AL	1-2/C#16 TWSP	300	PVC	
9	FIT7X3-PWR-1	FIT-7X3	I/O-1A	3/4"	PVC/AL	2#14 + 1#14 GND	600	THWN-2	
	FIT7X3-CTRL-1	FIT-7X3	I/O-1A	3/4"	PVC/AL	1-2/C#16 TWSP	300	PVC	
10	AIT7X1-PWR-1	AIT-7X1	I/O-1A	3/4"	PVC/AL	2#14 + 1#14 GND	600	THWN-2	
	AIT7X1-CTRL-1	AIT-7X1	I/O-1A	3/4"	PVC/AL	1-2/C#16 TWSP	300	PVC	
11	AIT7X2-PWR-1	AIT-7X2	I/O-1A	3/4"	PVC/AL	2#14 + 1#14 GND	600	THWN-2	
	AIT7X2-CTRL-1	AIT-7X2	I/O-1A	3/4"	PVC/AL	1-2/C#16 TWSP	300	PVC	
12	PIT7X1-CTRL-1	PIT-7X1	I/O-1A	3/4"	PVC/AL	1-2/C#16 TWSP	300	PVC	
13	PIT7X2-CTRL-1	PIT-7X2	I/O-1A	3/4"	PVC/AL	1-2/C#16 TWSP	300	PVC	
14	PIT7X3-CTRL-1	PIT-7X3	I/O-1A	3/4"	PVC/AL	1-2/C#16 TWSP	300	PVC	
15	PIT7X4-CTRL-1	PIT-7X4	I/O-1A	3/4"	PVC/AL	1-2/C#16 TWSP	300	PVC	
16	ROX-PWR-1	LUP1	RO SKID # XX	3/4"	PVC/AL	3#12 + 1#12 GND	600	THWN-2	
17	ROX-CTRL-1	RO SKID # XX	I/O-1A	1"	PVC/AL	18#14	600	THWN-2	
18	ROX-CTRL-2	RO SKID # XX	I/O-1A	2 1/2"	PVC/AL	10-2/C#16 TWSP	300	PVC	
19	YS-CTRL-1	RO # XX MONITOR	I/O-1A	3/4"	PVC/AL	4#14 + 1#14 GND	600	THWN-2	
20	YS-CTRL-2	RO # 1 MONITOR	I/O-1A	3/4"	PVC/AL	2#14	600	THWN-2	
21	YS-CTRL-3	RO # 2 MONITOR	I/O-1A	3/4"	PVC/AL	2#14	600	THWN-2	
22	YS-CTRL-4	RO # 1 MONITOR	LP	3/4"	PVC/AL	2#12 + 1#12 GND	600	THWN-2	
23	YS-CTRL-5	RO # 2 MONITOR	LP	3/4"	PVC/AL	2#12 + 1#12 GND	600	THWN-2	
24	YS-CTRL-6	RO # X MONITOR	LP	3/4"	PVC/AL	2#12 + 1#12 GND	600	THWN-2	
25	LPU1-PWR-1	LPU	LPU1	1"	AL	4#8 + 1#8 GND	600	THWN-2	
26	ETH-CTRL-1	I/O-1A	I/O-1	1"	AL	(2) CAT6 CABLES	-	-	
27	HEAT-PWR-1	LP	HEAT TRACE	3/4"	AL	2#10 + 1#10 GND	600	THWN-2	
28	HEAT-PWR-2	LP	HEAT TRACE	3/4"	AL	2#10 + 1#10 GND	600	THWN-2	
29	HEAT-PWR-3	LP	HEAT TRACE	3/4"	AL	2#10 + 1#10 GND	600	THWN-2	

EQUIPMENT SPECIFIC LABEL TABLE

	EQUIPMENT	GENERIC LABEL	SPECIFIC LABEL	COMMENTS
FOR	RO SKID # 3	REPLACE "XX" WITH	3	POWER / CONTROL
	RO SKID # 4		4	
FOR	CCV-X	REPLACE "X" WITH	"3" - FOR RO SKID NO.3 "4" - FOR RO SKID NO.4	POWER / CONTROL
	FWCV-X			
	FIT-7X1			
	FIT-7X2			
	FIT-7X3			
	PIT-7X1			
	PIT-7X2			
	PIT-7X3			
	PIT-7X4			
	AIT-7X1			
	AIT-7X2			
	YS-7X1			

NOTE:

1. REPLACE "X" OR "XX" WITH EACH EQUIPMENT LABEL INDICATED IN TABLE "EQUIPMENT SPECIFIC LABEL TABLE" ON THIS SHEET (E.G. "FWCV-X" WILL BE "FWCV-3" FOR RO # 3 AND "FWCV-4" FOR RO # 4)

RO SKID SYSTEM RISER DIAGRAM

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BID SET

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Certificate of Authorization No.: 3962

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

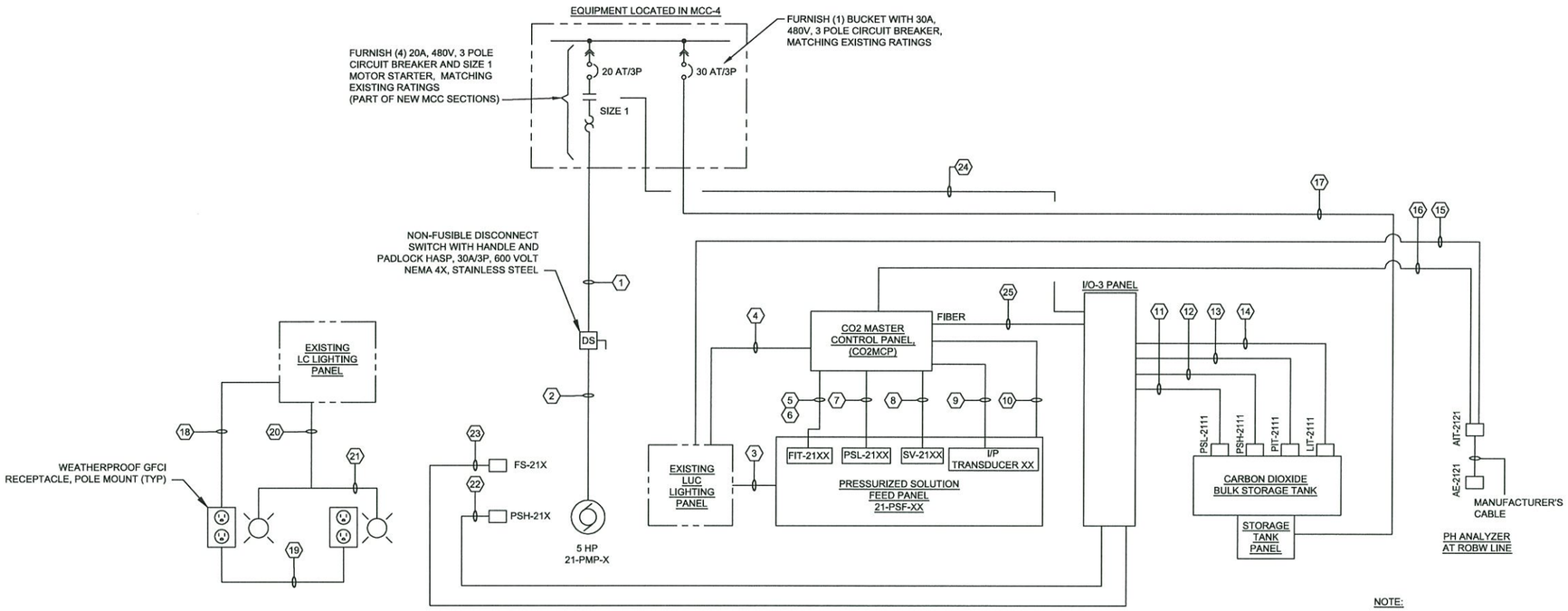
RISER DIAGRAM (4 OF 5)

ALAN M. SCHWAB
LICENSE
No. 61313
6-18-2020
STATE OF FLORIDA
PROFESSIONAL ENGINEER

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

E-121

Bar Measures 1 inch, otherwise drawing not to scale



NOTE:

1. REPLACE "X" OR "XX" WITH EACH EQUIPMENT LABEL INDICATED IN TABLE "EQUIPMENT SPECIFIC LABEL TABLE" ON THIS SHEET (E.G. "21-PMP-X" WILL BE "21-PMP-31")

CABLE SCHEDULE

				CONDUIT		CABLE			
NO.	CONDUIT LABEL	FROM	TO	SIZE	TYPE	QTY. AND SIZE	VOLT	TYPE	COMMENTS
1	PMPX-PWR-1	MCC-4	DISC. SWITCH	3/4"	PVC/AL	3#12 + 1#12 GND	600	THWN-2	
2	PMPX-PWR-2	DISC. SWITCH	21-PMP-X	3/4"	PVC/AL	3#12 + 1#12 GND	600	THWN-2	
3	PSFXX-PWR-1	LUC	21-PSF-XX	3/4"	PVC/AL	2#12 + 1#12 GND	600	THWN-2	
4	CO2CP-PWR-1	LUC	CO2MCP	3/4"	PVC/AL	2#12 + 1#12 GND	600	THWN-2	
5	FIT21XX-CTRL-1	FIT-21XX	CO2MCP	3/4"	PVC/AL	1-2/C#16 TWSP	300	PVC	
6	FIT21XX-PWR-1	FIT-21XX	CO2MCP	3/4"	PVC/AL	2#14 + 1#14 GND	600	THWN-2	
7	PSL21XX-CTRL-1	PSL-21XX	CO2MCP	3/4"	PVC/AL	2#14	600	THWN-2	
8	SOLXX-CTRL-1	SOL-21XX	CO2MCP	3/4"	PVC/AL	2#14 + #14 GND	600	THWN-2	
9	IPXX-CTRL-1	I/P TRANSDUC.XX	CO2MCP	3/4"	PVC/AL	2-2/C#16 TWSP	300	PVC	
10	PSF21XX-CTRL-1	PSF-21XX	CO2MCP	3/4"	PVC/AL	10#14 + 1#14GND	600	THWN-2	SPARES
	PSF21XX-CTRL-2	PSF-21XX	CO2MCP	3/4"	PVC/AL	2-2/C#16 TWSP	300	PVC	SPARES
11	PSL2111-CTRL-1	PSL-2111	I/O-3	3/4"	PVC/AL	2#14	600	THWN-2	
12	PSH2111-CTRL-1	PSH-2111	I/O-3	3/4"	PVC/AL	2#14	600	THWN-2	
13	FIT2111-CTRL-1	FIT-2111	I/O-3	3/4"	PVC/AL	1-2/C#16 TWSP	300	PVC	
	FIT2111-PWR-1	FIT-2111	I/O-3	3/4"	PVC/AL	2#14 + 1#14 GND	600	THWN-2	
14	PIT2111-CTRL-1	PIT-2111	I/O-3	3/4"	PVC/AL	1-2/C#16 TWSP	300	PVC	
	PIT2111-PWR-1	PIT-2111	I/O-3	3/4"	PVC/AL	2#14 + 1#14 GND	600	THWN-2	
15	AIT2111-CTRL-1	AIT-2111	CO2MCP	3/4"	PVC/AL	1-2/C#16 TWSP	300	PVC	
16	AIT2111-PWR-1	AIT-2111	CO2MCP	3/4"	PVC/AL	2#14 + 1#14 GND	600	THWN-2	
17	TANK-PWR-1	MCC-4	STORAGE TANK PNL	1"	PVC/AL	3#8 + 1#8 GND	600	THWN-2	
18	RECPT-PWR-1	LC	RECEPTACLE	3/4"	PVC/AL	2#10 + 1#10 GND	600	THWN-2	
19	RECPT-PWR-2	RECEPTACLE	RECEPTACLE	3/4"	PVC/AL	2#10 + 1#10 GND	600	THWN-2	
20	LIGHT-PWR-1	LC	LIGHT	3/4"	PVC/AL	2#10 + 1#10 GND	600	THWN-2	
21	LIGHT-PWR-2	LIGHT	LIGHT	3/4"	PVC/AL	2#10 + 1#10 GND	600	THWN-2	
22	PSH-CTRL-1	PSH-21X	I/O-3	3/4"	PVC/AL	2#14	600	THWN-2	
23	FS-CTRL-1	FS-21X	I/O-3	3/4"	PVC/AL	2#14	600	THWN-2	
24	PMP-CTRL-1	I/O-3	MCC-4	1 1/2"	PVC/AL	32#14	600	THWN-2	
25	FO-CTRL-1	CO2MCP	I/O-3	2"	PVC/AL	FIBER CABLE	-	-	

EQUIPMENT SPECIFIC LABEL TABLE

	EQUIPMENT	GENERIC LABEL	SPECIFIC LABEL	COMMENTS
FOR	21-PMP-31	REPLACE " X " WITH	31	POWER / CONTROL
	PSH-2131			
	FS-2131			
	21-PMP-32		32	
	PSH-2132			
	FS-2132			
	21-PMP-33		33	
	PSH-2133			
	FS-2133			
	21-PMP-34		34	
	PSH-2134			
	FS-2134			
FOR	21-PSF-21	REPLACE " XX " WITH	21	POWER / CONTROL
	FIT-2121			
	PSL-2121			
	SV-2121			
	I/P TRANSDUCER-2121			
	21-PSF-22		22	
	FIT-2122			
	PSL-2122			
	SV-2122			
	I/P TRANSDUCER-2122			

CO2 SYSTEM RISER DIAGRAM

ALAN M. SCHWAB LICENSE No. 61313 6-18-2020 STATE OF FLORIDA PROFESSIONAL ENGINEER

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321.728.3389
www.wadetrim.com
Certificate of Authorization No.: 3952

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

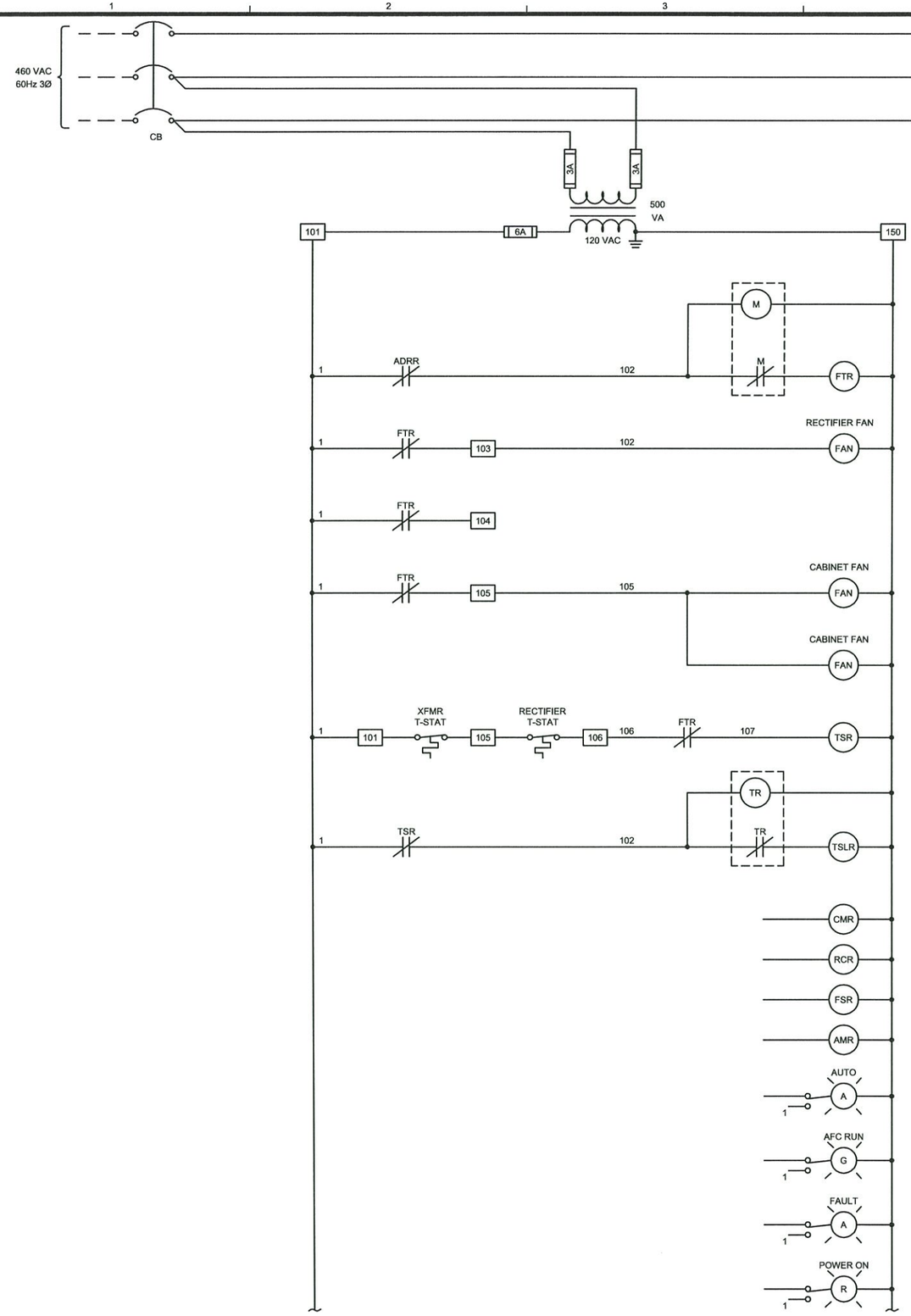
RISER DIAGRAM (5 OF 5)

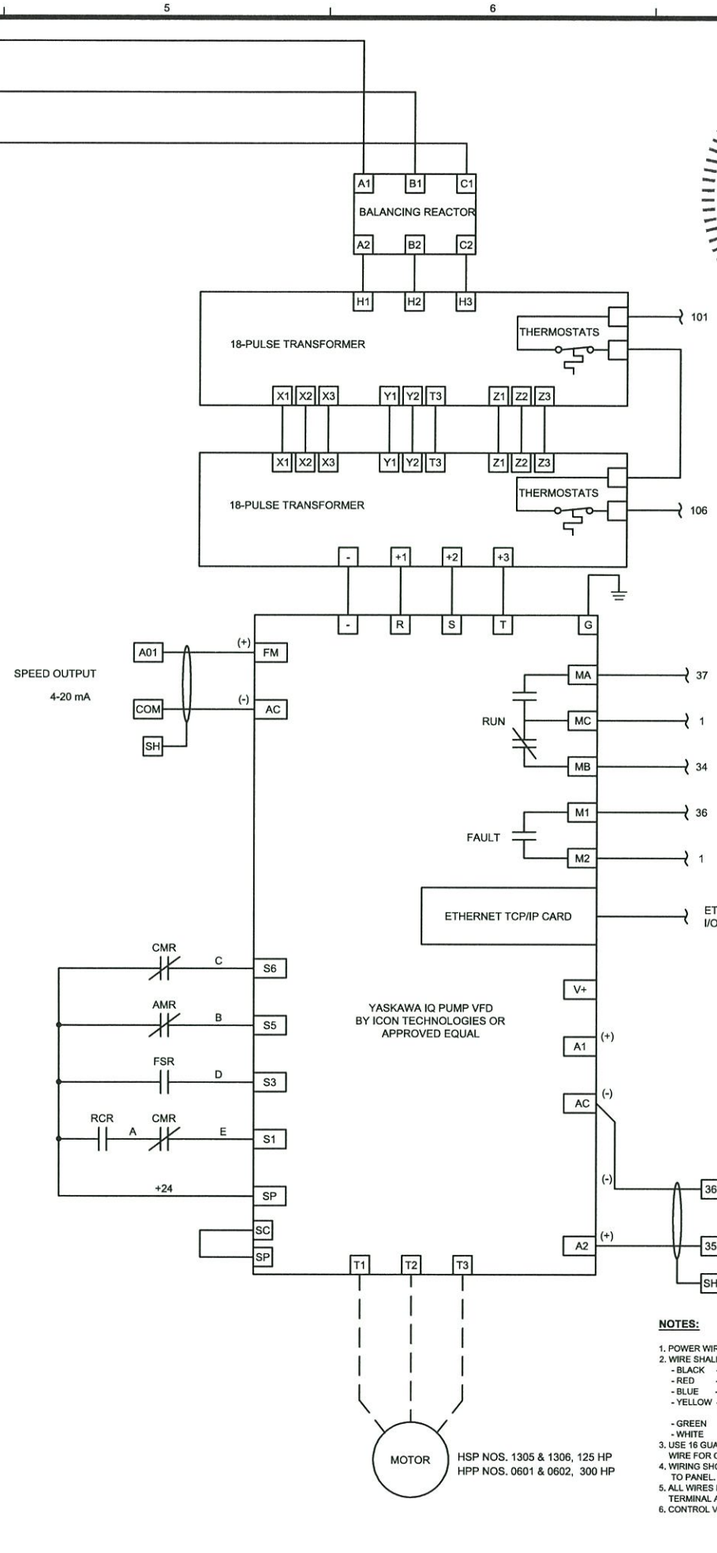
PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

E-122

6/18/2020 10:50:29 AM - C:\PW_WORK\OWESTHOFF\D0939911E-122 RISER DIAGRAM 5.DWG - WESTHOFF, ONEIDA

Bar Measures 1 inch, otherwise drawing not to scale





NOTES:

1. POWER WIRING TO BE SIZED FOR LOAD.
2. WIRE SHALL BE COLOR CODED AS FOLLOWS;
   - BLACK -LOAD AND CONTROL AT LINE VOLTAGE
   - RED -AC CONTROL CIRCUITS
   - BLUE -DC CONTROL CIRCUITS
   - YELLOW -CONTROL CIRCUITS WIRED FROM AN EXTERNAL POWER SOURCE
   - GREEN -GROUNDING CONDUCTORS
   - WHITE -NEUTRAL
3. USE 16 GUAGE MINIMUM STRANDED MACHINE TOOL WIRE FOR CONTROL WIRING.
4. WIRING SHOWN BROKEN - - - - - - - - IS EXTERNAL TO PANEL.
5. ALL WIRES MUST BE TAGGED AT BOTH ENDS, TERMINAL AND WIRE NUMBER TO BE THE SAME.
6. CONTROL VOLTAGE IS 120 VAC.

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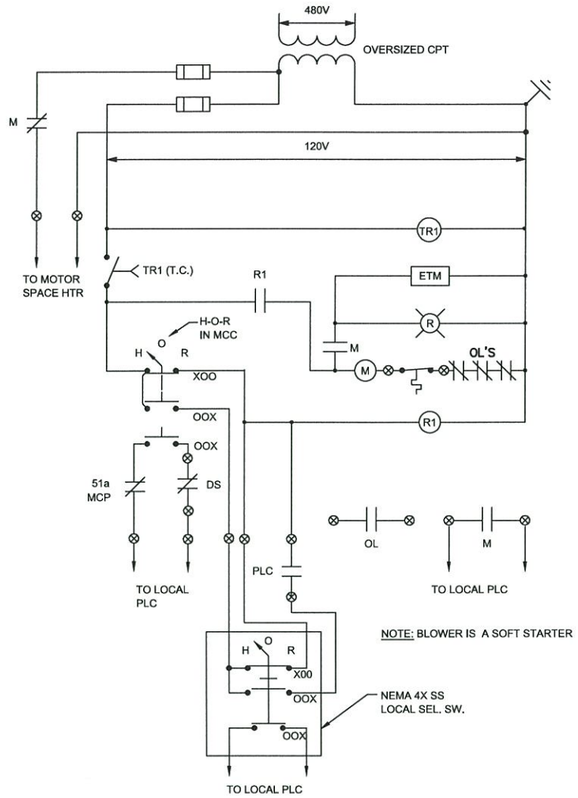
CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

VFD SCHEMATIC

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

E-123

Bar Measures 1 inch, otherwise drawing not to scale



1 TRANSFER PUMP, BLOWER AND RECIRCULATION PUMP

SCALE: NONE

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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

CONTROL SCHEMATICS

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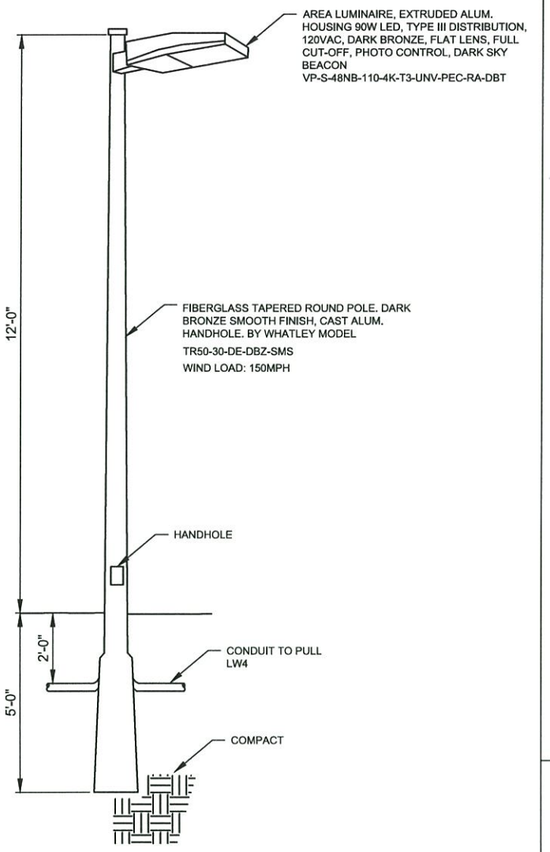
6-18-2020
STATE OF FLORIDA
PROFESSIONAL ENGINEER

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

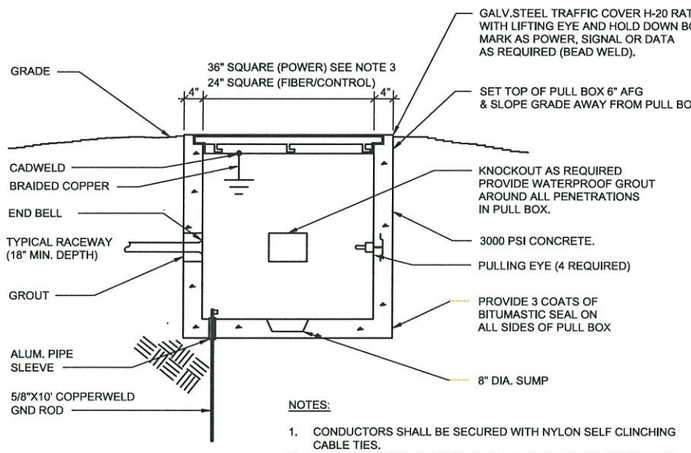
E-124

Bar Measures 1 inch, otherwise drawing not to scale

6/18/2020 10:50:46 AM - C:\PW_WORK\OWESTHOFF\D0093959\1E-124 CONTROL SCHEMATICS.DWG - WESTHOFF, ONEIDA



POLE AND LIGHT FIXTURE

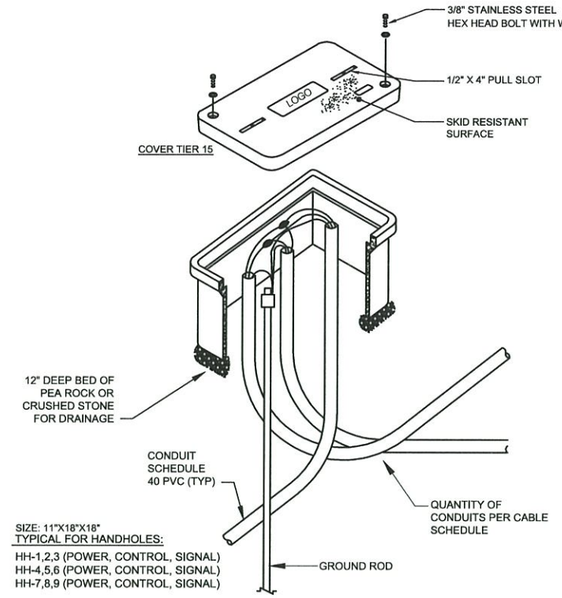


NOTES:

1. CONDUCTORS SHALL BE SECURED WITH NYLON SELF CLINCHING CABLE TIES.
2. PROVIDE RACK SUPPORTS FOR CABLES AND CONDUCTORS FOR SIDEWALL MOUNTING.
3. POWER HANDHOLES 14,17,19,21,23 AND 25 SHALL BE 24" SQUARE.

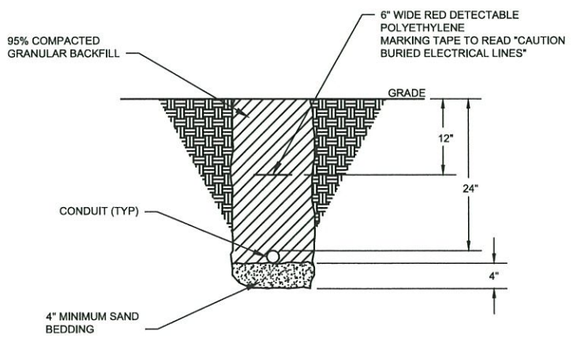
TYPICAL FOR HANDHOLES:

HH-10,11,12,13 (POWER, CONTROL, SIGNAL, FIBER)
HH-14,15,16 (POWER, CONTROL, FIBER)
HH-17,18 (POWER, FIBER)
HH-19,20 (POWER, FIBER)
HH-21,22 (POWER, FIBER)
HH-23,24 (POWER, FIBER)
HH-25,26 (POWER, FIBER)

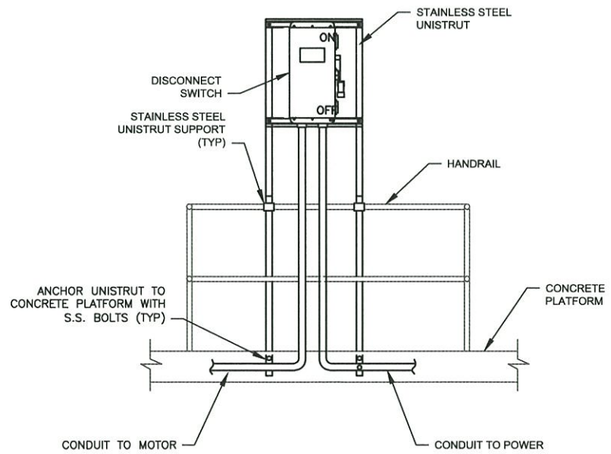


SIZE: 11"X18"X18"
TYPICAL FOR HANDHOLES:
HH-1,2,3 (POWER, CONTROL, SIGNAL)
HH-4,5,6 (POWER, CONTROL, SIGNAL)
HH-7,8,9 (POWER, CONTROL, SIGNAL)

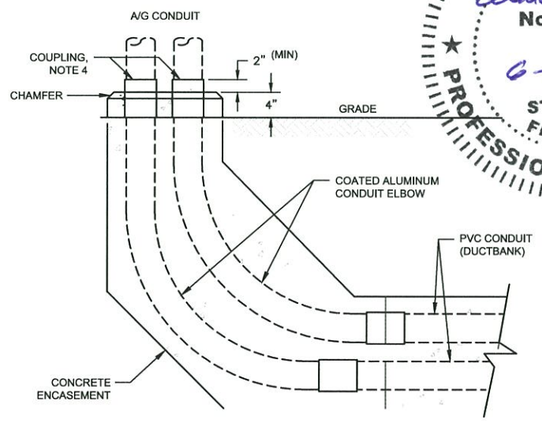
TYPICAL HANDHOLES



UNDERGROUND CONDUITS



DISCONNECT SWITCH MOUNTING DETAIL



U/G TO A/G DUCTBANK TRANSITION

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BID SET

MARK	DATE	DESCRIPTION	BY

WADE TRIM
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Palm Bay, FL 32905
321.728.3389
www.wadetrim.com
Certificate of Authorization No.: 3962

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

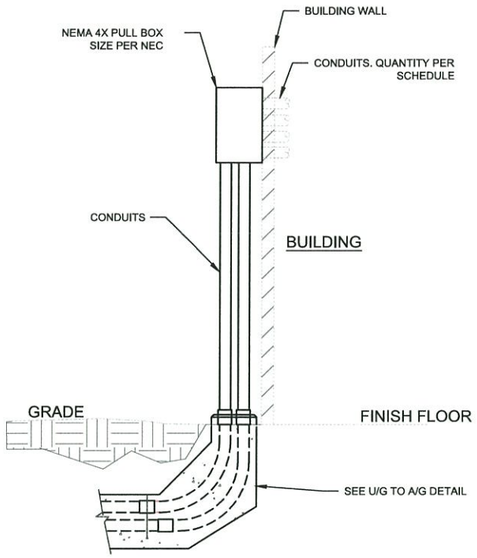
DETAILS 1

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

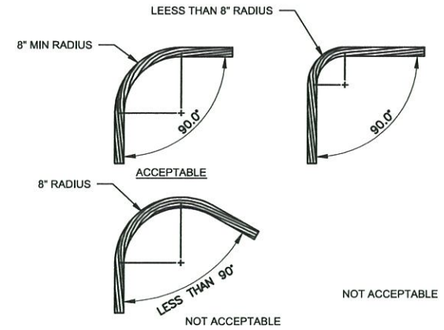
E-125

Bar Measures 1 inch, otherwise drawing not to scale

6/18/2020 10:50:54 AM - C:\PW_WORK\OWESTHOFF\D0939591\E-125 DETAILS1.DWG - WESTHOFF, ONEIDA

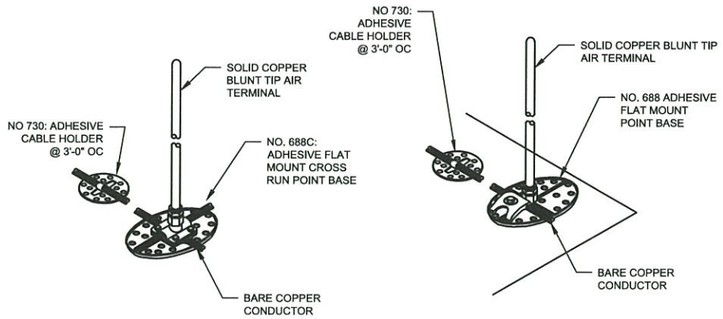


TYPICAL BUILDING WALL PENETRATION



NOTE:
NO BEND OF A CONDUCTOR SHALL FORM A FINAL INCLUDED ANGLE OF LESS THAN 90° NOR SHALL HAVE A RADIUS OF BEND OF LESS THAN 8"

TYPICAL CABLE BEND REQUIREMENTS



AIR TERMINAL FLAT SURFACE MOUNTING DETAIL

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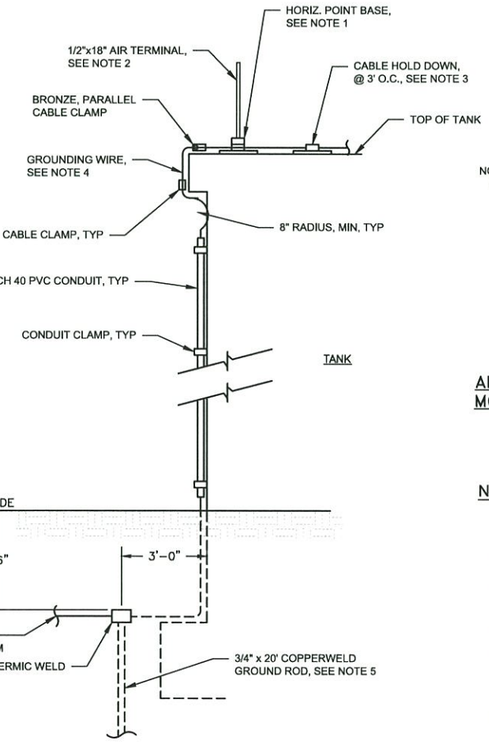
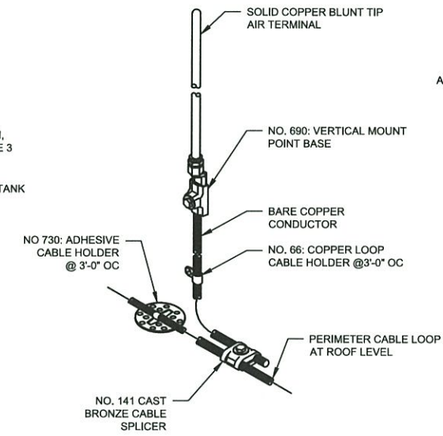
6-18-2020
STATE OF FLORIDA
PROFESSIONAL ENGINEER

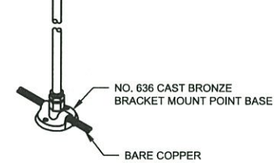


AIR TERMINAL AND GROUND CABLE



AIR TERMINAL VERTICAL SURFACE MOUNTING DETAIL

CABLE HOLDER MOUNTING DETAIL

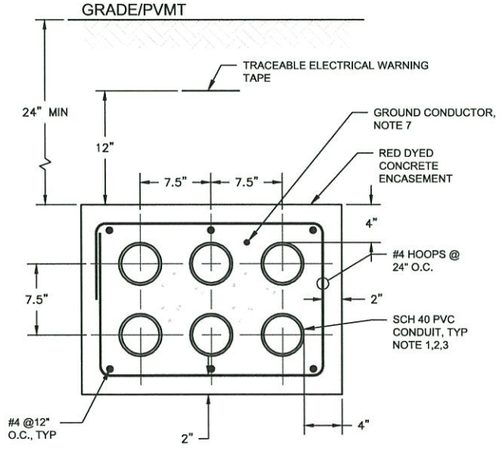


AIR TERMINAL CONNECTION DETAIL

NOTES:

1. AIR TERMINAL BASE SHALL BE CAST BRONZE, ADHESIVE TYPE, "THOMPSON" #688 OR #688C (AS REQ'D). MOUNT WITH "THOMPSON" ADHESIVE #731-M1, OR APPROVED EQUAL.
2. AIR TERMINAL BY SHALL BE ½"x18" COPPER "THOMPSON" #56BT, OR APPROVED EQUAL.
3. CABLE HOLDER SHALL BE COPPER, ADHESIVE TYPE, "THOMPSON" #730. MOUNT WITH "THOMPSON" ADHESIVE #731-M1, OR APPROVED EQUAL.
4. GROUNDING WIRE SHALL BE 28 STRAND, ½" DIA ROPE LAY COPPER WIRE, THOMPSON #506, OR APPROVED EQUAL.
5. THE CONTRACTOR SHALL INSTALL (1) 3/4"x10' GROUND ROD AT EACH OF THE (4) GROUNDING LOCATIONS SHOWN. ADDITIONAL GND ROD(S) SHALL BE ADDED, IF REQ'D TO MEET 25 0HMS OR LESS TO GND. NEW GND RODS SHALL BE BONDED TO THE EXIST PLANT/BLDG GROUND SYSTEM. ADJUST THE LOCATIONS OF THE NEW GROUND RODS IN THE FIELD AS NECESSARY TO AVOID OBSTRUCTIONS ABOVE AND BELOW GRADE.
6. ALL EXCAVATION SHALL BE BY HAND. EXIST U/G PIPING, DUCTBANKS, ETC SHALL BE LOCATED PRIOR TO GROUND ROD INSTALLATION TO ENSURE NEW RODS ARE CLEAR OF OBSTRUCTIONS.

TYPICAL LIGHTNING DETAILS



NOTES:
1. QUANTITY OF CONDUITS PER CONDUIT AND WIRE SCHEDULES.

NOTES:

1. REFER TO INSTALLATION DRAWINGS FOR NUMBER AND SIZE OF CONDUITS.
2. STAGGER COUPLINGS OF ADJACENT DUCTBANK CONDUITS BY A MIN. OF 6".
3. SUPPORT DUCTBANK CONDUITS WITH DUCT SPACERS AT 5'-0" O.C.
4. INSTALL 1250# (MIN) POLYARAMID PULLING TAPE AND REMOVABLE ALUM. CONDUIT PLUG IN ANY UNUSED, SPARE CONDUIT.
5. INSTALL GROUNDING BUSHINGS ON METAL CONDUIT STUB-UPS, BOND ALL BUSHINGS TOGETHER WITH #8 BARE CU (MIN) AND CONNECT TO EQUIPMENT GROUND BUS/LUG. NOT REQ'D FOR PVC CONDUIT STUB-UPS.
6. REFER TO INSTALLATION DRAWINGS FOR SIZE OF PULLBOX AND CONFIGURATION OF DUCTBANKS.
7. INSTALL #4/0 BARE COPPER GROUND CONDUCTOR IN DUCTBANK AND BOND TO GROUND SYSTEM AT BOTH ENDS.

CONCRETE REQUIREMENTS:

A. 28 DAY COMPRESSIVE STRENGTH (fc) = 3,000 PSI (MIN), TYPE I/II CEMENT.
B. w/c RATIO = 0.50 (MAX)
C. AIR ENTRAINMENT 5% ± 1%
D. AGGREGATE = PEA GRAVEL IN CONFORMANCE W/ASTM C33
E. SLUMP = 3" (MAX)

DUCTBANK - REINFORCED CONCRETE ENCASED

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Certificate of Authorization No. 3952

MARK	DATE	DESCRIPTION	BY

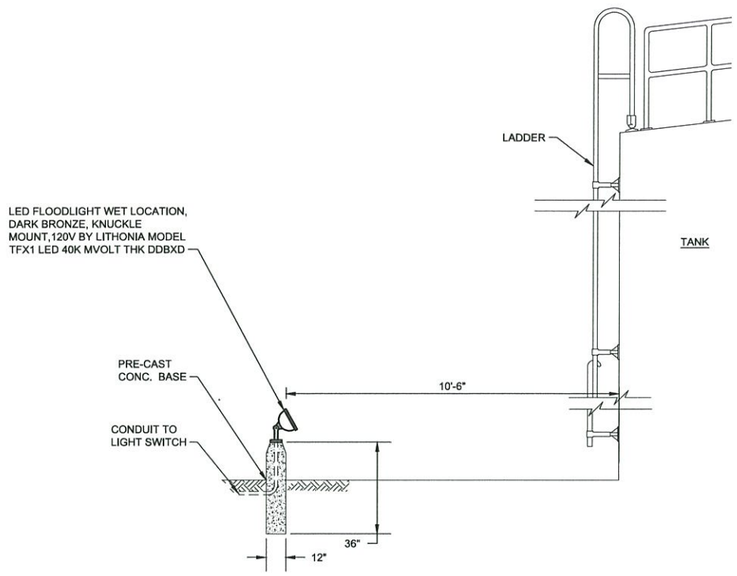
CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
DETAILS 2

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

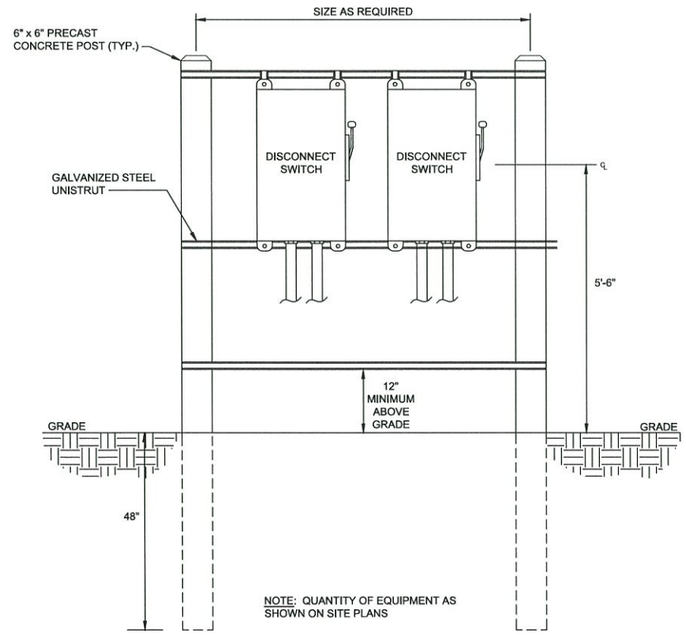
E-126

Bar Measures 1 inch, otherwise drawing not to scale

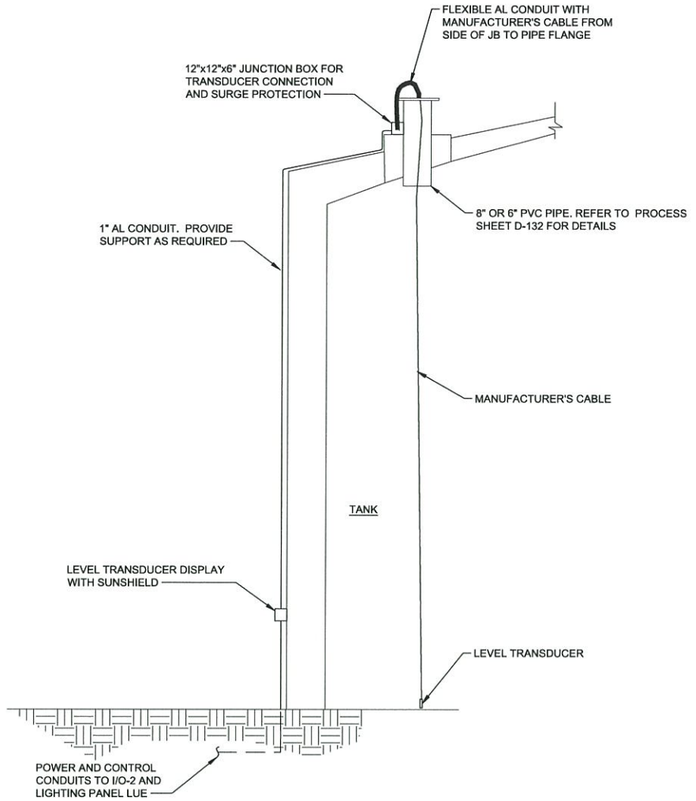
6/18/2020 10:51:02 AM - C:\PW_WORK\OWESTHOFF\D0939591\E-126 DETAILS2.DWG - WESTHOFF, ONEIDA



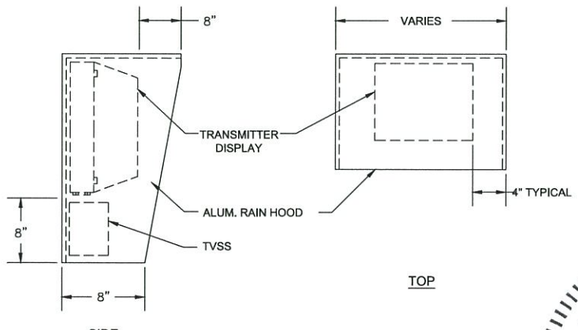
TYPICAL TANK LIGHTING DETAIL



TYPICAL RACK MOUNTING DETAIL



TANK LEVEL SENSOR MOUNTING DETAIL



NOTES:

1. SUN SHIELD SHALL BE 10 GA. ALUMINUM CONTINUOUS WELD, GROUND SMOOTH AND BURR FREE. DRILL HOLES AS PER MOUNTING HOLES FOR INSTRUMENT.

TYPICAL SUNSHIELD

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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

DETAILS 3

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

E-127

Bar Measures 1 inch, otherwise drawing not to scale

6/18/2020 10:51:11 AM - C:\PW_WORK\OWESTHOFF\D0093959\1\E-127 DETAILS.DWG - WESTHOFF, ONEIDA

GATE VALVE

GLOBE VALVE

BUTTERFLY VALVE

CHECK VALVE

BALL CHECK VALVE

DUAL DISC CHECK VALVE

DIAPHRAGM CHECK VALVE

BALL VALVE

PLUG VALVE

3 WAY VALVE

DIAPHRAGM VALVE

4 WAY VALVE

ROTARY VALVE

ANGLE VALVE

DIVERTER VALVE

EXCESS FLOW VALVE

GENERIC ROTARY VALVE

NEEDLE VALVE

PINCH VALVE

STOP CHECK VALVE

MANUAL ACTUATOR

SOLENOID

DIGITAL

PISTON / PNEUMATIC ACTUATOR

MOTORIZED ACTUATOR

MOTOR OPERATED ACTUATOR WITH POSITIONER

E-NET — ETHERNET

DATA CONNECTION

ELECTRICAL/DIGITAL SIGNAL

ANALOG ASIGNAL

PNEUMATIC SIGNAL

FILLED SYSTEM SIGNAL

STREAM TO/FROM I-X — STREAM TO AND FROM

STREAM TO/FROM I-X — STREAM TO AND FROM

STREAM TO/FROM I-X — STREAM TO AND FROM

EQUIPMENT NOT PROVIDED UNDER INSTRUMENTATION SPECIFICATION SECTIONS

FIELD MOUNTED INSTRUMENT XXX INDICATES LOCATION

FRONT PANEL MOUNTED INSTRUMENT

REAR-OF-PANEL MOUNTED INSTRUMENT (AUXILIARY SYMBOL INDICATES MODULE FUNCTION)

AUXILIARY PANEL MOUNTED INSTRUMENT

ON AND OFF EVENTS LIGHTS

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

ON-OFF HAND SWITCH,MOMENTARY CONTACT SWITCH (CONTROLLED DEVICE WILL NOT RESTART ON RETURN POWER AFTER POWER FAILURE)

ONE DEVICE WITH TWO OR MORE FUNCTIONS XXX INDICATES LOCATION

SHARED DISPLAY SYMBOL INDICATOR/CONTROLLER/RECORDER OR ALARM POINTS NORMALLY ACCESSIBLE TO OPERATOR

SHARED DISPLAY SYMBOL INDICATOR/CONTROLLER/RECORDER OR ALARM POINTS AUXILIARY OPERATOR'S INTERFACE DEVICE

SHARED DISPLAY SYMBOL INDICATOR/CONTROLLER/RECORDER OR ALARM POINTS NOT NORMALLY ACCESSIBLE TO OPERATOR

INTERNAL SYSTEM FUNCTION SYMBOL COMPUTATION/SIGNAL CONDITIONING

INTERLOCK

MOTOR

BLOWER

CENTRIFUGAL PUMP

SUBMERSIBLE PUMP

SUMP PUMP

TURBINE

VACUUM

VERTICAL TURBINE PUMP

PERISTALTIC METERING PUMP

DIAPHRAGM METERING PUMP

ELECTROMAGNETIC FLOW METER

ABBREVIATIONS & LETTER SYMBOLS

AVG	AVERAGE
CES	COMPUTER ELECTRICAL SUPPLY
C/L	REMOTE COMPUTER - LOCAL
CLSD	CLOSED
FR	FORWARD - REVERSE
ETH	ETHERNET
HOA	HAND - OFF - AUTO
HOR	HAND - OFF - REMOTE
LOS	LOCKOUT STOP
LR	LOCAL - REMOTE
MNL	MANUAL
MOA	MANUAL -OFF- AUTO
MC	MODULATE - CLOSE
MCC-X	MOTOR CONTROL CENTER NO.X
MTRA	MOTOR CURRENT
MTRV	MOTOR VOLTAGE
O-C	OPEN - CLOSE
OPND	OPENED
CLSD	CLOSED
OCR	OPEN - CLOSE - REMOTE
OCA	OPEN - CLOSE - AUTO
OO	ON - OFF
OOA	ON - OFF - AUTO
OOR	ON - OFF - REMOTE
OSC	OPEN - STOP - CLOSE
0R	OFF-REMOTE
pH	HYDROGEN ION CONCENTRATION
PSP	POSITION SETPOINT
PFB	POSITION FEEDBACK
S-S	START - STOP
SSC	SUPERVISORY SET POINT CONTROL
TURB	TURBIDITY
VIB	VIBRATION
C.R.	CHLORINE RESIDUAL
D.O.	DISSOLVED OXYGEN
RTU	REMOTE TERMINAL UNIT
COND	CONDUCTIVITY

MEANS OF IDENTIFICATION LETTERS

	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER FLAME		NOT USED	NOT USED	NOT USED
C	CONDUCTIVITY (ELECTRICAL)			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
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME OR TIME-SCHEDULE			CONTROL STATION	
L	LEVEL		PILOT		LOW
M	MOISTURE OR HUMIDITY				MIDDLE OR INTER-MEDIATE
N	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED
O	USER'S CHOICE		ORIFICE (RESTRICTION)		
P	PRESSURE OR VACUUM		POINT (TEST CONNECTION)		
Q	QUANTITY OR EVENT	INTEGRATE OR TOTALIZE			
R	RADIOACTIVITY		RECORD OR PRINT		
S	SPEED OR FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MALFUNCTION	MALFUNCTION	MALFUNCTION
V	VISCOSITY			VALVE, DAMPER, OR LOUVER	
W	WEIGHT OR FORCE		WELL		
X	SEE SPECIFICATIONS		UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT			RELAY OR COMPUTE	
Z	POSITION			DRIVE, ACTUATE OR UNCLASSIFIED FINAL CONTROL ELEMENT	

DRAFTING LEGEND

FY 300 (X) INDICATES QUANTITY

XXX INDICATES LOCATION

FIQ 300 X INDICATES UNITS

DENOTES SHEET NO. MOUNTING DETAIL IS SHOWN ON — I-10 A

XX XXX — DENOTES DETAIL LETTER IDENTIFICATION

GENERAL NOTES

1. REFER TO PROCESS DRAWINGS FOR DETAILED VALVES AND EQUIPMENT SYMBOLOGY.
2. SPARE DI AND AI ON THE PLC INPUT/OUTPUT SHALL BE PROVIDED AND INCLUDE PROGRAMMING SERVICES, GRAPHIC CONFIGURATION AND DOCUMENTATION REQUIRED FOR A TYPICAL STATUS POINT.
3. SPARE DO AND AO ON THE PLC INPUT/OUTPUT SHALL BE PROVIDED AND INCLUDE PROGRAMMING SERVICES, GRAPHIC CONFIGURATION AND DOCUMENTATION REQUIRED FOR A TYPICAL PROCESS INTERLOCK FOR A DISCRETE OUTPUT AND A REMOTE INDICATION FOR AN ANALOG OUTPUT.
4. FIELD TRANSMITTERS SHALL BE MOUNTED 42" ABOVE FINISH FLOOR OR GRADE

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BID SET

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3730 Dixie Highway NE, Suite D
Palm Bay, FL 32905
321.728.3389
www.wadetrim.com
Certificate of Authorization No. 3962

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

LEGEND P&ID

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

I-001

Bar Measures 1 inch, otherwise drawing not to scale

6/18/2020 10:59:45 AM - C:\PW_WORK\OWESTHOFF\D0939591\I-001 LEGEND.DWG - WESTHOFF, ONEIDA

LIR 104 | RUNNING YIQR 104 | START YC 104 | AUTO ZIR 104 | TAH 104 | REM ZIR 104A | OPND ZIO 104 | CLSD ZIC 104 | O YC 104A | C YC 104B | ALARM YA 104 | PIR 104 | PAL 104 | FAL 104 | FIQR 104

HMI

AI | DI | DO | DI | DI | DI | DI | DI | DO | DO | DI | AI | DI | DI | AI

PLC

TY 104

MCC

FIELD

RWCP-4

MOTORIZED ACTUATOR CONTROL STATION
LOCAL OFF REMOTE HS HS HS
CLOSED XL
OPENED XL
OPEN HC
CLOSE HC

PIT 104 | PE 104 | PI 104 | PSL 104

01-ARV6-04-2

01-BV-04-2 | 01-BV-04-3 | 01-GV-04-1 | 01-BV-04-4

01-ARV6-04-1 | 01-BV-04-1 | TSH 104

M 01-BFV5-04

01-CV10-04

FS 104 | FIT 104 | FE 104

01-BV-04-5 | 01-BV-04-6

12-RW-SST

01-SRV1-04 | 01-KGV-04 | 4-RW-SST

01-BFV4-04-2

SPLASH PAD

SAMPLE TAP

LT 104 | LE 104

WP-104

SST / PVC

FUTURE WELL CONNECTION

12-RW-PVC

16-RW-PVC

RAW WATER TRANSMISSION TO CARTRIDGE FILTRATION I-003

FUTURE WELL CONNECTION

24-RW-PVC

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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

PRODUCTION WELL NO.4 P&ID

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

I-002

Bar Measures 1 inch, otherwise drawing not to scale

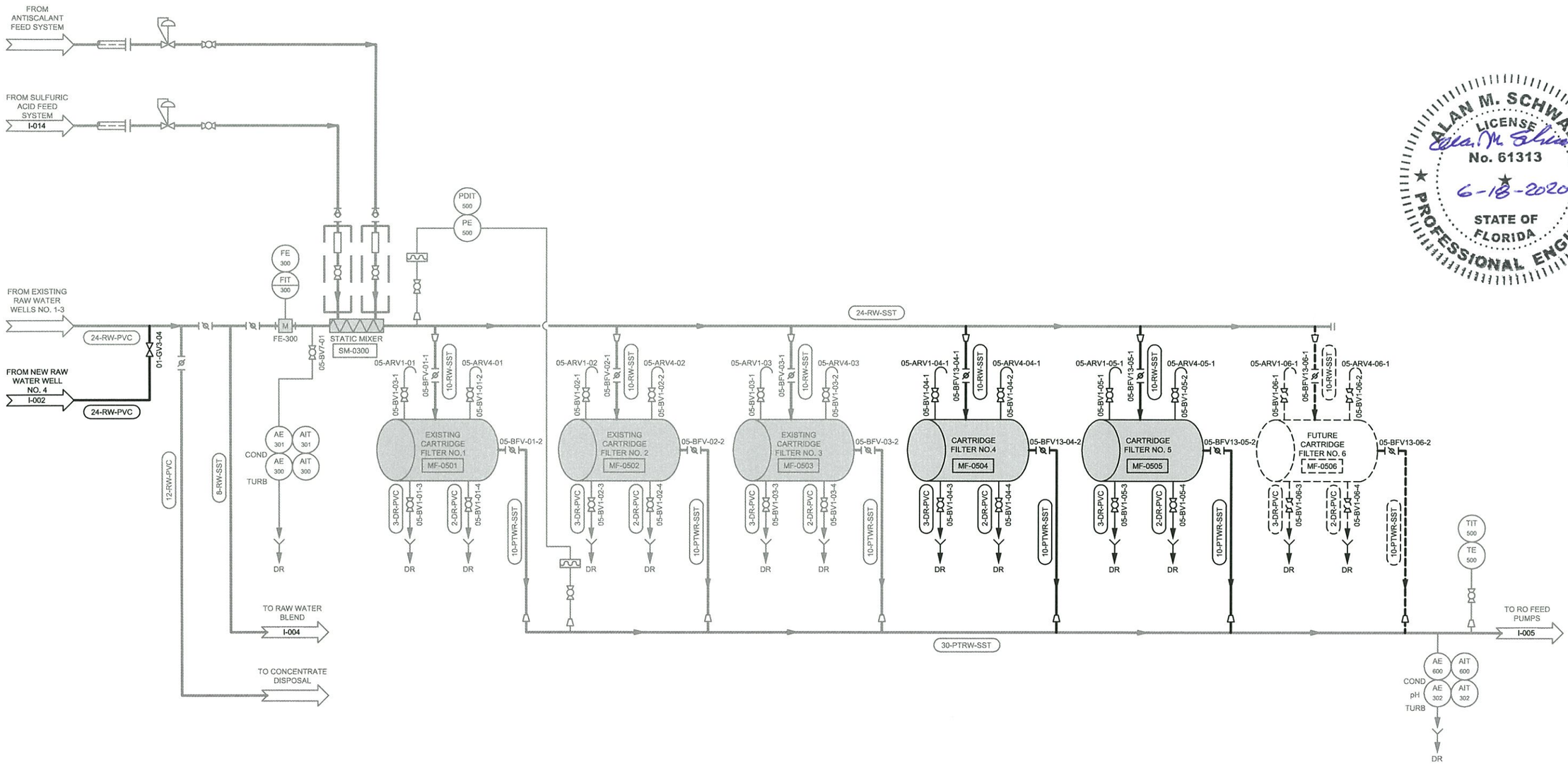
6/18/2020 11:00:04 AM - C:\PW_WORK\OWESTHOFF\D0939591\I-001 - 016 SHEETS.DWG - WESTHOFF, ONEIDA

HMI

PLC

MCC

FIELD



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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

CARTRIDGE FILTERS P&ID

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

I-003

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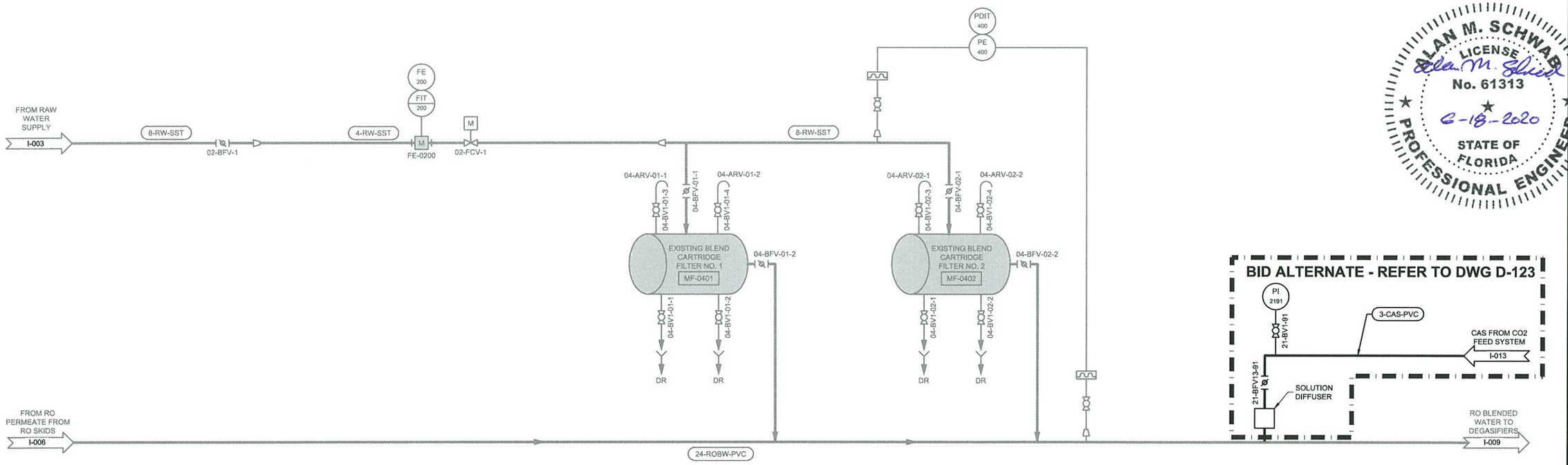
Bar Measures 1 inch, otherwise drawing not to scale

HMI

PLC

MCC

FIELD



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PROFESSIONAL ENGINEER

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

EXISTING BLEND CARTRIDGE FILTERS P&ID

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

I-004

Bar Measures 1 inch, otherwise drawing not to scale

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HMI

PLC

MCC

FIELD

CLSD ZIC 602-2 | OPND ZI 602-2 | OPND ZI 602-3 | CLSD ZIC 602-3 | CLSD ZIC 601-2 | OPND ZIO 601-2 | OPND ZI 601-3 | CLSD ZIC 601-3

DI DI DI DI DI DI DI DI

M 07-BFV5-00-1 RO BYPASS 10-PTRW-SST

PIT 700 | FE 700 | FIT 700 | M FE-0700 | 10-CNT-PVC | 12-CNT-PVC | RO CONCENTRATE TO DEEP INJECTION WELL

10-PTRW-SST | 12-PTRW-SST | 06-BFV10-01-1 | TS 601 | HPP-0601 | 10-ROF-SST | 06-CV1-01 | 06-BFV4-01-2 | 06-BFV4-01-3

PSH 601 | PI 601 | 06-BV7-01 | ZSO 601-2 | ZSC 601-2 | ZSO 601-3 | ZSC 601-3 | LS | 2-ROF-SST | 06-BV7-01

RO FEED TO RO STAGE 1 I-007

EXISTING RO SKID NO. 1

RO PERMEATE I-007 → 10-ROP-PVC

RO PERMEATE TO CIP I-007 → 4-CLNP-PVC

RO PERMEATE TO WASTE I-007 → 10-ROPW-PVC

RO CONCENTRATE I-007 → 4-CNT-SST

CIP FEED/RETURN I-007 → 8-CLNC/CLNS-PVC

CIP FEED/RETURN I-007 → 8-CLNC/CLNS-PVC

CIP FEED/RETURN I-007

8-CLNC/CLNS-PVC

6-CNT-SST | 4-CLNP-PVC | 10-ROPW-PVC | 16-ROP-PVC

AIR GAP → TO EXISTING STORMWATER SYSTEM

10-ROF-SST | 8-CLNC/CLNS-PVC

30-PTRW-SST | 12-PTRW-SST | 06-BFV10-02-1 | TS 602 | HPP-0602 | 10-ROF-SST | 06-CV1-02 | 06-BFV4-02-2 | 06-BFV4-02-3

PSH 602 | PI 602 | 06-BV7-02 | ZSO 602-2 | ZSC 602-2 | ZSO 602-3 | ZSC 602-3 | LS

RO FEED TO RO STAGE 1 I-007

EXISTING RO SKID NO. 2

RO PERMEATE I-007 → 10-ROP-PVC

RO PERMEATE TO CIP D-007 → 4-CLNP-PVC

RO PERMEATE TO WASTE I-007 → 10-ROPW-PVC

RO CONCENTRATE I-007 → 4-CNT-SST

CIP FEED/RETURN I-007 → 8-CLNC/CLNS-PVC

CIP FEED/RETURN I-007 → 8-CLNC/CLNS-PVC

CIP FEED/RETURN I-007

8-CLNC/CLNS-PVC

6-CNT-SST | 4-CLNP-PVC | 14-ROP-PVC

10-CNT-SST | 4-CLNP-PVC

3-ROP-PVC → RO CONCENTRATE TO CIP SYSTEM I-006

RO PERMEATE TO SKID NO. 3 I-006

ROPW FROM SKID NO. 3 I-006

CLNP HEADER TO CIP SYSTEM I-006

CNLP HEADER FROM SKID NO. 3 I-006

RO CONCENTRATE I-006

CLNC/CLNS HEADER TO/FROM CIP SYSTEM I-006

CLNC/CLNS HEADER TO/FROM SKID NO. 3 I-006

PTRW HEADER FROM CARTRIDGE FILTER I-006

CLNC/CLNS HEADER TO/FROM CIP SYSTEM I-006

CLNC/CLNS HEADER TO/FROM SKID NO. 3 I-006

ROF TO/FROM RO FEED HEADER I-006

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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

RO FEED AND OVERALL SKID P&ID

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

I-005

6/18/2020 11:00:22 AM - C:\PW_WORK\WESTHOFF\D0939591\I-001 - I16 SHEETS.DWG - WESTHOFF, ONEIDA

Bar Measures 1 inch, otherwise drawing not to scale

TYPICAL FOR HPP-0604

FAIL EAR 603 | SPEED ZC 603 | RUNNING YQIR 603 | RUN YC 603B | SPEED ZI 603 | MTRV YIR 603B | MTRA YIR 603A | READY YIR 603 | REM ZIR 603 | TAH 603 | PAH 603 | PAH 604 | CLSD ZIC 603-2 | OPND ZIO 603-2 | OPND ZIO 603-3 | CLSD ZIC 603-3 | CLSD ZIC 604-2 | OPND ZIO 604-2 | OPND ZIO 604-3 | CLSD ZIC 604-3

HMI

PLC

MCC

FIELD

MODBUS TCP/IP

AO | DI | DO | AI | AI | AI | DI | DI | DI | DI | DI | DI | DI | DI | DI | DI | DI | DI | DI

VFD
(TYPICAL FOR HPP-0604)

YA 603 FAULT | HS 603 HOR | SI 603 | SC 603

PTRW HEADER TO RO FEED PUMPS I-005

30-PTRW-SST

12-PTRW-SST

06-BFV10-03-1 | 06-BFV10-04-1 | 06-BFV10-05-1

TS 603 | TS 604 | TS 605

10-ROF-SST

06-CV1-03 | 06-CV1-04 | 06-CV1-05

PSH 603 PI 603 | PSH 604 PI 604 | PSH 605 PI 605

06-BFV7-03 | 06-BFV7-04 | 06-BFV7-05

ZSO 603-2 ZSC 603-2 ZSO 603-3 ZSC 603-3 | ZSO 604-2 ZSC 604-2 ZSO 604-3 ZSC 604-3 | ZSO 605-2 ZSC 605-2 ZSO 605-3 ZSC 605-3

LS

06-BFV4-03-2 | 06-BFV4-04-2 | 06-BFV4-05-2

06-BFV4-03-3 | 06-BFV4-04-3 | 06-BFV4-05-3

HPP-0603 | HPP-0604 | HPP-0605

ROF TO/FROM RO FEED HEADER I-005

10-ROF-SST

RO FEED TO RO STAGE 1 I-008

CIP FEED/RETURN I-008

8-CLNC/CLNS-PVC

CLNC/CLNS HEADER TO/FROM SKID NO. 2 I-005

06-BV1-01

PROPOSED RO SKID NO. 3

PROPOSED RO SKID NO. 4

FUTURE RO SKID NO. 5

RO PERMEATE I-008 — 10-ROP-PVC

RO PERMEATE TO CIP I-007 — 4-CLNP-PVC

RO PERMEATE TO WASTE I-008 — 10-ROPW-PVC

RO CONCENTRATE I-008 — 4-CNT-PVC

CIP FEED/RETURN I-008 — 8-CLNC/CLNS-PVC

ROP HEADER FROM SKIDS NO. 1 & 2 I-005

ROPW HEADER TO SKID NO. 2 I-005

CLNP HEADER FROM SKIDS NO. 1 & 2 I-005

RO CONCENTRATE HEADER FROM SKIDS NO. 1 & 2 I-005

CLNC/CLNS HEADER TO/FROM SKID NO. 2 I-005

2-CLNC/CLNS-PVC

8-CNT-SST | 6-CNT-SST | 4-CNT-SST

4-CLNP-PVC

10-ROPW-PVC

14-ROP-PVC | 16-ROP-PVC | 20-ROP-PVC

18-BPV-01

FROM SULFURIC ACID FEED SYSTEM I-015

18-CV-01

18-BV-01

REPLACE EXISTING SPOOL PIECE WITH STAINLESS STEEL PIPING. SEE DWG D-111.

ROP HEADER TO BLENDING I-004

24-PERM-SST

PVC SST | SST PVC

06-BV6-02

PTRW FROM CARTRIDGE FILTERS I-003

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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

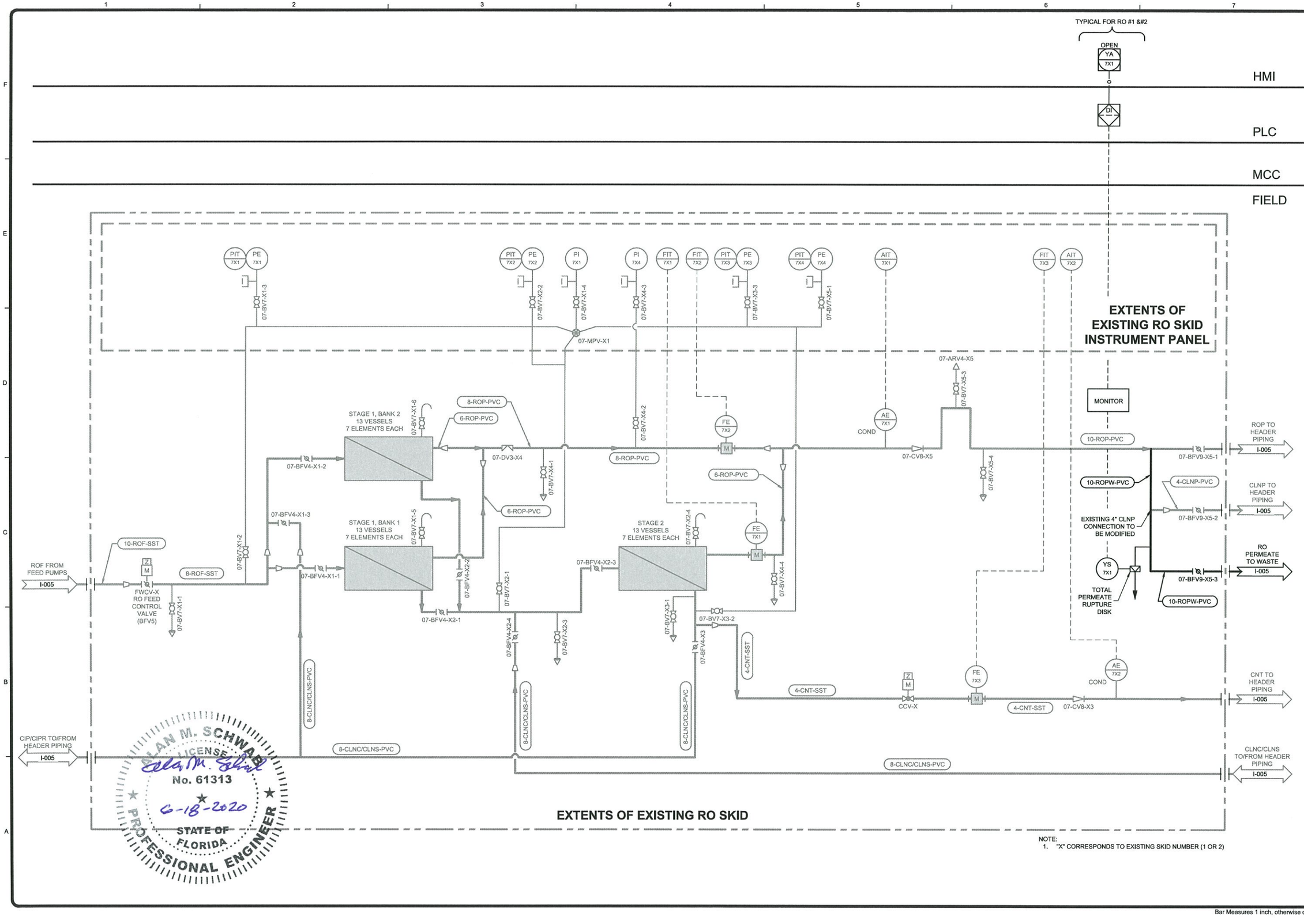
RO FEED AND OVERALL SKID P&ID

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

I-006

6/18/2020 11:00:28 AM - C:\PW_WORK\OWESTHOFF\D0093959\1\I-001 - 016 SHEETS.DWG - WESTHOFF, ONEIDA

Bar Measures 1 inch, otherwise drawing not to scale



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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
TYPICAL EXISITNG RO SKID MODIFICATIONS P&ID

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

I-007

Bar Measures 1 inch, otherwise drawing not to scale

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TYPICAL FOR BOTH MOTORIZED ACTUATORS FOR RO SYSTEMS # 3 & 4

TYPICAL FOR RO SYSTEMS # 3 & 4

REM START PSP PFB FAIL

ZIR 7X1 | YC 7X1 | ZC 7X1 | ZIR 7X1 | YA 7X1

PIR 7X1 | PIR 7X2 | FIR 7X1 | FIR 7X2 | PIR 7X3 | PIR 7X4 | COND AIR 7X1 | FIR 7X3 | COND AIR 7X2 | OPEN YA 7X1

HMI

PLC

MCC

FIELD

DI | DI | AO | AI | DI

AI | AI | AI | AI | AI | AI | AI | AI | AI | DI

PIT 7X1 | PE 7X1 | PIT 7X2 | PE 7X2 | PI 7X1 | PI 7X4 | FIT 7X1 | FIT 7X2 | PIT 7X3 | PE 7X3 | PIT 7X4 | PE 7X4 | AIT 7X1 | FIT 7X3 | AIT 7X2

MONITOR

MOUNTED ON INSTRUMENT

EXTENTS OF PROPOSED RO SKID INSTRUMENT PANEL

07-BV7-X1-3 | 07-BV7-X2-2 | 07-BV7-X1-4 | 07-BV7-X4-3 | 07-BV7-X3-3 | 07-BV7-X5-1

07-MPV-X1

PERMEATE TUBE SAMPLE VALVE (TYP FOR EA VESSEL, EA STAGE)

07-BV7-X1-6

6-ROP-PVC

07-BV7-X4-2

07-ARV4-X5

07-VRV1-X5

07-BV7-X5-3

AE 7X1 COND

FE 7X2 8"

07-DV3-X4

07-BV7-X4-1

8-ROP-PVC

07-CV8-X5

10-ROP-PVC

07-BFV9-X5-1

PERM TO HEADER PIPING I-006

6-ROF-SST

STAGE 1, BANK 2 13 VESSELS 7 ELEMENTS EACH

07-BFV4-X1-2

6-ROP-PVC

07-BV7-X4-4

10-ROP-PVC

4-CLNP-PVC

07-BFV9-X5-2

CLNP TO HEADER PIPING I-006

6-CNT-SST

07-BFV4-X1-3

STAGE 1, BANK 1 13 VESSELS 7 ELEMENTS EACH

07-BV7-X1-5

STAGE 2 13 VESSELS 7 ELEMENTS EACH

07-BV7-X2-4

FE 7X1 6"

10-ROF-SST

SEE NOTE 2

ROF FROM FEED PUMPS I-006

Z M

FWCV-X RO FEED CONTROL VALVE (BFV5)

07-BV7-X1-1

8-ROF-SST

07-BFV4-X1-1

07-BV7-X1-2

07-BV7-X1-1

07-BFV4-X2-2

07-BFV4-X2-3

6-CNT-SST

07-BV7-X2-1

07-BV7-X4-4

RO PERMEATE TO WASTE I-006

07-BFV9-X5-3

10-ROPW-PVC

YS 7X1

TOTAL PERMEATE RUPTURE DISK

07-BFV4-X2-1

07-BV7-X3-2

07-BV7-X3-1

07-BFV4-X3

4-CNT-SST

PIPE MATERIAL CHANGE (TYP)

07-BV7-X2-3

6-CLNC/CLNS-PVC

8-CLNC/CLNS-PVC

CCV-X

SEE NOTES 2 & 3

FE 7X3 4"

07-BV7-X3-4

AE 7X2 COND

07-CV8-X3

CNT TO HEADER PIPING I-006

CIP/CIPR TO/FROM HEADER PIPING I-006

CLNC/CLNS TO/FROM HEADER PIPING I-006

MOTORIZED ACTUATOR CONTROL STATION

LOCAL OFF REMOTE | HS | HS | HS | CLOSED | XL | OPENED | XL | OPEN | HC | CLOSE | HC

EXTENTS OF NEW RO SKID

ALAN M. SCHWAB LICENSE Alan M. Schwab No. 61313 6-18-2020 STATE OF FLORIDA PROFESSIONAL ENGINEER

NOTES:
1. "X" CORRESPONDS TO NEW SKID NUMBER (3 OR 4)
2. TAG NAMING CONSISTENT W/ EXISTING VALVES ON SKIDS 1 AND 2.
3. SEE SPECIFICATION SECTION 15105 FOR VALVE CRITERIA.
4. ALL INSTRUMENTATION FIELD DEVICES AND MOTORIZED VALVES SHOWN ON THIS SHEET SHALL BE SUPPLIED BY THE MEMBRANE OEM. COORDINATE WITH INTEGRATOR AND GC FOR UNIFORMITY OF EQUIPMENT MANUFACTURER.

TETRA TECH
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201 EAST PINE STREET, SUITE 1000
ORLANDO, FLORIDA 32801
TEL: (407) 839-3955 FAX: (407) 839-3790

BID SET

WADE TRIM
3790 Dixie Highway NE, Suite D
Palm Bay, FL 32905
321.728.3389
www.wadetrim.com
Certificate of Authorization No.: 3962

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

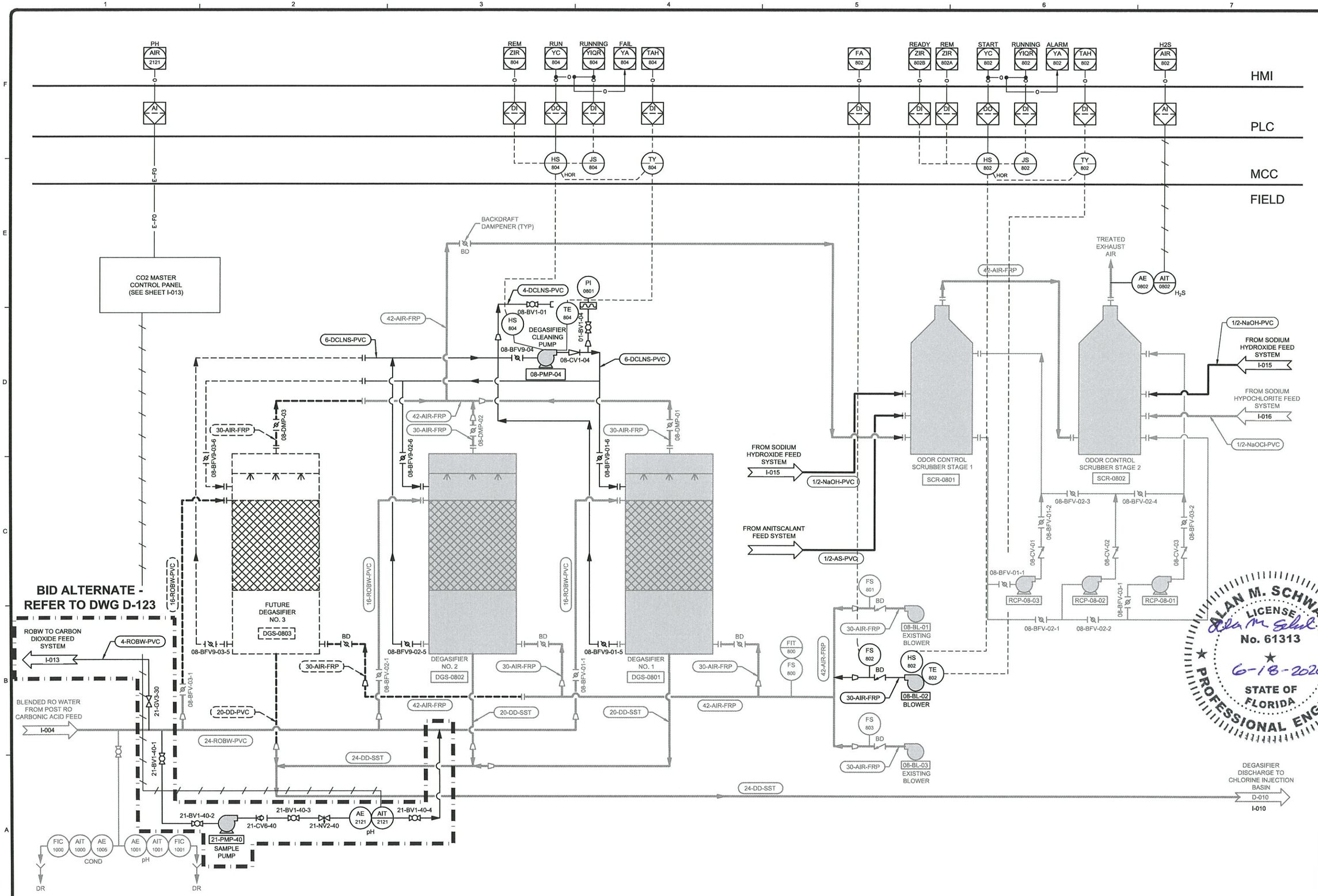
TYPICAL PROPOSED RO SKID P&ID

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

I-008

6/18/2020 11:00:40 AM - C:\PW_WORK\OWESTHOFF\D0939591\I-001 - 016 SHEETS.DWG - WESTHOFF, ONEIDA

Bar Measures 1 inch, otherwise drawing not to scale



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WADE TRIM
3790 Dixie Highway NE, Suite D
Palm Bay, FL 32905
321.728.3389
www.wadetrim.com
Certificate of Authorization No.: 3932

BY	MARK	DATE	DESCRIPTION

CITY OF PALM BAY, FLORIDA
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

DESGASIFIER SYSTEM MODIFICATIONS P&ID

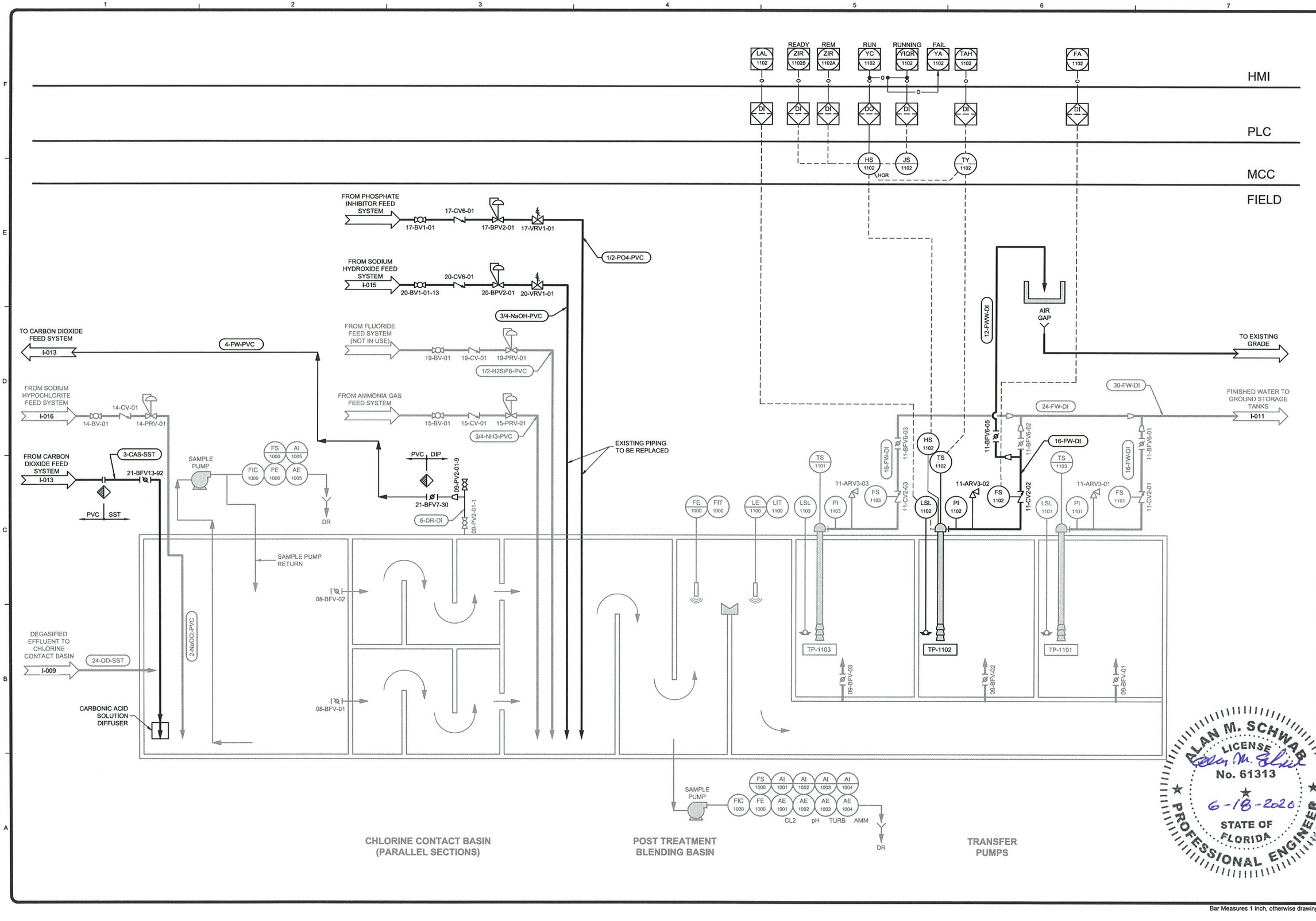
PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

I-009

ALAN M. SCHWAB
LICENSE
No. 61313
6-18-2020
STATE OF FLORIDA
PROFESSIONAL ENGINEER

Bar Measures 1 inch, otherwise drawing not to scale

6/18/2020 11:00:46 AM - C:\PW_WORK\OWESTHOFF\D0939591\I-001 - 016 SHEETS.DWG - WESTHOFF, ONEIDA



TETRA TECH
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201 EAST PINE STREET, SUITE 1000
ORLANDO, FLORIDA 32801
TEL: (407) 839-3395 FAX: (407) 839-3790

BID SET

WADE TRIM
3790 Dixie Highway NE, Suite D
Palm Bay, FL 32905
321.728.3889
www.wadetrim.com
Certificate of Authorization No.: 3952

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

CLEARWELL TRANSFER PUMPS MODIFICATIONS P&ID

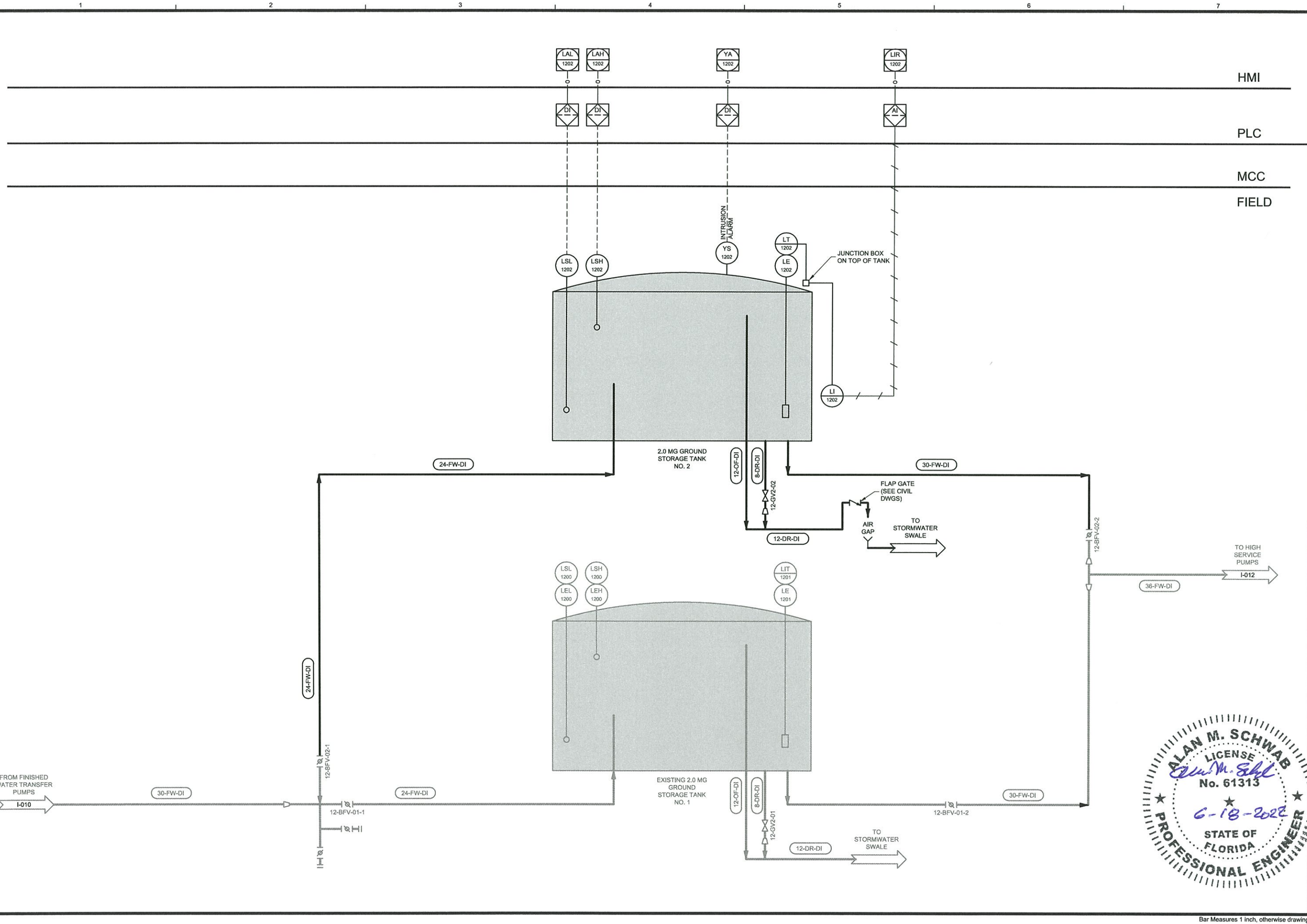
PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

I-010

ALAN M. SCHWAB
LICENSE
No. 61313
6-18-2020
STATE OF FLORIDA
PROFESSIONAL ENGINEER

6/18/2020 11:00:52 AM - C:\PW_WORK\OWESTHOFF\D0939591\I-001 - 016 SHEETS.DWG - WESTHOFF, ONEIDA

Bar Measures 1 inch, otherwise drawing not to scale



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BID SET

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Certificate of Authorization No. 3962

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
GROUND STORAGE TANK P&ID

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

I-011

ALAN M. SCHWAB
LICENSE
No. 61313
6-18-2020
STATE OF FLORIDA
PROFESSIONAL ENGINEER

Bar Measures 1 inch, otherwise drawing not to scale

6/18/2020 11:00:58 AM - C:\FW_WORK\OWESTHOFF\D0939591\I-001 - 018 SHEETS.DWG - WESTHOFF, ONEIDA

TYPICAL FOR HPP-0604

FAIL EAR 1305 | SPEED ZC 1305 | RUNNING YQIR 1305 | RUN YC 1305B | SPEED ZI 1305 | MTRV YIR 1305B | MTRA YIR 1305A | READY YIR 1305 | REM ZIR 1305A | TAH 1305 | FA 1305 | FA 1306

HMI

PLC

MODBUS TCP/IP

MCC

FIELD

AO | DI | DO | AI | AI | AI | DI | DI | DI | DI | DI

YA 1305 — FAULT — HS 1305 — HOR — SI 1305 — SC 1305

VFD
(TYPICAL FOR HPP-1306)

24-PW-DI

30-PW-DI

12-PW-DI

PI 1301 | TS 1301 | FS1 1301 | 13-BV-01 | 13-ARV-01 | 13-BFV-01-2 | 13-CV-01

PI 1302 | TS 1302 | FS2 1302 | 13-BV-02 | 13-ARV-02 | 13-BFV-02-2 | 13-CV-02

PI 1303 | TS 1303 | FS3 1303 | 13-BV-03 | 13-ARV-03 | 13-BFV-03-2 | 13-CV-03

PI 1304 | TS 1304 | FS4 1304 | 13-BV-04 | 13-ARV-04 | 13-BFV-04-2 | 13-CV-04

PI 1305 | TS 1305 | FS5 1305 | 13-BV-05 | 13-ARV3-05 | 13-BFV6-05-2 | 13-CV2-05

PI 1306 | TS 1306 | FS6 1306 | 13-BV-06 | 13-ARV3-06 | 13-BFV6-06-2 | 13-CV2-06

PIT 1300 | PE 1300 | PSH 1300 | PSL 1300 | DR

FE 1300 | FITH 1300 | FITL 1300

AIT 1304 | AIT 1303 | AIT 1302 | AIT 1301
AE 1304 | AE 1303 | AE 1302 | AE 1301
TURB | NH_3 | TCl_2 | pH

14-FW-DI | 13-BFV-01-1 | HSP-1301

14-FW-DI | 13-BFV-02-1 | HSP-1302

14-FW-DI | 13-BFV-03-1 | HSP-1303

14-FW-DI | 13-BFV-04-1 | HSP-1304

14-FW-DI | 13-BFV-05-1 | HSP-1305

14-FW-DI | 13-BFV-06-1 | HSP-1306

I-011

36-FW-DI

30-FW-DI

20-FW-DI

PE 1301 | PIT 1301

POTABLE WATER TO DISTRIBUTION

30-PW-DI

DR

ALAN M. SCHWAB
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6-18-2020
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BID SET

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Certificate of Authorization No. 3952

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT
PLANT EXPANSION - 4-MGD TO 6-MGD

HIGH SERVICE PUMPS MODIFICATIONS P&ID

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

I-012

Bar Measures 1 inch, otherwise drawing not to scale

6/18/2020 11:01:04 AM - C:\PW_WORK\OWESTHOFF\D0939591\I-001 - 016 SHEETS.DWG - WESTHOFF, ONEIDA

PRESSURIZED SOLUTION FEED (PSF) SYSTEM #1
(TYPICAL FOR PSF SYSTEM #2) REFER TO SECTION 11300 FOR COMPLETE CONTROL/DIGITAL SIGNALS

PAL 2111 | PAH 2111 | PIR 2111 | LIR 2111 | MASS FIQR 2121 | AUTO YI 2121 A | MNL YI 2121 B | ON YI 2121 A | OFF YI 2121 B | FAULT YA 2121

DI | DI | AI | AI | DI | AI | DI | DI | DI | DI | DI

TYPICAL FOR
21-PMP-32, 21-PMP-33 & 21-PMP-34

PAH 2131 | REM YI 2131 | RUN YC 2131 | RUNNING YI 2131 | FAIL YA 2131 | TAH 2131 | FA 2131

DI | DI | DO | DI | DI | DI

HMI
PLC
MCC
FIELD

HS 2131 HOR | JS 2131 | TY 2131

E–FO

EXTENTS OF CO2 SOLUTION PANEL (FURNISHED BY CO2 SYSTEM MANUFACTURER)

TERMINAL BOX

21-BPR-21

PI 2121-1 | 21-BV-21-2 | 21-PRV-21-2 | 21-PRRV-21-1 | 21-BV-21-3

PI 2121-2 | 21-BV-21-4

MASS FLOW METER (TYP)

FIT 2121 | FE 2121

21-BV-21-1 | 21-BV-21-5 | 21-BV-21-6 | 21-BV-21-7 | 21-PRV-21-1

21-BV-21-8 | 21-BV-21-9 | 21-PAV-21 | 21-NV-21

(SEE BID ALTERNATE) 3/4-CO2-SST

PRESSURIZED SOLUTION FEED PANEL NO. 1
21-PSF-21
(SEE BID ALTERNATE)

PI 2121-4 | 21-BV-21-11 | PI 2121-3 | 21-BV-21-10

21-SM-21-1 | 21-SM-21-2 | 21-BV-21-12

21-CV-21 | PSL 2121 | 21-ARV4-41 | 21-BV1-41

21-BV1-51

21-BV1-31-2 | 21-CV17-31 | 21-BV1-31-3 | PI 2131 | PSH 2131 | TE 2131 | FS 2131 | 21-PMP-31 | 21-BV1-31-1

FROM ROBW SUPPLY
I-009
(SEE BID ALTERNATE)

3-ROBW-PVC | 4-ROBW-PVC

E–FO

MASTER CONTROL PANEL

TERMINAL BOX

21-BV-22-8 | 21-BV-22-9 | 21-PAV-22-1 | 21-NV-22-1

21-BV-22-10 | 21-BV-22-11 | 21-PAV-22-2 | 21-NV-22-2

21-BPR-22

PI 2122-1 | 21-BV-22-2 | 21-PRV-22-2 | 21-PRRV-22-1 | 21-BV-22-3

PI 2122-2 | 21-BV-22-4

FIT 2122 | FE 2122

21-BV-22-1 | 21-BV-22-5 | 21-BV-22-6 | 21-BV-22-7 | 21-PRV-22-1

PRESSURIZED SOLUTION FEED PANEL NO. 2
21-PSF-22

PI 2122-3 | 21-BV-22-13 | PI 2122-2 | 21-BV-22-12

21-SM-22-1 | 21-SM-22-2 | 21-BV-22-14

21-CV-22-2 | 21-CV-22-1 | PSL 2122 | 21-ARV4-42 | 21-BV1-42

21-BV1-52

21-BV1-32-2 | 21-CV17-32 | 21-BV1-32-3 | PI 2132 | PSH 2132 | TE 2132 | FS 2132 | 21-PMP-32 | 21-BV1-32-1

3-ROBW-PVC | 4-ROBW-PVC

(SEE BID ALTERNATE)

21-BV1-33-2 | 21-CV17-33 | 21-BV1-33-3 | PI 2133 | PSH 2133 | TE 2131 | FS 2133 | 21-PMP-33 | 21-BV1-33-1

FROM CHLORINATED WATER SUPPLY
I-010

3-FW-PVC | 4-FW-PVC

21-BV1-34-2 | 21-CV17-34 | 21-BV1-34-3 | PI 2134 | PSH 2134 | TE 2134 | FS 2134 | 21-PMP-34 | 21-BV1-34-1

3-CAS-PVC

TO DEGASIFIER DICHARGE INJECTION LOCATION
3-CAS-PVC
I-010

TO RO BLENDED WATER INJECTION LOCATION
3-CAS-PVC
(SEE BID ALTERNATE)
I-004

EXTENTS OF CO2 STORAGE AND TANK EQUIPMENT ENCLOSURE
(FURNISHED BY CO2 SYSTEM MANUFACTURER)

SAFETY RELIEF VALVE ASSEMBLY

PSL 2111 | PSH 2111 | PIT 2111 | LIT 2111

VAPOR HEATER

21-PRV-01-1 | 21-PRRV-01 | 21-BV-01-1

PI 2112

3/4-CO2-SST

50 TON CARBON DIOXIDE BULK STORAGE TANK
21-BST-01

REFRIGERATION UNIT

21-PRV-01-2

VAPORIZER

21-BV-01-2 | 21-BV-01-3 | 21-BV-01-4

TANK LIQUID FILL CONNECTION

VAPOR BALANCE CONNECTION

BID ALTERNATE:

CONTRACTOR SHALL PROVIDE ADDITIVE BID ALTERNATE TO PROVIDE AND INSTALL THE PRE-DEGASIFICATION CO2 FEED SYSTEM FOR THE CO2 APPLICATION TO THE RO BLENDED WATER. REFER TO DRAWING D-123 FOR ADDITIONAL INFORMATION.

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6-18-2020
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www.wadetrim.com
Certificate of Authorization No. 3952

BID SET

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
CARBON DIOXIDE FEED SYSTEM P&ID

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

I-013

6/18/2020 11:01:10 AM - C:\PW_WORKOWESTHOFFD0939591\I-001 - 016 SHEETS.DWG - WESTHOFF, ONEIDA

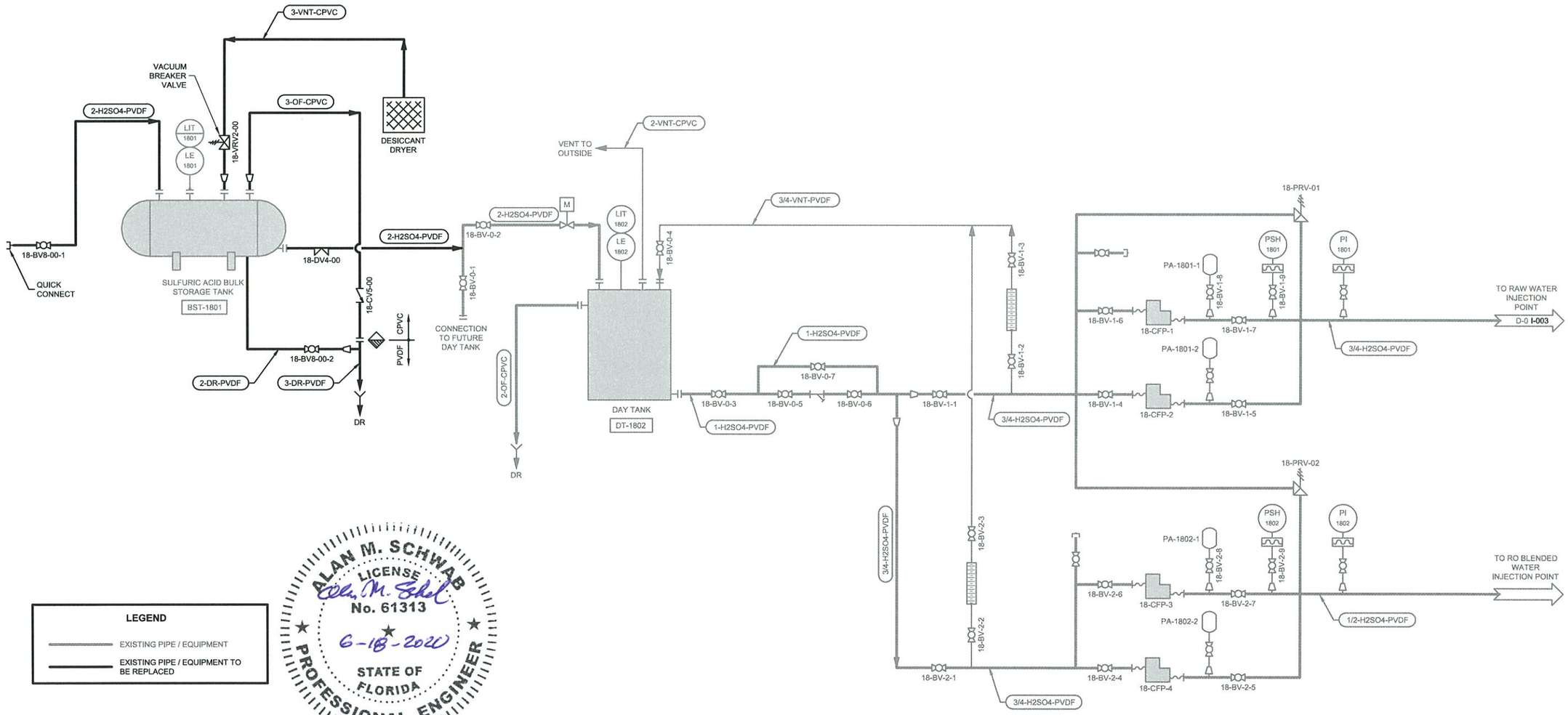
Bar Measures 1 inch, otherwise drawing not to scale

HMI

PLC

MCC

FIELD



LEGEND

- EXISTING PIPE / EQUIPMENT
- EXISTING PIPE / EQUIPMENT TO BE REPLACED

ALAN M. SCHWAB
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No. 61313
6-18-2020
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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

SULFURIC ACID FEED SYSTEM P&ID

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

I-014

6/18/2020 11:01:16 AM - C:\PW_WORK\OWESTHOFF\D0093959\I\I-001 - 016 SHEETS.DWG - WESTHOFF, ONEIDA

Bar Measures 1 inch, otherwise drawing not to scale

HMI

PLC

MCC

FIELD

RECONNECT EXISTING SIGNAL TO PLC (TYP)

2-NaOH-PVC

LIT 2001

LE 2001

3-OF-PVC

20-BV1-00-1

QUICK CONNECT

SODIUM HYDROXIDE BULK STORAGE TANK

BST-2001

20-DV1-00-1

20-BV1-00-2

2-DR-PVC

DR

2-NaOH-PVC

20-DV1-00-2

20-DV1-00-3

CONNECTION TO FUTURE DAY TANK

2-NaOH-PVC

M

20-MOV-00 (BV1)

LIT 2002

LE 2002

DAY TANK

DT-2002

3-OF-PVC

3-DR-PVC

DR

20-BV1-00-4

20-BV1-00-7

20-BV1-00-5

20-BV1-00-6

PVC WYE STRAINER

20-PRV2-03

20-BV1-03-7

20-BV1-03-6

PSH 2003

PI

PI 2003

20-BV1-03-3

PA-2003

20-BV1-03-4

20-BV1-03-5

20-BV1-03-1

20-CFP-01

20-BV1-03-2

20-BPV2-03

TO ODOR CONTROL STAGE 1

D-C I-009

PULSATION DAMPENER (TYP)

20-PRV2-02

20-BV1-02-3

20-BV1-02-10

20-BV1-02-9

PSH 2002

PI

PI 2002

20-BV1-02-2

20-BV1-02-6

PA-2002

20-BV1-02-7

20-BV1-02-8

20-BV1-02-1

20-BV1-02-4

20-CFP-02

20-BV1-02-5

20-BPV2-02

TO ODOR CONTROL STAGE 2

D-C I-009

20-PRV2-01

20-BV1-01-3

20-BV1-01-12

20-BV1-01-11

PSH 2001

PI

PI 2001

20-BV1-01-2

20-BV1-01-8

PA-2001

20-BV1-01-9

20-BV1-01-10

20-BV1-01-1

20-BV1-01-6

20-CFP-03

20-BV1-01-7

20-BPV2-01

TO BLEND BASIN INJECTION POINT

D-C I-010

20-BV1-01-4

20-CFP-04

20-BV1-01-5

LEGEND

EXISTING PIPE / EQUIPMENT

EXISTING PIPE / EQUIPMENT TO BE REPLACED

ALAN M. SCHWAB LICENSE No. 61313 6-18-2020 STATE OF FLORIDA PROFESSIONAL ENGINEER

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MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

SODIUM HYDROXIDE FEED SYSTEM P&ID

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

I-015

6/18/2020 11:01:22 AM - C:\PW_WORK\OWESTHOFF\D0939591\I-001 - 016 SHEETS.DWG - WESTHOFF, ONEIDA

Bar Measures 1 inch, otherwise drawing not to scale

HMI

PLC

MCC

FIELD

LEGEND

EXISTING PIPE / EQUIPMENT

EXISTING PIPE / EQUIPMENT TO BE REPLACED

RECONNECT EXISTING SIGNAL TO PLC (TYP)

LIT 1401 / LE 1401

4-VNT-PVC

2-NaOCl-PVC

QUICK CONNECT

14-BV3-00-1

1-NaOCl-PVC

14-BV3-00-2

6,650 GAL BULK STORAGE TANK

14-BST-01

14-BV3-00-3

14-MOV-01

EXISTING DAY TRANSFER PUMP

14-CPT-01

14-BV3-00-4

2-NaOCl-PVC

14-BV3-00-5

14-BV3-00-6

LIT 1403 / LE 1403

VENT

14-BV3-00-7

14-BV3-00-9

DAY TANK

DT-1401

14-BV3-00-10

14-BV3-00-21

14-BV3-00-22

PVC WYE STRAINER

14-BV3-00-23

14-BV3-00-24

14-BV3-00-25

14-BV3-01-1

14-BV3-01-2

14-BV3-02-1

PULSATION DAMPENER (TYP)

PSH 1401

PI

PA-1401

14-BV3-01-7

14-BV3-01-8

14-PRV3-01

14-BV3-01-9

CHEMICAL FEED PUMP (TYP)

14-BV3-01-3

14-CFP-01

14-BV3-01-4

14-BV3-01-5

14-CFP-02

14-BV3-01-6

14-BPV2-01

TO ODOR CONTROL INJECTION POINT

LIT 1402 / LE 1402

4-VNT-PVC

2-NaOCl-PVC

14-BV3-00-11

1-NaOCl-PVC

14-BV3-00-12

6,650 GAL BULK STORAGE TANK

14-BST-02

14-BV3-00-13

14-MOV-02

EXISTING DAY TRANSFER PUMP

14-CPT-02

14-BV3-00-14

2-NaOCl-PVC

14-BV3-00-15

14-BV3-00-16

LIT 1404 / LE 1404

VENT

14-BV3-00-17

14-BV3-00-19

DAY TANK

DT-1402

14-BV3-00-20

14-BV3-02-3

14-BV3-02-2

PSH 1402

PI

PA-1402

14-BV3-02-8

14-BV3-02-9

14-PRV3-02

14-BV3-02-10

CHEMICAL FEED PUMP (TYP)

14-BV3-02-4

14-CFP-03

14-BV3-02-5

14-BV3-02-6

14-CFP-04

14-BV3-02-7

14-BV3-02-11

14-BPV2-02

TO CHLORINE CONTACT BASIN INJECTION POINT

ALAN M. SCHWAB LICENSE No. 61313 6-18-2020 STATE OF FLORIDA PROFESSIONAL ENGINEER

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Certificate of Authorization No.: 3952

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

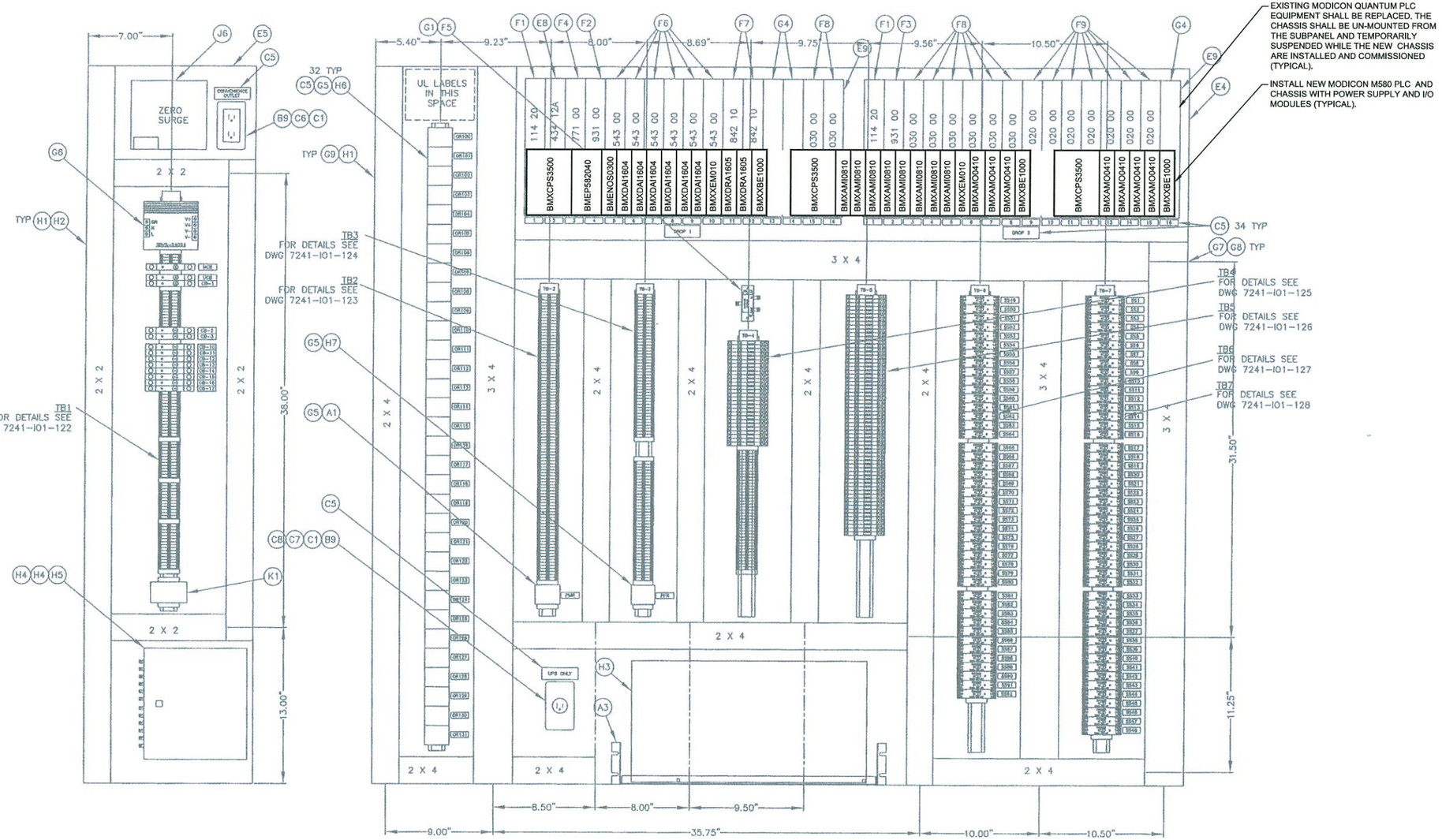
SODIUM HYPOCHLORITE FEED SYSTEM P&ID

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

I-016

6/18/2020 11:01:28 AM - C:\PW_WORK\OWESTHOFF\D0893691\I-001 - 016 SHEETS.DWG - WESTHOFF, ONEIDA

Bar Measures 1 inch, otherwise drawing not to scale



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Certificate of Authorization No. 3962

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD
IO-1 PANEL PLC CHASSIS REPLACEMENT

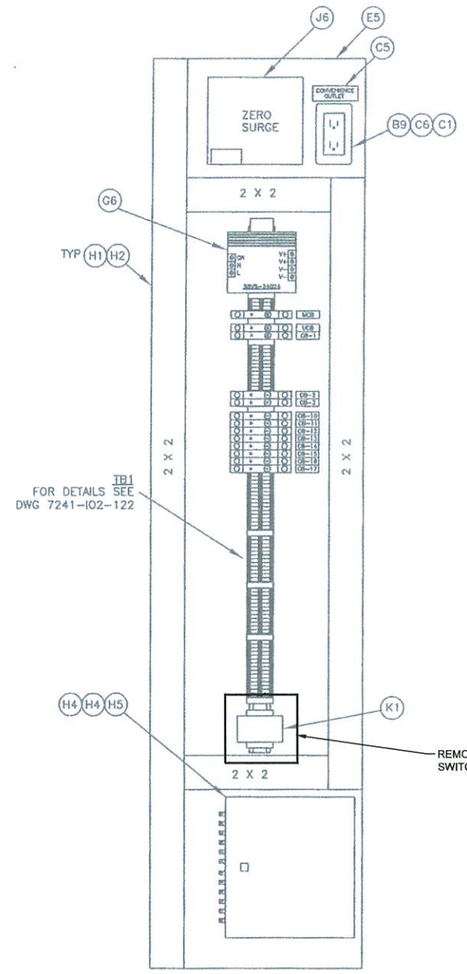
ALAN M. SCHWAB
LICENSE
No. 61313
6-18-2020
STATE OF FLORIDA
PROFESSIONAL ENGINEER

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

I-017

Bar Measures 1 inch, otherwise drawing not to scale

6/18/2020 11:01:42 AM - C:\PW_WORK\OWESTHOFF\D0939591\I-017 - 020 NETWORK.DWG - WESTHOFF, ONEIDA

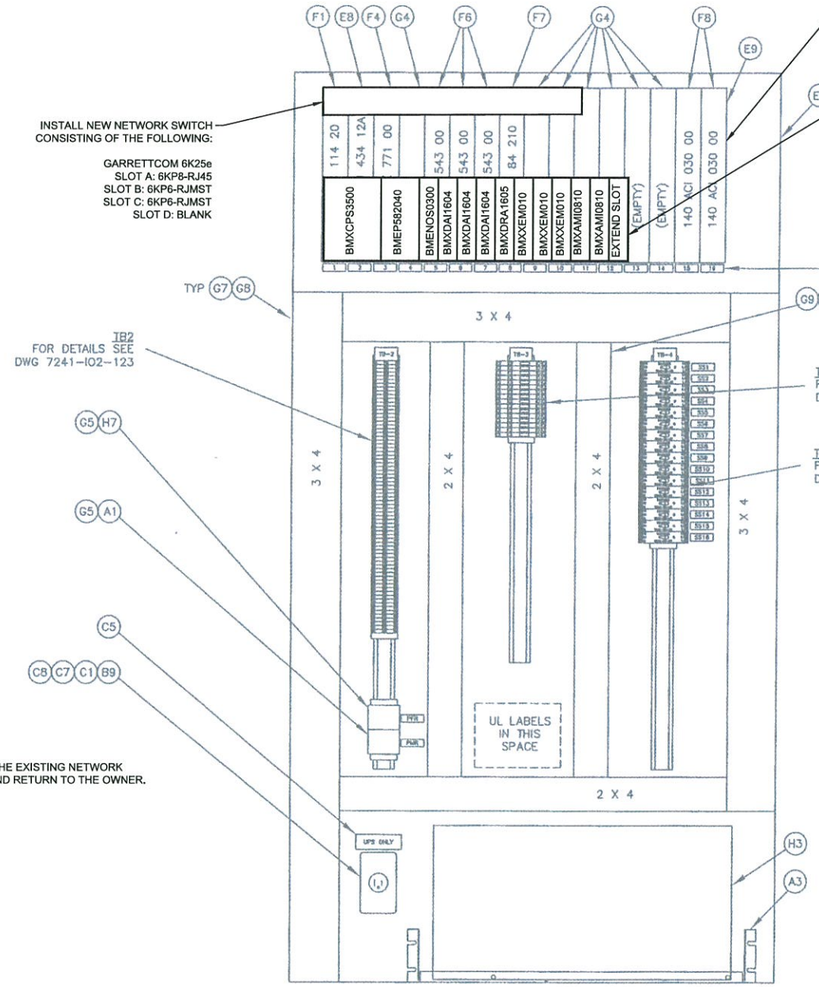


REMOVE THE EXISTING NETWORK SWITCH AND RETURN TO THE OWNER.

LEFT SIDE PANEL

INSTALL NEW NETWORK SWITCH CONSISTING OF THE FOLLOWING:

GARRETTCOM 6K25e
SLOT A: 6KP8-RJ45
SLOT B: 6KP6-RJMST
SLOT C: 6KP6-RJMST
SLOT D: BLANK



EXISTING MODICON QUANTUM PLC EQUIPMENT SHALL BE REPLACED. THE CHASSIS SHALL BE UN-MOUNTED FROM THE SUBPANEL AND TEMPORARILY SUSPENDED WHILE THE NEW CHASSIS ARE INSTALLED AND COMMISSIONED (TYPICAL).

INSTALL NEW MODICON M580 PLC AND CHASSIS WITH POWER SUPPLY AND I/O MODULES (TYPICAL).

BACK PANEL

TETRA TECH
ENGINEERING BUSINESS NO. 2429
www.tetratech.com
201 EAST PINE STREET, SUITE 1000
ORLANDO, FLORIDA 32801
TEL: (407) 839-3955 FAX: (407) 839-3790

BID SET

WADE TRIM
3790 Dixie Highway NE, Suite D
Palm Bay, FL 32905
321.728.3589
www.wadetrim.com
Certificate of Authorization No.: 3952

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY
SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

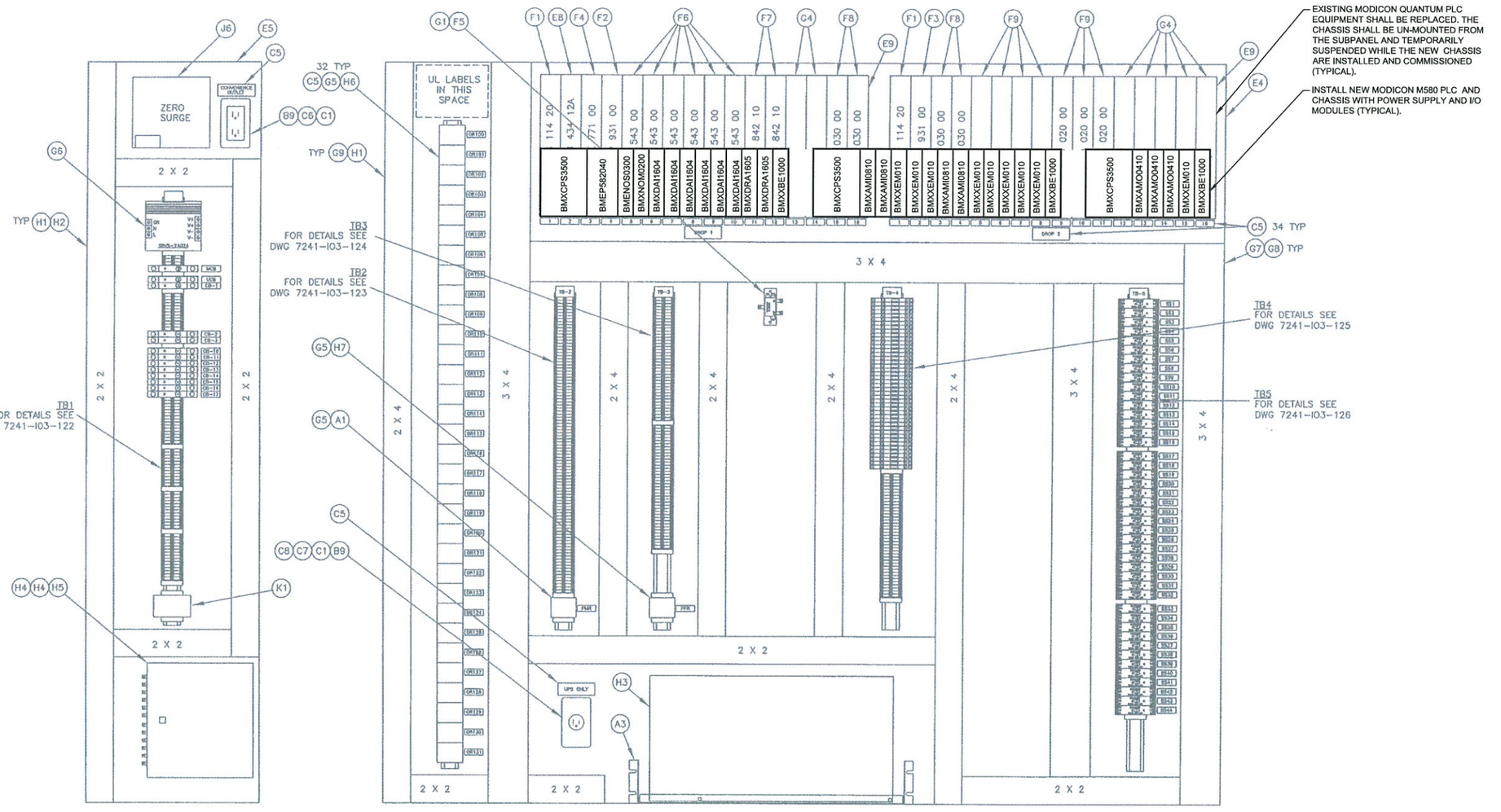
IO-2 PANEL PLC CHASSIS REPLACEMENT

ALAN M. SCHWARZ
LICENSE
No. 61313
6-18-2020
STATE OF FLORIDA
PROFESSIONAL ENGINEER

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

I-018

Bar Measures 1 inch, otherwise drawing not to scale



LEFT SIDE PANEL

BACK PANEL

ALAN M. SCHWAB
LICENSE
No. 61313
6-18-2020
STATE OF FLORIDA
PROFESSIONAL ENGINEER

TETRA TECH
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www.tetratech.com
201 EAST PINE STREET, SUITE 1000
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BID SET

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3790 Dixie Highway NE, Suite D
Palm Bay, FL 32905
321.728.3389
www.wadetrim.com
Certificate of Authorization No. 3952

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

IO-3 PANEL PLC CHASSIS REPLACEMENT

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

I-019

Bar Measures 1 inch, otherwise drawing not to scale

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16 ETHERNET PORTS AVAILABLE FOR CONTROL ROOM
GARRETTCOM 6K32T

A Tx Rx B Tx Rx

JPR-5

JPR-6

JPR-1

JPR-2

JPR-3

WIC-24

JPR-4

BL OR GN BR BL OR GN BR BL OR GN BR BL OR BL OR GN BR

FOC-1

FOC-2

FOC-3

FOC-4

FOC-5

FOC-6

FOC-7

FOC-8

I/O-1

Rx B Tx Rx A Tx

ETHERNET TO FIBER OPTIC
SELF-HEALING RING
MEDIA CONVERTER
GARRETTCOM ES42

PLC-1
M580

I/O-2

ETHERNET TO FIBER OPTIC
SELF-HEALING RING
MEDIA CONVERTER
GARRETTCOM ES42

INSTALL NEW NETWORK SWITCH. SEE DRAWING I-018.

PLC-2
M580

I/O-3

ETHERNET TO FIBER OPTIC
SELF-HEALING RING
MEDIA CONVERTER
GARRETTCOM ES42

PLC-3
M580

MAKE CONNECTIONS IN EXISTING I/0-3 FIBER PATCH PANEL.

INSTALL NEW MODICON M580 PLC AND CHASSIS WITH POWER SUPPLY AND I/O MODULES (TYPICAL FOR PLC-1, 2, AND 3).

MCC-3
MCC-4

I/O-4

ETHERNET TO FIBER OPTIC
SELF-HEALING RING
MEDIA CONVERTER
GARRETTCOM ES42

PLC-4
MOMENTUM

I/O-6

ETHERNET TO FIBER OPTIC
SELF-HEALING RING
MEDIA CONVERTER
GARRETTCOM ES42

PLC-6
MOMENTUM

I/O-5

ETHERNET TO FIBER OPTIC
SELF-HEALING RING
MEDIA CONVERTER
GARRETTCOM ES42

PLC-5
MOMENTUM

I/O-7

ETHERNET TO FIBER OPTIC
SELF-HEALING RING
MEDIA CONVERTER
GARRETTCOM ES42

PLC-7
MOMENTUM

I/O-1A

X80 I/O

NEW REMOTE I/O PANEL. NEMA 4X STAINLESS STEEL 72"H x 36"W x 24"D WITH X80 12-SLOT I/O CHASSIS, POWER SUPPLY, BMXCRA31210 REMOTE I/O ADAPTER AND I/O MODULES TO ACCOMMODATE THE I/O IN THE I/O LIST. CONSTRUCTION SHALL MATCH THE I/O-1 PANEL.

HSP-1
HSP-2
HSP-3
HSP-4
HSP-5
HSP-6
HPP-1
HPP-2
HPP-3
HPP-4

I/O-8

Rx B Tx Rx A Tx

ETHERNET TO FIBER OPTIC
SELF-HEALING RING
MEDIA CONVERTER
GARRETTCOM ES42H-2ST-Hd

PLC-8
M251

NEW WELL NO.4 PLC PANEL. NEMA 4X STAINLESS STEEL 72"H x 31"W x 24"D. CONSTRUCTION TO MATCH THE EXISTING WELL PANELS.

FIBER OPTIC CABLE
ETHERNET UTP
MODBUS PLUS
MODBUS ETHERNET TCP/IP

ALAN M. SCHWAR
LICENSE
No. 61313
6-18-2020
STATE OF FLORIDA
PROFESSIONAL ENGINEER

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TEL: (407) 839-3955 FAX: (407) 839-3790

BID SET

WADE TRIM
3790 Dixie Highway NE, Suite D
Palm Bay, FL 32905
321.733.3338
www.wadetrim.com
Certificate of Authorization No.: 3992

MARK	DATE	DESCRIPTION	BY

CITY OF PALM BAY

SOUTH REGIONAL WATER TREATMENT PLANT EXPANSION - 4-MGD TO 6-MGD

NETWORK DIAGRAM

PROJ:	200-08507-19001
DESN:	AS/OW
DRWN:	OW
CHKD:	AS

I-020

Bar Measures 1 inch, otherwise drawing not to scale

6/18/2020 11:01:43 AM - C:\PW_WORK\OWESTHOFF\D0939591\I-017 - 020 NETWORK.DWG - WESTHOFF, ONEIDA