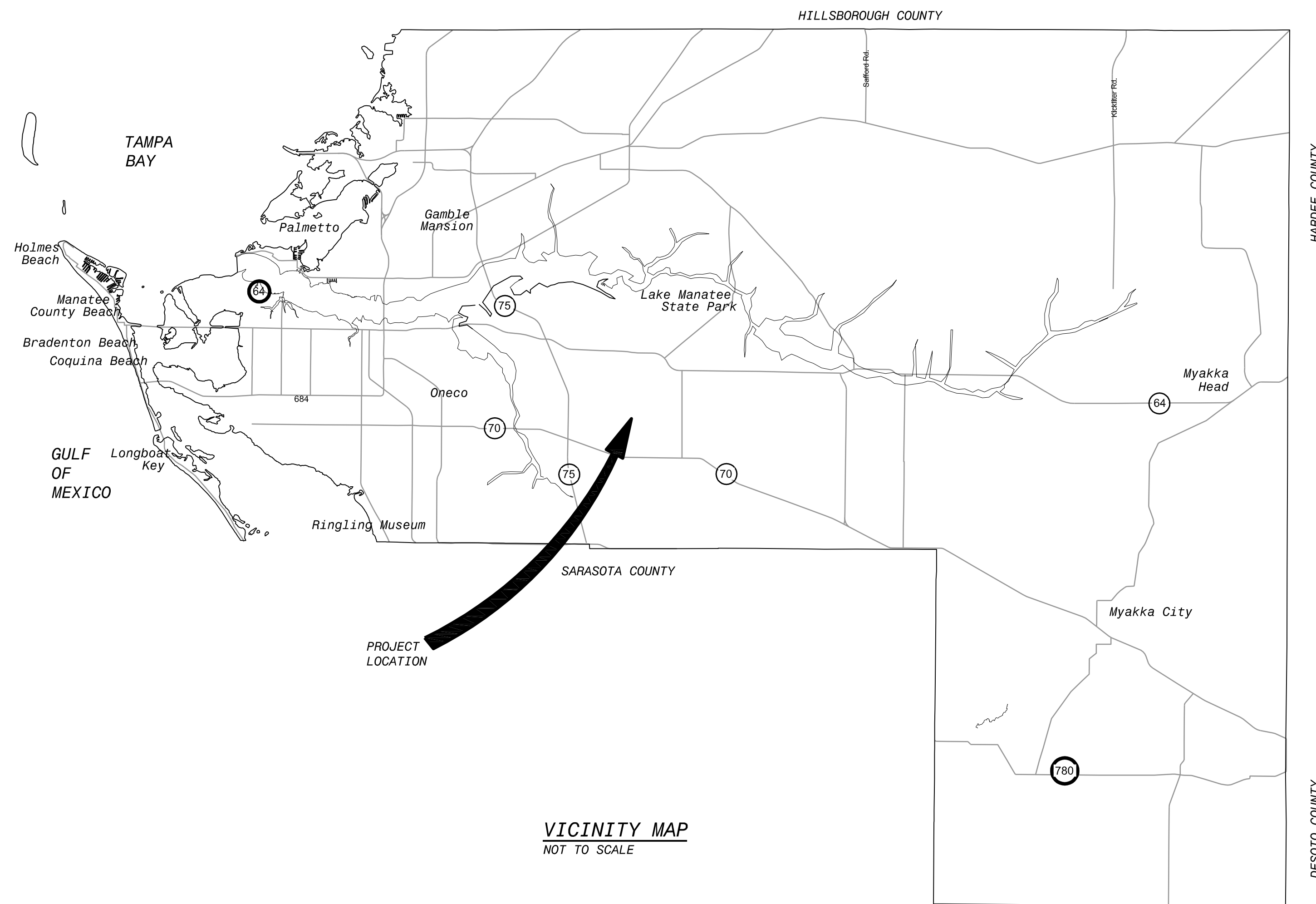


# MANATEE COUNTY SOUTHEAST WATER RECLAMATION FACILITY (SEWRF) PLANT DRAIN PUMP STATION



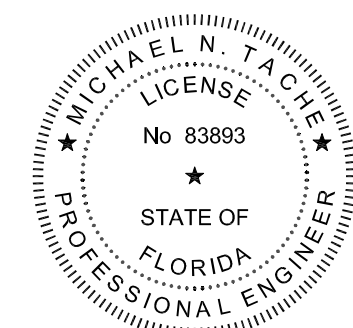
PROJECT LOCATION  
MANATEE COUNTY SOUTHEAST  
REGIONAL WATER RECLAMATION FACILITY

100% SUBMITTAL  
FEBRUARY 2019  
PROJECT #6092080



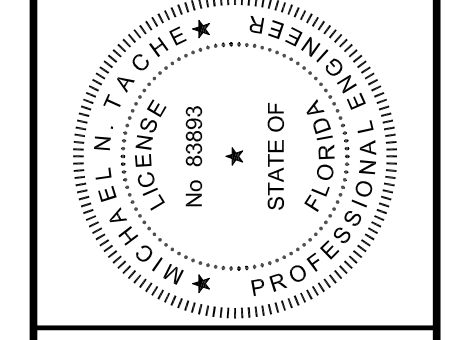
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<u>SHEET</u>	<u>DRAWING NO.</u>	<u>DRAWING TITLE</u>
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3	G-02	GENERAL - NOTES, LEGEND AND ABBREVIATIONS
4	G-03	GENERAL - SITE LAYOUT
<b>DEMOLITION</b>		
5	D-01	DEMOLITION - SOUTH PLANT DRAIN PUMP STATION - PLAN AND SECTION
<b>SITework</b>		
6	SW-01	CIVIL - YARD PIPING PLAN
7	SW-02	CIVIL - PARTIAL YARD PIPING PLAN I
8	SW-03	CIVIL - PARTIAL YARD PIPING PLAN II
9	SW-04	CIVIL - PARTIAL YARD PIPING PLAN III
10	SW-05	CIVIL - PARTIAL YARD PIPING PLAN IV
11	SW-06	CIVIL - PARTIAL YARD PIPING PLAN V
12	SW-07	CIVIL DETAILS
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15	S-03	STRUCTURAL - TYPICAL DETAILS
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17	M-02	MECHANICAL - SECTION - SOUTH PLANT DRAIN PUMP STATION
18	M-03	MECHANICAL - PLAN - WEST PLANT DRAIN PUMP STATION
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20	M-05	MECHANICAL - DETAILS I
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27	E-05	ELECTRICAL - POWER ONE LINE DIAGRAMS
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MANATEE COUNTY, FLORIDA  
SOUTHEAST WATER RECLAMATION FACILITY  
PLANT DRAIN PUMP STATION

GENERAL  
INDEX OF DRAWINGS

DESIGNED: DH  
DETAILED: AD  
CHECKED: BV  
APPROVED: MT  
DATE: FEB 2019

0 1/2 1  
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.  
198896

**G-01**  
SHEET  
02 OF 42

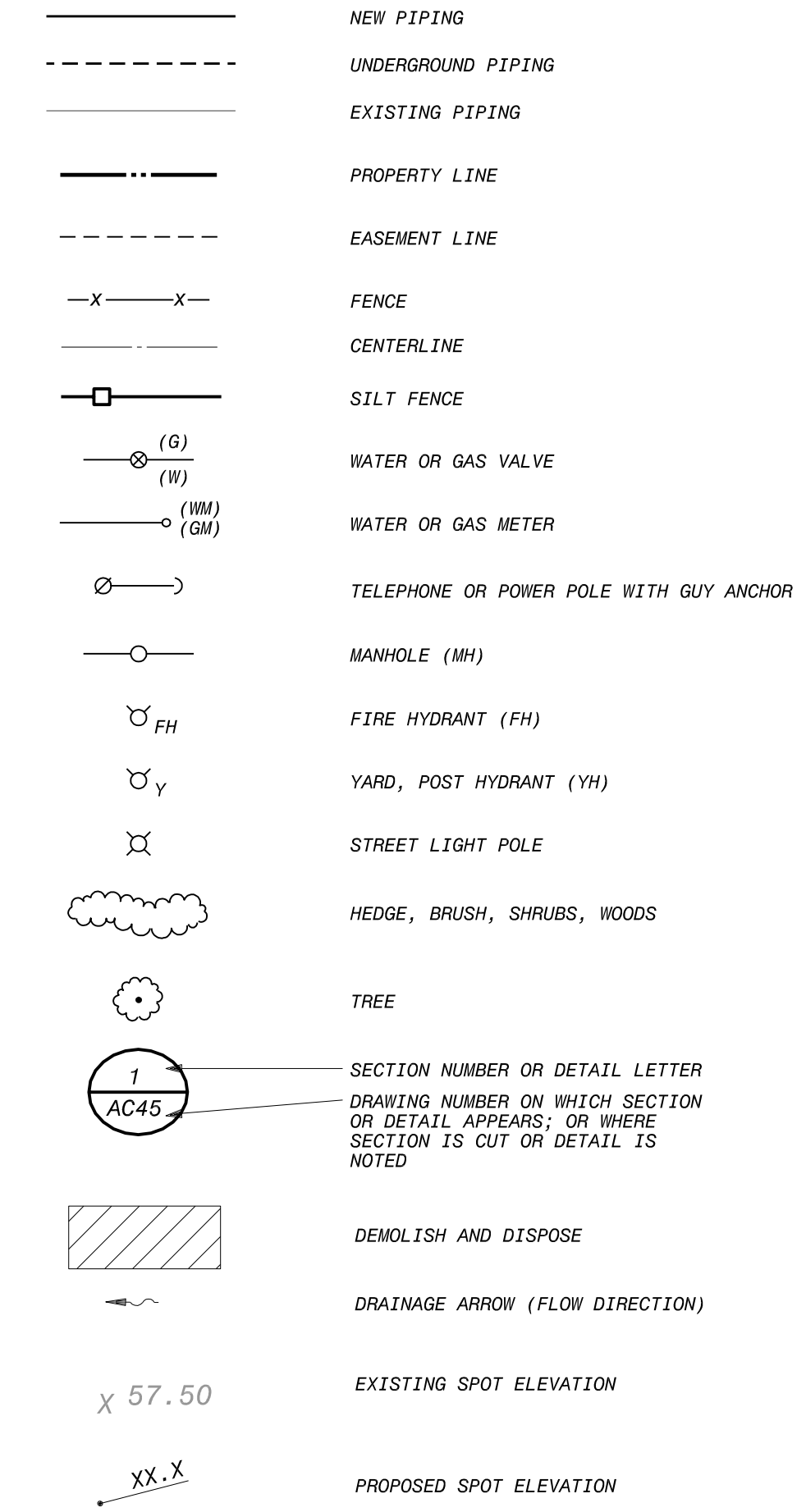
GENERAL

- 1. THESE GENERAL NOTES SHALL APPLY TO ALL DRAWINGS INCLUDED IN THE CONTRACT.
2. COORDINATES INDICATED ON THE DRAWINGS ARE FLORIDA STATE PLANE COORDINATE SYSTEM. NORTH AMERICAN DATUM OF 1983. ELEVATIONS INDICATED ON THE DRAWINGS ARE BASED ON A NATIONAL GEODETIC VERTICAL DATUM, 1929.
3. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHEN EXCAVATING. PIPING AND UTILITY LOCATIONS SHOWN ON PLANS ARE NOT EXACT OR GUARANTEED. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING EXISTING UTILITY LOCATIONS.
4. EXISTING UTILITIES AND STRUCTURES (UNDERGROUND, SURFACE, OR OVERHEAD) ARE INDICATED ONLY TO THE EXTENT THAT SUCH INFORMATION WAS KNOWN, OR MADE AVAILABLE TO, OR DISCOVERED BY THE ENGINEER IN PREPARING THE DRAWINGS. THE LOCATIONS, CONFIGURATIONS, AND ELEVATIONS OF SUBSURFACE FACILITIES AND UTILITIES ARE APPROXIMATE, AND NOT ALL UTILITIES AND FACILITIES MAY BE INDICATED. THE CONTRACTOR SHALL VERIFY THE EXACT HORIZONTAL AND VERTICAL LOCATION OF UNDERGROUND UTILITIES IN THE AREA OF CONSTRUCTION PRIOR TO PROCEEDING WITH THE WORK.
5. "SCREENED" (LIGHT) DELINEATION INDICATED ON THE DRAWINGS DENOTES EXISTING FACILITIES. "SCREENED" INFORMATION WAS TAKEN FROM EXISTING CONSTRUCTION DRAWINGS AND DATA, AND IS FOR REFERENCE ONLY, AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO THE ORDERING OF MATERIALS AND BEGINNING OF CONSTRUCTION. "BOLD" DELINEATION IS NEW WORK TO BE CONSTRUCTED UNDER THIS CONTRACT.
6. THE TERM "PROPOSED" AS INDICATED ON THE DRAWINGS MEANS THE ITEM IS DESIGNED OR PLANNED TO BE PROVIDED BY OWNER OR OTHERS SEPARATE FROM THIS CONTRACT. THE TERM "FUTURE" AS INDICATED ON THE DRAWINGS REFERS TO THE ENGINEER'S INTERPRETATION OF THE ITEM FOR THE FUTURE, BASED ON AVAILABLE INFORMATION.
7. CONTRACTOR SHALL ADJUST VALVE BOXES, AIR RELEASE VALVES, FIRE HYDRANTS, MANHOLES, MANHOLE COVERS, ETC IN CONFLICT WITH NEW WORK.
8. OWNER SHALL OPERATE WATER, WASTEWATER, AND RECLAIMED WATER VALVES. COORDINATE VALVE OPERATION WITH OWNER.
9. CONTRACTOR SHALL PROTECT EXISTING INFRASTRUCTURE / EQUIPMENT FROM DAMAGE DURING THE DURATION OF CONSTRUCTION. THE CONTRACTOR, AT THE CONTRACTOR'S EXPENSE, SHALL IMMEDIATELY REPAIR ALL DAMAGES TO UTILITIES, MAINS AND FACILITIES. IF THE REPAIR IS NOT MADE IN A TIMELY MANNER, AS DETERMINED BY OWNER, OWNER MAY PERFORM REQUIRED REPAIRS AND CLEANUP. THE CONTRACTOR WILL BE CHARGED FOR ALL EXPENSES ASSOCIATED WITH THE REPAIR.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL SURVEY BENCHMARKS. SURVEY BENCHMARKS DAMAGED BY CONSTRUCTION ACTIVITIES SHALL BE REESTABLISHED BY A LAND SURVEYOR LICENSED IN THE STATE OF FLORIDA.
11. CONTRACTOR SHALL PROTECT AND MAINTAIN ALL EXISTING TREES, SHRUBS, AND PLANTS, UNLESS OTHERWISE NOTED.
12. CONTRACTOR SHALL NOT ADVERSELY IMPACT DRAINAGE SYSTEMS DURING CONSTRUCTION. TEMPORARILY RECONFIGURE THE DRAINAGE SYSTEM, AS NEEDED AS THE CONSTRUCTION WORK PROGRESSES, TO NOT CAUSE ADVERSE IMPACTS TO SURFACE WATER DRAINAGE EFFICIENCY. DO NOT IMPAIR SURFACE WATER DRAINAGE CAPACITY. FOLLOW THE REQUIREMENTS OF THE APPROVED POLLUTION PREVENTION PLAN FOR THE PROJECT.
13. CONTRACTOR SHALL RETURN THE ENTIRE AREA DISTURBED BY CONSTRUCTION ACTIVITIES TO THE ORIGINAL CONDITION OR BETTER UPON COMPLETION OF THE WORK, IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, UNLESS OTHERWISE SPECIFIED OR REQUIRED TO MEET THE DESIGN INTENT. GRADE SHALL BE RETURNED TO ORIGINAL ELEVATION. THE ENTIRE DISTURBED AREA OF ALL ESTABLISHED LAWN AREAS SHALL BE SEEDED. AREA OF ALL DISTURBED ROADWAYS/PAVEMENT WILL BE RESTORED PER COUNTY STANDARDS. ANY DISTURBANCE TO ANY LAND OR OTHER APPURTENANCES, OUTSIDE THE LIMITS OF CONSTRUCTION, CAUSED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE OWNER OF THE LAND OR APPURTENANCE. NO PAYMENT SHALL BE MADE FOR SUCH WORK.
14. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL PROPERTIES ADJACENT TO THE WORK THROUGHOUT THE PERIOD OF CONSTRUCTION, AND AT NO TIME SHALL HIS OPERATIONS BLOCK OR RESTRICT ACCESS TO PLANT STAFF WITHOUT ADVANCED NOTIFICATION AND APPROVAL.
15. THE CONTRACTOR SHALL NOTIFY THE OWNER PRIOR TO CONNECTING TO OR DISRUPTING ANY EXISTING SERVICES (PIPING, ELECTRICAL, ETC).
16. CONTRACTOR SHALL FIELD VERIFY PRECISE LOCATION, ELEVATION, AND ARRANGEMENT OF CONNECTIONS OF NEW PIPELINES WITH EXISTING PIPELINES BASED ON FIELD CONDITIONS, INCLUDING EXPOSING EXISTING PIPING PRIOR TO FABRICATING NEW PIPING. CONTRACTOR SHALL PROVIDE FITTINGS, ADAPTERS, SOLID SLEEVE CLOSURES, AND HARNESS MECHANICAL COUPLING; ROTATE FITTINGS; DEFLECT JOINTS; AND MODIFY EXISTING PIPING AS APPLICABLE AND AS REQUIRED TO MAKE CONNECTIONS, INCLUDING ADJUSTMENTS FOR ANY OFFSETS IN CENTERLINE ELEVATIONS BETWEEN PIPELINES. CONTRACTOR SHALL PROVIDE TEMPORARY PLUG WITH FACTORY OUTLET SIZED AS REQUIRED FOR CONTRACTOR'S TESTING AND DISINFECTION WORK BEFORE MAKING CONNECTION, WHEN APPLICABLE. CONTRACTOR SHALL COORDINATE EACH TIE-IN WITH THE OWNER.
17. ALL BELOW GRADE PIPING SHALL HAVE A MINIMUM COVER OF 36 INCHES, UNLESS OTHERWISE NOTED.
18. RESTRAINED JOINTS SHALL BE PROVIDED FOR ALL BURIED PIPING.
19. FOR ALL SITE GRADING, SMOOTH PARABOLIC TRANSITIONS SHALL BE MADE BETWEEN CHANGES IN SLOPE. PARABOLIC ROUNDING SHALL APPLY TO ALL CUT AND FILL SECTIONS.
20. ALL DIRECTION CHANGES IN DIP BOTH HORIZONTAL AND VERTICAL SHALL BE BY JOINT DEFLECTION. JOINT DEFLECTION IN DIP SHALL NOT EXCEED 75% OF THE MANUFACTURER'S RECOMMENDED DEFLECTION. NO JOINT DEFLECTION OR PIPE BENDING IS ALLOWED FOR PVC PIPE. THE MAXIMUM ALLOWABLE TOLERANCE IN THE JOINT DUE TO VARIANCES IN INSTALLATION IS 0.75 DEGREES (3-INCHES PER JOINT PER 20-FOOT STICK OF PIPE). NO BENDING TOLERANCE IN THE PIPE BARREL SHALL BE ACCEPTABLE. ALIGNMENT CHANGE SHALL BE MADE ONLY WITH SLEEVES AND FITTINGS.
21. NO WATER FROM TEMPORARY DE-WATERING OPERATIONS SHALL BE DISCHARGED IN A LOCATION OR MANNER WHICH WILL CAUSE THE TRANSFER OF SEDIMENT INTO DITCHES OR OTHER WETLAND AREAS.
22. CONSTRUCTION ACTIVITIES SHALL BE SCHEDULED AND SEQUENCED TO ENSURE CONTINUOUS OPERATION OF EXISTING FACILITIES, UNLESS OTHERWISE SPECIFICALLY ALLOWED FOR IN THE CONTRACT DOCUMENTS AND WITH WRITTEN AUTHORIZATION FROM OWNER. REFER TO SPECIAL CONDITIONS FOR ADDITIONAL CONSTRUCTION CONSTRAINTS.
23. THE SOIL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE INSTALLED PRIOR TO CONSTRUCTION, MAINTAINED THROUGHOUT CONSTRUCTION AND UNTIL THE SITE IS PERMANENTLY STABILIZED. THE CONTRACTOR SHALL PROVIDE AND INSTALL SILT SCREENS AROUND THE PROPOSED CONSTRUCTION ACTIVITY, AS NECESSARY, TO PREVENT THE TRANSPORT OF SEDIMENT DOWNSTREAM INTO STREET, STORM SEWERS, OPEN DITCHES, LAKES, DETENTION PONDS, ETC., AND SHALL PERFORM ALL NECESSARY INSPECTIONS AT A MINIMUM.
24. THE CONTRACTOR SHALL DEVELOP A STORM WATER POLLUTION PLAN (SWPP) AND APPOINT A DESIGNATED SWPP INSPECTOR FOR THE PROJECT SITE. THE CONTRACTOR SHALL PAY FOR AND FILE A NOTICE OF INTENT TO USE THE STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION GENERIC PERMIT FOR STORM WATER DISCHARGE FROM LARGE AND SMALL CONSTRUCTION ACTIVITIES (HENCEFORTH REFERRED AS "FDEP GENERIC PERMIT") AT LEAST ONE WEEK PRIOR TO COMMENCEMENT OF CONSTRUCTION AND SHALL FILE A NOTICE OF TERMINATION TO USE THE FDEP GENERIC PERMIT AT THE COMPLETION OF THE PROJECT.
25. THE CONTRACTOR SHALL REMOVE AND LEGALLY DISPOSE OF ALL SURPLUS EXCAVATION MATERIALS AND DEBRIS FROM THE SITE AND SHALL MAINTAIN THE SITE IN A NEAT AND ORDERLY CONDITION. REFER TO SPECIFICATIONS SECTIONS 02200 AND 02202.
26. THE DRAWINGS INDICATE TYPES OF PIPE SUPPORT SYSTEMS AT VARIOUS LOCATIONS. HOWEVER, ALL PIPE SUPPORTS, HANGERS, BRACKETS, INSERTS OR BRACES ARE NOT SHOWN. CONTRACTOR SHALL REFER TO SPECIFICATION 15140 REQUIREMENTS AND PROVIDE A COMPLETE SUPPORT SYSTEM AS REQUIRED.
27. AT A MINIMUM, CONTRACTOR SHALL NOTIFY OWNER TWENTY-ONE (21) DAYS IN ADVANCE OF TIE-ING INTO EXISTING FACILITIES / PIPING.
28. UNLESS ADDITIONAL SPACE IS APPROVED BY OWNER, CONTRACTOR'S STAGING, PARKING AND MATERIAL STORAGE SHALL BE LIMITED TO THE LOCATION(S) INDICATED ON THE DRAWINGS. PROVIDING ADDITIONAL STORAGE AREAS OR PARKING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

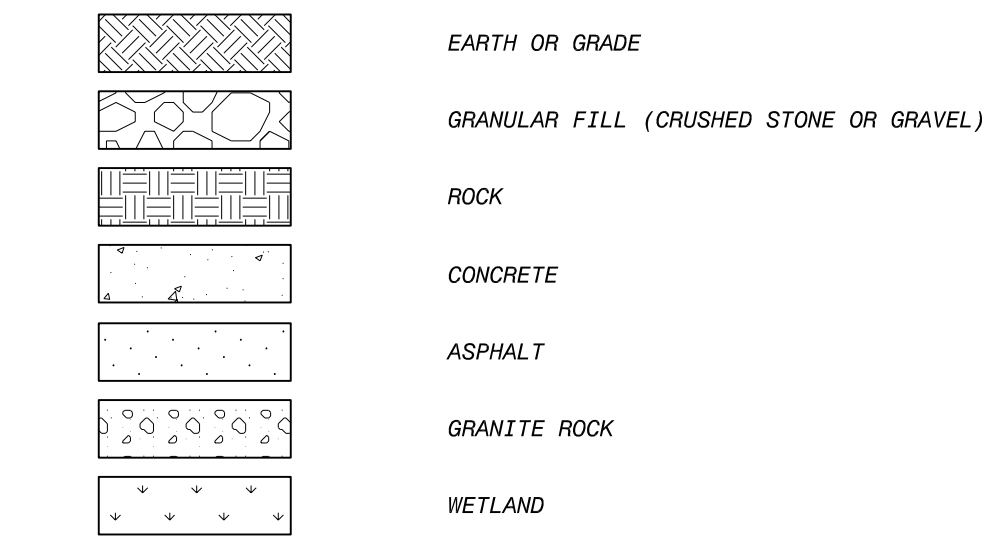
ABBREVIATIONS

Table listing abbreviations for materials and equipment. Includes columns for abbreviations and full names. Examples: ALUM (ALUMINUM), PVC (POLYVINYL CHLORIDE), MANHOLE (MH), etc.

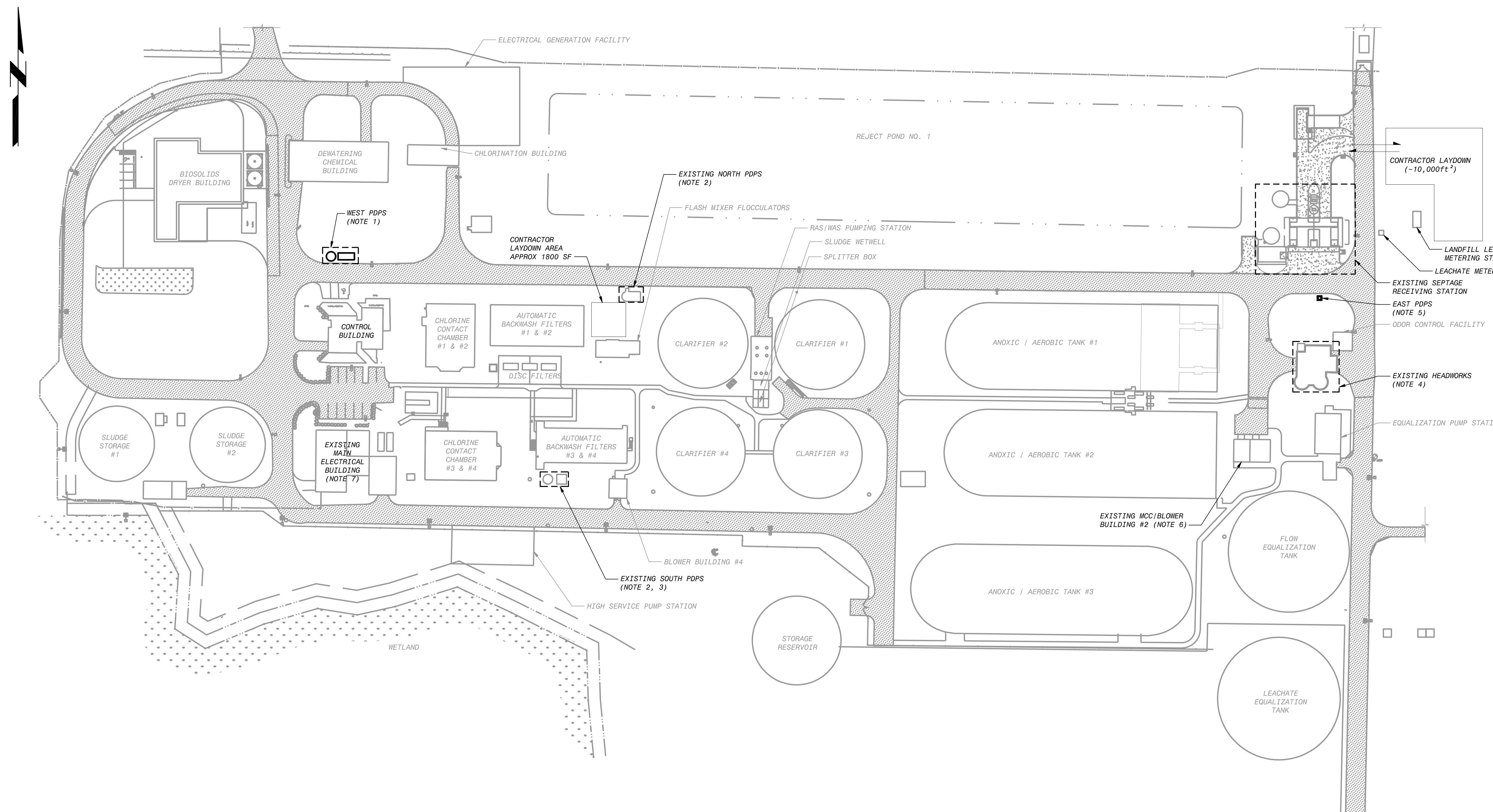
GENERAL LEGEND



MATERIALS LEGEND

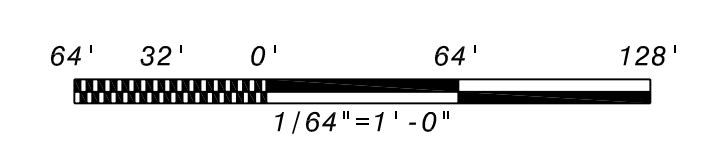


Project information block including: MANATEE COUNTY, FLORIDA SOUTHEAST WATER RECLAMATION FACILITY PLANT DRAIN PUMP STATION; PROJECT NO. 198896; SHEET G-02 03 OF 42; DESIGNER: DH; DATE: FEB 2019; and a circular professional seal for Black & Veatch.

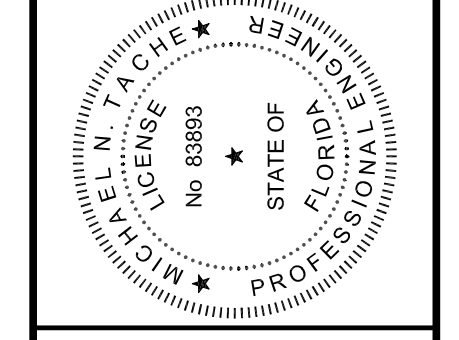


PLAN  
1/64" = 1'-0"

- NOTES:
1. REFER TO DRAWINGS M-03 AND M-04 FOR MECHANICAL LAYOUT OF WEST PLANT DRAIN PUMP STATION.
  2. REFER TO YARD PIPING PLANS FOR NEW PIPE TO HYDRAULICALLY CONNECT THE NORTH PDPS TO THE SOUTH PDPS.
  3. REFER TO DRAWINGS M-01 AND M-02 FOR MECHANICAL LAYOUT OF SOUTH PDPS, WHICH IS BEING RETROFITTED.
  4. REFER TO DRAWING M-06 FOR TIE-IN TO EXISTING HEADWORKS FACILITY FROM WEST PLANT DRAIN PUMP STATION AND EAST PLANT DRAIN PUMP STATION.
  5. REFER TO SPECIFICATIONS AND DRAWING I-04 FOR DETAILS ON THE PACKAGED EAST PLANT DRAIN PUMP STATION. REFER TO DRAWING M-07 FOR MECHANICAL LAYOUT.
  6. REFER TO ELECTRICAL DRAWINGS FOR TIE-IN WORK AT MCC BUILDING #2 FOR POWERING EAST PLANT DRAIN PUMP STATION.
  7. REFER TO ELECTRICAL DRAWINGS FOR TIE-IN WORK AT MAIN ELECTRICAL BUILDING FOR POWERING WEST PLANT DRAIN PUMP STATION.



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DEC 2018	90% SUBMITTAL		
FEB 2019	100% SUBMITTAL		

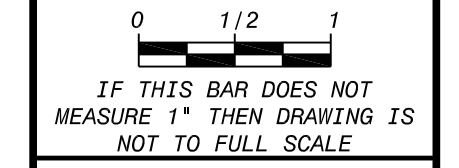


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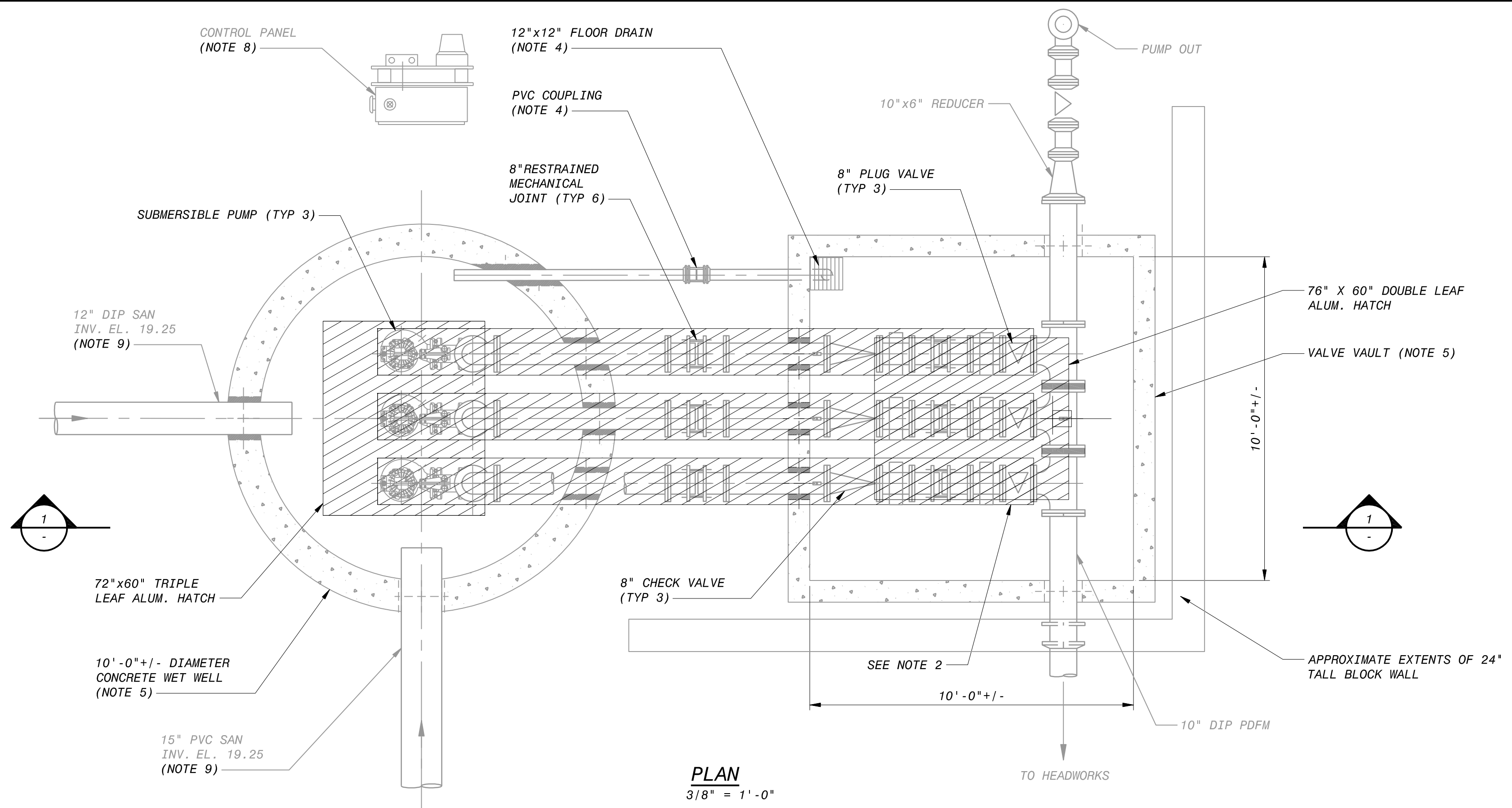
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Tampa, Florida  
Certificate No. 8132

MANATEE COUNTY, FLORIDA  
SOUTHEAST WATER RECLAMATION FACILITY  
PLANT DRAIN PUMP STATION  
GENERAL  
SITE LAYOUT

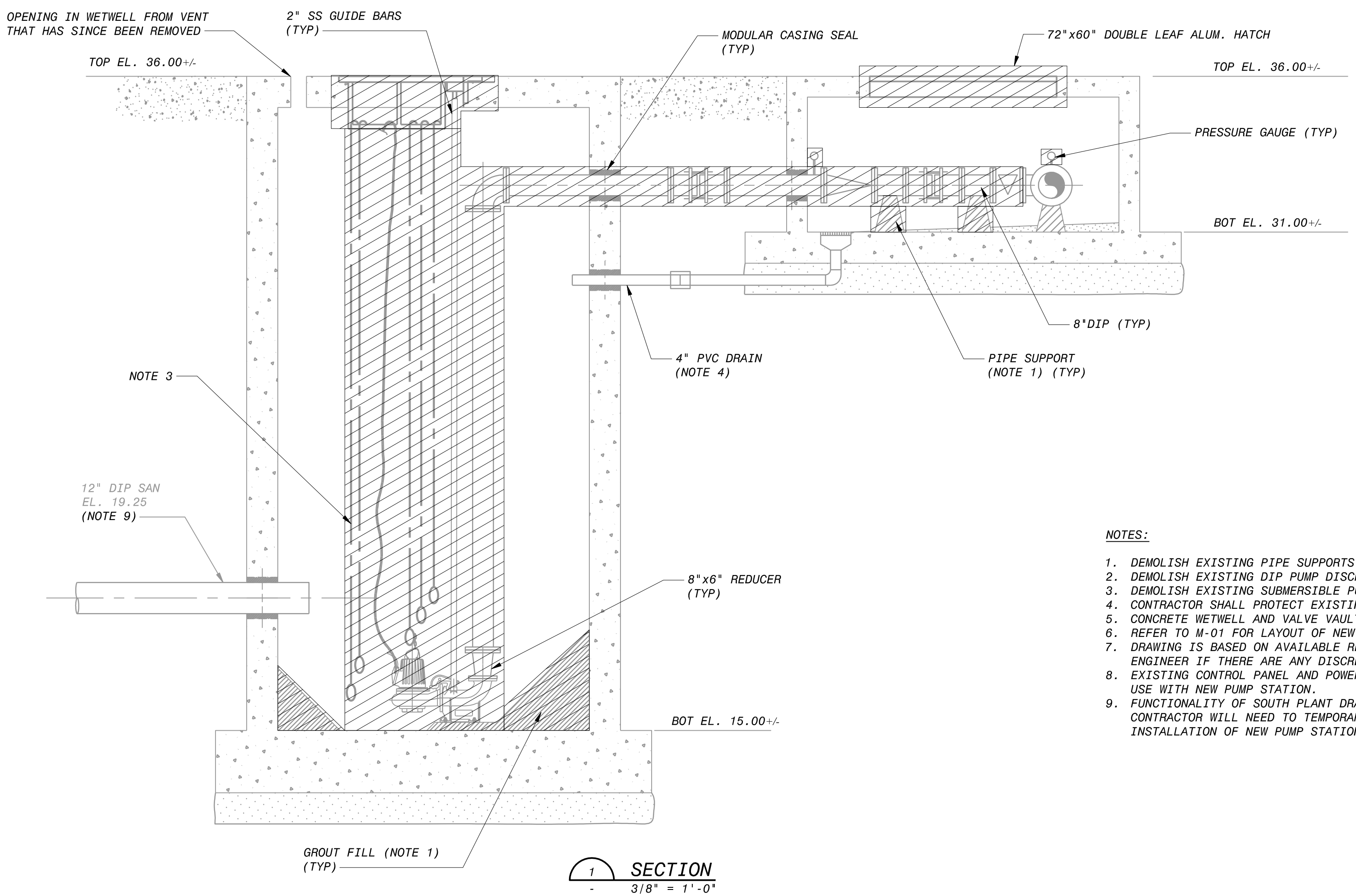
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APPROVED: MT  
DATE: FEB 2019



PROJECT NO.  
198896  
G-03  
SHEET  
04 OF 42



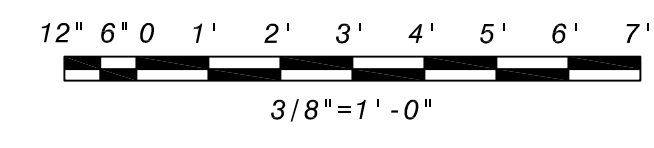
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3/8" = 1'-0"



**SECTION**  
3/8" = 1'-0"

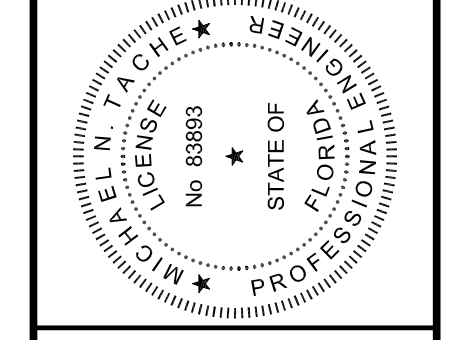
**NOTES:**

1. DEMOLISH EXISTING PIPE SUPPORTS. DEMOLISH GROUT FILL AS NECESSARY TO FACILITATE INSTALLATION OF NEW EQUIPMENT.
2. DEMOLISH EXISTING DIP PUMP DISCHARGE UP TO AND INCLUDING 8" PLUG VALVES AT COMMON DISCHARGE HEADER.
3. DEMOLISH EXISTING SUBMERSIBLE PUMPS, GUIDE RAILS, FLOAT SWITCHES AND APPURTENANCES AS SHOWN.
4. CONTRACTOR SHALL PROTECT EXISTING FLOOR DRAIN DURING CONSTRUCTION.
5. CONCRETE WETWELL AND VALVE VAULT SHALL BE REFINISHED IN ACCORDANCE WITH THE SPECIFICATIONS.
6. REFER TO M-01 FOR LAYOUT OF NEW PUMP STATION (PUMPS, PIPING, VALVES AND APPURTENANCES).
7. DRAWING IS BASED ON AVAILABLE RECORDS AND INFORMATION COLLECTED DURING SITE VISITS. CONTRACTOR SHALL NOTIFY ENGINEER IF THERE ARE ANY DISCREPANCIES.
8. EXISTING CONTROL PANEL AND POWER CONDUITS SHALL BE PROTECTED IN PLACE. CONTROL PANEL SHALL BE RE-PURPOSED FOR USE WITH NEW PUMP STATION.
9. FUNCTIONALITY OF SOUTH PLANT DRAIN PUMP STATION SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT. CONTRACTOR WILL NEED TO TEMPORARILY BYPASS WETWELL DURING THE DURATION OF DEMOLITION ACTIVITIES AND INSTALLATION OF NEW PUMP STATION. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.



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FEB 2019 100% SUBMITTAL  
 DEC 2018 90% SUBMITTAL  
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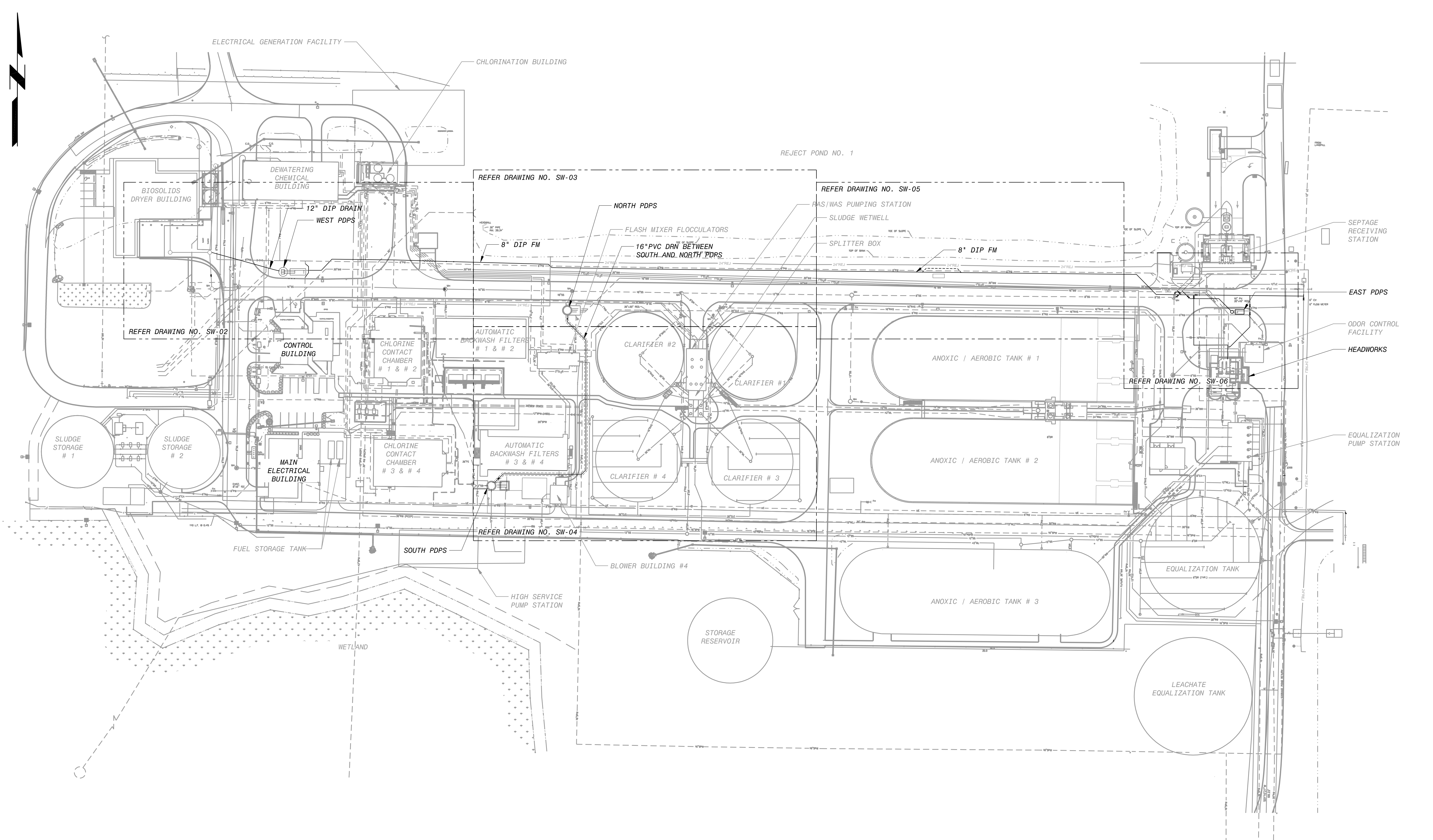
**MANATEE COUNTY, FLORIDA  
SOUTHEAST WATER RECLAMATION FACILITY  
PLANT DRAIN PUMP STATION**

**DEMOLITION  
SOUTH PLANT DRAIN PUMP STATION  
PLANT AND SECTION**

DESIGNED: DH  
 DETAILED: AD  
 CHECKED: BV  
 APPROVED: MT  
 DATE: FEB 2019

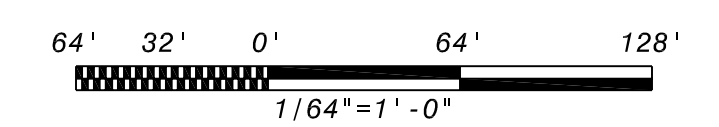
PROJECT NO.  
**198896**

**D-01**  
 SHEET  
 05 OF 42

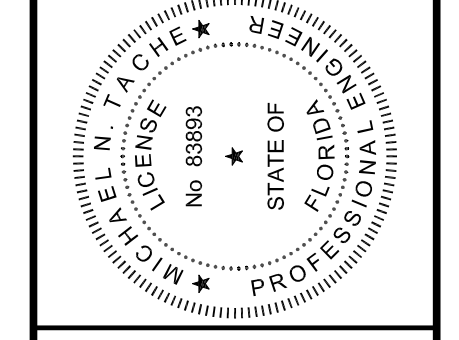


- NOTES:**
- CONTRACTOR WILL BE REQUIRED TO DO FIELD INVESTIGATIONS ALONG EACH YARD PIPING RUN TO CONFIRM THERE ARE NO UNFORESEEN CONFLICTS. PIPE LAYOUT SHALL BE CONFIRMED BEFORE THE CONTRACTOR ORDERS PIPING, FITTINGS, AND APPURTENANCES, TO PREVENT SCHEDULING DELAY.
  - REFER TO SPECIFICATIONS FOR ADDITIONAL FITTINGS AND APPURTENANCES THAT THE CONTRACTOR SHALL HAVE ON HAND TO PREVENT CONSTRUCTION DELAYS DUE TO UNFORESEEN CONDITIONS (E.G., UPDATES TO PIPE ROUTING REQUIRED TO MATCH FIELD CONDITIONS).
  - REFER TO SPECIFICATIONS FOR CONSTRUCTION REQUIREMENTS, INCLUDING CONSTRUCTION CONSTRAINTS LISTED IN SPECIFICATION 01000.

**PLAN**  
1/64"=1'-0"



FEB 2019	100% SUBMITTAL	D	AD	DN	MT
DEC 2018	90% SUBMITTAL	C	AD	MM	MT
SEPT 2018	60% SUBMITTAL	B	AD	MM	MT
JULY 2018	30% SUBMITTAL	A	AD	MM	MT
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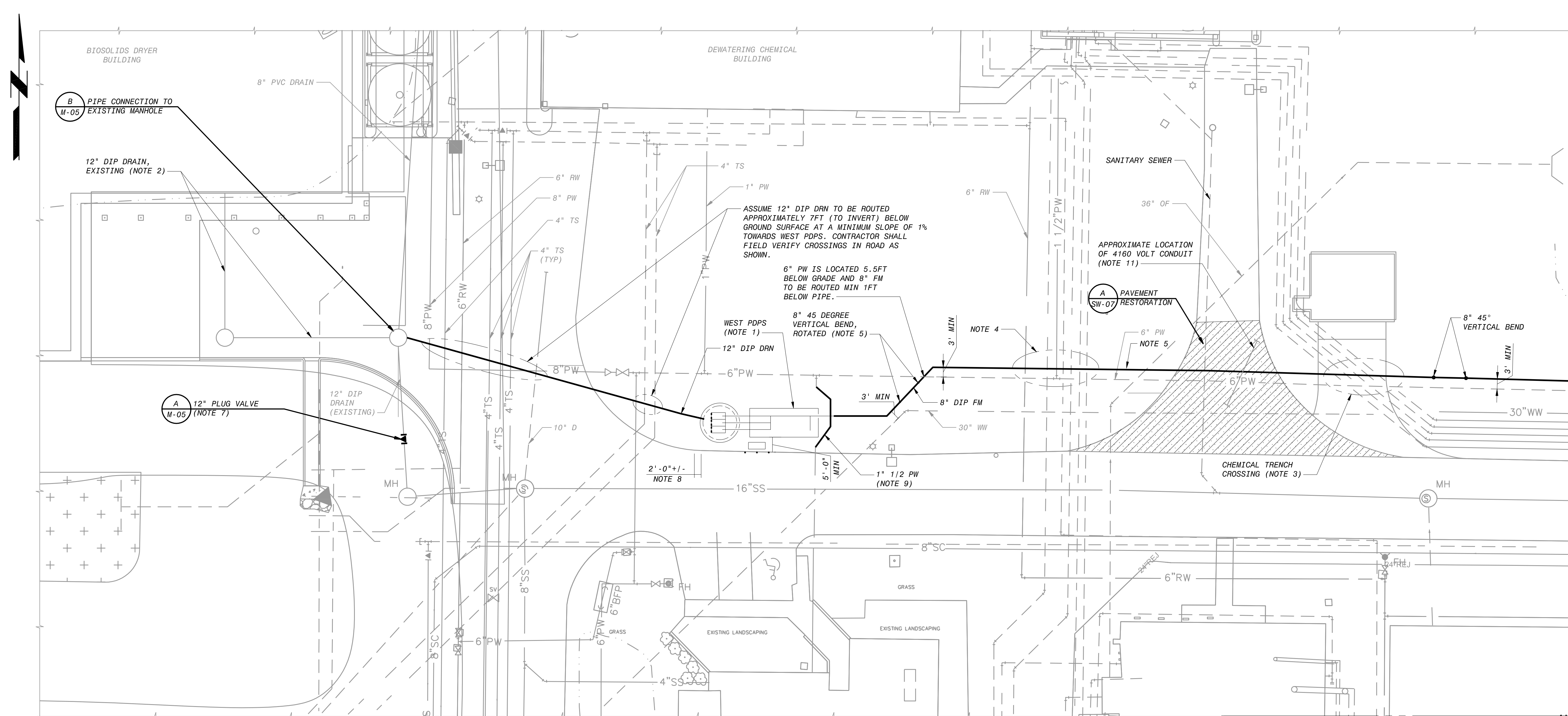
**MANATEE COUNTY, FLORIDA**  
**SOUTHEAST WATER RECLAMATION FACILITY**  
**PLANT DRAIN PUMP STATION**

CIVIL  
YARD PIPING PLAN

DESIGNED: DH  
DETAILED: PR  
CHECKED: BV  
APPROVED: MT  
DATE: FEB 2019

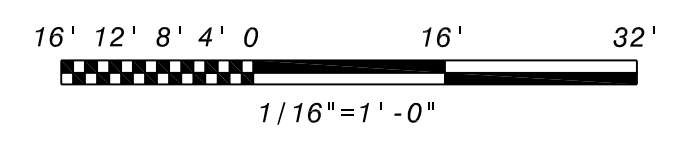
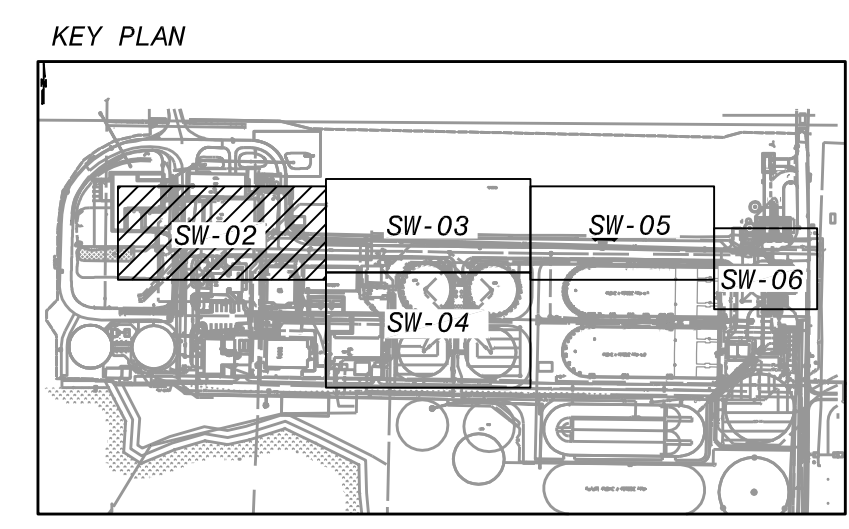
PROJECT NO.  
198896

**SW-01**  
SHEET  
06 OF 42



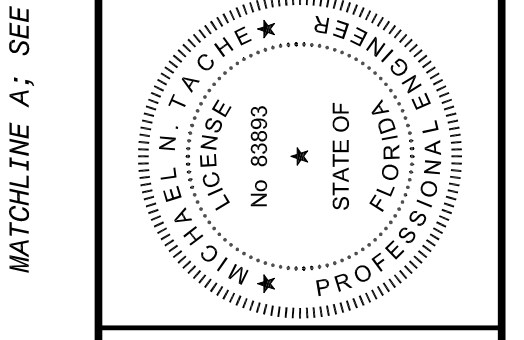
PLAN  
1/16" = 1' - 0"

- NOTES:**
- REFER TO DRAWINGS M-03 AND M-04 FOR DESIGN OF WEST PLANT DRAIN PUMP STATION.
  - DRAINAGE FROM CONDENSER IS ROUTED OUT OF BIOSOLIDS DRYER BUILDING AND TO BE DIRECTED TO NEW WEST PLANT DRAIN PUMP STATION VIA THE NEW 12" DIP DRAIN.
  - CROSSING INCLUDES: 2" P, 2" AL, 2" CHLORINE (LIQUID), 2" CHLORINE (GAS), AND 1" CHLORINE (GAS). ROUTE 8" FM UNDER EXISTING PIPING. SIMILAR TO ALL PIPING, CONTRACTOR SHALL FIELD VERIFY LOCATION/DEPTH. REFER TO NOTE 5.
  - CROSSING INCLUDES: 6" RW, 3" CLS (X2), 1.5" SAM, 3" SAM, AND 1.5" PW. ROUTE 8" FM UNDER EXISTING PIPING. SIMILAR TO ALL PIPING, CONTRACTOR SHALL FIELD VERIFY LOCATION/DEPTH. REFER TO NOTE 5.
  - FOR THE PURPOSE OF BIDDING THIS WORK, CONTRACTOR SHALL ASSUME 8" FM WILL BE ROUTED TO A DEPTH OF 8FT (INVERT OF PIPE), VIA THE ROTATED 45 DEGREE BENDS SHOWN WEST OF THE PIPE CROSSINGS INDICATED BY NOTE 4. THE FM SHALL MAINTAIN THAT DEPTH UNTIL CROSSING THE PIPES INDICATED BY NOTE 3, AND RETURN TO MINIMUM COVER WITH THE 45 DEGREE VERTICAL BENDS SHOWN.
  - DRAWING IS BASED ON AVAILABLE RECORDS AND INFORMATION COLLECTED DURING SITE VISITS. CONTRACTOR SHALL NOTIFY ENGINEER IF THERE ARE ANY DISCREPANCIES. CONTRACTOR SHALL CONFIRM ALIGNMENT BASED ON GENERAL NOTE #4.
  - INSTALLATION OF PLUG VALVE SHALL BE COORDINATED WITH OWNER AND ENGINEER. UNLESS OTHERWISE ALLOWED, THIS WORK WILL NEED TO BE DONE DURING WEEKEND HOURS OR WHEN THE CONDENSER IS OFFLINE. REFER TO CONSTRUCTION CONSTRAINTS LISTED IN THE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
  - EXACT LOCATION OF WETWELL AND VALVE PAD TO BE FIELD DETERMINED AND AGREED UPON BY OWNER AND ENGINEER.
  - RELOCATION OF 1 1/2" PW LINE SHALL BE COORDINATED WITH OWNER 2 WEEKS IN ADVANCE OF OUTAGE. 1 1/2" PW PIPE SHALL BE PVC IN ACCORDANCE WITH SPECIFICATION 15067. PIPELINE SHALL BE CLEANED AND DISINFECTED (TABLET METHOD) BEFORE PUTTING INTO SERVICE. DISINFECTION WORK SHALL CONFORM TO ANSI/AWWA C651 (INCLUDING CHLORINE RESIDUAL TESTS BY DROP DILUTION METHOD AND BACTERIOLOGICAL TESTS). CONTRACTOR SHALL SUBMIT DISINFECTION PLAN TO ENGINEER FOR APPROVAL.
  - 8" DIP FM TO BE INSTALLED AT DEPTH REQUIRED FOR AVOIDANCE OF CONFLICTS, BUT NO LESS THAN 3' COVER AT ALL LOCATIONS.
  - APPROXIMATE LOCATION OF 4160 VOLT CONDUIT, WHICH SHALL BE FIELD CONFIRMED. NEW 8" DIP FM SHALL CROSS UNDERNEATH THIS ELECTRICAL DUCT BANK.



REV	DATE	DESCRIPTION	BY	CHK	APP
1	FEB 2019	100% SUBMITTAL			
2	DEC 2018	90% SUBMITTAL			
3	SEPT 2018	60% SUBMITTAL			
4	JULY 2018	30% SUBMITTAL			

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 USER:RANG4017 DWG. VER: 1020



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**MANATEE COUNTY, FLORIDA**  
**SOUTHEAST WATER RECLAMATION FACILITY**  
**PLANT DRAIN PUMP STATION**

CIVIL  
 PARTIAL YARD PIPING PLAN I

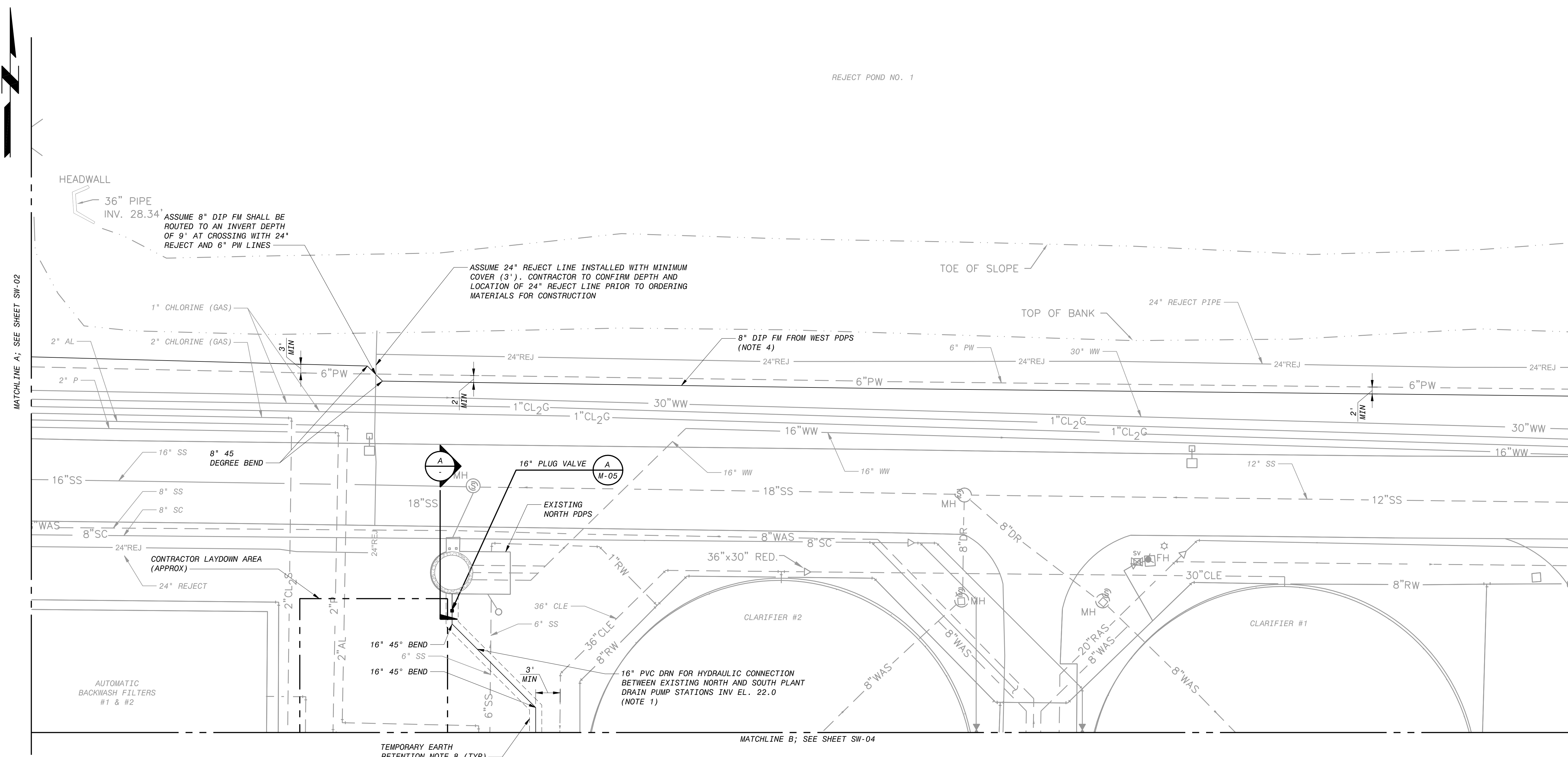
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PROJECT NO.  
 198896

**SW-02**  
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 07 OF 42

**PRELIMINARY - NOT FOR CONSTRUCTION**

07/20/19  
 198896

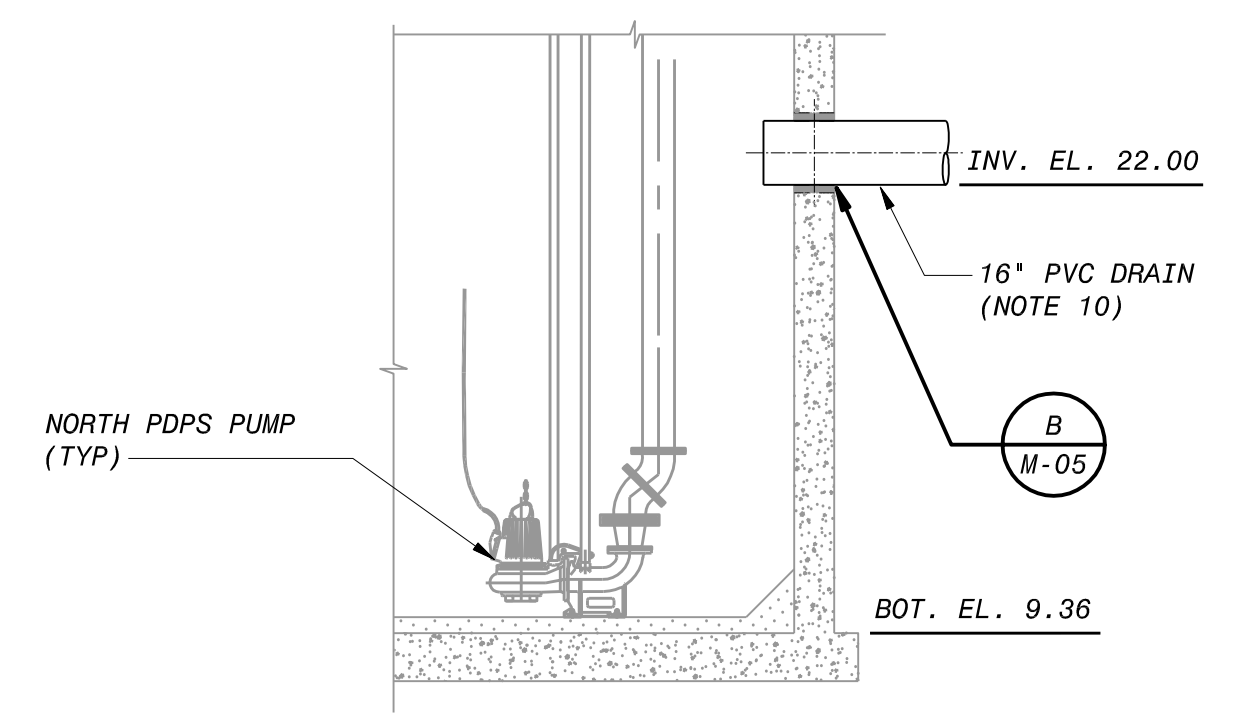


**PLAN**  
1/16" = 1'-0"

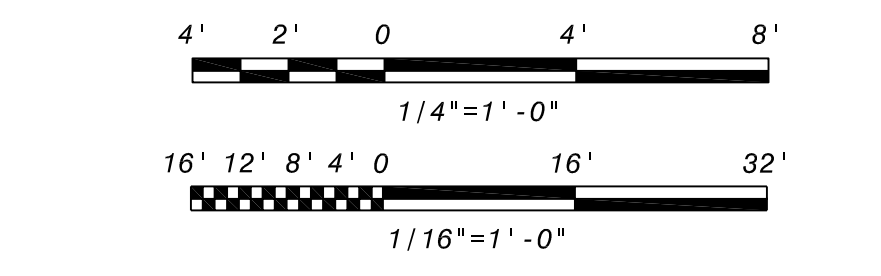
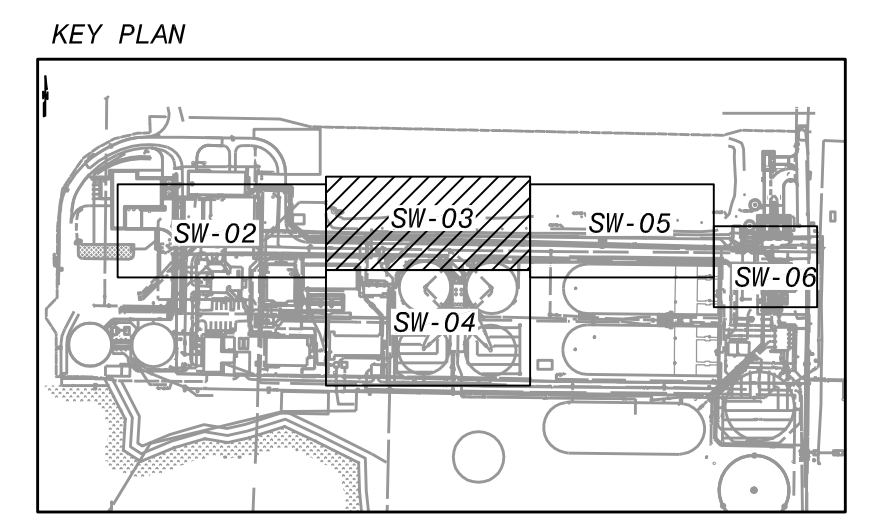
**NOTES:**

- 16" PVC DRAIN PIPE SHALL BE INSTALLED LEVEL, WITH NO SLOPE IN EITHER DIRECTION. CONNECTION TO THE EXISTING NORTH AND SOUTH PLANT DRAIN PUMP STATIONS SHALL BE MADE AT THE SAME ELEVATION (INV EL. 22.0 FT). ENTIRE STRETCH OF CONNECTION SHALL REQUIRE TEMPORARY EARTH RETENTION DURING CONSTRUCTION. REFER TO THE EARTHWORK SPECIFICATIONS AND NOTE 8.
- 16" PVC DRAIN CONNECTION TO THE NORTH PDPS SHALL BE MADE IN THE SAME MANNER AS THE SOUTH PDPS. REFER TO M-01, M-02 AND M-05 FOR DETAILS ON PIPE CONNECTION TO THE EXISTING SOUTH PLANT DRAIN PUMP STATION.
- DRAWING IS BASED ON AVAILABLE RECORDS AND INFORMATION COLLECTED DURING SITE VISITS. CONTRACTOR SHALL NOTIFY ENGINEER IF THERE ARE ANY DISCREPANCIES. CONTRACTOR SHALL CONFIRM ALIGNMENT BASED ON GENERAL NOTE #4.
- 8" DIP FM TO BE INSTALLED AT DEPTH REQUIRED FOR AVOIDANCE OF CONFLICTS, BUT NO LESS THAN 3' COVER AT ALL LOCATIONS.
- ALTHOUGH CONTRACTOR SHALL FIELD VERIFY EXISTING PIPING ALONG PROPOSED PIPE ROUTING, IT SHOULD BE NOTED THAT THERE IS MORE CONFIDENCE IN THE LOCATIONS OF THE 24" REJECT LINE AND 6" PW LINE BASED ON RECENT WORK AT THE SEWRP. WHEN ROUTING THE 8" DIP FM TO THE SOUTH OF THE 6" FM, CONTRACTOR SHALL MAINTAIN MINIMUM PIPE SEPARATION AS NOTED.
- CONTRACTOR TO DETERMINE ELEVATION OF PIPE CROSSINGS WITH HYDRAULIC CONNECTION. REFER TO SPECIFICATION 02200 FOR DETAILS REGARDING PROTECTION OF EXISTING UTILITIES DURING CONSTRUCTION WITH TEMPORARY EARTH RETENTION.
- 8" DIP FM TO BE INSTALLED AT DEPTH REQUIRED FOR AVOIDANCE OF CONFLICTS, BUT NO LESS THAN 3' COVER AT ALL LOCATIONS.
- THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE PLAN EXTENT OF TEMPORARY EARTH RETENTION SYSTEMS. THE USE OF THE FOLLOWING DEVICES IS PROHIBITED FOR TEMPORARY EARTH RETENTION SYSTEMS WHEN THE PURPOSE IS TO LIMIT GROUND MOVEMENT TO PROTECT STRUCTURES, UTILITIES, AND OTHER ADJACENT FACILITIES.
  - SOLDIER PILES WITH (STREET) PLATE OR OTHER TYPE OF PLATE LAGGING
  - SLIDE RAIL SYSTEMS
  - TRENCH SHIELDS i.e. TRENCH BOXES (TRENCH SHIELDS ARE CONSIDERED WORKER PROTECTION ONLY, NOT TEMPORARY EARTH RETENTION SYSTEMS)

- THE ABOVE RESTRICTIONS DO NOT PROHIBIT USING THE DEVICES STRICTLY FOR PROTECTION OF WORKERS IN EXCAVATIONS. REFER TO EXCAVATION AND FILL FOR STRUCTURES SPECIFICATION AND TRENCHING AND BACKFILLING SPECIFICATION FOR FURTHER DETAILS.
- TIE-IN WITH EXISTING NORTH PDPS SHALL BE DONE WITHOUT IMPACTING OPERATIONS TO THE PUMP STATION. REFER TO SPECIFICATIONS FOR ADDITIONAL CONSTRUCTION CONSTRAINTS.
  - PROTECT EXISTING STRUCTURES, PIPES, AND OTHER UTILITIES DURING THE INSTALLATION OF THE NEW 16" DIAMETER PIPE.

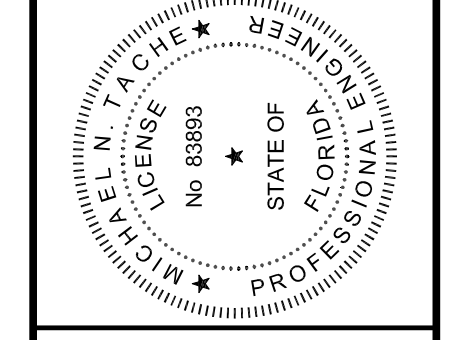


**PARTIAL SECTION**  
1/4" = 1'-0"



**PRELIMINARY - NOT FOR CONSTRUCTION**

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**SOUTHEAST WATER RECLAMATION FACILITY**  
**PLANT DRAIN PUMP STATION**

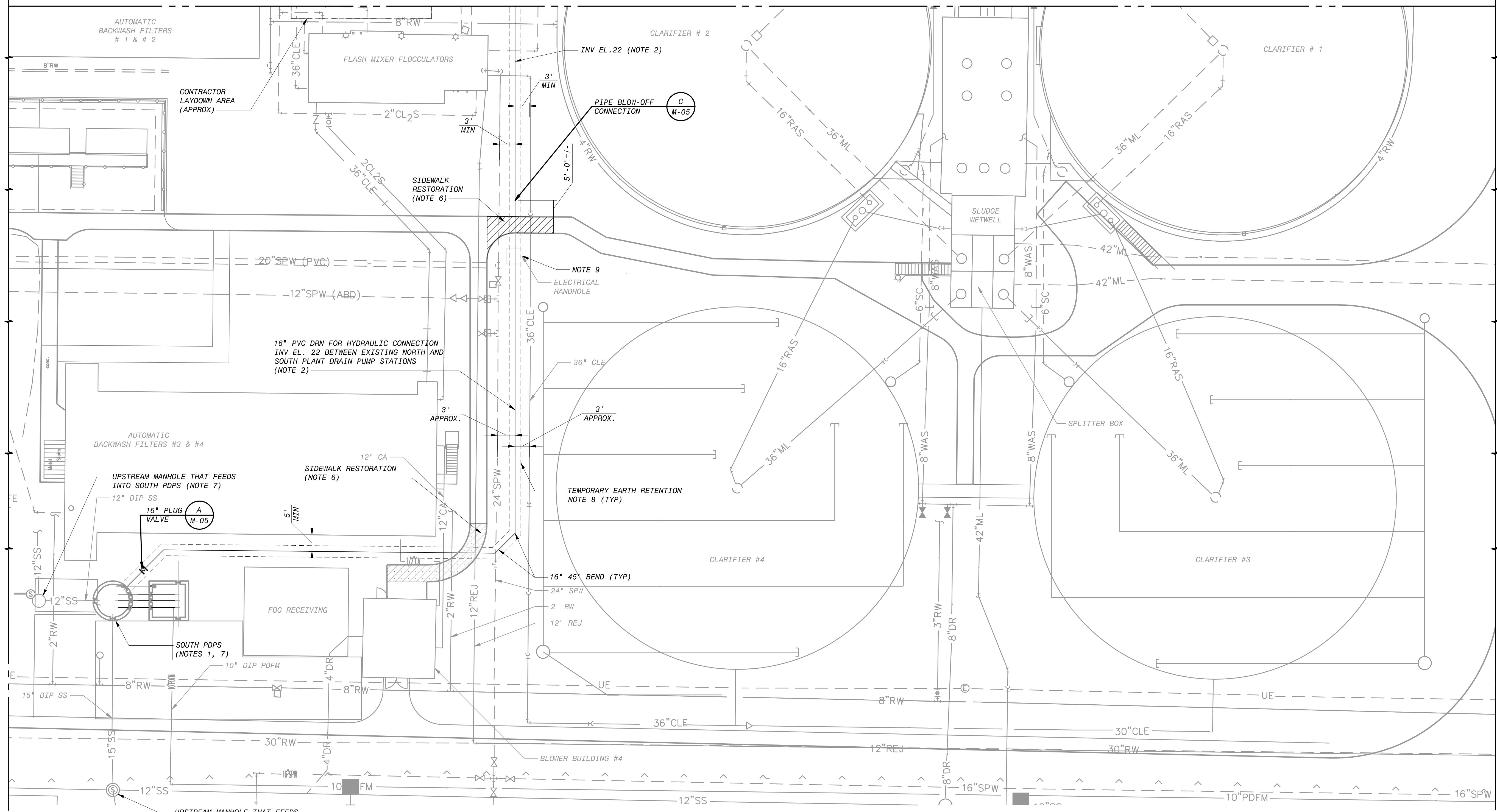
CIVIL  
PARTIAL YARD PIPING PLAN II

DESIGNED: DH  
DETAILED: PR  
CHECKED: BV  
APPROVED: MT  
DATE: FEB 2019

PROJECT NO.  
**198896**

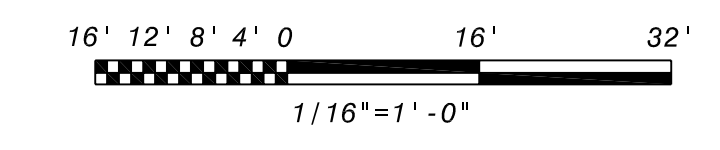
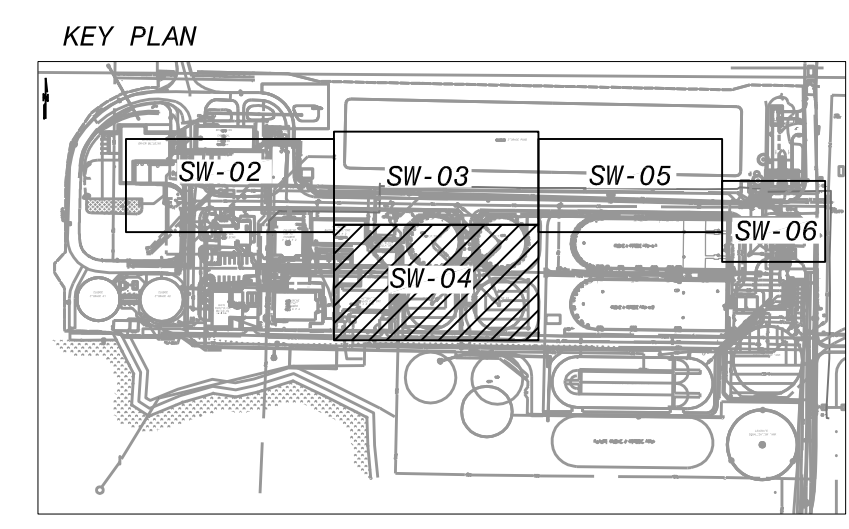
**SW-03**  
SHEET  
08 OF 42



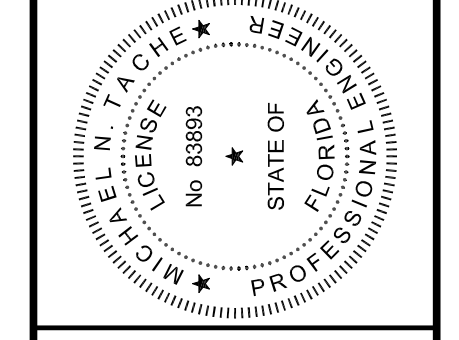


**PLAN**  
1/16" = 1'-0"

- NOTES:**
- REFER TO DRAWINGS M-01 AND M-02 FOR RETROFIT WORK AT THE SOUTH PLANT DRAIN PUMP STATION.
  - 16" PVC PS PIPE SHALL BE INSTALLED LEVEL, WITH NO SLOPE IN EITHER DIRECTION. CONNECTION TO THE EXISTING NORTH AND SOUTH PLANT DRAIN PUMP STATIONS SHALL BE MADE AT THE SAME ELEVATION (INV EL. 22.0). ENTIRE STRETCH OF CONNECTION SHALL REQUIRE TEMPORARY EARTH RETENTION DURING CONSTRUCTION. REFER TO THE EARTHWORK SPECIFICATIONS AND NOTE 8.
  - REFER TO M-01, M-02 AND M-05 FOR DETAILS ON PIPE CONNECTION TO THE EXISTING SOUTH PLANT DRAIN PUMP STATION.
  - DRAWING IS BASED ON AVAILABLE RECORDS AND INFORMATION COLLECTED DURING SITE VISITS. CONTRACTOR SHALL NOTIFY ENGINEER IF THERE ARE ANY DISCREPANCIES. CONTRACTOR SHALL CONFIRM ALIGNMENT BASED ON GENERAL NOTE #4.
  - CONTRACTOR TO DETERMINE ELEVATION OF PIPE CROSSINGS WITH HYDRAULIC CONNECTION. REFER TO SPECIFICATION 02200 FOR DETAILS REGARDING PROTECTION OF EXISTING UTILITIES DURING CONSTRUCTION WITH TEMPORARY EARTH RETENTION.
  - SIDEWALK RESTORATION TO BE PERFORMED PER COUNTY STANDARDS.
  - FUNCTIONALITY OF SOUTH PLANT DRAIN PUMP STATION SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT. CONTRACTOR IS RESPONSIBLE FOR PROVIDING EQUIPMENT / MATERIALS TO TEMPORARILY BYPASS WETWELL DURING THE DURATION OF DEMOLITION ACTIVITIES AND INSTALLATION OF NEW PUMP STATION. THE TWO MANHOLES THAT SEND FLOW TO THE SOUTH PDPS ARE INDICATED. DEPENDING ON CONTRACTOR'S METHODOLOGY FOR CONDUCTING THIS BYPASS, PUMPING EQUIPMENT MAY BE NEEDED IN MANHOLES TO BYPASS FLOW. CONTRACTOR MAY USE 16" DRN TO SEND THIS BYPASSED FLOW TO THE NORTH PDPS. REFER TO CONSTRUCTION CONSTRAINTS LISTED IN SPECIFICATIONS FOR ADDITIONAL INFORMATION.
  - THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE PLAN EXTENT OF TEMPORARY EARTH RETENTION SYSTEMS. THE USE OF THE FOLLOWING DEVICES IS PROHIBITED FOR TEMPORARY EARTH RETENTION SYSTEMS WHEN THE PURPOSE IS TO LIMIT GROUND MOVEMENT TO PROTECT STRUCTURES, UTILITIES, AND OTHER ADJACENT FACILITIES.
    - SOLDIER PILES WITH (STREET) PLATE OR OTHER TYPE OF PLATE LAGGING
    - SLIDE RAIL SYSTEMS
    - TRENCH SHIELDS I.E. TRENCH BOXES (TRENCH SHIELDS ARE CONSIDERED WORKER PROTECTION ONLY, NOT TEMPORARY EARTH RETENTION SYSTEMS)
- THE ABOVE RESTRICTIONS DO NOT PROHIBIT USING THE DEVICES STRICTLY FOR PROTECTION OF WORKERS IN EXCAVATIONS. REFER TO EXCAVATION AND FILL FOR STRUCTURES SPECIFICATION AND TRENCHING AND BACKFILLING SPECIFICATION FOR FURTHER DETAILS.
- ELECTRICAL HANDHOLE LOCATED IN THE FIELD. RECORD DRAWINGS INDICATE THAT THIS DUCTBANK RUNS EAST-WEST. ELECTRICAL HANDHOLE IS TO BE PROTECTED IN PLACE.



FEB 2019	100% SUBMITTAL	D	AD	DN	MT
DEC 2018	90% SUBMITTAL	C	AD	MM	MT
SEPT 2018	60% SUBMITTAL	B	AD	MM	MT
JULY 2018	30% SUBMITTAL	A	AD	MM	MT
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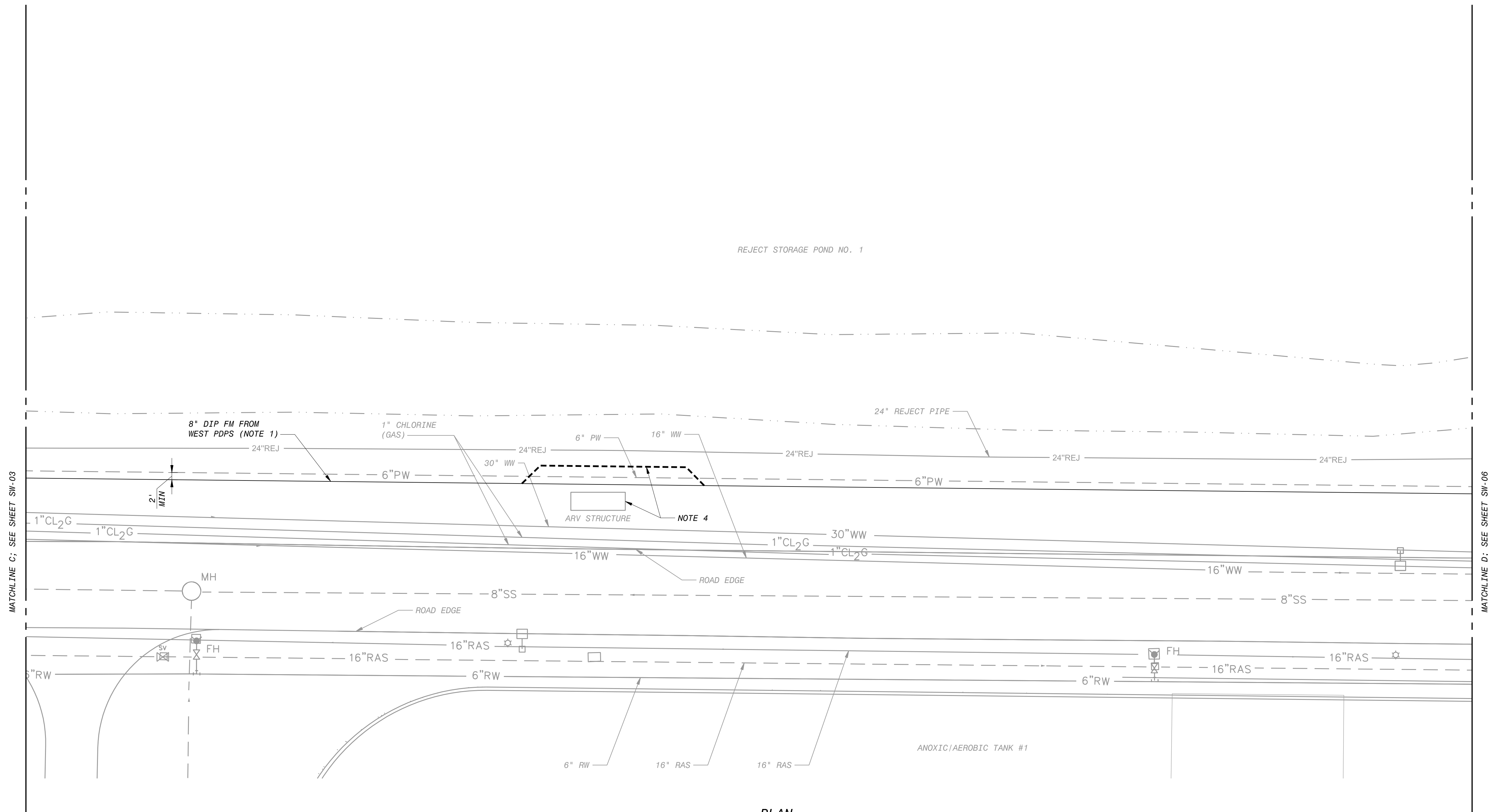
**MANATEE COUNTY, FLORIDA**  
**SOUTHEAST WATER RECLAMATION FACILITY**  
**PLANT DRAIN PUMP STATION**

CIVIL  
PARTIAL YARD PIPING PLAN III

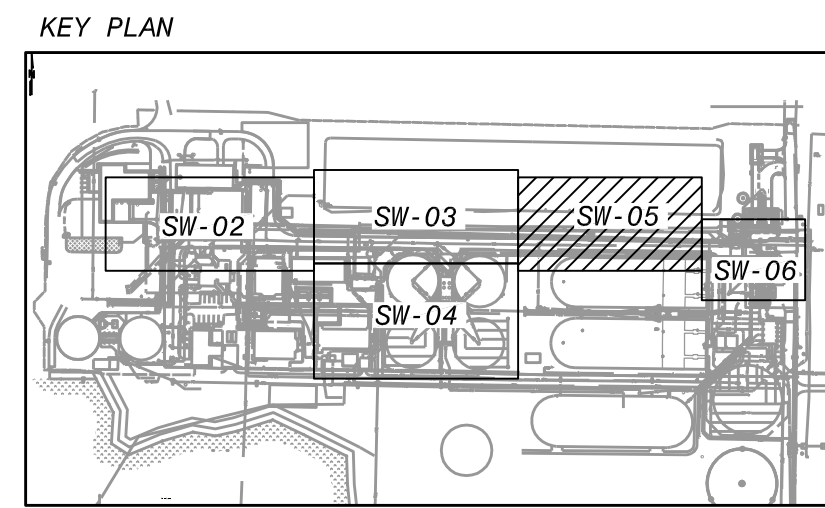
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DETAILED: PR  
CHECKED: BV  
APPROVED: MT  
DATE: FEB 2019

PROJECT NO.  
**198896**

**SW-04**  
SHEET  
09 OF 42



PLAN  
1/16" = 1'-0"



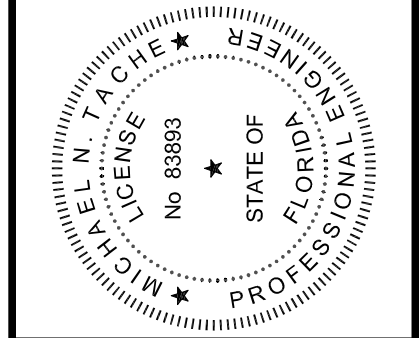
16' 12' 8' 4' 0' 16' 32'  
1/16" = 1'-0"

- NOTES:
- 8" DIP FM TO BE INSTALLED AT DEPTH REQUIRED FOR AVOIDANCE OF CONFLICTS, BUT NO LESS THAN 3' COVER AT ALL LOCATIONS.
  - ALTHOUGH CONTRACTOR SHALL FIELD VERIFY EXISTING PIPING ALONG PROPOSED PIPE ROUTING, IT SHOULD BE NOTED THAT THERE IS MORE CONFIDENCE IN THE LOCATIONS OF THE 24" REJECT LINE AND 6" PW LINE BASED ON RECENT WORK AT THE SEWRF. WHEN ROUTING THE 8" DIP FM TO THE SOUTH OF THE 6" FM, CONTRACTOR SHALL CONSIDER MAINTAINING MINIMUM PIPE SEPARATION AS NOTED.
  - DRAWING IS BASED ON AVAILABLE RECORDS AND INFORMATION COLLECTED DURING SITE VISITS. CONTRACTOR SHALL NOTIFY ENGINEER IF THERE ARE ANY DISCREPANCIES. CONTRACTOR SHALL CONFIRM ALIGNMENT BASED ON GENERAL NOTE #4.
  - ARV STRUCTURE LOCATED IN THE FIELD, BUT NOT SHOWN ON RECORD DRAWINGS. CONTRACTOR SHALL TAKE PARTICULAR CARE WHEN ROUTING 8" DIP FM AROUND THIS STRUCTURE. IF NEEDED, CONTRACTOR MAY TEMPORARILY ROUTE PIPING BETWEEN 6" PW AND 24" REJECT LINE. SERVICE OF ARV IS NOT KNOWN.

REJECT STORAGE POND NO. 1

ANOXIC/AEROBIC TANK #1

FEB 2019	100% SUBMITTAL	D	AD	DN	MT
DEC 2018	90% SUBMITTAL	C	AD	MM	MT
SEPT 2018	60% SUBMITTAL	B	AD	MM	MT
JULY 2018	30% SUBMITTAL	A	AD	MM	MT
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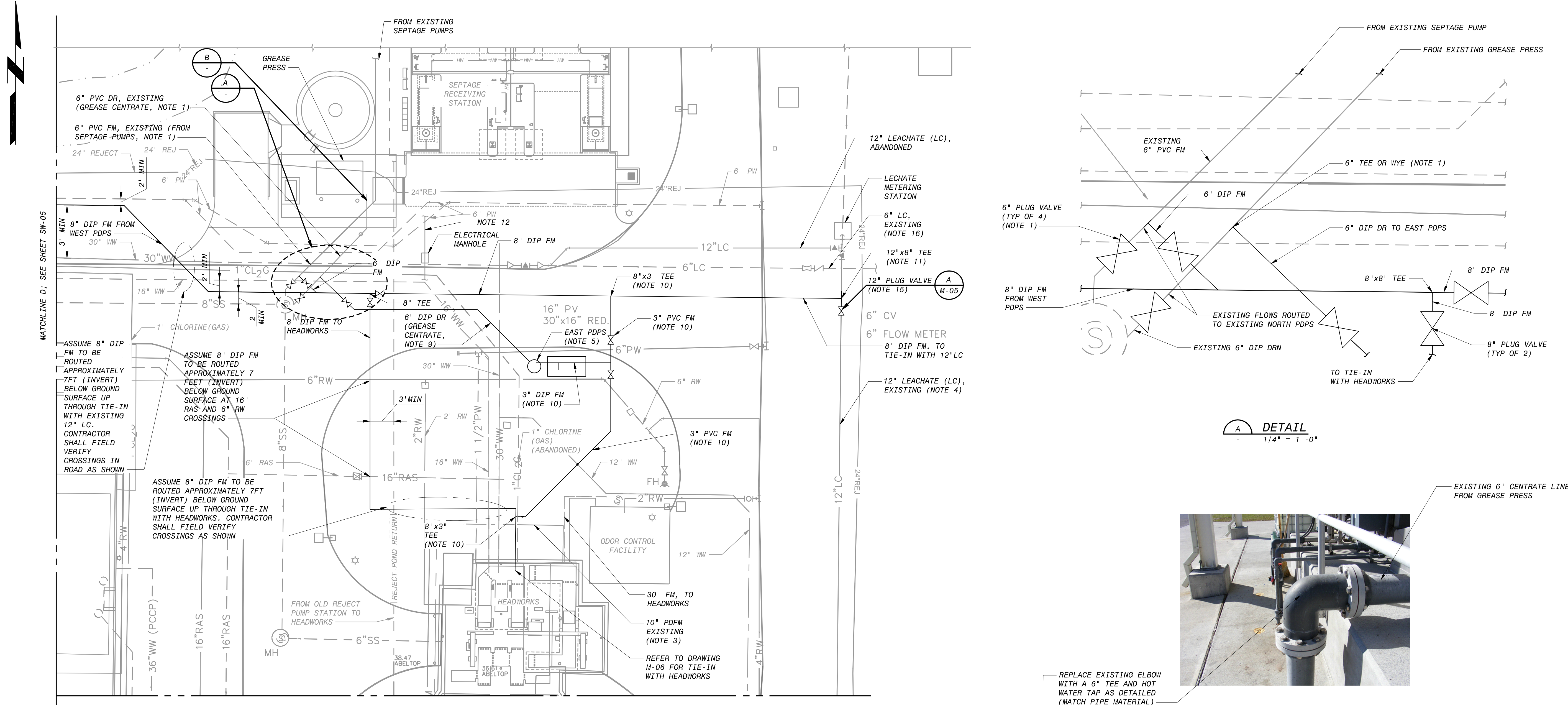
MANATEE COUNTY, FLORIDA  
SOUTHEAST WATER RECLAMATION FACILITY  
PLANT DRAIN PUMP STATION

CIVIL  
PARTIAL YARD PIPING PLAN IV

DESIGNED: DH  
DETAILED: PR  
CHECKED: BV  
APPROVED: MT  
DATE: FEB 2019

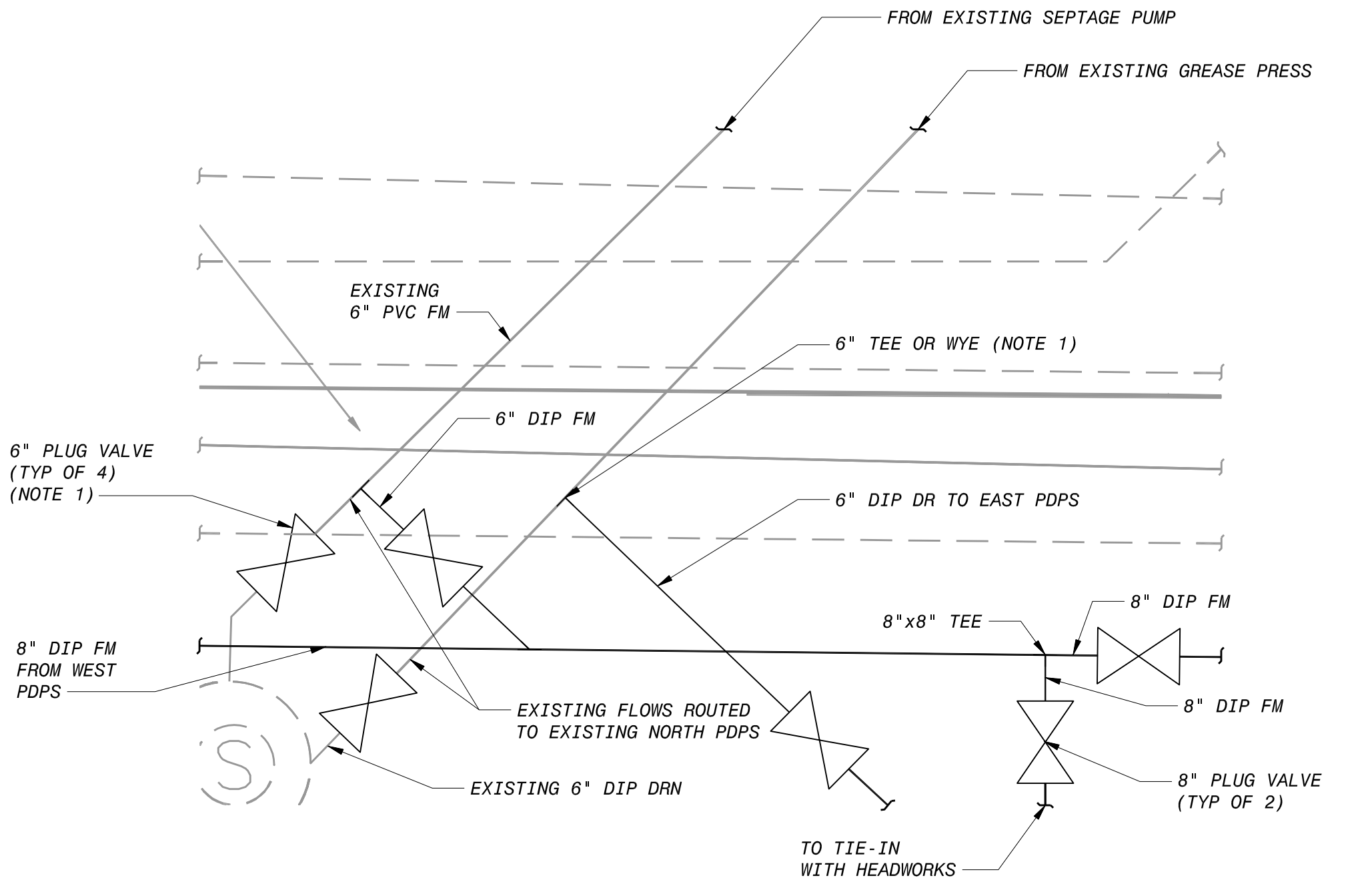
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SW-05  
SHEET  
10 OF 42



**PLAN**  
1/16" = 1'-0"

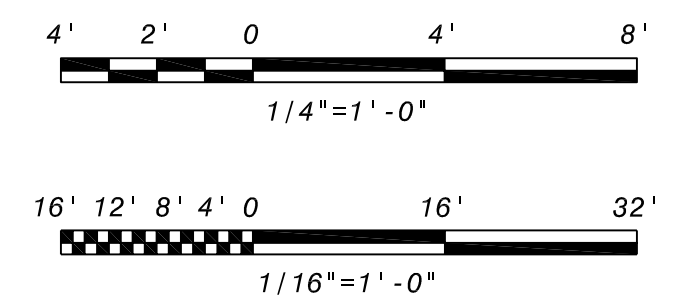
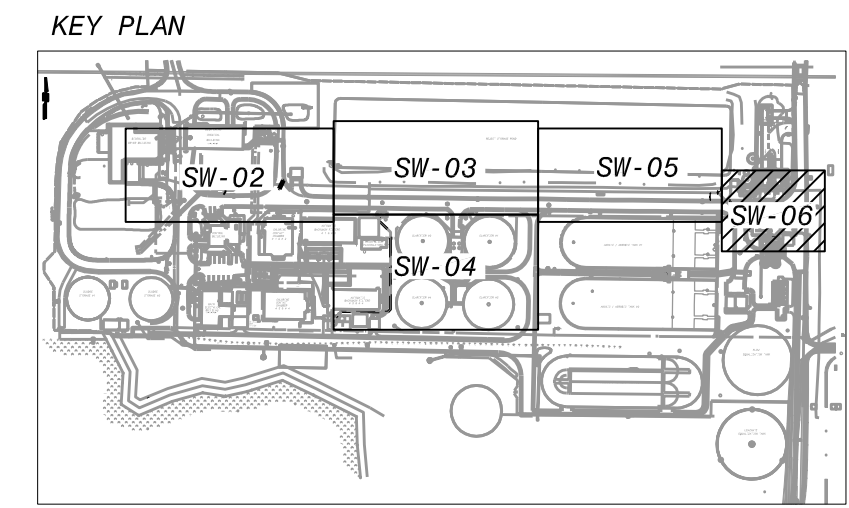
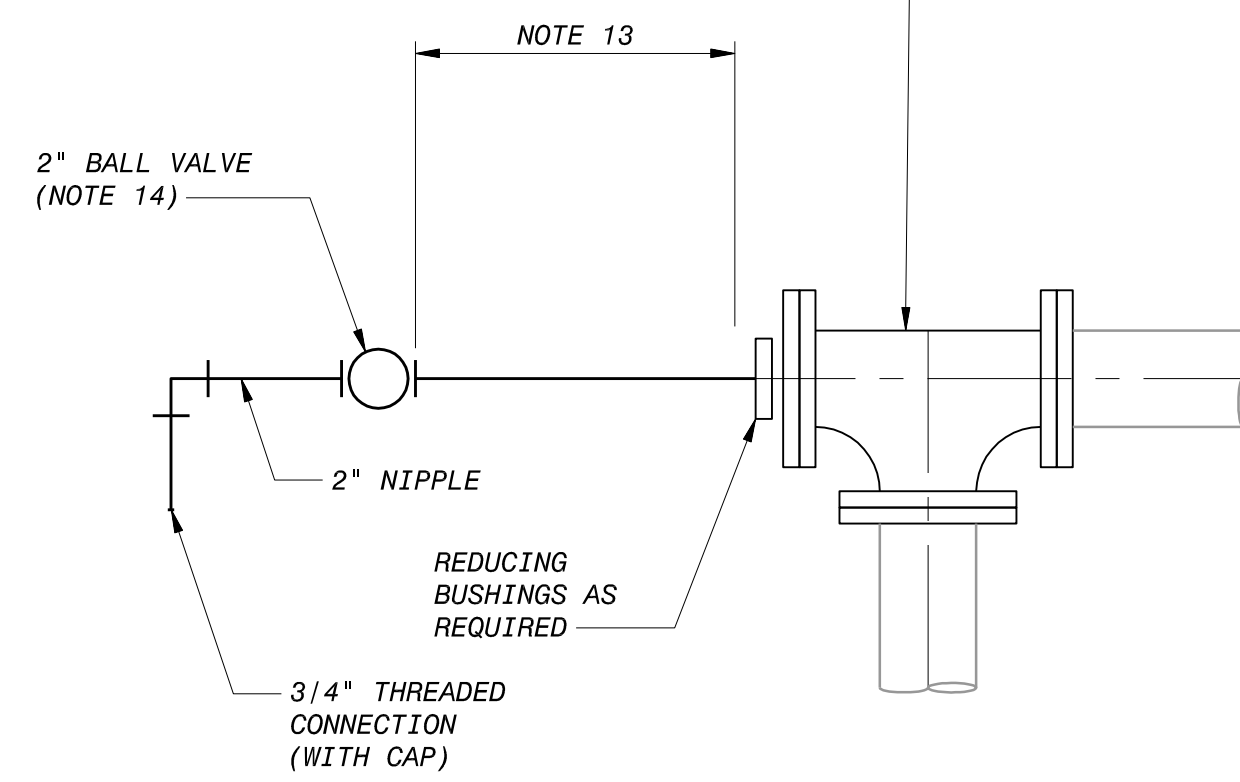
- NOTES:**
- TIE-IN TO EXISTING 6" FM (FROM SEPTAGE PUMPS, PVC C900) AND 6" DR (GREASE CENTRATE FROM GREASE PRESS, PVC) SHALL BE COORDINATED WITH OWNER. UNLESS OTHERWISE ALLOWED, TIE-IN WILL NEED TO BE CONDUCTED DURING WEEKEND HOURS WHEN THE EQUIPMENT IS OFFLINE. THE FOUR (4) 6" PLUG VALVES AND TWO 8" PLUG VALVES AND ASSOCIATED PIPING TO THE SOUTH OF THE SEPTAGE RECEIVING FACILITY SHALL BE INSTALLED AS PART OF THIS TIE-IN SEQUENCE. REFER TO SPECIFICATIONS FOR CONSTRUCTION CONSTRAINTS. NORMAL OPERATION OF THE SEPTAGE RECEIVING FACILITY SHALL NOT BE IMPACTED.
  - THE FOLLOWING FLOWS ARE TO BE ROUTED INTO EXISTING 12" LC VIA THE 8" FM (FROM WEST PDPS); 3" FM (FROM EAST PDPS) AND 6" FM (FROM EXISTING SEPTAGE PUMP STATION).
  - 10" PDFM FROM EXISTING SOUTH PLANT DRAIN PUMP STATION TO HEADWORKS.
  - AS NOTED IN THE SPECIFICATIONS, THE 12" LEACHATE (LC) IS USED TO CONVEY LEACHATE FROM LOCAL LANDFILL TO BOTH EXISTING EQ BASINS. NEW FLOWS WILL BE CONVEYED INTO EXISTING 12" LC INDICATED.
  - REFER TO SPECIFICATIONS AND DRAWINGS M-07 AND I-04 FOR DETAILS ON THE PACKAGED EAST PLANT DRAIN PUMP STATION.
  - DRAWING IS BASED ON AVAILABLE RECORDS AND INFORMATION COLLECTED DURING SITE VISITS. CONTRACTOR SHALL NOTIFY ENGINEER IF THERE ARE ANY DISCREPANCIES. CONTRACTOR SHALL CONFIRM ALIGNMENT BASED ON GENERAL NOTE #4.
  - CONTRACTOR SHALL PROVIDE ANY NECESSARY COUPLINGS, SLEEVES, OR APPURTENANCES NECESSARY TO CONNECT TO EXISTING PIPING. ALL TO BE RESTRAINED JOINT PIPE.
  - EXACT LOCATION OF EAST PDPS WETWELL AND VALVE PAD TO BE FIELD DETERMINED AND AGREED WITH BY OWNER AND ENGINEER.
  - ROUTE GREASE CENTRATE LINE TO EAST PDPS AT APPROXIMATELY 5 FEET BELOW GROUND SURFACE. MAINTAIN SLIGHT DOWNWARD SLOPE TOWARDS WETWELL, WITH TIE-IN TO EAST PDPS WETWELL AT ELEVATION 31.5 FEET. TIE-IN WITH WETWELL SHALL BE COORDINATED WITH SUPPLIER OF EAST PDPS.
  - ROUTE EAST PDPS DISCHARGE PIPE APPROXIMATELY 7 FEET (INVERT) BELOW GROUND SURFACE TO ALLOW FOR CONNECTION TO EACH 8" X 3" TEE.
  - CONTRACTOR TO FIELD LOCATE EXISTING 12" LC LINE AND TIE-IN AS INDICATED. A FLOWMETER TO BE INSTALLED ON THE 12" LC, LOCATED TO THE NORTH OF THIS TEE WILL BE DONE UNDER A SEPARATE PROJECT. 12" LC IS DUCTILE IRON PIPE (DIP).
  - CONTRACTOR SHALL NOTE THAT THERE IS A CONCRETE ENCASED 480 VOLT FEEDER AND SPARE CONDUIT, INSTALLED AS PART OF THE 2017 SEPTAGE RECEIVING PROJECT. EXACT LOCATION IS UNKNOWN. INFORMATION WAS OBTAINED FROM CONSTRUCTION RED-LINES AND SHALL BE CONFIRMED BY CONTRACTOR.
  - DIMENSION BETWEEN REDUCING BUSHINGS AND BALL VALVE SHALL BE SUFFICIENT TO PREVENT CONTACT BETWEEN THE VALVE OPERATING LEVER AND ADJACENT PIPING BUT SHALL NOT EXCEED FOUR INCHES UNLESS OTHERWISE PERMITTED BY THE ENGINEER.
  - BALL VALVE SHALL BE CONBRACO INDUSTRIES "APOLLO 83-200 SERIES" WITH MANUAL LEVER OPERATOR.
  - INSTALLATION OF PLUG VALVE SHALL BE COORDINATED WITH OWNER AND ENGINEER. UNLESS OTHERWISE ALLOWED, THIS WORK WILL NEED TO BE DONE DURING WEEKEND HOURS OR WHEN THE LEACHATE LINE IS TEMPORARILY OFFLINE.
  - ALL BURIED PLUG VALVES SHALL MEET REQUIREMENTS IN DETAIL A ON DRAWING M-05.



**DETAIL A**  
1/4" = 1'-0"



**DETAIL B**  
HOT WATER TAP DETAIL  
NTS



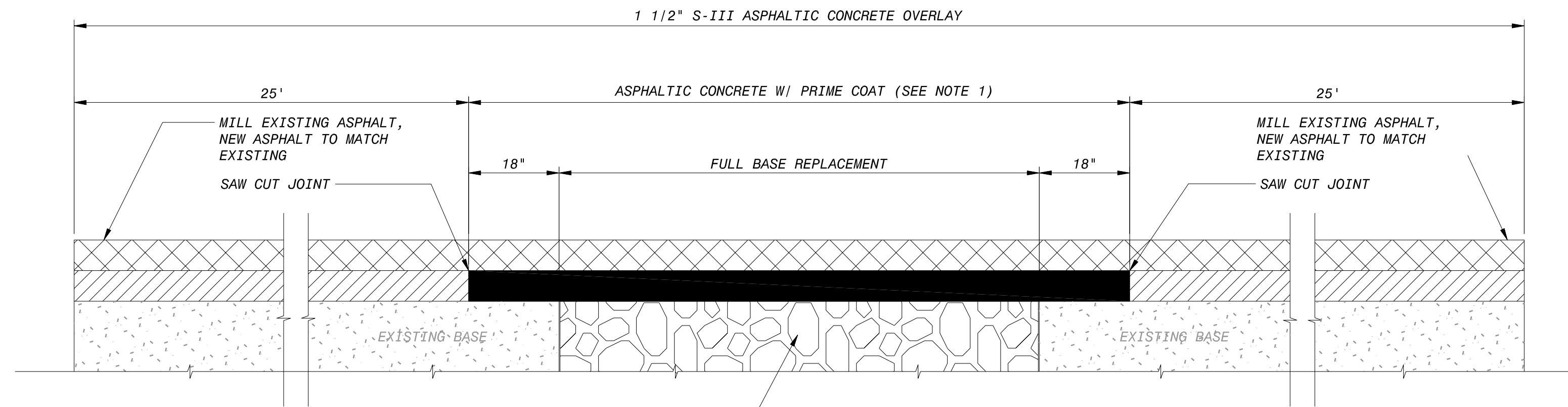
**PRELIMINARY - NOT FOR CONSTRUCTION**

DESIGNED: DH	PROJECT NO. 198896
DATE: FEB 2019	SHEET 11 OF 42
Detailed: PR	SW-06
Checked: BV	
Approved: MT	
REVISIONS AND RECORD OF ISSUE	
NO. BY CR APP	
A AD MM MT	
B AD MM MT	
C AD MM MT	
D AD MM MT	

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 DEC 2018 90% SUBMITTAL  
 SEPT 2018 60% SUBMITTAL  
 JULY 2018 30% SUBMITTAL  
 DATE REVISED BY  
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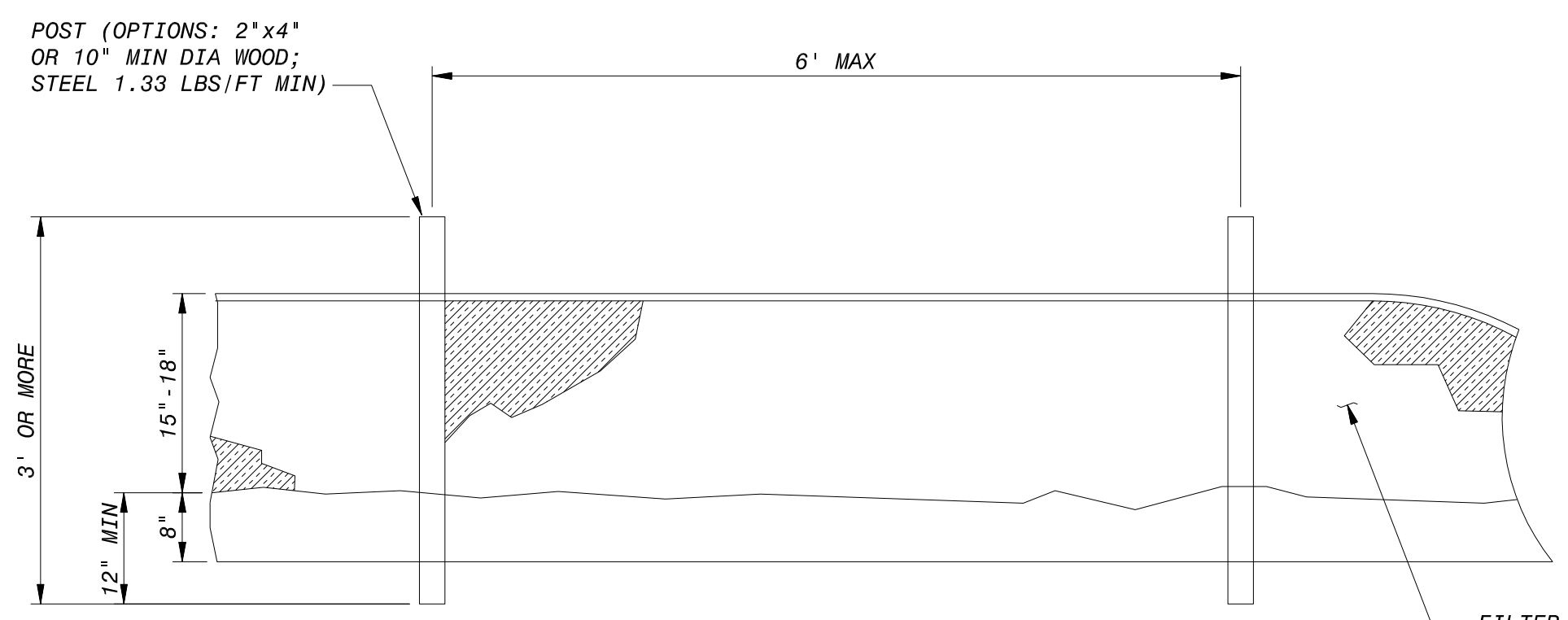
MANATEE COUNTY, FLORIDA  
 SOUTHEAST WATER RECLAMATION FACILITY  
 PLANT DRAIN PUMP STATION  
 CIVIL  
 PARTIAL YARD PIPING PLAN V

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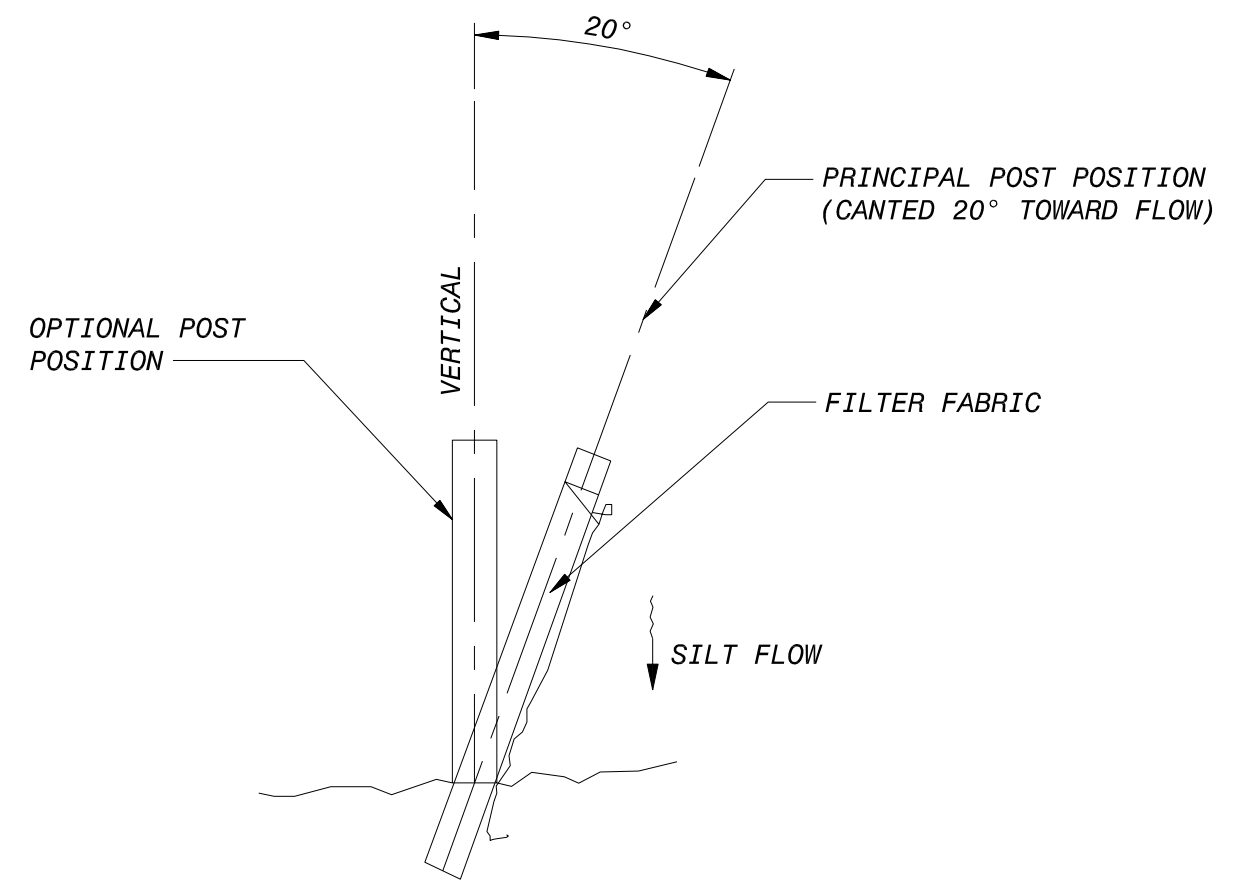


SEE NOTE 4  
**A PAVEMENT RESTORATION**  
 SW-02, SW-04, SW-06 NO SCALE

1. ASPHALT CONCRETE STRUCTURE COURSE WITH PRIME COAT SHALL BE THE SAME DEPTH AND TYPE AS EXISTING OR A MINIMUM OF 1 1/4 INCH, WHICHEVER IS GREATER.
2. MILL 25' BACK FROM TRENCH SAW CUT, ADJUST MILLING PER INDIVIDUAL SITE TO NOT IMPACT BASE. BUTT JOINT TO EXIST ASPHALT. FINAL OVERLAY LIMITS ARE FROM EDGE OF PAVEMENT TO EDGE OF PAVEMENT. FINAL OVERLAY TO MATCH EXISTING WITH NO DISCERNABLE "BUMP" AT JOINT. MILLING LIMITS THAT IMPACT INTERSECTION SHALL BE ADDRESSED ON A CASE BY CASE BASIS AND APPROVED BY MANATEE COUNTY.
3. SHEETING ORDERED LEFT IN PLACE TO BE CUT OFF 24" BELOW FINISHED GRADE OR 12" BELOW SUBGRADE.
4. BASE SHALL BE 8" MINIMUM THICKNESS CRUSHED CONCRETE.

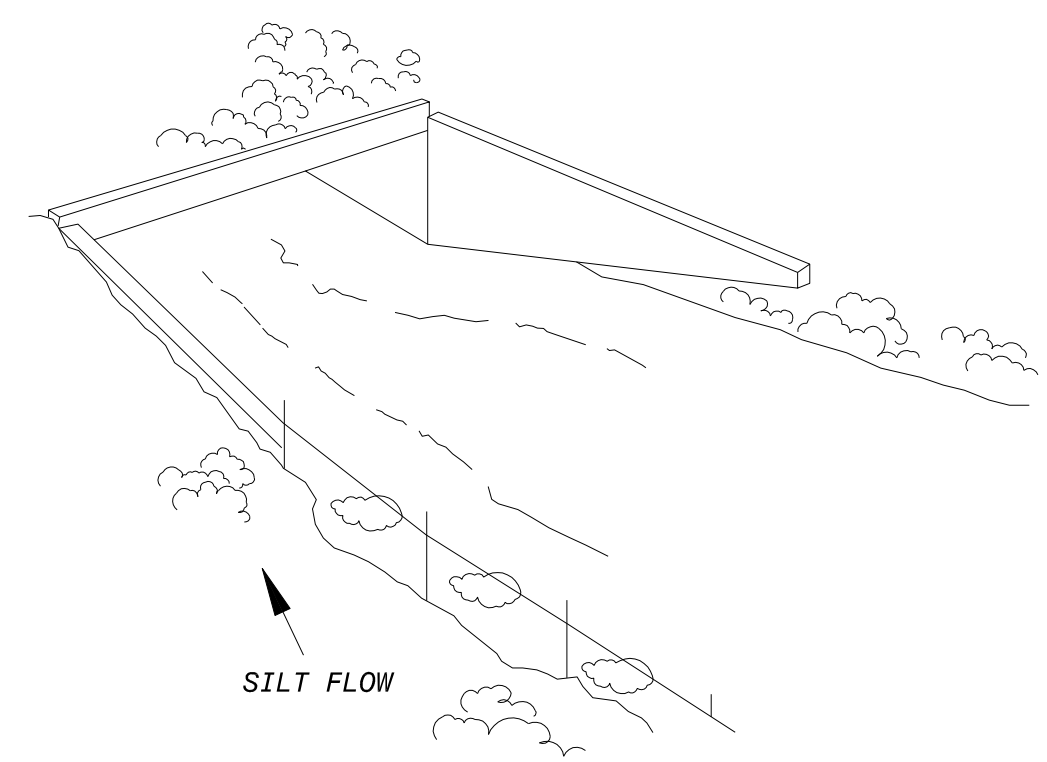


**ELEVATION**

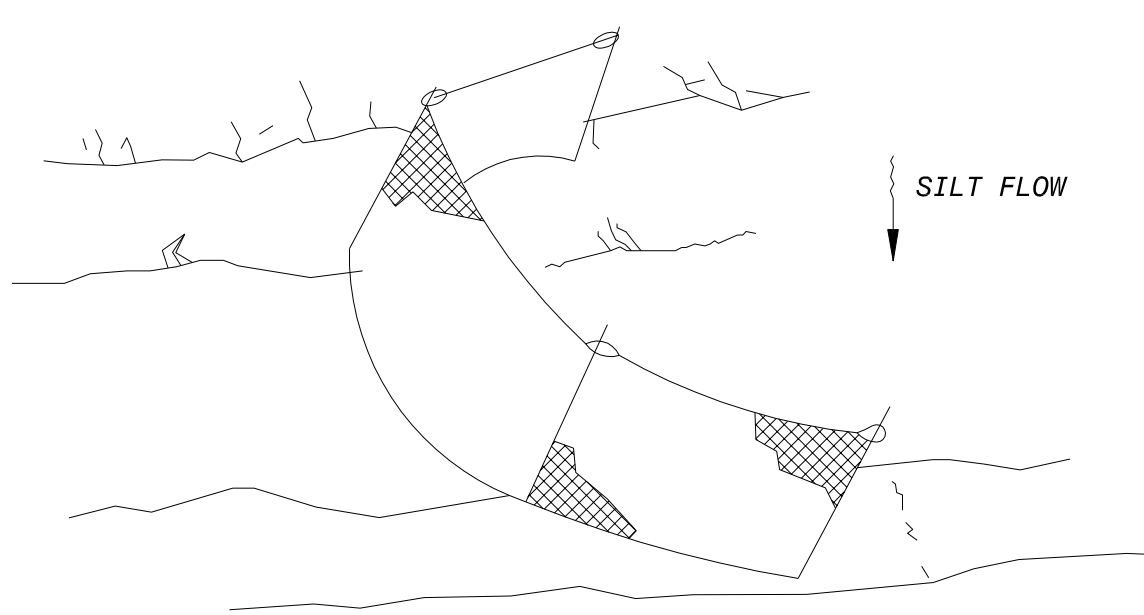


**SECTION**

**TYPE 3 SILT FENCE**



**TYPE 3 SILT FENCE**



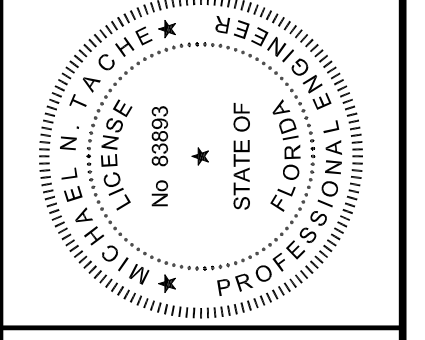
**TYPE 3 SILT FENCE**

DO NOT DEPLOY IN A MANNER THAT SILT FENCES WILL ACT AS A DAM ACROSS PERMANENT FLOWING WATERCOURSES. SILT FENCES ARE TO BE USED AT UPLAND LOCATIONS AND TURBIDITY BARRIERS USED AT PERMANENT BODIES OF WATER.

**TYPE 3 SILT FENCE APPLICATIONS**

**SILT FENCE**  
 NO SCALE

FEB 2019	100% SUBMITTAL	B	AD	DH	MT
DEC 2018	90% SUBMITTAL	A	AD	IM	MT
DATE	REVISED AND RECORD OF ISSUE	NO.	BY	CHK	APP
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SW-07.dwg					
SAVED:RAM64017_05-02-2019 13:56:26	XREF1:				
PLOTTED:	XREF2:				
USER:RAM64017	XREF3:				
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	DWG. VER: 1004				



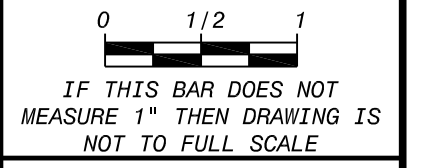
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 Certificate No. 8132

MANATEE COUNTY, FLORIDA  
 SOUTHEAST WATER RECLAMATION FACILITY  
 PLANT DRAIN PUMP STATION

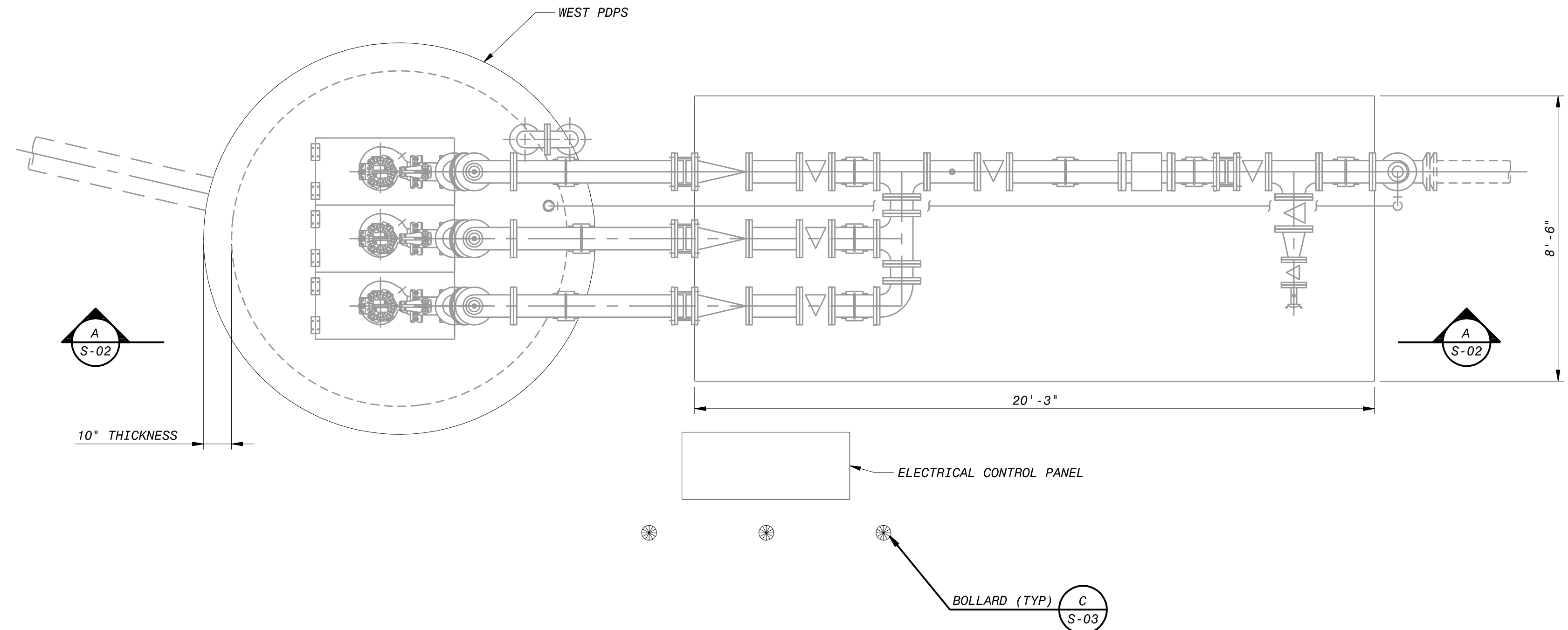
CIVIL  
 DETAILS

DESIGNED: DH  
 DETAILED: PR  
 CHECKED: BV  
 APPROVED: MT  
 DATE: FEB 2019

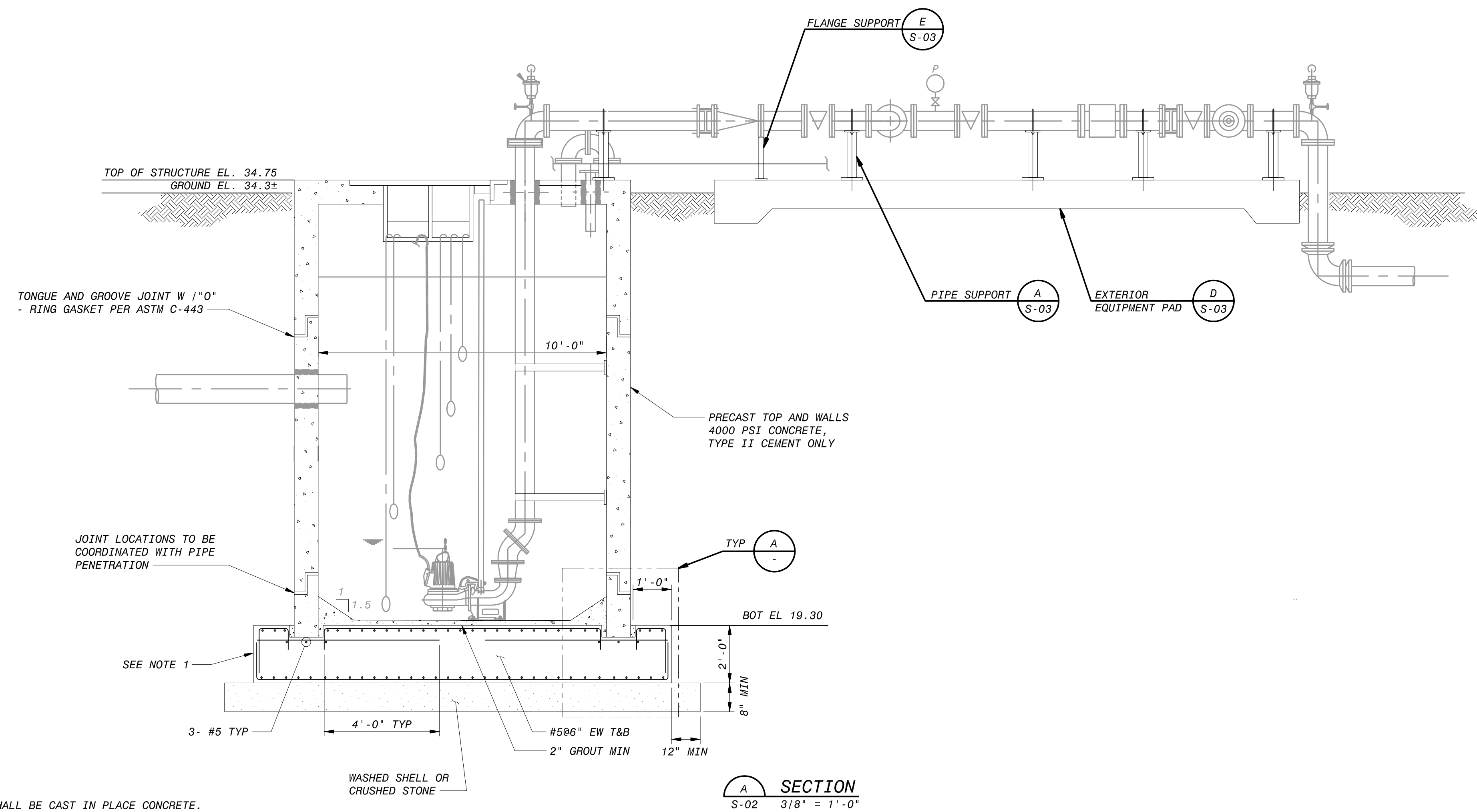


PROJECT NO.  
 198896  
**SW-07**  
 SHEET  
 12 OF 42

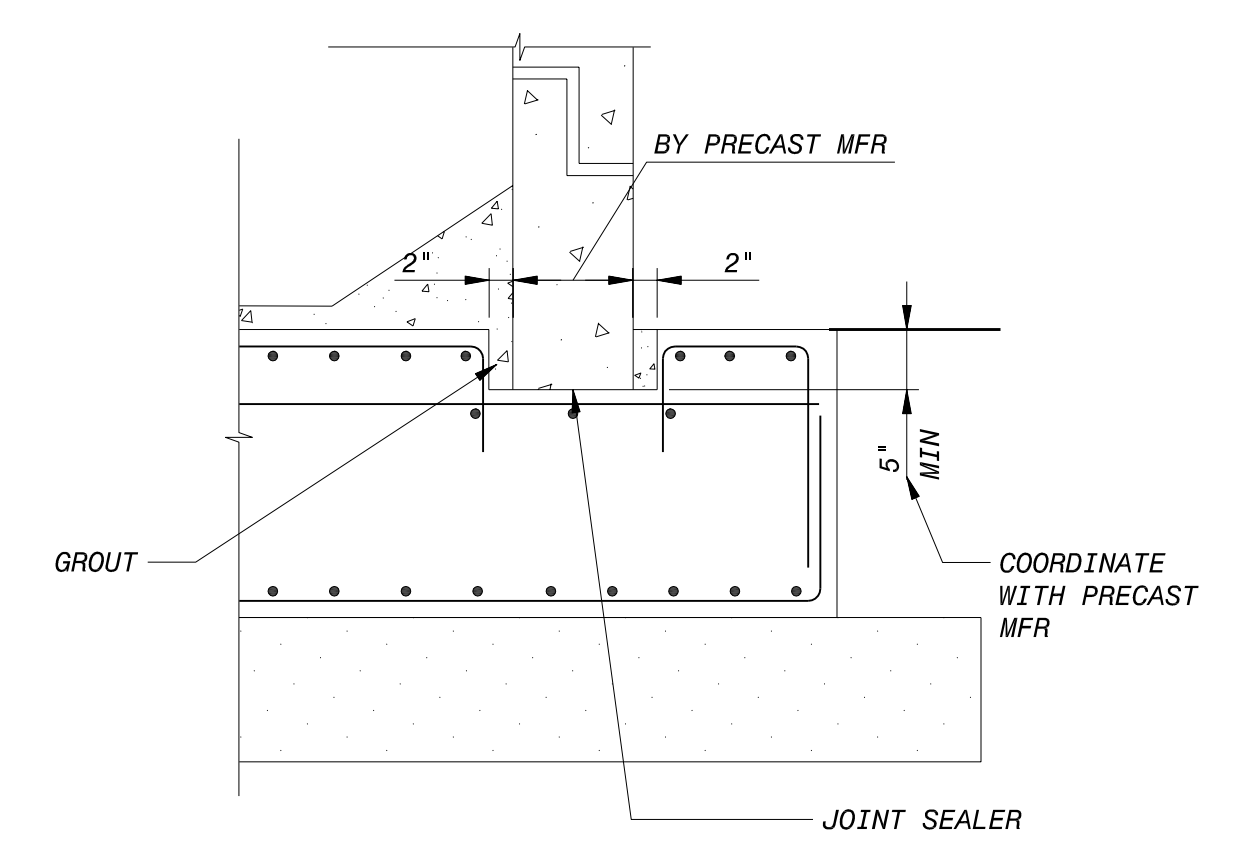




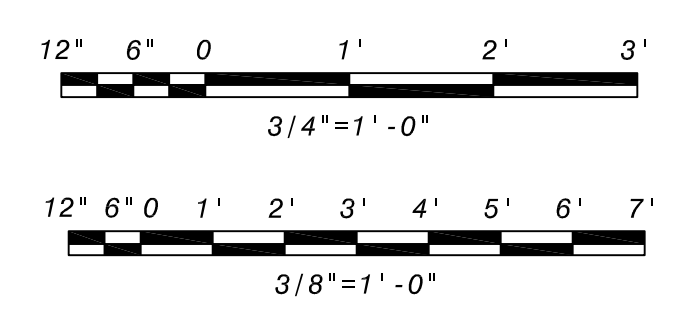
**WETWELL - TOP PLAN**  
3/8" = 1'-0"



**SECTION**  
A S-02 3/8" = 1'-0"

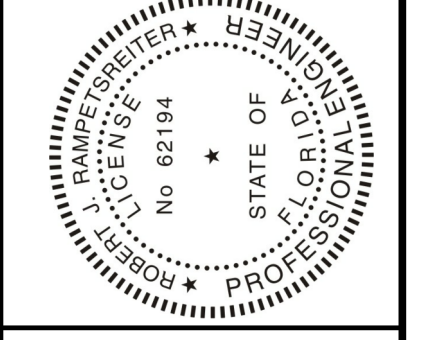


**DETAIL**  
A S-02 3/4" = 1'-0"



- NOTES:**
1. MANHOLE BASE SHALL BE CAST IN PLACE CONCRETE.
  2. REFER TO SPECIFICATIONS FOR EARTHWORK REQUIREMENTS.

FEB 2019	100% SUBMITTAL	C	AD	DM	MT
DEC 2018	90% SUBMITTAL	B	AD	MM	MT
SEPT 2018	60% SUBMITTAL	A	RZ	MM	MT
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CHK	APP
50.3400	Structural Drawings				
S-02.dwg					
SAVED: KAJ46814, 1/29/2019 4:28:21 PM					
PLOTTED: PAK3322, 25-10-2018 14:1					
USER: KAJ46814 DWG VER: 1003					



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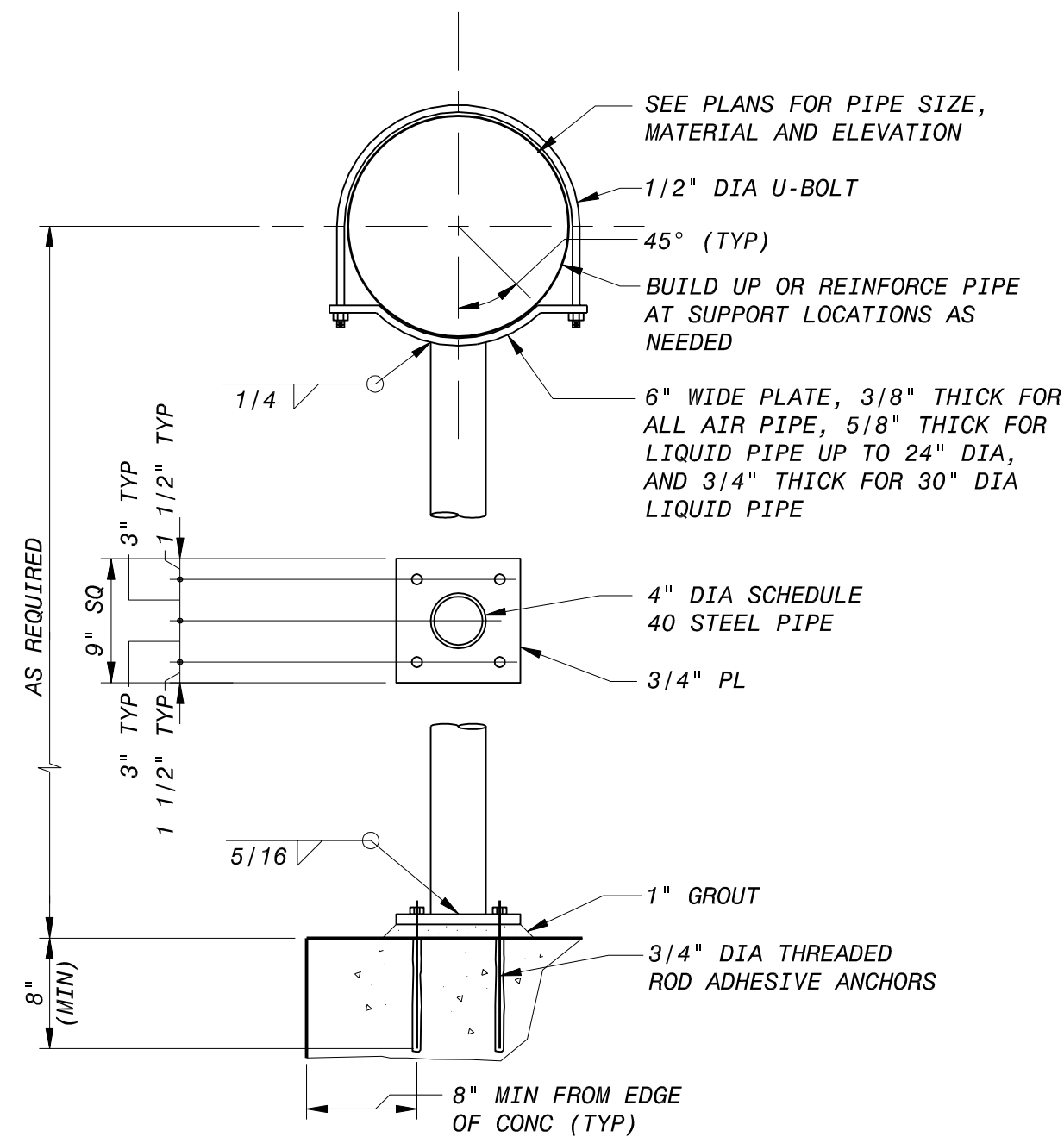
MANATEE COUNTY, FLORIDA  
SOUTHEAST WATER RECLAMATION FACILITY  
PLANT DRAIN PUMP STATION

STRUCTURAL  
WEST PLANT DRAIN PUMP STATION  
PLAN AND SECTION

DESIGNED: AS/RZ  
DETAILED: PR  
CHECKED: DD  
APPROVED: RR  
DATE: FEB 2019

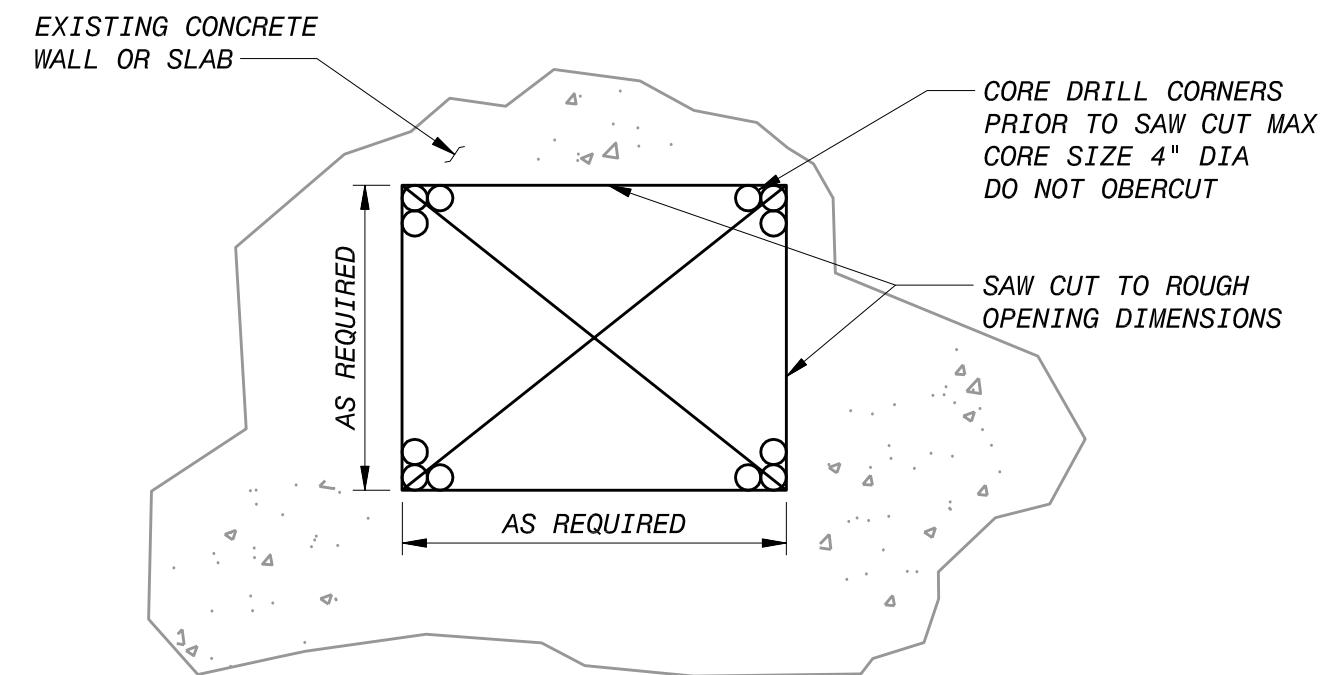
PROJECT NO.  
198896

**S-02**  
SHEET  
14 OF 42

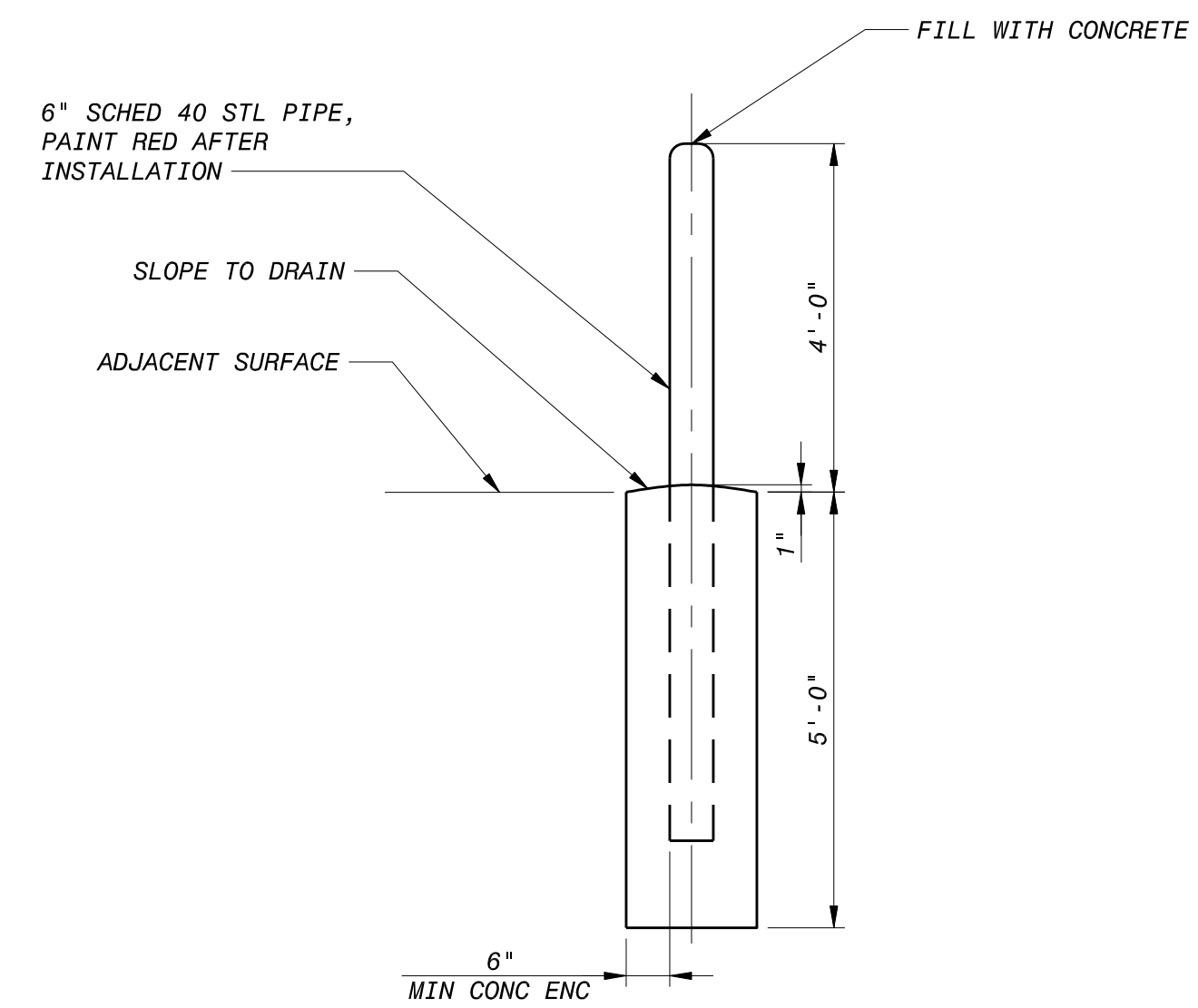


NOTE: ALL STEEL MATERIALS SHALL BE HOT-DIP GALVANIZED FOR EXTERIOR LOCATIONS. VENT HOLES FOR GALVANIZING SHALL BE THE MINIMUM SIZE NECESSARY. HOLES SHALL BE LOCATED IN THE BOTTOM BASEPLATE AND ALSO LOCATED IN THE TOP OF THE PIPE, ADJACENT TO THE CURVED PLATE.

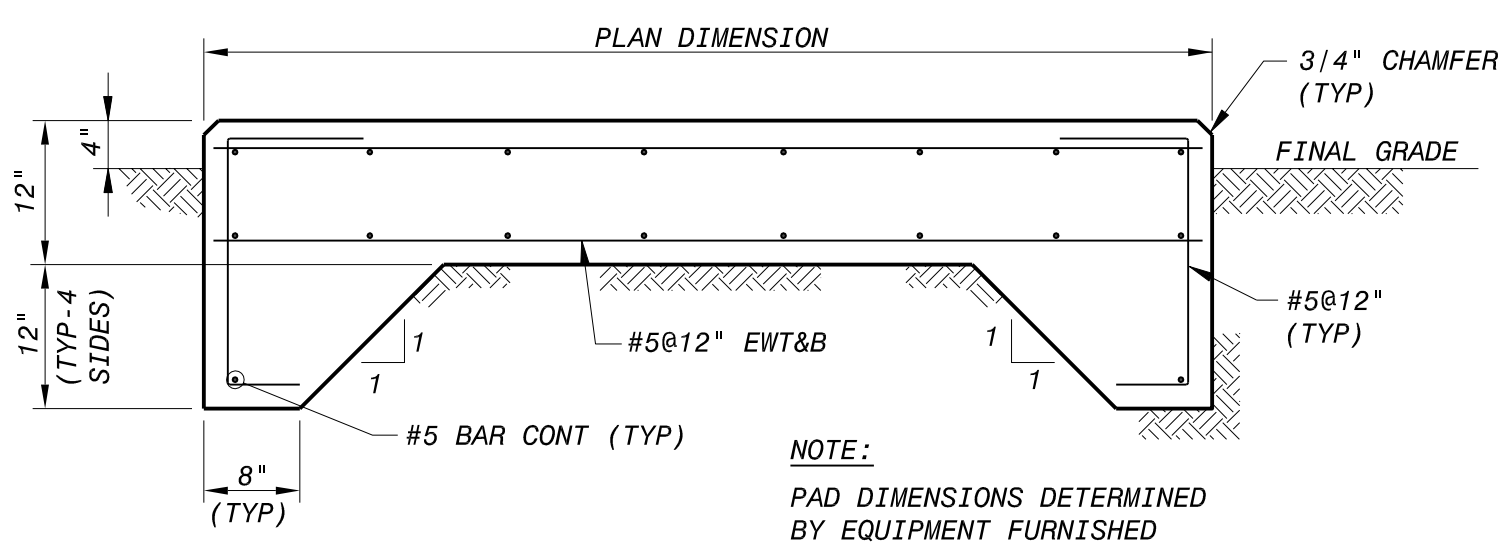
**A** 4 INCH DIAMETER STEEL COLUMN PIPE SUPPORT  
S-02 NO SCALE



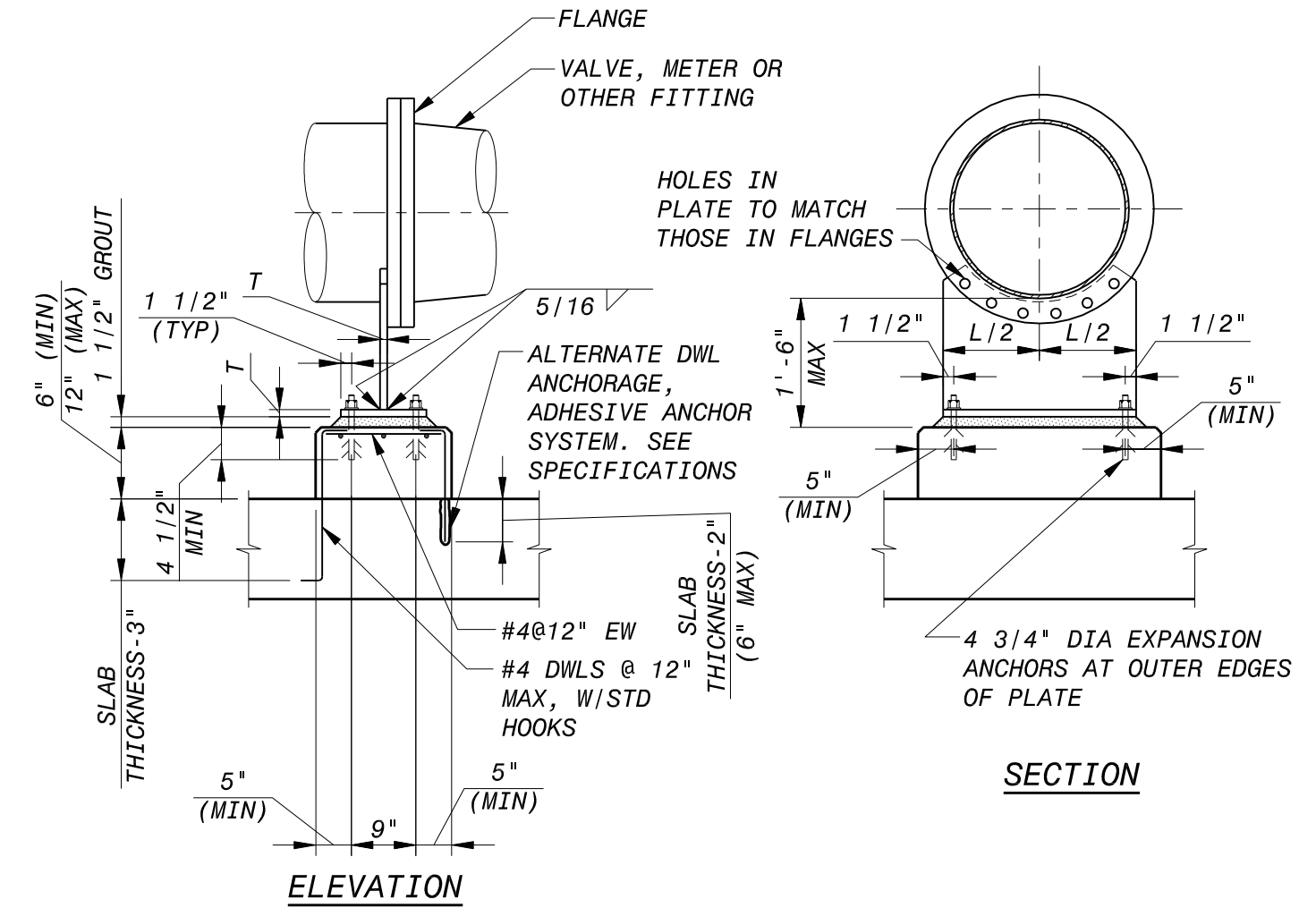
**B** PROCEDURE FOR CUTTING OR ENLARGING OPENING IN EXISTING CONCRETE SLABS OR WALLS  
S-W-02 1" = 1'-0"



**C** BOLLARD  
S-02 NO SCALE

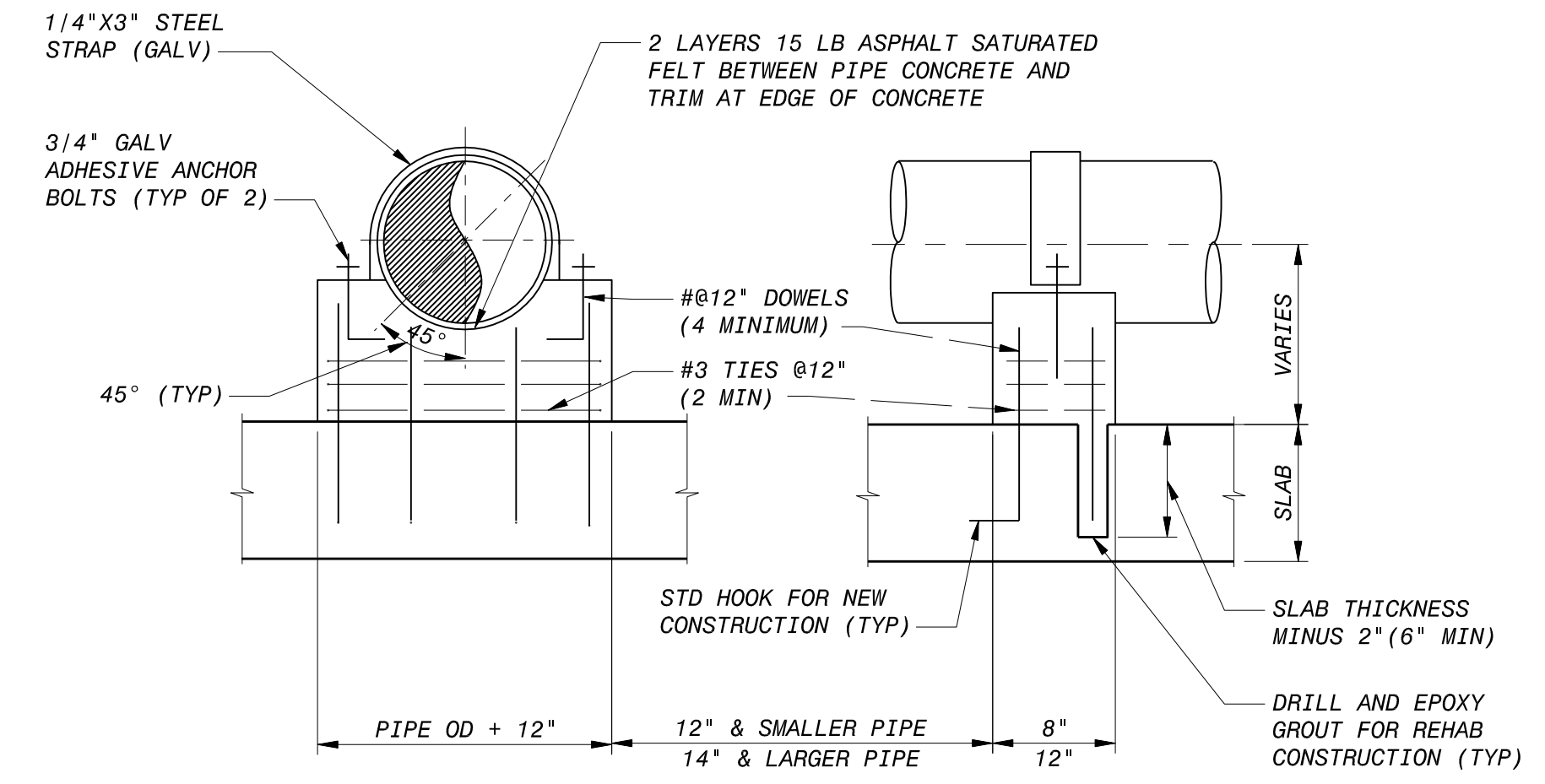


**D** EXTERIOR EQUIPMENT PAD  
S-02 NO SCALE



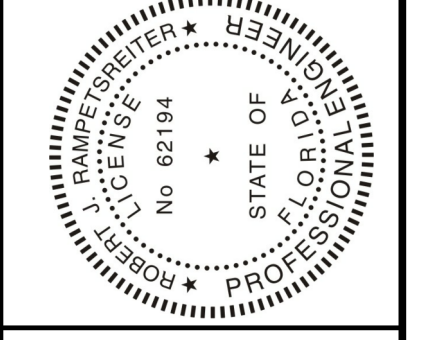
**E** FLANGE PIPE SUPPORT  
S-02 NO SCALE

PIPE SIZE	T	L
8"-18"	5/8"	PIPE OD
20	3/4"	18"
24	3/4"	21"
30	3/4"	27"
36	3/4"	33"
42	3/4"	36"
48	3/4"	42"
54	3/4"	44"
60	3/4"	50"



**F** CONCRETE SUPPORT DETAILS  
M-01, M-02 NO SCALE

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CHK	APP
FEB 2019	100% SUBMITTAL				
DEC 2018	90% SUBMITTAL				
SEPT 2018	60% SUBMITTAL				



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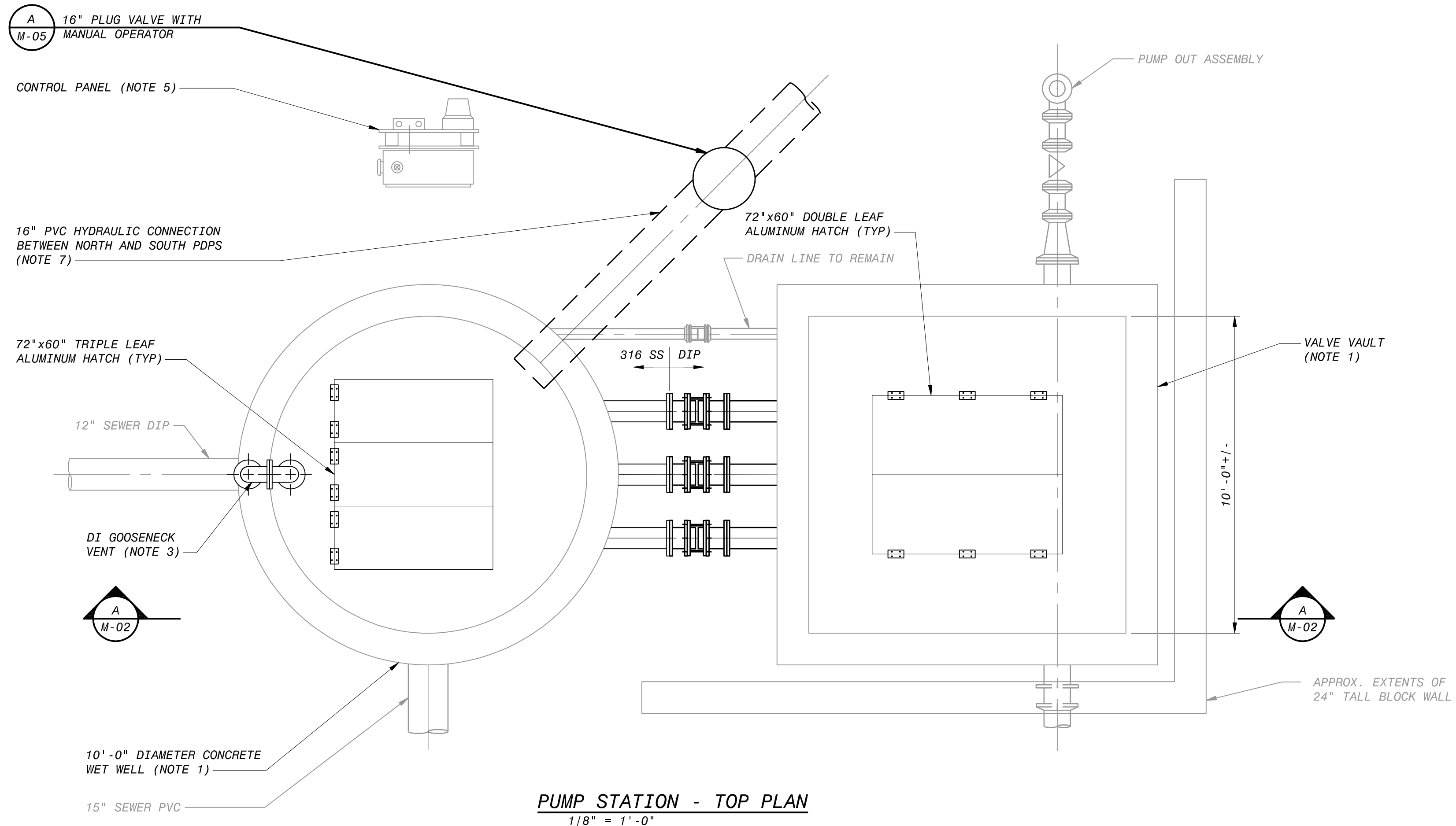
MANATEE COUNTY, FLORIDA  
SOUTHEAST WATER RECLAMATION FACILITY  
PLANT DRAIN PUMP STATION  
STRUCTURAL  
TYPICAL DETAILS

DESIGNED: AS/RZ  
DETAILED: JM  
CHECKED: DD  
APPROVED: RR  
DATE: FEB 2019

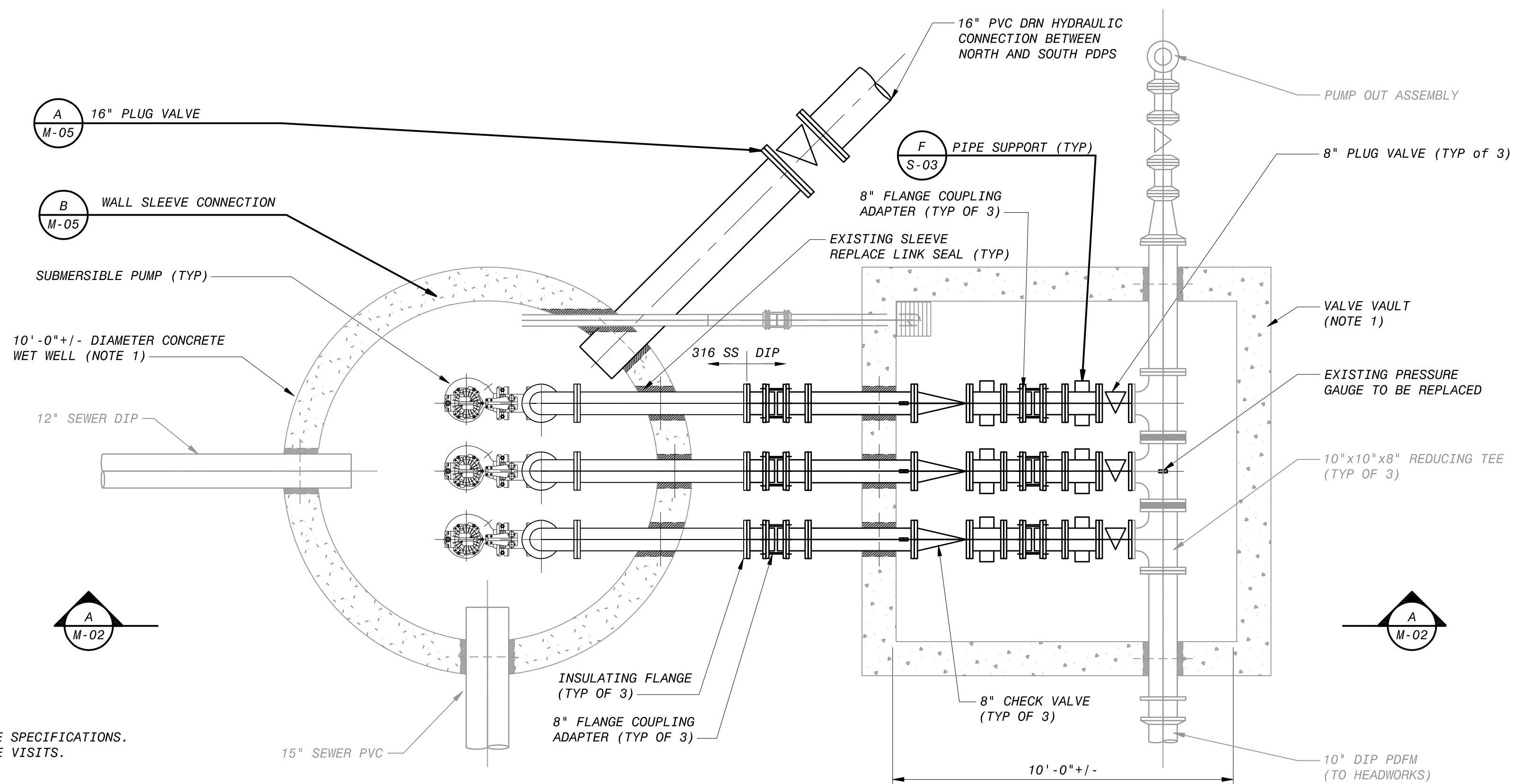
0 1/2 1  
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.  
198896  
S-03  
SHEET  
15 OF 42

PRELIMINARY - NOT FOR CONSTRUCTION

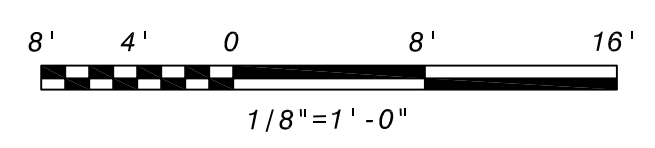


**PUMP STATION - TOP PLAN**  
1/8" = 1'-0"



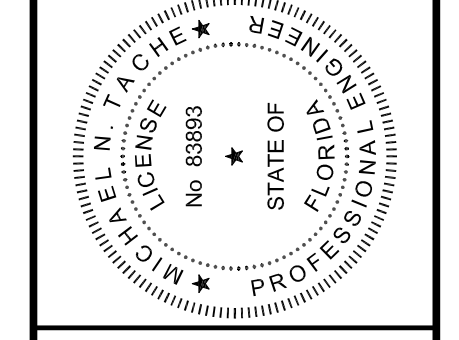
**PUMP STATION - BOTTOM PLAN**  
1/8" = 1'-0"

- NOTES:**
1. CONCRETE WETWELL AND VALVE VAULT SHALL BE REFINISHED IN ACCORDANCE WITH THE SPECIFICATIONS.
  2. DRAWING IS BASED ON AVAILABLE RECORDS AND INFORMATION COLLECTED DURING SITE VISITS. CONTRACTOR SHALL NOTIFY ENGINEER IF THERE ARE ANY DISCREPANCIES.
  3. INSTALL GOOSENECK VENT AT EXISTING PENETRATION IN CONCRETE WETWELL.
  4. HATCHES FOR WETWELL AND VALVE VAULT SHALL BE FABRICATED TO FIT INTO EXISTING OPENINGS FROM DEMOLISHED HATCHES.
  5. PROTECT EXISTING CONTROL PANEL AND CONNECT NEW PUMP POWER AND CONTROLS TO EXISTING CONTROL PANEL.
  6. FUNCTIONALITY OF SOUTH PLANT DRAIN PUMP STATION SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT. CONTRACTOR IS RESPONSIBLE FOR PROVIDING EQUIPMENT / MATERIALS TO TEMPORARILY BYPASS WETWELL DURING THE DURATION OF DEMOLITION ACTIVITIES AND INSTALLATION OF NEW PUMP STATION. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS, INCLUDING SPECIFICATION 01000 WHICH DICTATES CONSTRUCTION CONSTRAINTS.
  7. PROTECT EXISTING STRUCTURES, PIPES, AND OTHER UTILITIES DURING THE INSTALLATION OF THE NEW 16" DIAMETER PIPE. SEE NOTE 8 ON DRAWING SW-03 AND SW-04.



DATE	DESCRIPTION	BY	CHK	APP
FEB 2019	100% SUBMITTAL	DH	MT	
DEC 2018	90% SUBMITTAL	C	MM	MT
SEPT 2018	60% SUBMITTAL	B	AD	MM
JULY 2018	30% SUBMITTAL	A	AD	MM
	REVIEWS AND RECORD OF ISSUE	NO.	BY	CHK
				APP

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PLOTTED: RAN64017, 25-06-2018 15:4  
USER: KAJ46814 DWG VER: 1005



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**MANATEE COUNTY, FLORIDA**  
**SOUTHEAST WATER RECLAMATION FACILITY**  
**PLANT DRAIN PUMP STATION**

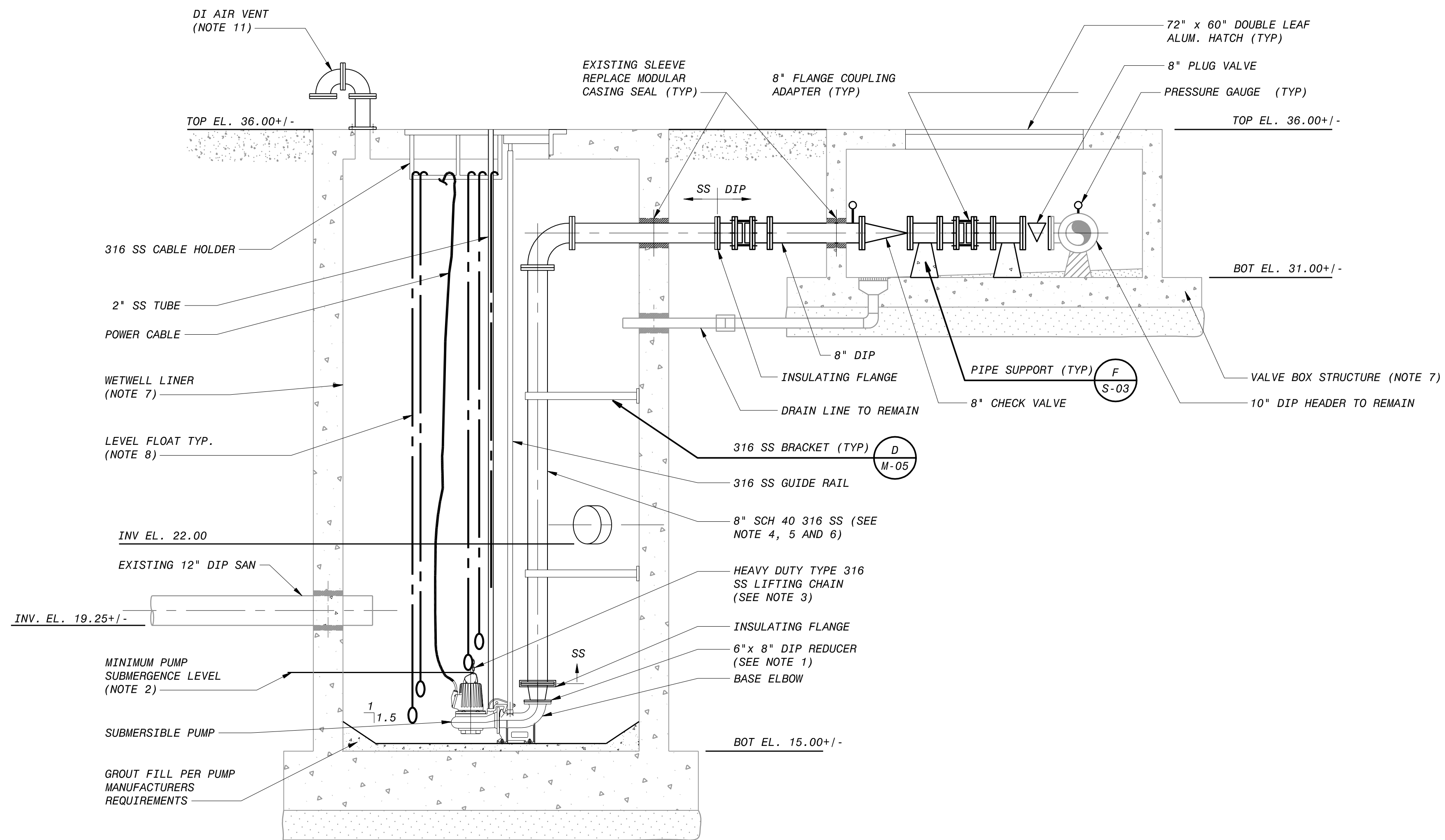
**MECHANICAL**  
**PLAN - SOUTH PLANT DRAIN PUMP STATION**

DESIGNED: DH  
DETAILED: PR  
CHECKED: BV  
APPROVED: MT  
DATE: FEB 2019

PROJECT NO.  
**198896**

**M-01**  
SHEET  
16 OF 42

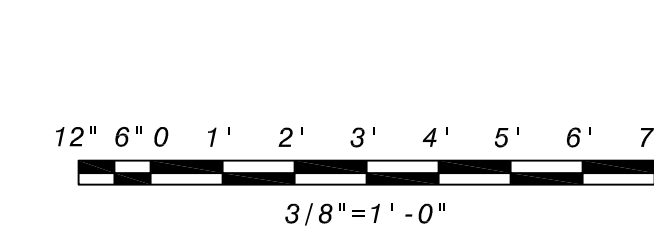




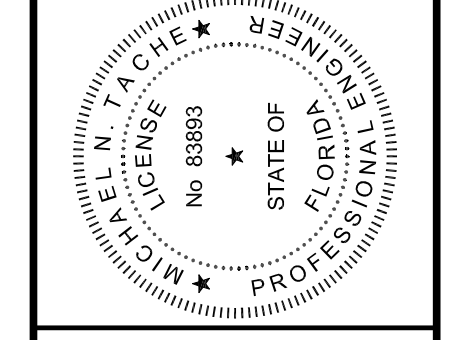
**SECTION**  
M-01 3/8" = 1'-0"

**NOTES:**

1. CONTRACTOR TO ADJUST DESIGN AS NEEDED BASED ON PUMP MANUFACTURER'S REQUIREMENTS IF THEY ARE DIFFERENT THAN SHOWN. THIS INCLUDES BASE ELBOW SIZE, REDUCER SIZE, OFFSET DIMENSIONS, SLIDE RAIL, PUMP BASE PLATE, LIFTING CHAIN SIZE, WIRE SIZE, CONDUIT SIZE OR OTHER.
2. PER MANUFACTURER'S MINIMUM SUBMERGENCE REQUIREMENTS (ADJUST AS REQUIRED PER SUPPLIED PUMP MANUFACTURER'S REQUIREMENTS).
3. EACH PUMP SHALL BE FITTED WITH 316 SS, 3/8" LIFTING CHAIN (OR LARGER AS REQUIRED BY THE PUMP MANUFACTURER) WITH LIFTING RINGS EVERY 4 FEET MINIMUM.
4. ALL FLANGES, PIPE, VALVES AND APPURTENANCES SHALL HAVE 316 SS HARDWARE.
5. ALL PIPING IN THE WETWELL SHALL BE 316 SCH 40 FLANGED STAINLESS STEEL.
6. STAINLESS STEEL RISER PIPE TO BE FLANGED AT THE 90 AT THE TOP AND AT THE CONNECTION TO REDUCER AT THE BOTTOM. CONTRACTOR HAS THE OPTION TO WELD BENDS INSTEAD OF FLANGES.
7. CONCRETE WETWELL AND VALVE VAULT SHALL BE REFINISHED IN ACCORDANCE WITH THE SPECIFICATIONS.
8. REFER TO SPECIFICATION 13550 FOR CONTROL STRATEGY OF WETWELL, INCLUDING FLOAT ELEVATIONS.
9. GROUT FILL IN THE VALVE VAULT THAT WAS REMOVED, TO SUPPORT THE DEMO ACTIVITIES, SHALL BE REPLACED TO ALLOW VAULT TO PROPERLY DRAIN.
10. DRAWING IS BASED ON AVAILABLE RECORDS AND INFORMATION COLLECTED DURING SITE VISITS. CONTRACTOR SHALL NOTIFY ENGINEER IF THERE ARE ANY DISCREPANCIES.
11. INSTALL DI AIR VENT AT EXISTING OPENING IN WETWELL.



FEB 2019	100% SUBMITTAL	D	AD	DN	MT
DEC 2018	90% SUBMITTAL	C	AD	MM	MT
SEPT 2018	60% SUBMITTAL	B	AD	MM	MT
JULY 2018	30% SUBMITTAL	A	AD	MM	MT
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	XREF4:				



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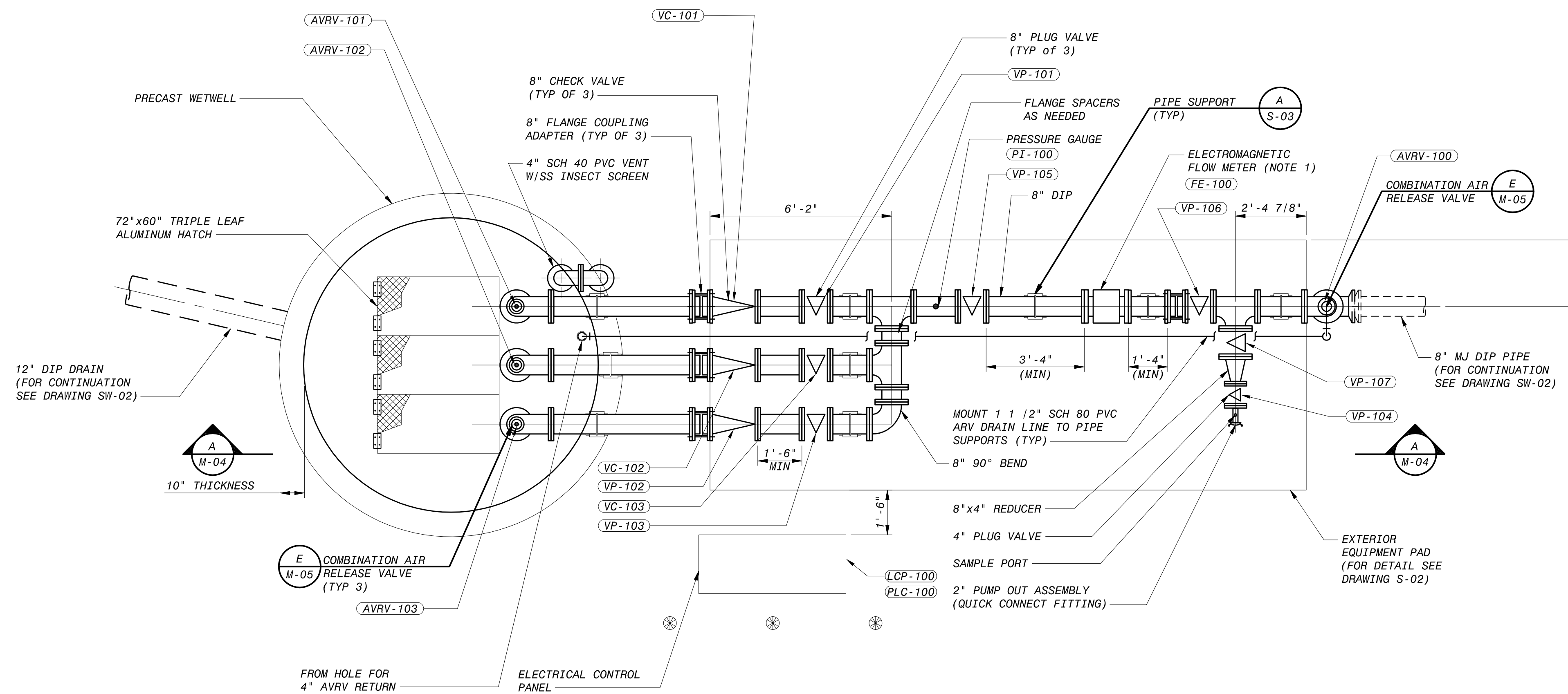
MANATEE COUNTY, FLORIDA  
SOUTHEAST WATER RECLAMATION FACILITY  
PLANT DRAIN PUMP STATION

MECHANICAL  
SECTION - SOUTH PLANT DRAIN PUMP STATION

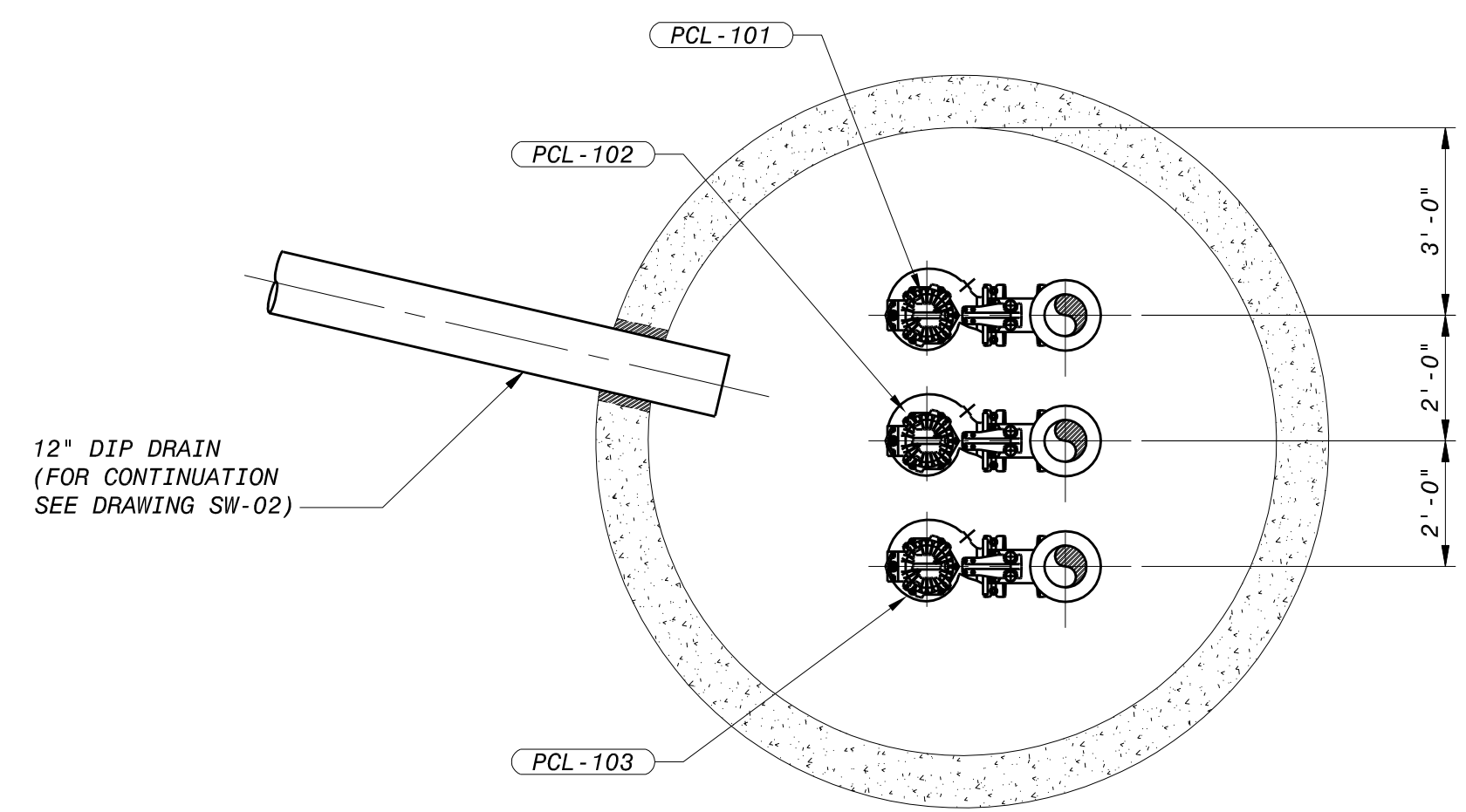
DESIGNED: DH  
DETAILED: PR  
CHECKED: BV  
APPROVED: MT  
DATE: FEB 2019

PROJECT NO.  
198896

**M-02**  
SHEET  
17 OF 42

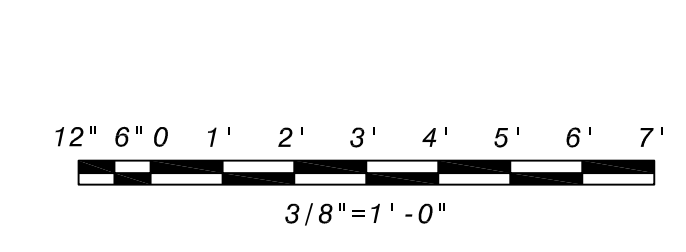


**PUMP STATION - PLAN**  
3/8" = 1'-0"

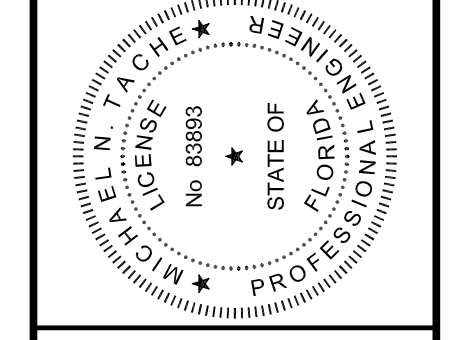


**WETWELL - PUMP LEVEL PLAN**  
3/8" = 1'-0"

- NOTES:**
1. AN EXTRA SPOOL PIECE SHALL BE PROVIDED FOR REPLACING THE MAGNETIC FLOW METER IN INSTANCES WHERE SERVICE OR REPLACEMENT IS REQUIRED, TO ALLOW CONTINUED OPERATION OF THE PLANT DRAIN PUMP STATION.
  2. EXACT LOCATION OF WETWELL AND VALVE PAD TO BE FIELD DETERMINED AND AGREED UPON BY OWNER AND ENGINEER. REFER TO SW-02 FOR APPROXIMATE LOCATION.



FEB 2019	100% SUBMITTAL	D	AD	DM	MT
NOV 2018	90% SUBMITTAL	C	AD	MM	MT
SEPT 2018	60% SUBMITTAL	B	AD	MM	MT
JULY 2018	30% SUBMITTAL	A	AD	MM	MT
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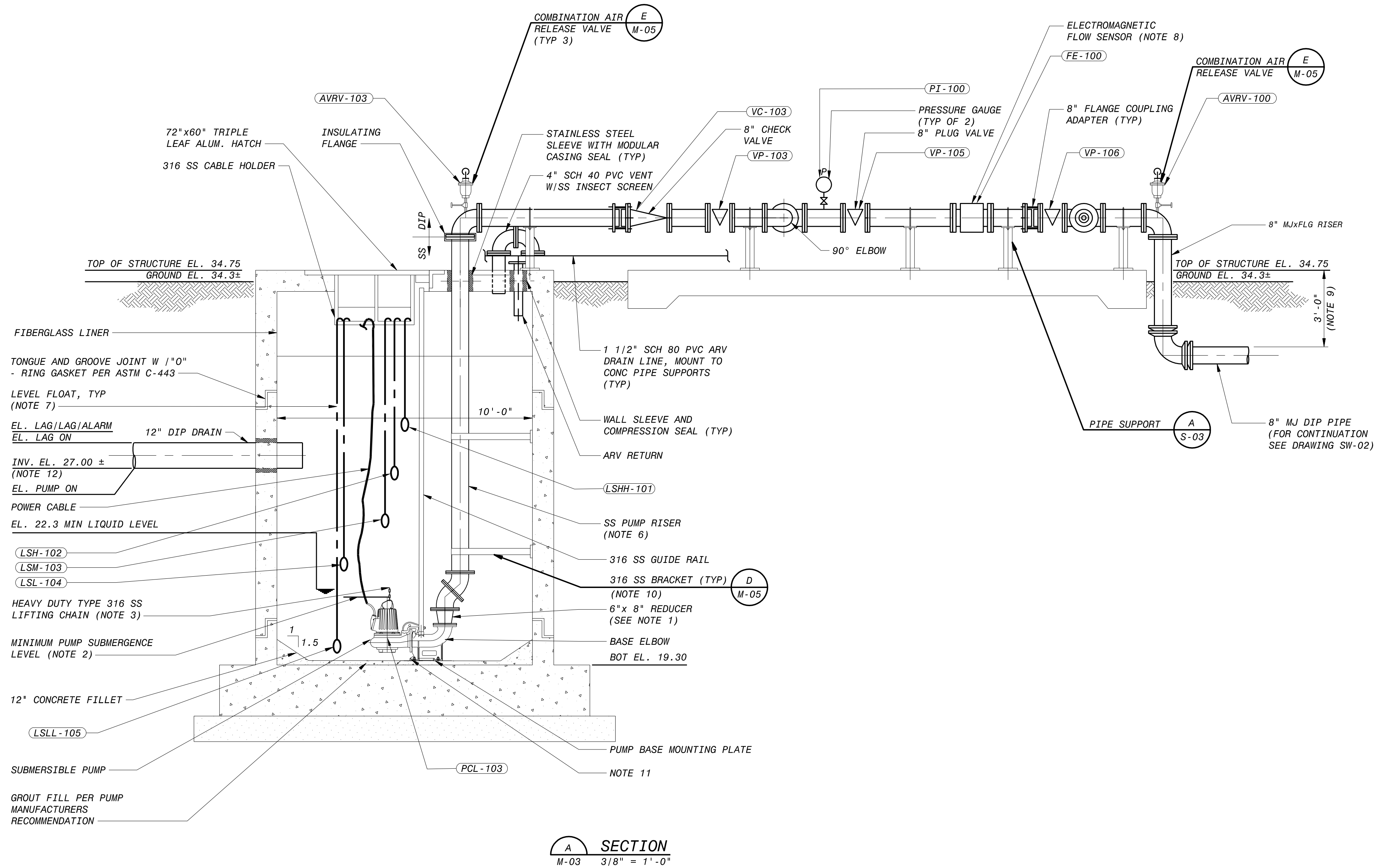
MANATEE COUNTY, FLORIDA  
SOUTHEAST WATER RECLAMATION FACILITY  
PLANT DRAIN PUMP STATION

MECHANICAL  
PLAN - WEST PLANT DRAIN PUMP STATION

DESIGNED: DH  
DETAILED: PR  
CHECKED: BV  
APPROVED: MT  
DATE: FEB 2019

PROJECT NO.  
**198896**

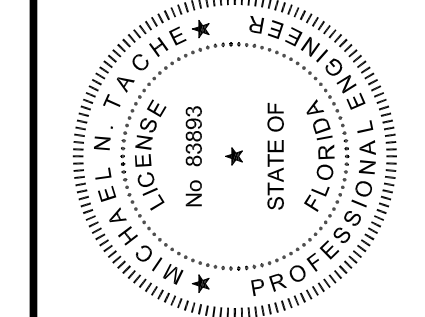
**M-03**  
SHEET  
18 OF 42



**NOTES:**

1. CONTRACTOR TO ADJUST LAYOUT AS NEEDED BASED ON PUMP MANUFACTURER'S REQUIREMENTS IF THEY ARE DIFFERENT THAN SHOWN. THIS INCLUDES BASE ELBOW SIZE, REDUCER SIZE, OFFSET DIMENSIONS, SLIDE RAIL, PUMP BASE PLATE, LIFTING CHAIN SIZE, WIRE SIZE, CONDUIT SIZE OR OTHER. ALL CHANGES SHALL BE APPROVED BY OWNER AND ENGINEER.
2. PER MANUFACTURER'S MINIMUM SUBMERGENCE REQUIREMENTS (ADJUST AS REQUIRED PER SUPPLIED PUMP MANUFACTURER'S REQUIREMENTS).
3. EACH PUMP SHALL BE FITTED WITH 316 SS, 3/8" LIFTING CHAIN (OR LARGER AS REQUIRED BY THE PUMP MANUFACTURER) WITH LIFTING RINGS EVERY 4 FEET MINIMUM.
4. ALL FLANGES, PIPE, VALVES AND APPURTENANCES SHALL HAVE 316 SS HARDWARE.
5. ALL PIPING IN THE WETWELL SHALL BE 316 SCH 40 FLANGED STAINLESS STEEL.
6. STAINLESS STEEL RISER PIPE TO BE FLANGED AT THE 90 AT THE TOP AND AT THE CONNECTION TO REDUCER TO THE BOTTOM.
7. CONTRACTOR HAS THE OPTION TO WELD BENDS INSTEAD OF FLANGES.
8. REFER TO SPECIFICATION 13550 FOR CONTROL STRATEGY OF WETWELL, INCLUDING FLOAT ELEVATIONS.
9. AN EXTRA SPOOL PIECE SHALL BE PROVIDED FOR REPLACING THE MAGNETIC FLOW METER IN INSTANCES WHERE SERVICE OR REPLACEMENT IS REQUIRED, TO ALLOW CONTINUED OPERATION OF THE PLANT DRAIN PUMP STATION.
10. UNLESS OTHERWISE NOTED ON THE YARD PIPING PLANS, CONTRACTOR SHALL MAINTAIN A MINIMUM OF 3FT OF COVER OVER YARD PIPE.
11. INSTALL SS BRACKET EVERY 8 LF OF VERTICAL PUMP DISCHARGE PIPING.
12. PUMP MANUFACTURER TO PROVIDE PUMP ANCHORAGE DESIGN PER SPECIFICATIONS.
13. INVERT ELEVATION TO BE DETERMINED BASED ON MINIMUM 1% SLOPE TO WEST PDPS AND CONTRACTOR ROUTING OF PIPE.

REV	DATE	DESCRIPTION	BY	CHK	APP
1	02/20/2019	ISSUE FOR PERMIT	MT		
2	09/10/2018	REVISED PER COMMENTS	MM		
3	07/10/2018	REVISED PER COMMENTS	MM		
4	07/10/2018	REVISED PER COMMENTS	MM		
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50	07/10/2018	REVISED PER COMMENTS	MM		



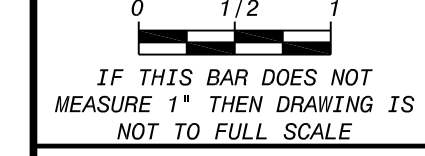
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Certificate No. 8132

**MANATEE COUNTY, FLORIDA  
SOUTHEAST WATER RECLAMATION FACILITY  
PLANT DRAIN PUMP STATION**

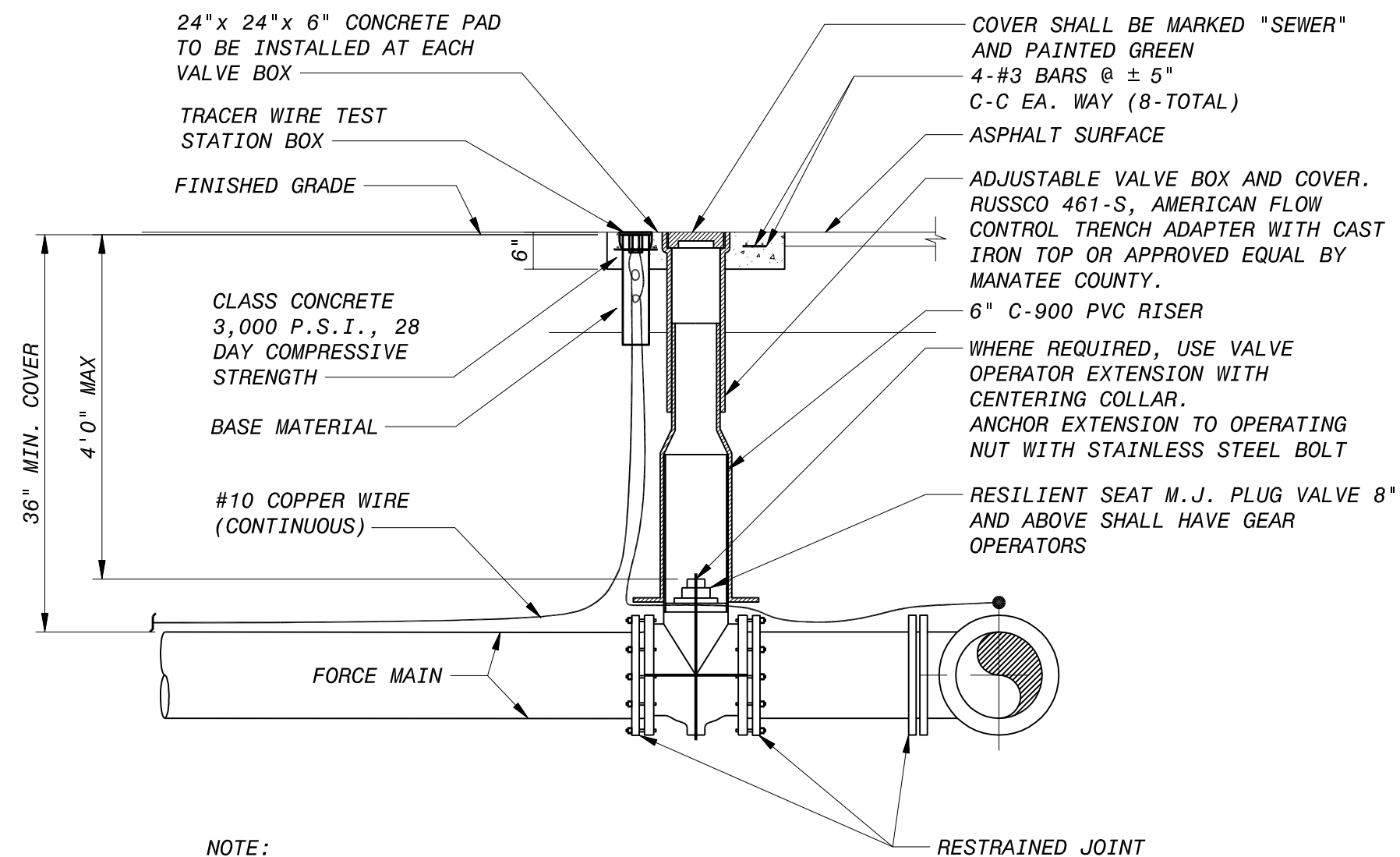
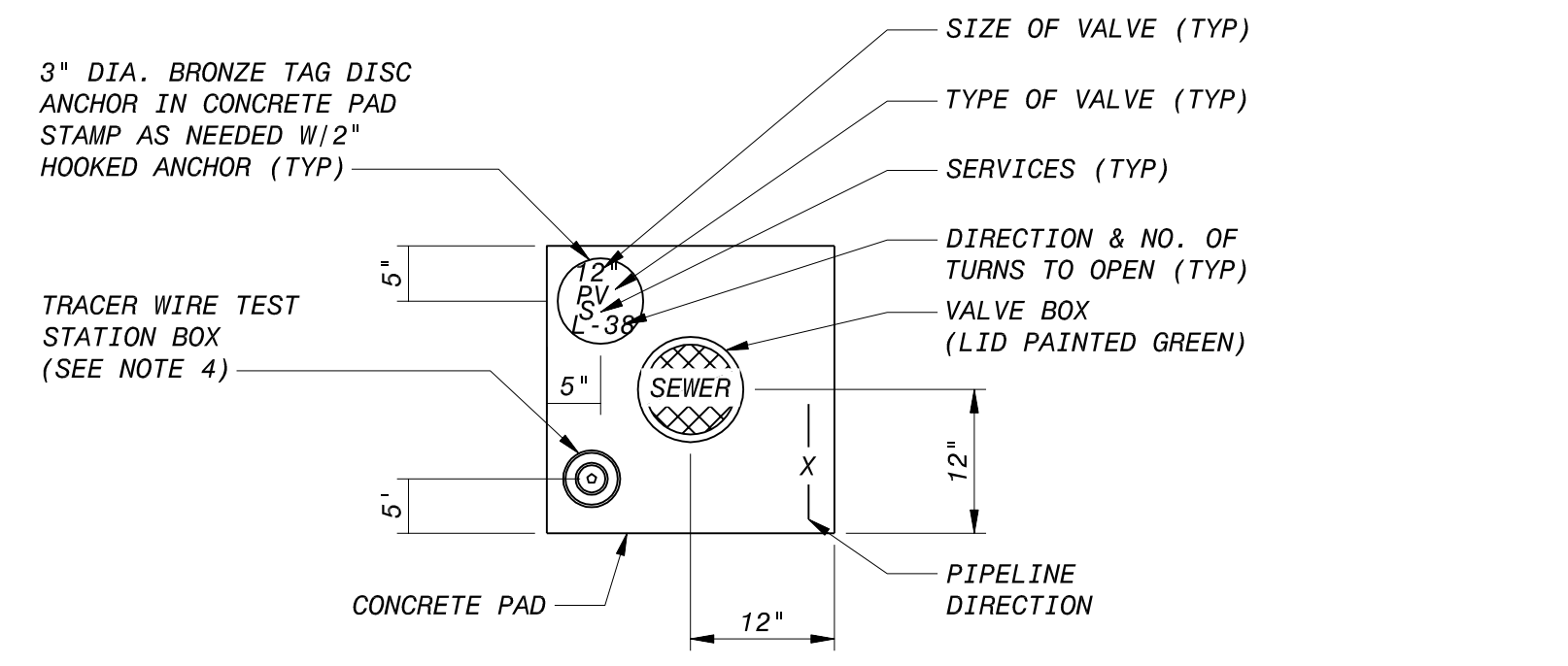
**MECHANICAL  
SECTIONS - WEST DRAIN PUMP STATION**

DESIGNED: DH
DETAILED: PR
CHECKED: BV
APPROVED: MT
DATE: FEB 2019



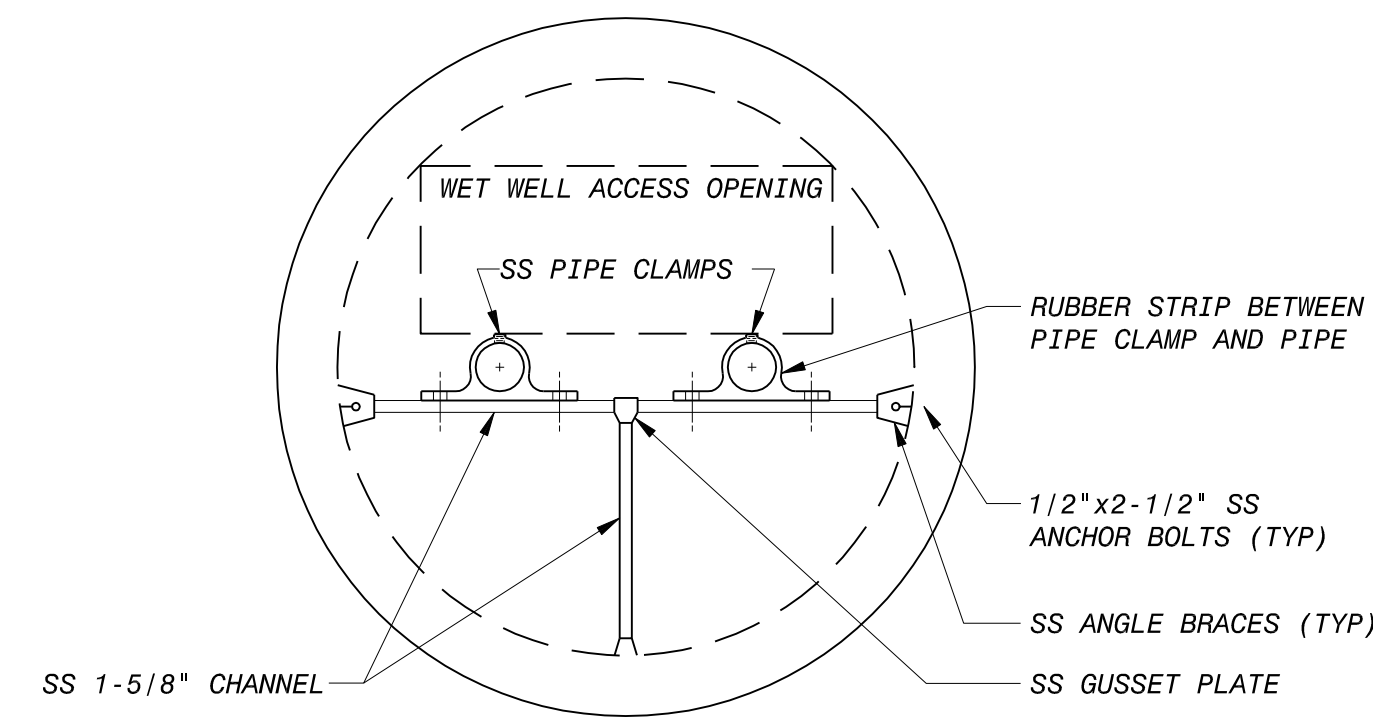
PROJECT NO.  
**198896**

**M-04**  
SHEET  
19 OF 42

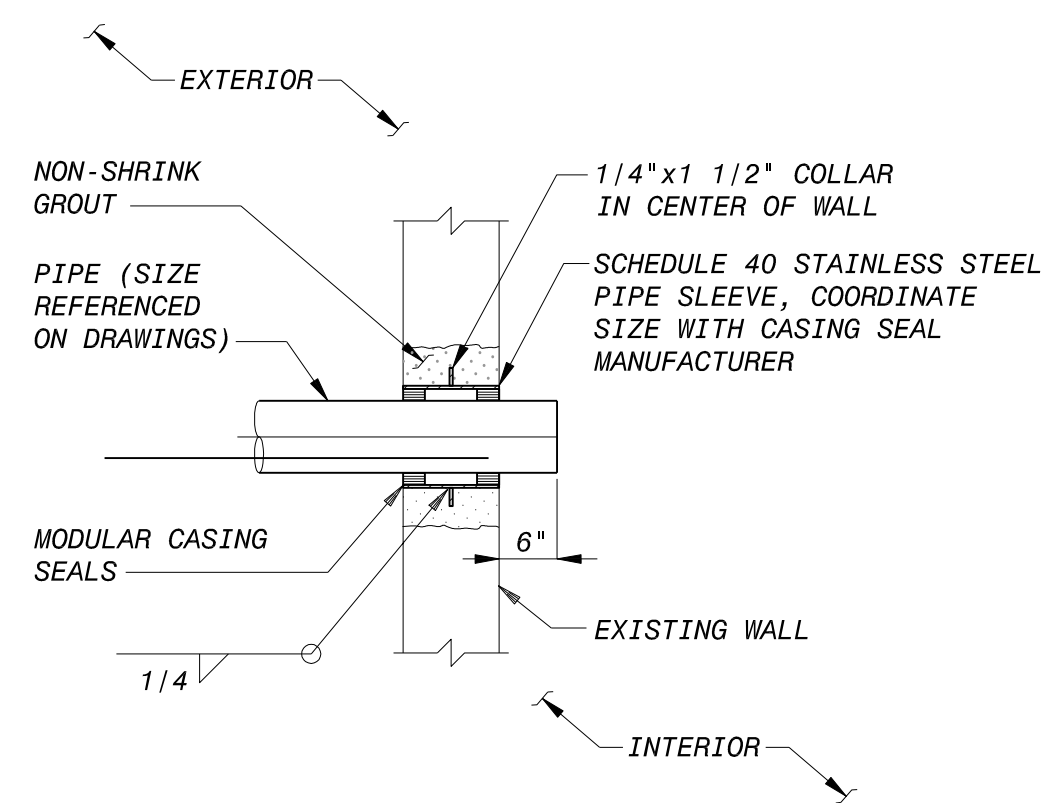


- NOTE:**
1. ALL PROPOSED VALVE BOXES SHALL BE ADJUSTED TO FINISHED GRADES AS ESTABLISHED IN THE FIELD.
  2. PRECAST CONCRETE PADS SHALL NOT BE USED.
  3. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 1/2".
  4. TEST BOX TO BE BINGHAM & TAYLOR P200NFG OR EQUAL FOR NORMAL YARD SERVICE. WHERE VALVE WILL BE IN STREET OR UNDER VEHICLE TRAFFIC, USE P525RD CENTERED IN SEPARATED CONCRETE PAD SIMILAR TO STANDARED VALVE BOX PAD.

**PLUG VALVE A**  
NO SCALE  
SW-02, SW-03,  
SW-04 AND SW-06

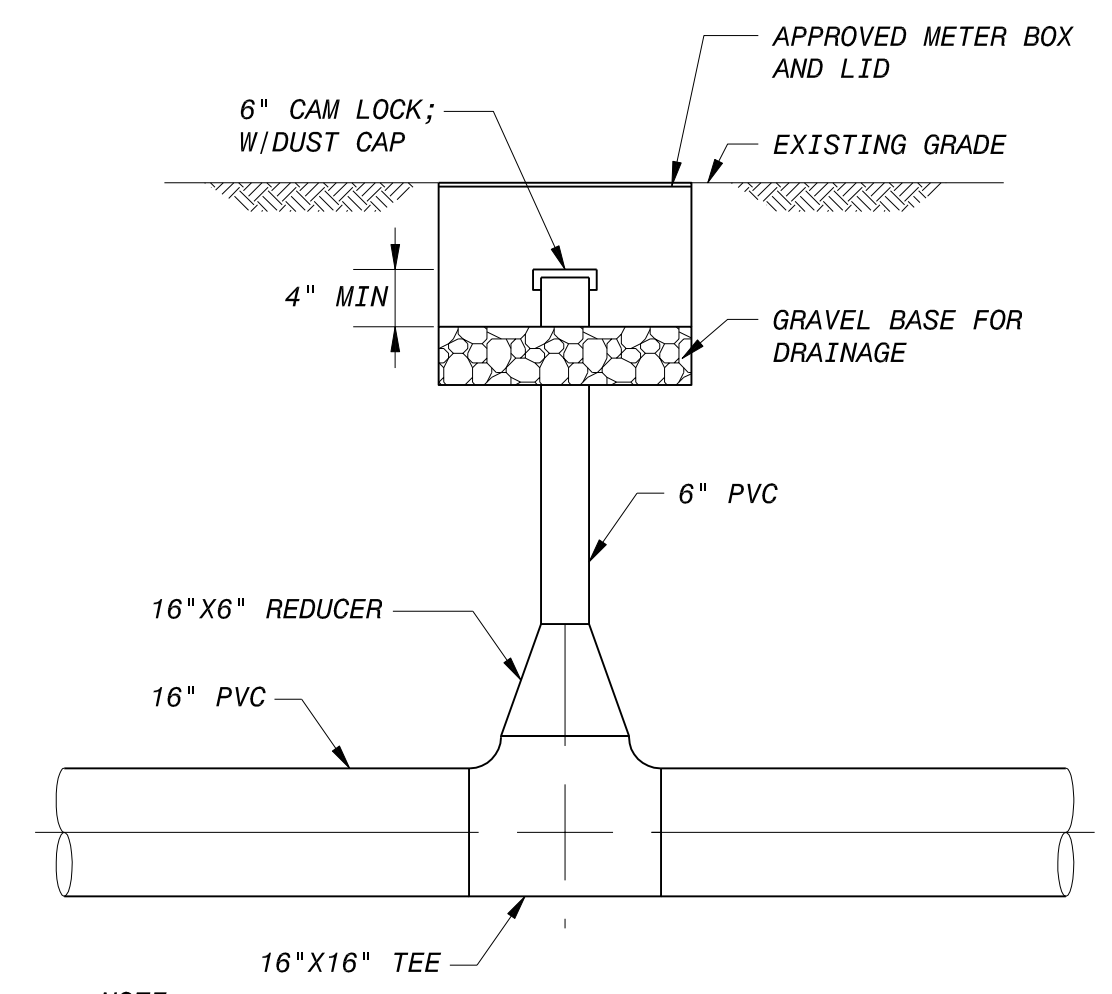


**PIPE BRACKET D**  
NO SCALE  
M-02, M-04,  
AND M-06



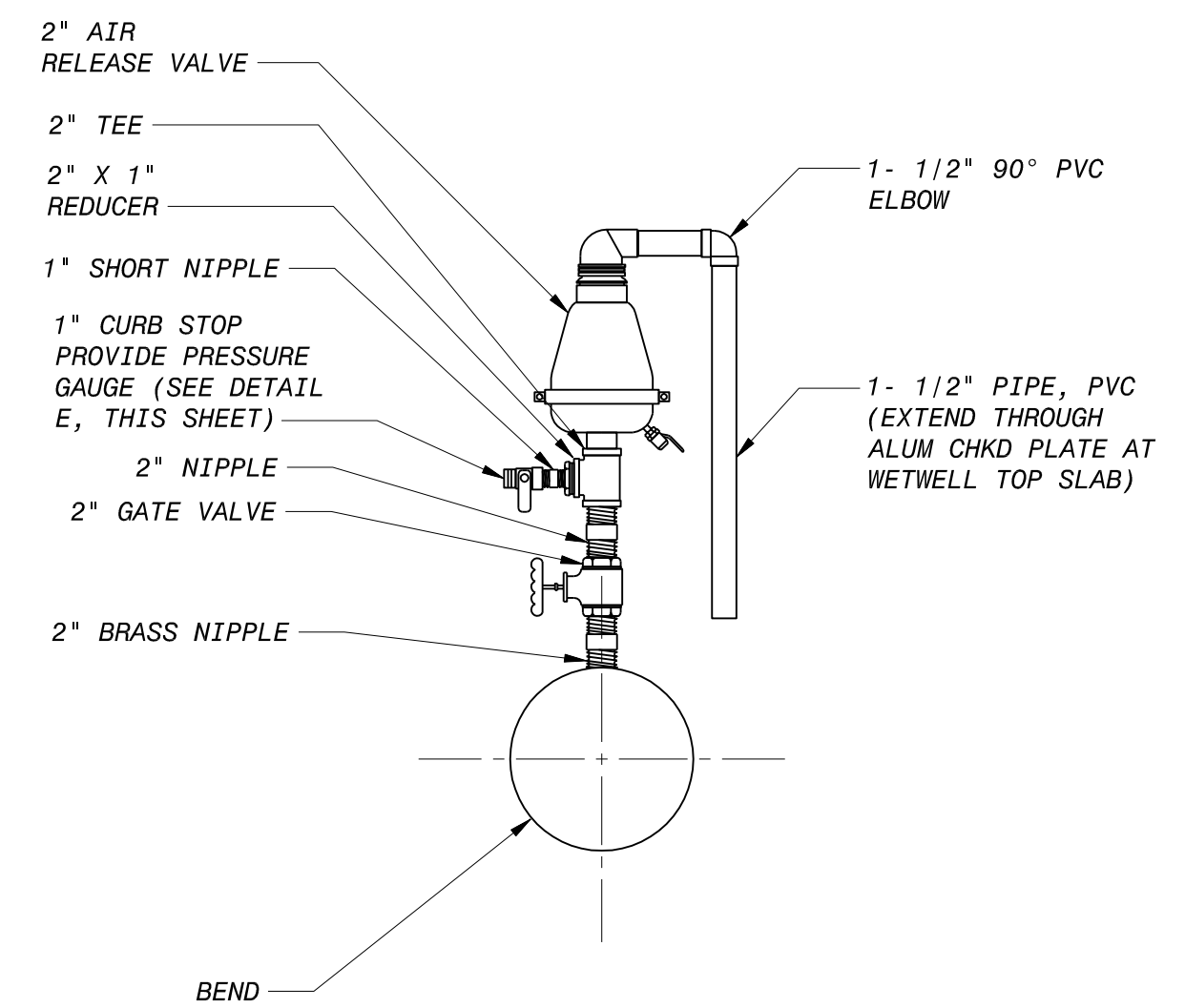
**NOTE:**  
CUT OPENING FOR WALL SLEEVE, ROUGHEN EXISTING CONCRETE, APPLY SIKA "SIKADUR HIMOD" BONDING AGENT AND FILL WITH NON-SHRINK GROUT PER THE SPECIFICATIONS. DIAMETER OF OPENING TO BE WATERSTOP DIAMETER + 4". CONTRACTOR TO ENSURE FITTINGS CAN FIT THROUGH WALL SLEEVE

**WALL SLEEVE CONNECTION B**  
NO SCALE



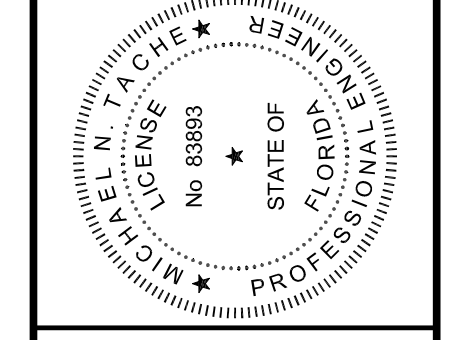
**NOTE:**  
BLOW-OFF LOCATIONS SHOWN ON DRAWINGS ARE APPROXIMATE. PROPOSED BLOW-OFF LOCATIONS SHALL BE INCLUDED WITH CONTRACTORS PIPELINE SUBMITTAL.

**PIPE BLOW-OFF CONNECTION C**  
NO SCALE  
SW-04



**AIR RELEASE VALVE ASSEMBLY WASTEWATER E**  
NO SCALE  
M-03, M-04

FEB 2019	100% SUBMITTAL	C	AD	DH	MT
DEC 2018	90% SUBMITTAL	B	AD	MM	MT
SEPT 2018	60% SUBMITTAL	A	AD	MM	MT
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M-05.dwg					
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PLOTTED:					
USER: KAJ46814					
DWG. VER: 1004					



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**MANATEE COUNTY, FLORIDA**  
**SOUTH WATER RECLAMATION FACILITY**  
**PLANT DRAIN PUMP STATION**

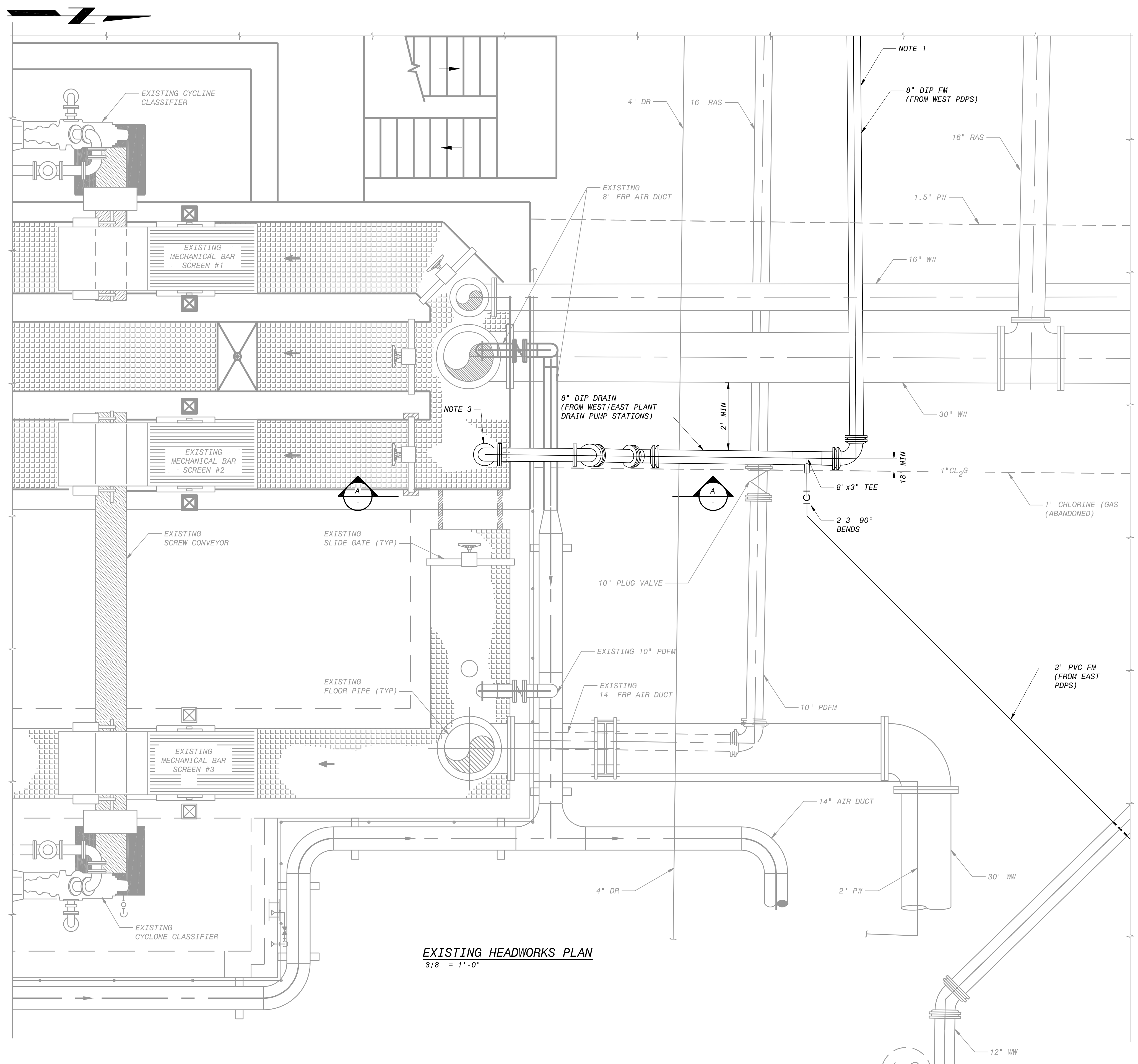
**MECHANICAL**  
**DETAILS I**

DESIGNED: DH  
DETAILED: PR  
CHECKED: BV  
APPROVED: MT  
DATE: FEB 2019

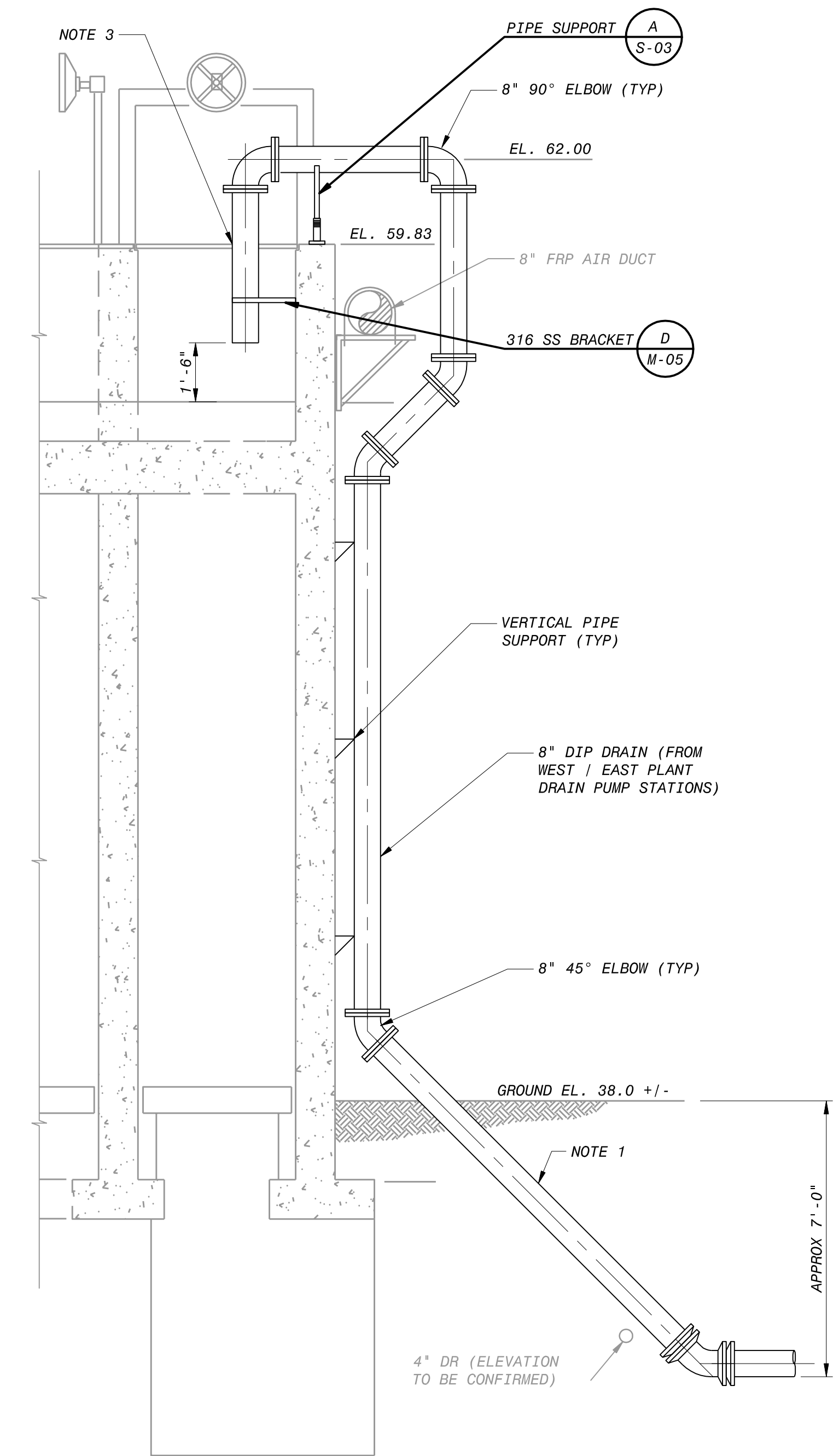
0 1/2 1  
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.  
**198896**

**M-05**  
SHEET  
20 OF 42

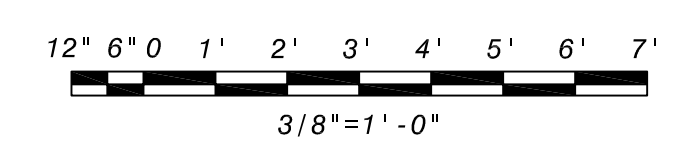


**EXISTING HEADWORKS PLAN**  
3/8" = 1'-0"



**SECTION A-A**  
3/8" = 1'-0"

- NOTES:**
- SEE YARD PIPING PLANS FOR PIPING CONTINUATION.
  - DRAWING IS BASED ON AVAILABLE RECORDS AND INFORMATION COLLECTED DURING SITE VISITS. CONTRACTOR SHALL NOTIFY ENGINEER IF THERE ARE ANY DISCREPANCIES. CONTRACTOR SHALL CONFIRM ALIGNMENT BASED ON GENERAL NOTE #4.
  - GRATING PENETRATION TO OCCUR SUCH THAT ONLY ONE PANEL OF GRATING IS IMPACTED. PENETRATION SHOULD BE MADE IN A CIRCULAR FASHION, 10" DIA MAXIMUM.
  - FUNCTIONALITY OF HEADWORKS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT.



D	AD	DM	MT
C	AD	MM	MT
B	AD	MM	MT
A	AD	MM	MT
NO.	BY	CHK	APP

FEB 2019 100% SUBMITTAL  
DEC 2018 90% SUBMITTAL  
SEPT 2018 60% SUBMITTAL  
JULY 2018 30% SUBMITTAL

DATE  
60-3090 - Mechanical Drawings  
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1/29/2019 4:10:51 PM  
SAVED:KAL46814, 1/29/2019 4:10:51 PM  
PLOTTER:  
USER:KAL46814 DWG VER:1007

REVISITONS AND RECORD OF ISSUE

MANATEE COUNTY PROFESSIONAL ENGINEER  
STATE OF FLORIDA  
No. 89893  
BLACK & VEATCH

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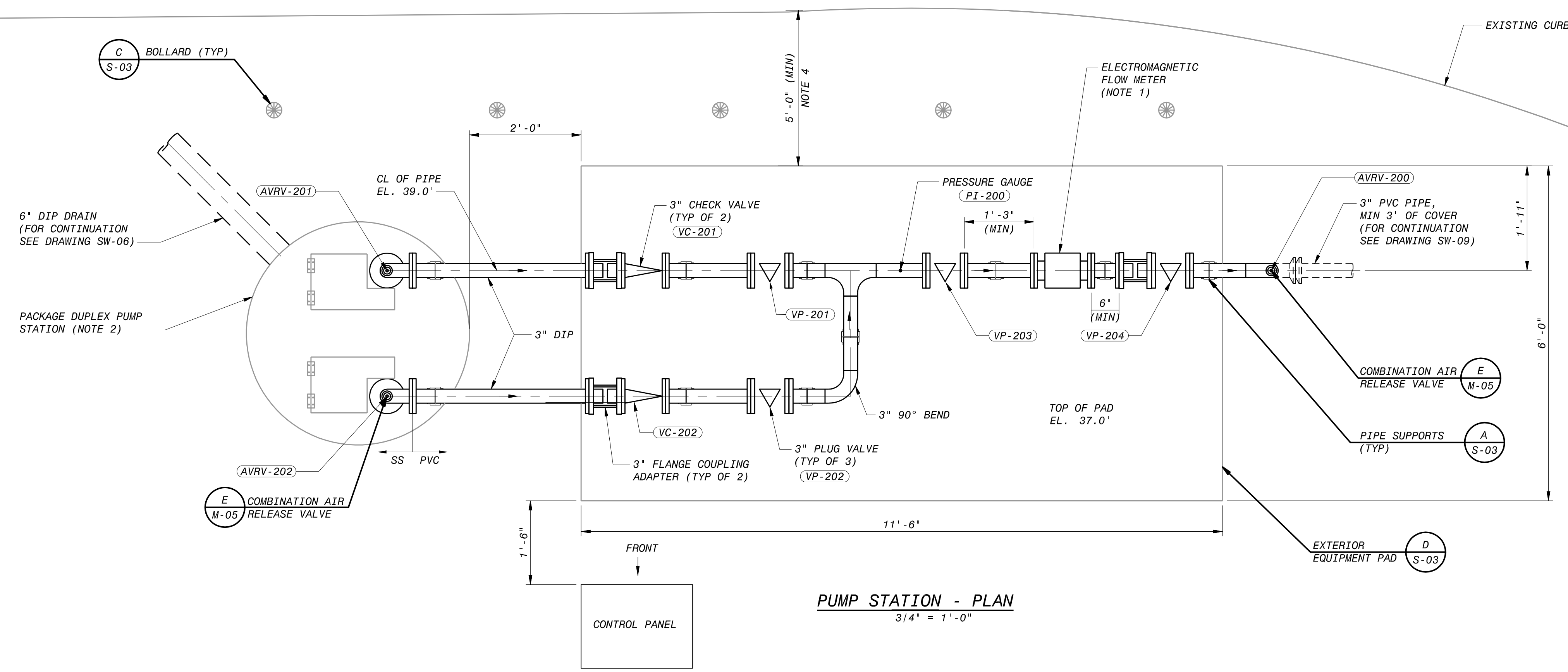
**MANATEE COUNTY, FLORIDA**  
**SOUTHEAST WATER RECLAMATION FACILITY**  
**PLANT DRAIN PUMP STATION**

**MECHANICAL CONNECTION WITH HEADWORKS - EXISTING**  
**PLAN AND SECTION**

DESIGNED: DH  
DETAILED: PR  
CHECKED: BV  
APPROVED: MT  
DATE: FEB 2019

PROJECT NO.  
198896

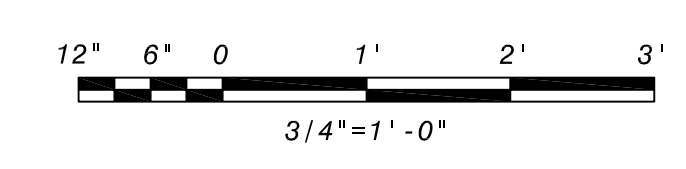
**M-06**  
SHEET  
21 OF 42



**PUMP STATION - PLAN**  
3/4" = 1'-0"

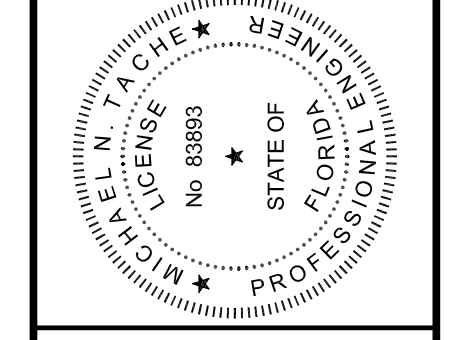
**NOTES:**

1. A PIPE SPOOL PIECE SHALL BE INCLUDED FOR REPLACING THE MAGNETIC FLOW METER IN INSTANCES WHERE SERVICE OR REPLACEMENT IS REQUIRED, TO ALLOW CONTINUED OPERATION OF THE PLANT DRAIN PUMP STATION.
2. EAST PLANT PUMP STATION WET WELL WILL BE A PACKAGE PUMP STATION IN ACCORDANCE WITH SPECIFICATION 11151.
3. INSULATING FLANGES SHALL BE USED TO PREVENT CONTACT OF DISSIMILAR METALS.
4. EXACT LOCATION OF WETWELL AND VALVE PAD TO BE FIELD DETERMINED AND AGREED UPON BY OWNER AND ENGINEER.



**PRELIMINARY - NOT FOR CONSTRUCTION**

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CHK	APP
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	M-07.dwg				
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	PLOTTED:RAN64017, 25-06-2018 15:54				
	USER:DH067407				
	DWG. VER: 1001				



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MANATEE COUNTY, FLORIDA  
SOUTHEAST WATER RECLAMATION FACILITY  
PLANT DRAIN PUMP STATION

MECHANICAL  
PLAN - EAST PLANT DRAIN PUMP STATION

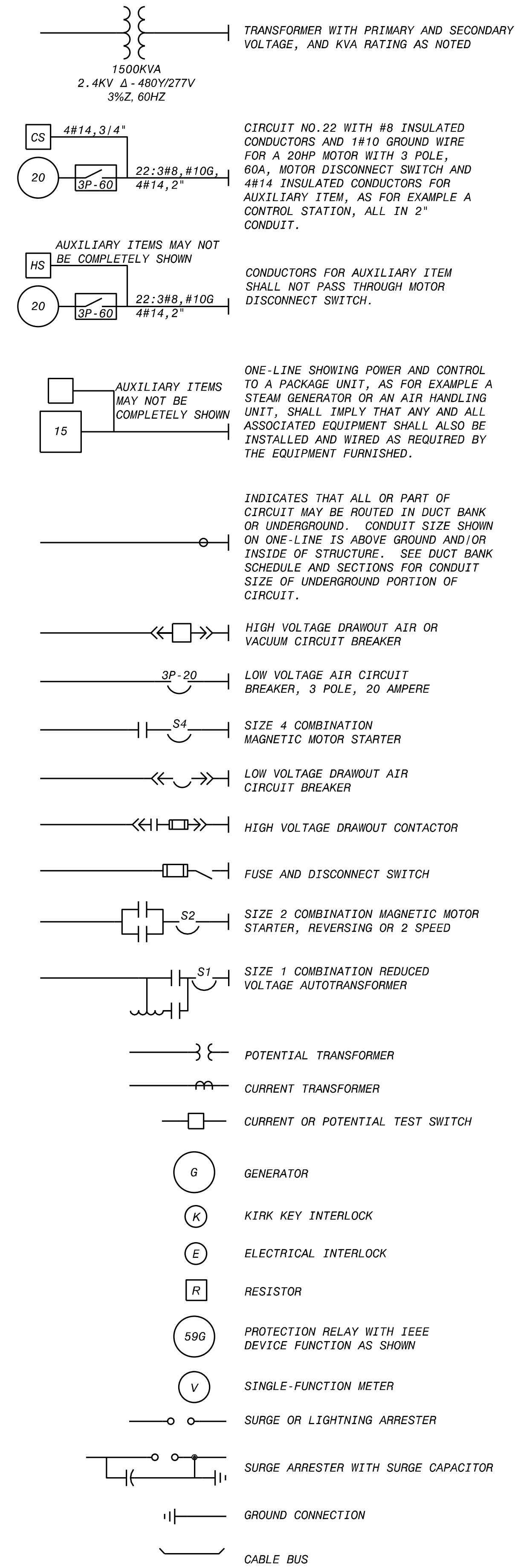
DESIGNED: DH  
DETAILED: PR  
CHECKED: BV  
APPROVED: MT  
DATE: FEB 2019

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.  
**198896**

**M-07**  
SHEET  
22 OF 42

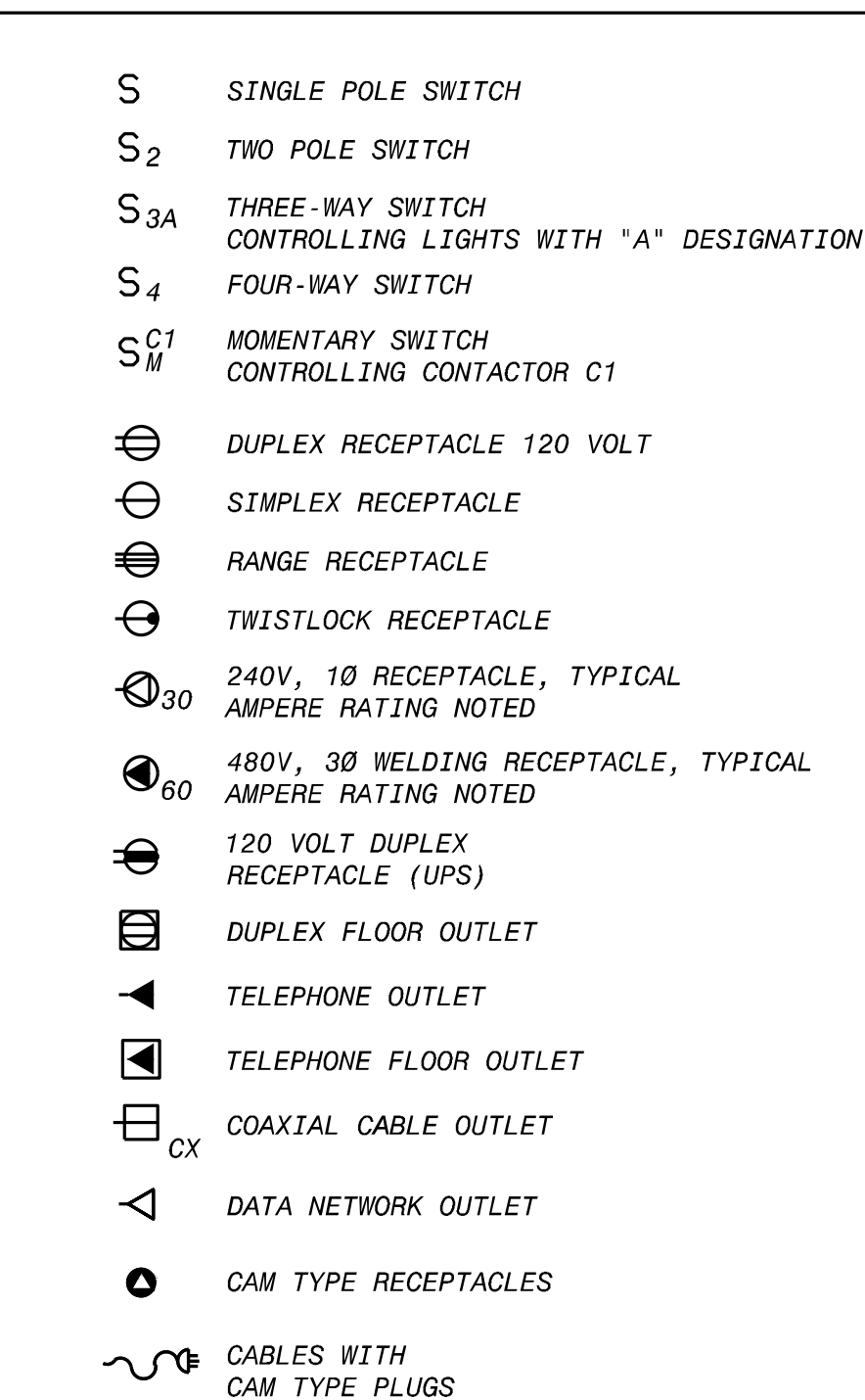
ONE-LINE DIAGRAM LEGEND



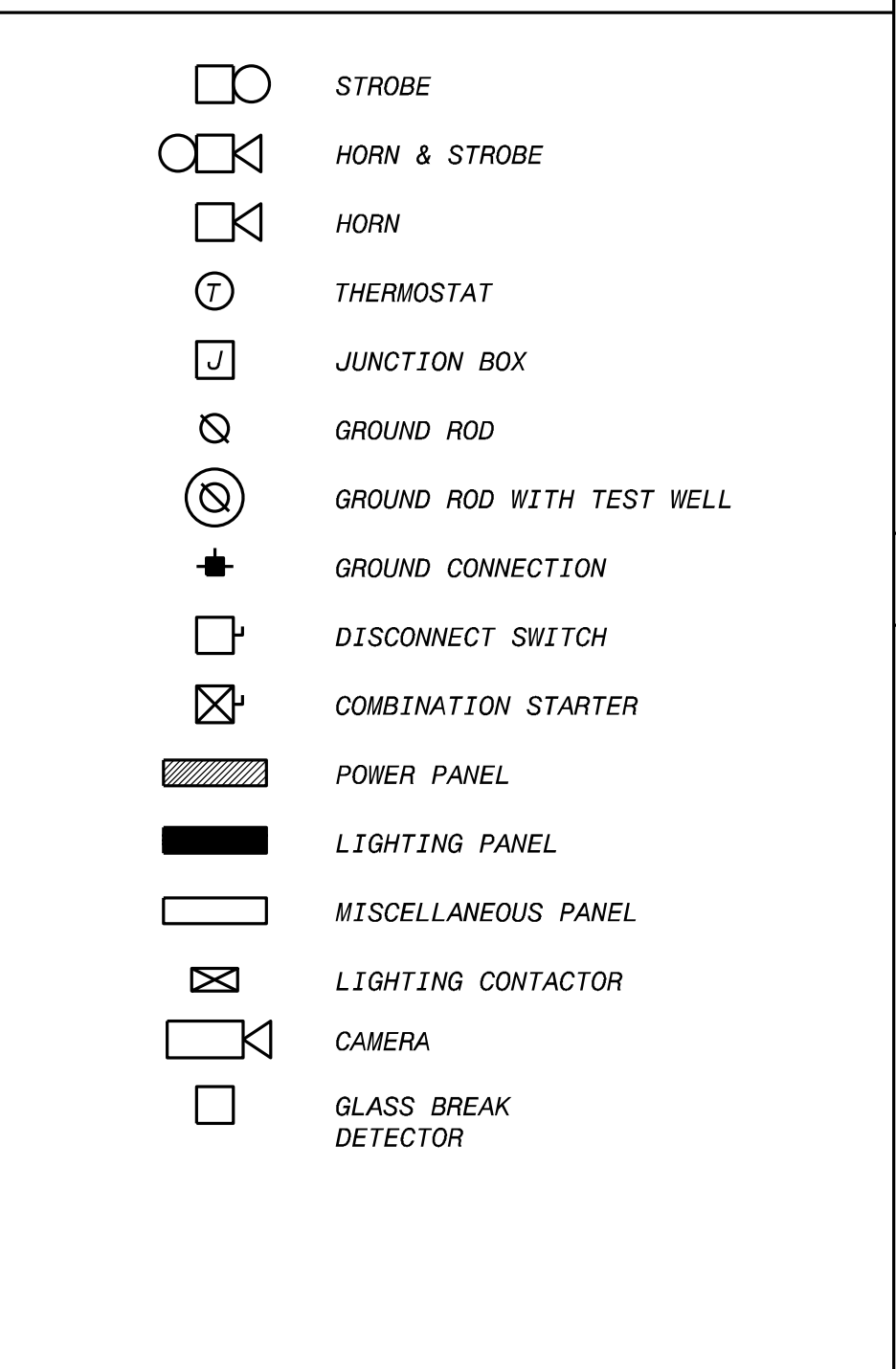
SCHEMATIC SYMBOLS



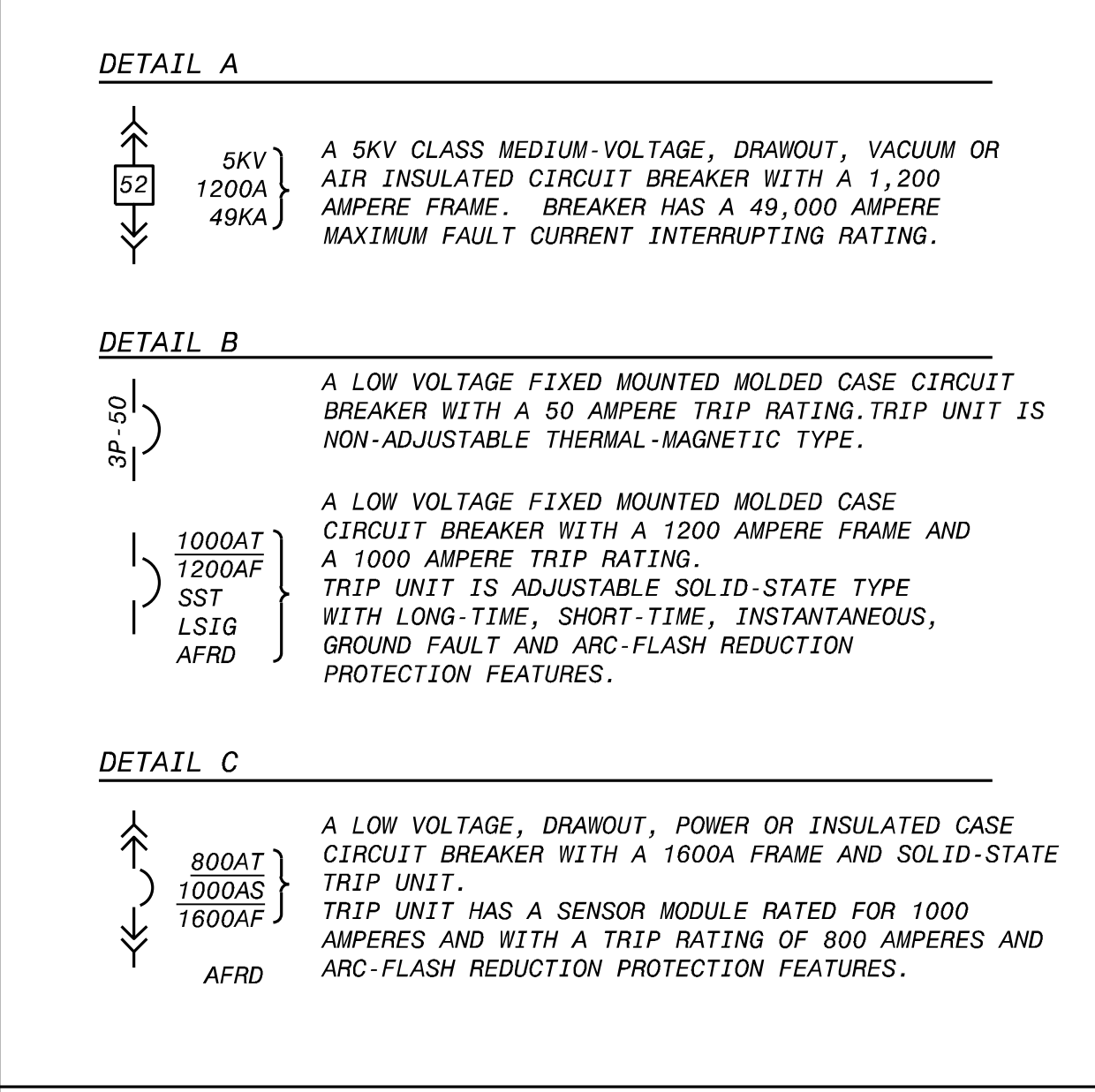
SWITCH & OUTLET SYMBOLS



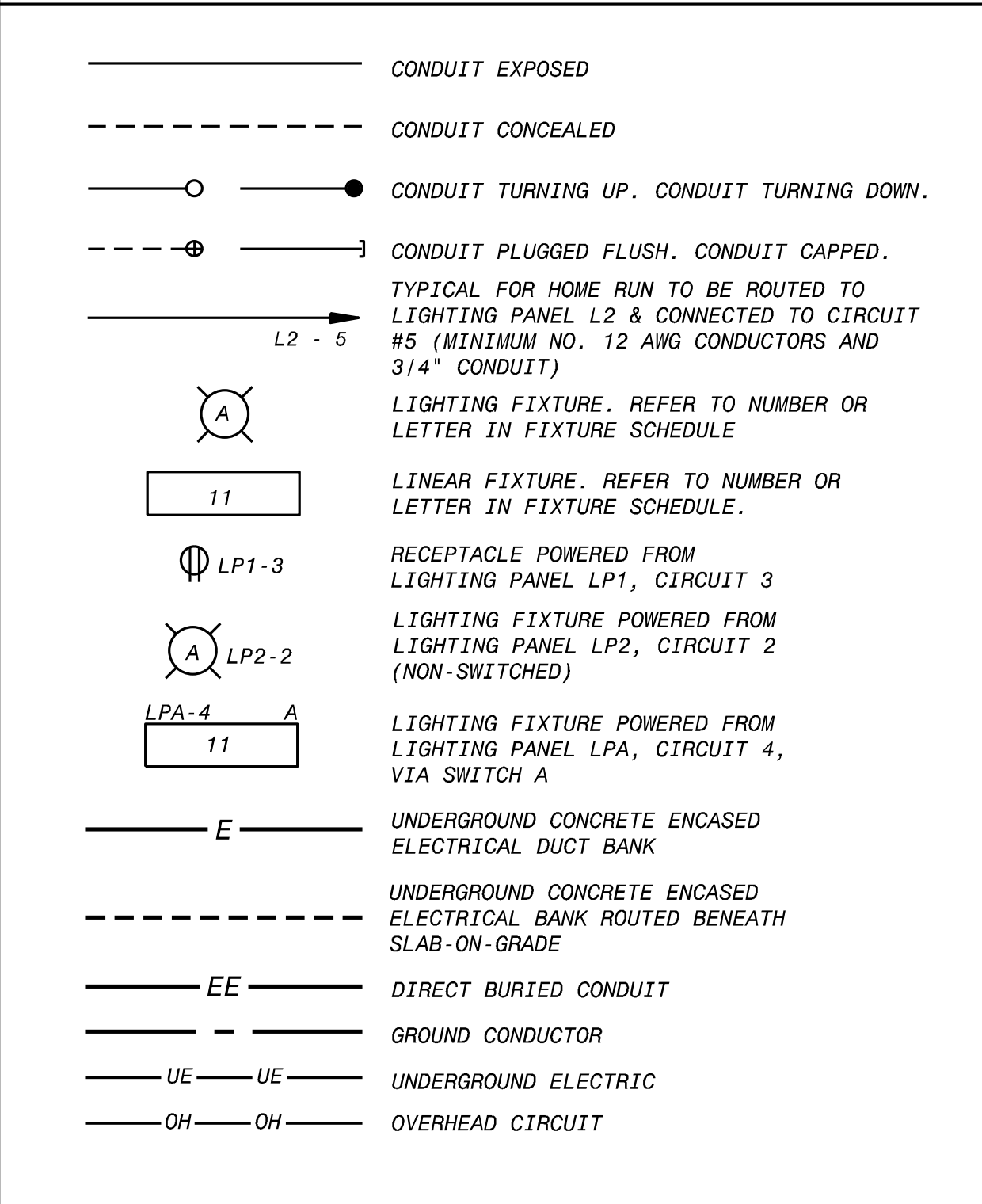
MISCELLANEOUS SYMBOLS



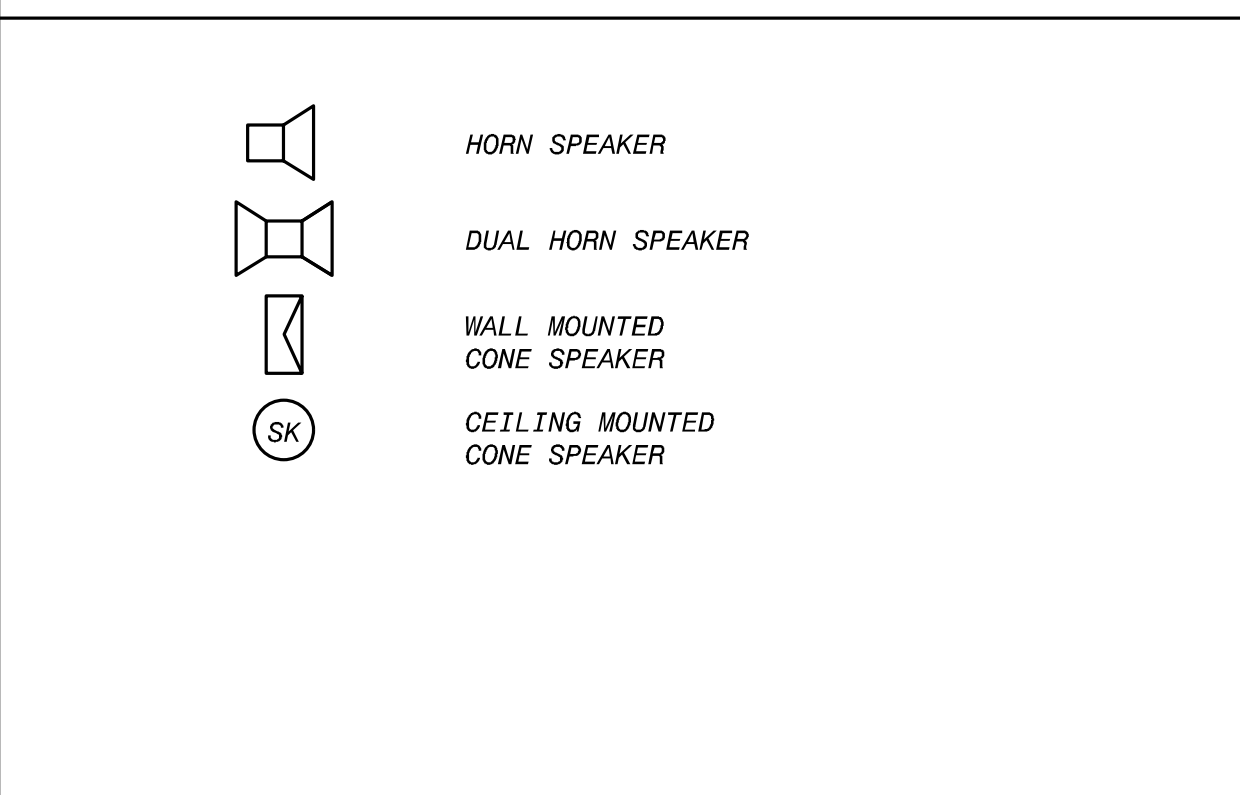
BREAKER DETAILS



CONDUIT & WIRING INSTALLATION LEGEND



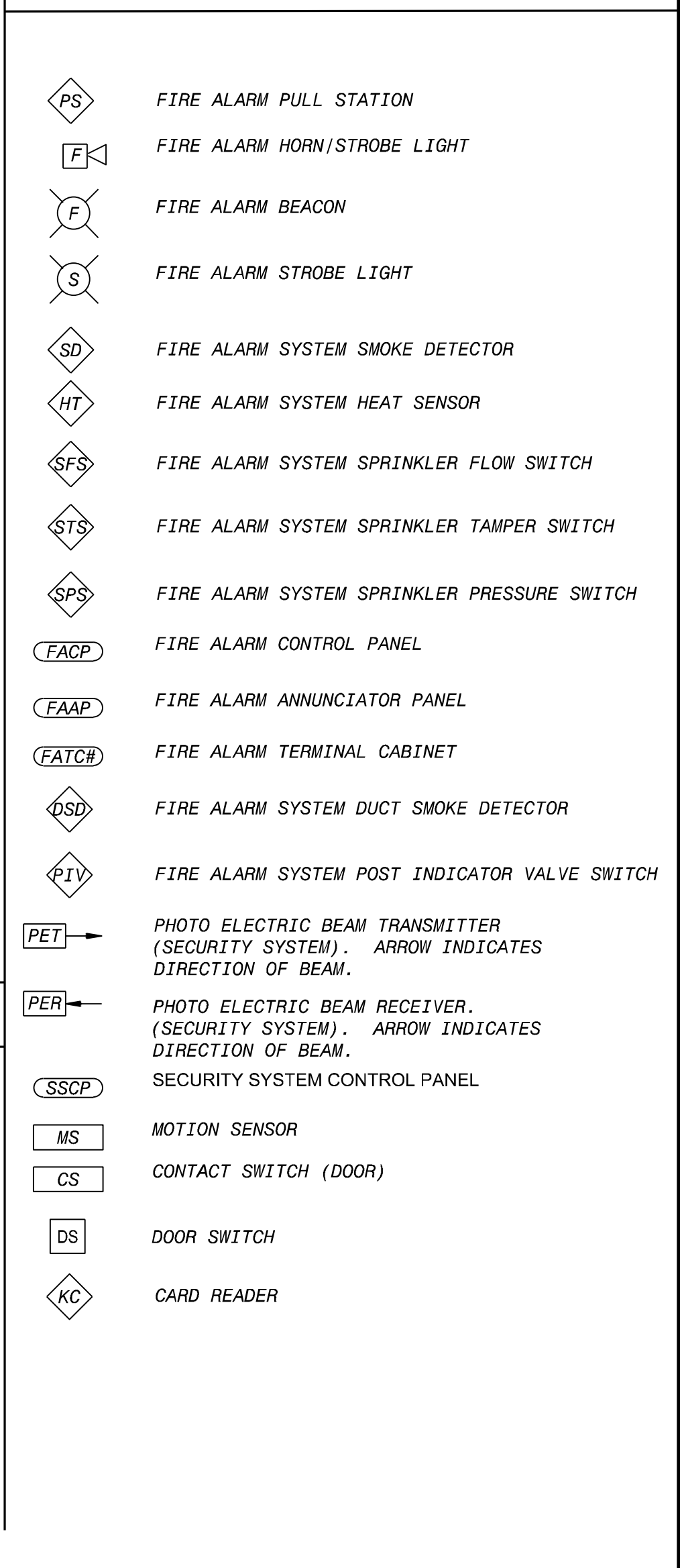
COMMUNICATION SYMBOLS



PROTECTION/RELAY DEVICE NUMBERS

- 25 - SYNCHRONIZING OR SYNCHRONISM-CHECK DEVICE
- 27 - UNDERVOLTAGE RELAY
- 32 - DIRECTIONAL POWER RELAY
- 37 - UNDERCURRENT OR UNDERPOWER RELAY
- 46 - REV. PHASE OR PHASE-BAL. CURRENT RELAY
- 47 - PHASE SEQ. OR PHASE BAL. VOLTAGE RELAY
- 49 - MACHINE OR TRANSFORMER THERMAL RELAY
- 50 - INSTANTANEOUS OVERCURRENT
- 51 - AC TIME OVERCURRENT RELAY
- 52 - AC CIRCUIT BREAKER
- 59 - OVERVOLTAGE RELAY
- 63 - PRESSURE SWITCH
- 64 - GROUND DETECTOR RELAY
- 67 - AC DIRECTIONAL OVERCURRENT RELAY
- 71 - LIQUID OR GAS LEVEL RELAY
- 81 - FREQUENCY RELAY
- 83 - AUTOMATIC SELECTIVE CONTROL OR TRANSFER RELAY
- 86 - LOCKOUT RELAY
- 87 - DIFFERENTIAL PROTECTIVE RELAY

CONTROL SCHEMATIC LEGEND



DESIGNED: RDT  
 DETAILED: AD  
 CHECKED: LB  
 APPROVED: MT  
 DATE: FEB 2019

PROJECT NO. 198896  
**E-01**  
 SHEET 23 OF 42

MANATEE COUNTY, FLORIDA  
 SOUTHEAST WATER RECLAMATION FACILITY  
 PLANT DRAIN PUMP STATION

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ELECTRICAL LEGEND

REVISIONS AND RECORD OF ISSUE

NO.	BY	DATE	REVISIONS
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**ELECTRICAL GENERAL NOTES**

- SOLID LINES ( ————— ) INDICATE NEW WORK OR EQUIPMENT.
- SCREENED LINES ( ———— ) INDICATE EXISTING WORK OR EQUIPMENT.
- DASHED LINES ( - - - - - ) INDICATE FUTURE WORK OR EQUIPMENT.
- REFER TO INDIVIDUAL DISCIPLINE CONTRACT DRAWINGS FOR ADDITIONAL ABBREVIATIONS, DETAILS, AND GENERAL DESIGN NOTES.
- LEGEND SHEETS ARE GENERAL. SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE UTILIZED ON THIS SPECIFIC PROJECT.
- INFORMATION RELATED TO CIRCUIT IDENTIFICATION, WIRE & CONDUIT SIZES, AND ROUTING, IS ON THE FOLLOWING DRAWING TYPES.
  - ONE-LINE DIAGRAMS SHOW CIRCUIT IDENTIFICATION, WIRE QUANTITY AND SIZES, AND CONDUIT SIZE WITHIN STRUCTURES. ONE-LINE DIAGRAMS ALSO INDICATE ORIGIN AND DESTINATION OF CIRCUITS, AND IDENTIFY CIRCUITS ROUTED UNDERGROUND.
  - FOR CIRCUITS WITHOUT UNDERGROUND PORTIONS, BUILDING FLOOR PLANS SHOW LOCATION OF EQUIPMENT FOR DETERMINING CIRCUIT LENGTH WITHIN THE STRUCTURE. FOR CIRCUITS WITH UNDERGROUND PORTIONS, ANTICIPATED PENETRATION OF UNDERGROUND CONDUITS ARE SHOWN ON STRUCTURE PLANS FOR DETERMINING THE LENGTH OF THE IN-STRUCTURE PORTIONS OF CIRCUITS. BUILDING FLOOR PLANS MAY ALSO SHOW HOME RUNS FOR LIGHTING, RECEPTACLE, AND OTHER MISCELLANEOUS EQUIPMENT CIRCUITS.
  - SITE PLANS INDICATE THE GENERAL ROUTING OF UNDERGROUND CONDUITS AND DUCT BANKS. CIRCUITS ROUTED IN UNDERGROUND CONDUITS OR DUCT BANKS ARE INDICATED IN DUCT BANK SECTIONS REFERENCED ON THE SITE PLAN.
  - DUCT BANK SECTIONS AND SCHEDULES IDENTIFY CONDUIT SIZE, CONDUIT MATERIAL, ARRANGEMENT OF THE UNDERGROUND CONDUITS, AND CIRCUITS ROUTED IN EACH UNDERGROUND CONDUIT.

**AREA DESIGNATIONS**

THE SPECIAL AREA DESIGNATION BOXES, AS DEFINED BELOW, ARE LOCATED ON THE PLAN DRAWINGS TO DEFINE ELECTRICAL INSTALLATION REQUIREMENTS. DESIGNATION BOXES ARE LOCATED WITHIN ROOM OR BELOW ROOM NUMBER. ALL INDOOR AREAS NOT INDICATED OTHERWISE ARE AREA TYPE 1 AND MINIMUM NEMA TYPE 1 ENCLOSURES.

- AREA TYPE 1A** CORROSIVE CHEMICAL FEED AND STORAGE ROOMS. CONDUIT SYSTEM SHALL BE EXPOSED SCHEDULE 80 PVC RIGID NON-METALLIC CONDUIT WITH PVC FITTINGS, BOXES AND ACCESSORIES.
- AREA TYPE 4** INDOOR WET LOCATIONS SUCH AS VAULTS, HOSEDOWN AREAS, BASEMENTS, ETC. MINIMUM NEMA TYPE 4 ENCLOSURE FOR EQUIPMENT AND GASKETED FITTINGS IN A CONDUIT SYSTEM.
- AREA TYPE 7A** CLASS I, DIVISION 1 AREA AS DEFINED BY NEC. ALL EQUIPMENT AND CONDUIT SYSTEMS SHALL BE RATED FOR USE IN THIS AREA.
- AREA TYPE 7B** CLASS I, DIVISION 2, GROUP C AND D (METHANE, GASOLINE) AS DEFINED BY NEC. EQUIPMENT AND CONDUITS SYSTEMS SHALL BE RATED FOR USE IN THIS AREA.
- AREA TYPE 12** INDOOR, DRY, DIRTY AREA. REQUIRES MINIMUM NEMA TYPE 12 GASKETED ENCLOSURES FOR ALL EQUIPMENT AND GASKETED FITTINGS IN CONDUIT SYSTEMS.

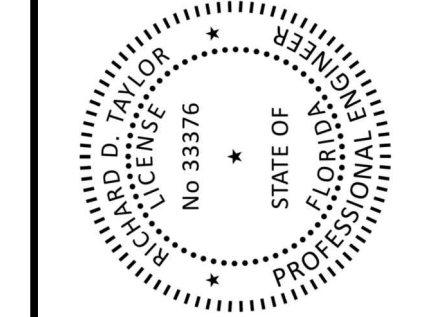
**GENERAL REQUIREMENTS**

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ROUTING ALL CONDUITS NOT SHOWN ON THE PLANS. THIS SHALL INCLUDE ALL CONDUITS SHOWN ON THE ONE-LINES AND HOME-RUNS SHOWN ON THE PLAN DRAWINGS. CONDUITS SHALL BE ROUTED AS DEFINED IN THE SPECIFICATION.
- SPARE WIRES SHALL BE TAPED AND COILED AND LABELED TO INDICATE WHERE OTHER END OF SPARE WIRE IS LOCATED.
- IF EQUIPMENT SUPPLIED BY MANUFACTURER HAS A LARGER LOAD THAN VALUE SHOWN, THE CABLE CONDUIT AND ELECTRICAL EQUIPMENT SHALL BE ENLARGED, AS REQUIRED, TO ACCOMMODATE THE HIGHER VALUE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING PROPERLY SIZED STARTER OVERLOADS FOR EQUIPMENT FURNISHED.
- LIGHTING AND RECEPTACLE CIRCUITS DESIGNATED ON THE FLOOR PLANS ARE NOT SHOWN ON THE ONE-LINES. CONDUCTORS FOR LIGHTING, RECEPTACLES, AND MISCELLANEOUS 120VAC CIRCUITS SHALL BE MINIMUM NO. 12AWG. CONDUIT FOR LIGHTING, RECEPTACLES, AND MISCELLANEOUS 120VAC CIRCUITS SHALL BE MINIMUM 3/4".
- IN AREAS WHERE THERE ARE OVERHEAD BRIDGE CRANES, HOISTS, ETC. NO CONDUITS SHALL BE RUN OVERHEAD THAT WILL INTERFERE WITH THE OPERATION OF THE EQUIPMENT.

**ELECTRICAL ABBREVIATIONS**

<b>A</b>	A AC ACB ACR AF AFD AFRD AM ANN AR AS AT ATS AUX AWG	AMBER, AMPERE, ALARM ALTERNATING CURRENT AIR CIRCUIT BREAKER ACCESS CARD READER AMPERE FRAME ADJUSTABLE FREQUENCY DRIVE ARC-FLASH REDUCTION DEVICE ANMMETER ANNUNCIATOR ALARM RELAY AMMETER SWITCH, AMPERE SENSOR AMPERE TRIP AUTOMATIC TRANSFER SWITCH AUXILIARY AMERICAN WIRE GAUGE	<b>I</b>	I/O I IJB  J J, JB  K KAIC KMIL KO KV KVA KVAR KW KWH	INPUT/OUTPUT INSTANTANEOUS INTERCOM JUNCTION BOX  JUNCTION BOX  KEY INTERLOCK THOUSAND AMPERES INTERRUPTING CURRENT THOUSAND CIRCULAR MIL KEY OPERATED KILOVOLT KILOVOLT AMPERE KILOVOLT KILOWATT KILOWATT HOUR	<b>S</b>	S SA SCADA  SF6 SH SN SO SP SPD SPDT SPST SS SSM SSS SST SUPV SV SWB, SWBD SWG, SWGR	SHORT-TIME, SHIELDED, STARTER SURGE ARRESTER, SPEAKER AMPLIFIER SUPERVISORY CONTROL AND DATA ACQUISITION SULFUR HEXAFLUORIDE SPACE HEATER SOLID NEUTRAL SOLENOID OILER SINGLE POLE SURGE PROTECTION DEVICE SINGLE POLE DOUBLE THROW SINGLE POLE SINGLE THROW SELECTOR SWITCH, START/STOP SOLID-STATE METERING SOLID-STATE STARTER SOLID-STATE TRIP SUPERVISORY CONTROL SOLENOID VALVE SWITCHBOARD SWITCHGEAR
<b>B</b>	B BC BKR BR BT	BUS BATTERY CHARGER BREAKER BRAKE BEARING TEMPERATURE	<b>L</b>	L LA LAN LC LCP LCS LOA LOR LOS LP LS LTG LVHH LVMH LWCO	LOW, LEVEL, LONG-TIME LIGHTNING ARRESTER LOCAL AREA NETWORK LIGHTING CONTRACTOR LOCAL CONTROL PANEL LOCAL CONTROL STATION LOCAL-OFF-AUTO LOCAL-OFF-REMOTE LOCK OUT STOP LIGHTING PANEL LIMIT OR LEVEL SWITCH LIGHTING LOW VOLTAGE HANDHOLE LOW VOLTAGE MANHOLE LOW WATER CUTOFF	<b>T</b>	T TACH TB TC TD TEMP TM TQ TR TS TTB	THERMOSTAT, TIMER, TOTALIZER, TRANSFORMER TACHOMETER TERMINAL BLOCK TIMER CLUTCH TIME DELAY RELAY TEMPERATURE TIMER MOTOR TORQUE TIMER RELAY, TRIAD TEMPERATURE SWITCH TELEPHONE TERMINAL BOARD
<b>C</b>	C CAP CB CB"A" CB"B"	CLOSE, COUNTER, CONTACTOR, CONTROL, CCTV CAMERA CAPACITOR CIRCUIT BREAKER CIRCUIT BREAKER AUXILIARY CONTACT (OPEN WHEN BREAKER IS OPEN) CIRCUIT BREAKER AUXILIARY CONTACT (CLOSED WHEN BREAKER IS OPEN)	<b>M</b>	M MA MCB MCC MCLU MD MDL MFR MH MOV MPR MS MSH MTS MV MVA MVHH	MAGNETIC MOTOR STARTER MILLIAMPERE MAIN CIRCUIT BREAKER MOTOR CONTROL CENTER MOTOR CONTROL LINEUP MOISTURE DETECTOR, MOTION DETECTOR MAGNETIC DOOR LOCK MANUFACTURER MANHOLE, MOUNTING HEIGHT MOTOR OPERATED VALVE MOTOR PROTECTION RELAY MANUAL MOTOR STARTER MOTOR SPACE HEATER MANUAL TRANSFER SWITCH MILLIVOLT, MEDIUM VOLTAGE MEGAVOLT AMPERE MEDIUM VOLTAGE HANDHOLE	<b>U</b>	UG UPS UTS	UNDERGROUND UNINTERRUPTIBLE POWER SUPPLY UP TO SPEED
<b>D</b>	DC DI DM	DIRECT CURRENT, DOOR CONTACT DOOR INTERLOCK DAMPER MOTOR, DEMAND METER, DIMMER SWITCH	<b>N</b>	N NGR NGT NC NO	NEUTRAL NEUTRAL GROUNDING RESISTOR NEUTRAL GROUNDING TRANSFORMER NORMALLY CLOSED NORMALLY OPEN, NUMBER	<b>V</b>	V VA VAR VFD VI VLS VM VPI VS	VOLTS, VOLTAGE RESTRAINED VOLT AMPERE VARMETER VARIABLE FREQUENCY DRIVE VACUUM INTERRUPTER VALVE LIMIT SWITCH VOLT METER VALVE POSITION INDICATOR VOLT METER SWITCH
<b>E</b>	EC EDS EG EGCP EL EMH ER ES E-STOP ETM EX EXP EH	ELECTRIC OPERATOR FOR CONTROL DAMPER OR VALVE EMPTY CONDUIT ELECTRICAL DOOR STRIKE ENGINE GENERATOR ENGINE GENERATOR CONTROL PANEL ELEVATION, EMERGENCY LIGHT ELECTRICAL MANHOLE ELECTRODE RELAY END SWITCH, REQUEST TO EXIT SENSOR EMERGENCY STOP ELAPSED TIME METER EXISTING EXPLOSION PROOF ELECTRICAL HANDHOLE	<b>O</b>	O OL OOA OOR O/U	OPEN OVERLOAD ON-OFF-AUTO ON-OFF-REMOTE OVER/UNDER	<b>W</b>	W WH WM WP WPI WS	WHITE, WATTS WATTHOUR METER WATT METER WEATHERPROOF WEATHERPROOF IN-USE WALL STATION
<b>F</b>	F FO FPR FS	FORWARD, FIELD FIBER OPTIC FEEDER PROTECTION RELAY FLOW SWITCH	<b>P</b>	P PCS PB PF PFCC PH PL PLC PP PR PRS PS PT	PRIMARY, POWER, POLE PLANT CONTROL SYSTEM PUSH BUTTON, PULL BOX POWER FACTOR POWER FACTOR CORRECTION CAPACITOR PHASE PILOT LIGHT PROGRAMMABLE LOGIC CONTROLLER POWER PANEL PAIR PROXIMITY SWITCH PRESSURE SWITCH POTENTIAL TRANSFORMER, PROGRAM TIMER	<b>X</b>	X XFMR XP	AUXILIARY RELAY TRANSFORMER EXPLOSION PROOF
<b>G</b>	G GD GEN GFI GLS GPR GND #8G	GREEN, GROUND, GENERATOR, GROUND FAULT GROUND DETECTOR GENERATOR GROUND FAULT INTERRUPTOR GEARED LIMIT SWITCH GENERATOR PROTECTION RELAY GROUND #8 GROUND WIRE	<b>Q</b>	Q	NOT USED	<b>Y</b>	Y	YELLOW
<b>H</b>	H HH HMT HOA HOR HP HS HWCO HZ	HIGH, HUMIDISTAT HANDHOLE HIGH MOTOR TEMPERATURE HAND-OFF-AUTO HAND-OFF-REMOTE HORSEPOWER HAND STATION HIGH WATER CUTOFF HERTZ (CYCLE)	<b>R</b>	R RECP RES RH RT RTD RTU RVSS	RED, RAISE, RELAY, REVERSE RECEPTACLE RESISTOR REMOTE HANDSET REPEATING TIMER RESISTANCE TEMPERATURE DETECTOR REMOTE TERMINAL UNIT REDUCED VOLTAGE SOLID STATE STARTER	<b>Z</b>	Z ZS ZSS	AUXILIARY RELAY, IMPEDANCE POSITION SWITCH ZERO SPEED SWITCH
<b>1-PR#16S</b>		ONE, SINGLE PAIR, TWISTED SHIELDED #16 CABLE						
<b>3-7/C#14</b>		THREE, SINGLE, SEVEN CONDUCTOR #14 MULTICONDUCTOR CONTROL CABLES						
<b>1-1TR#16S</b>		ONE, TRIAD, TWISTED SHIELDED #16 CABLE						

FEB 2019	100% SUBMITTAL	D	AD	DN	MT
DEC 2018	90% SUBMITTAL	C	AD	RD	MT
SEPT 2018	60% SUBMITTAL	B	AD	MM	RD
JULY 2018	30% SUBMITTAL	A	AD	MM	RD
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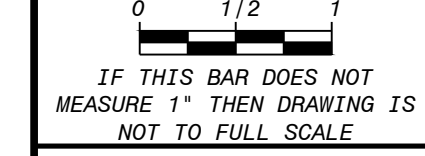
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Tampa, Florida

Professional Engineer  
Certificate No. 8132

**MANATEE COUNTY, FLORIDA**  
**SOUTHEAST WATER RECLAMATION FACILITY**  
**PLANT DRAIN PUMP STATION**

**ELECTRICAL**  
**ABBREVIATIONS AND NOTES**

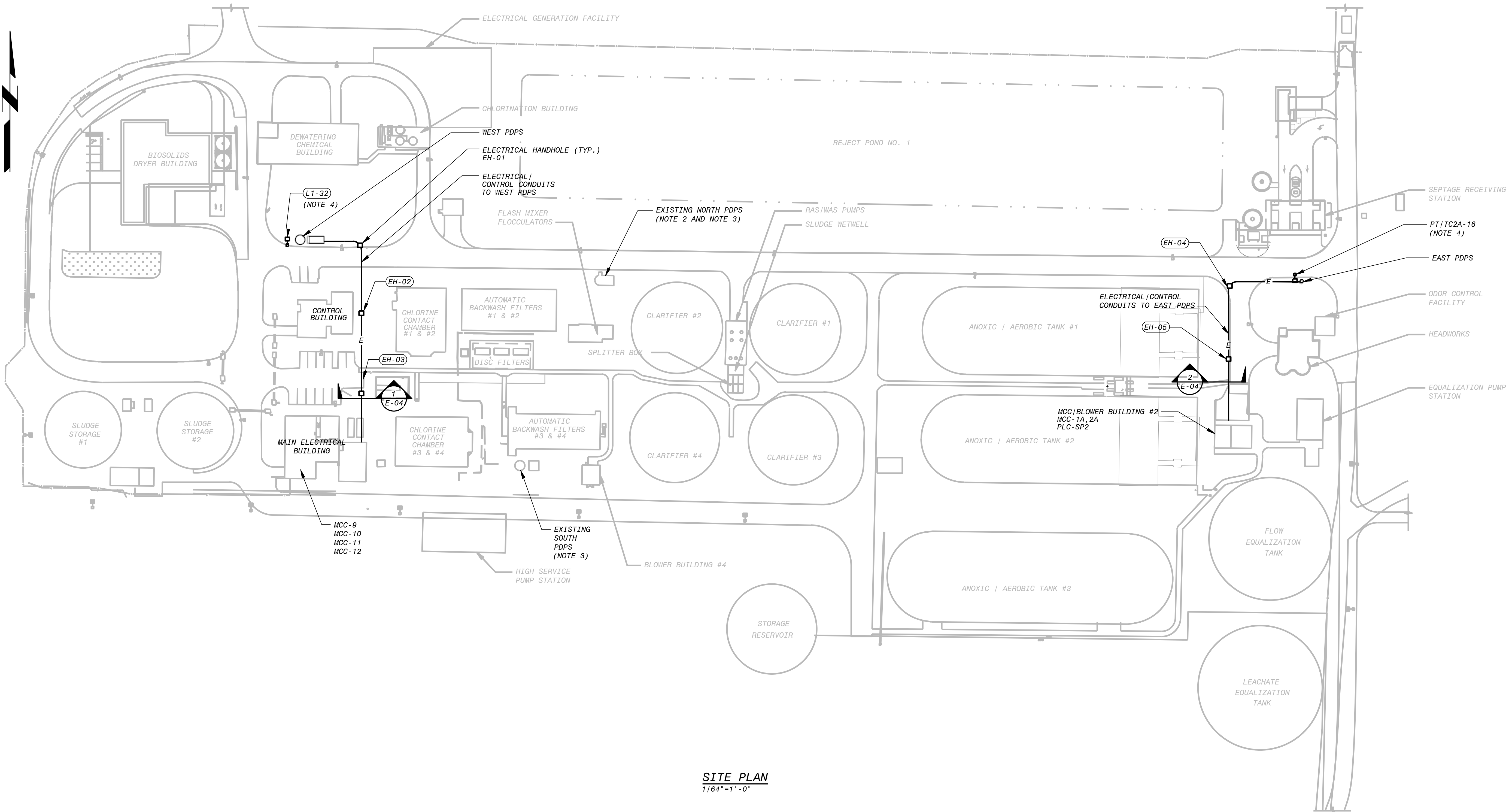
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DETAILED: AD
CHECKED: LB
APPROVED: MT
DATE: FEB 2019



PROJECT NO.  
**198896**

**E-02**  
SHEET  
24 OF 42



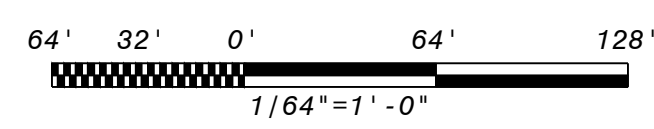


**SITE PLAN**  
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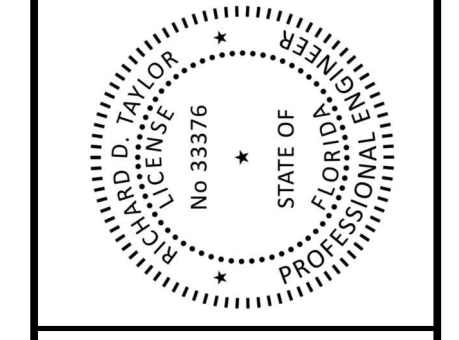
LIGHTING FIXTURE SCHEDULE				
FIXTURE	LAMP	MTG HGT	DESCRIPTION	MANUFACTURER
1	LED 209W 22,047 LUMENS	MOUNTED ON EXISTING POLE. POLE HEIGHT FOR EAST AND WEST PDPS FIXTURE SHALL BE 12FT TALL.	209W LED OUTDOOR AREA LIGHT, SINGLE-PIECE DIE-CAST ALUMINUM HOUSING, INTEGRAL HEAT SINK, ZINC-INFUSED SUPER DURABLE TGIC THERMOSET POWDER COAT FINISH, T3M OPTICS, 5000K, NIGHT TIME FRIENDLY PRODUCT, MAST ARM POLE MOUNTED, 480V	LITHONIA #DSX1 LED 60C 1000 50K T3M 480 MA DBLXD

**LIGHTING FIXTURE SCHEDULE**

- NOTES:**
- SEE DRAWING E-01 AND E-02 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL NOTES.
  - EXISTING NORTH PDPS CONTROL PANEL MOUNTING SHALL BE MODIFIED AS ON DRAWING E-13 DETAIL.
  - CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF EXISTING LIGHT-POLE AT NORTH AND SOUTH PDPS. CONTRACTOR SHALL REPLACE THESE HPS LIGHT FIXTURES WITH LED FIXTURE NO.1 ON EXISTING POLE.
  - CONTRACTOR SHALL INSTALL 2 NEW LIGHT POLES, EACH WITH LED FIXTURE NO.1, ONE POLE AT EAST AND WEST PLANT DRAIN PUMP STATION AS SHOWN ON DRAWINGS E-7 & E-8.



FEB 2019	100% SUBMITTAL	MT
DEC 2018	90% SUBMITTAL	MT
SEPT 2018	60% SUBMITTAL	MT
JULY 2018	30% SUBMITTAL	MT
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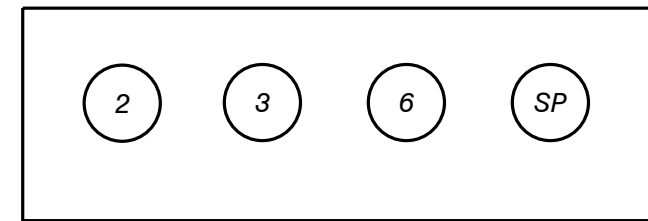
**MANATEE COUNTY, FLORIDA  
SOUTHEAST WATER RECLAMATION FACILITY  
PLANT DRAIN PUMP STATION**

**ELECTRICAL  
SITE PLAN**

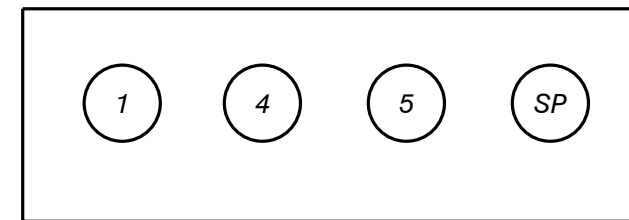
DESIGNED: RDT
DETAILED: AD
CHECKED: LB
APPROVED: MT
DATE: FEB 2019
PROJECT NO. 198896
<b>E-03</b> SHEET 25 OF 42

DUCT BANK SCHEDULE				
CONDUIT . NO.	CONDUIT SIZE	TYPE OF CABLE - POWER/ CONTROL/ SIGNAL	CKT NO	LOAD
1	2"	P	MCC1A-11	EAST PLANT DRAIN PS DUPLEX PUMP CONTROL PANEL
2	2"	P	MCC10-1	WEST PLANT DRAIN PS TRIPLEX PUMP CONTROL PANEL
3	2"	C	WDSPCP-5	FIBER-OPTIC NETWORK CABLING TO WEST DRAIN PDPS PLC
4	2"	C	EDPSCP-4	FIBER-OPTIC NETWORK CABLING TO EAST DRAIN PDPS PLC
5	2"	P	PT/TC2A-16	LIGHT FIXTURE AT EAST DRAIN PUMP STATION
6	2"	P	LI-32	LIGHT FIXTURE AT WEST DRAIN PUMP STATION
7	2"	P/C	SPARE	

DUCT BANK SCHDEULE



SECTION 1  
NTS E-03

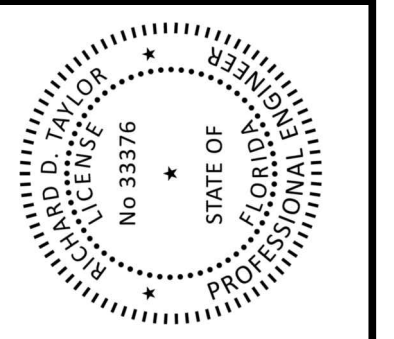


SECTION 2  
NTS E-03

**NOTE:**

1. SEE DRAWING E-01 AND E-02 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.

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DEC 2018	90% SUBMITTAL	A	AD	ROT	MT
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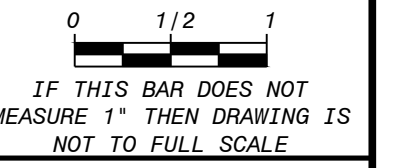
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MANATEE COUNTY, FLORIDA  
SOUTHEAST WATER RECLAMATION FACILITY  
PLANT DRAIN PUMP STATION

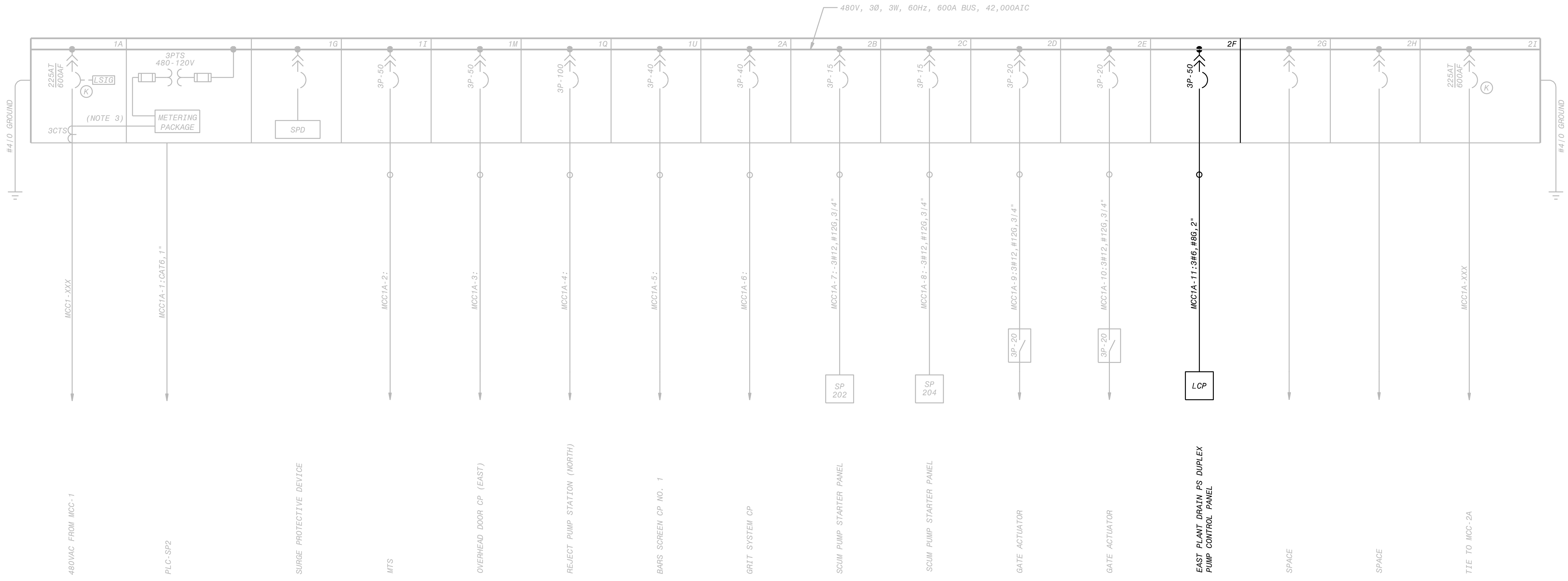
ELECTRICAL  
DUCT BANK SCHEDULE AND SECTIONS

DESIGNED: RDT  
DETAILED: AD  
CHECKED: LB  
APPROVED: MT  
DATE: FEB 2019

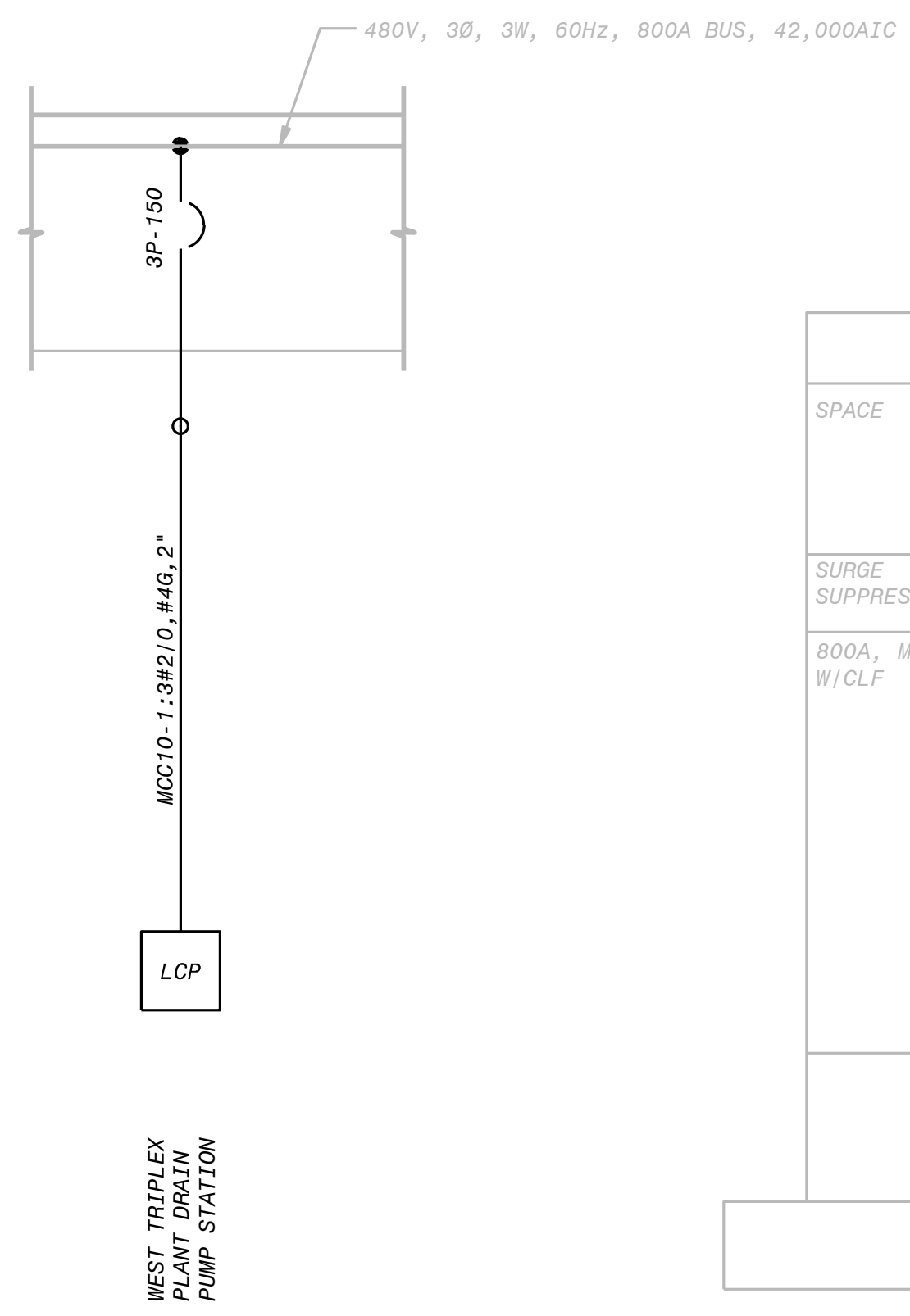


PROJECT NO.  
198896

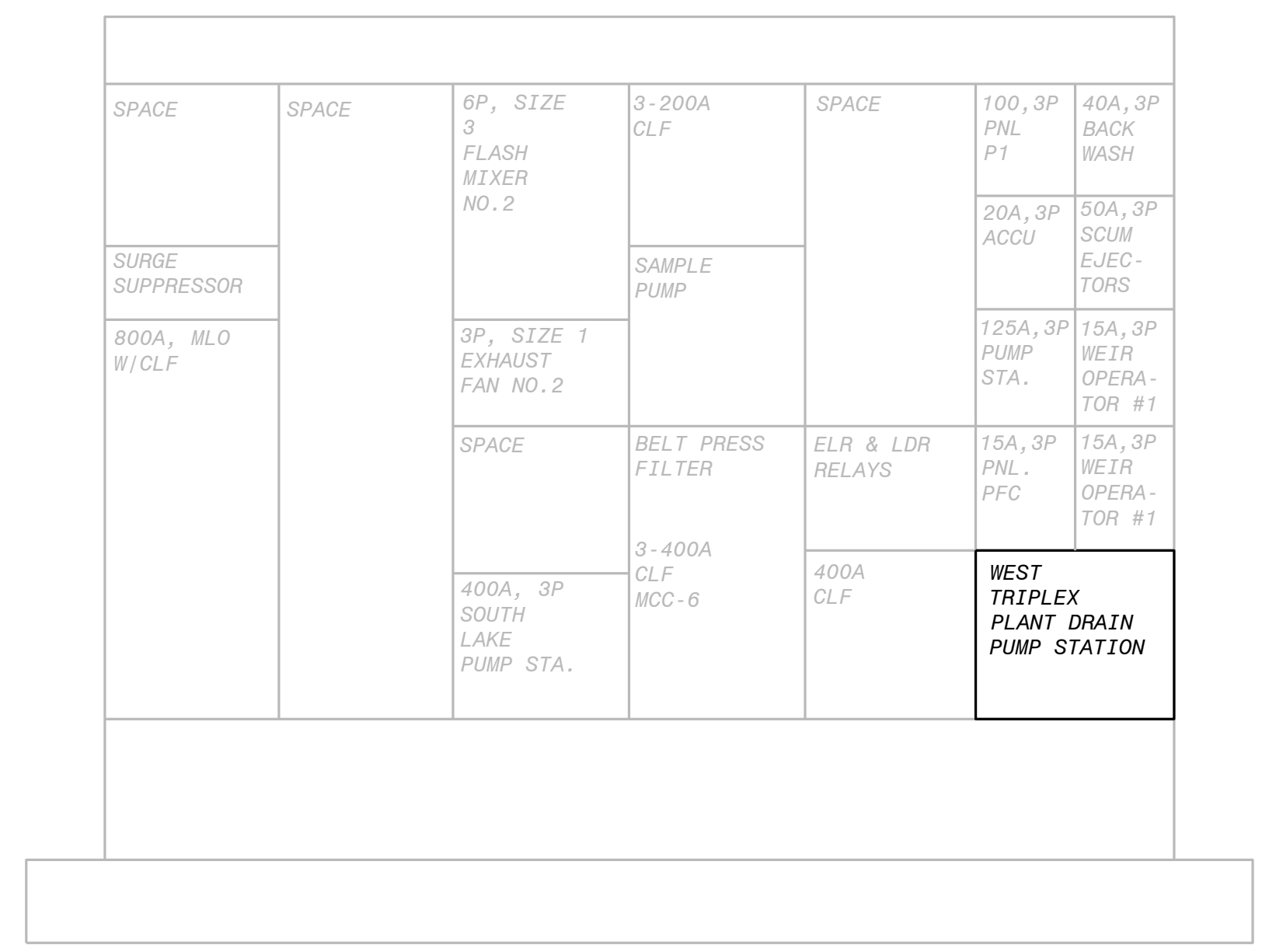
**E-04**  
SHEET  
26 OF 42



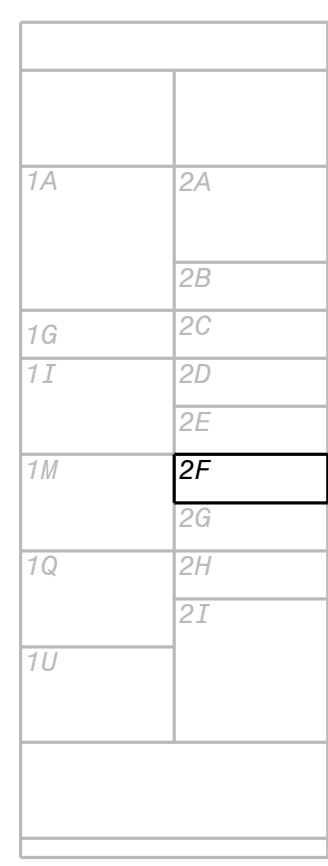
**MCC-1A ONE-LINE DIAGRAM**  
ELECTRICAL BUILDING NO.2



**MCC-10 ONE-LINE DIAGRAM**  
ELECTRICAL BUILDING NO.1  
NTS



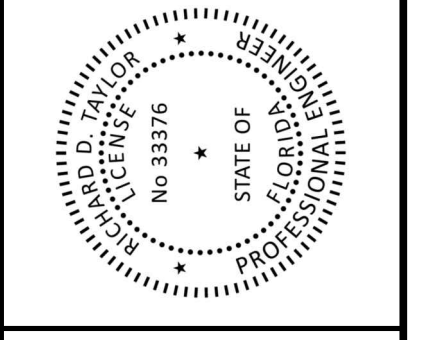
**MCC-10 FRONT VIEW**  
NTS



**MCC 1A - FRONT ELEVATION**  
NTS

**NOTE:**  
1. SEE DRAWING E-01 AND E-02 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CHK	APP
FEB 2019	100% SUBMITTAL	C	AD	DH	MT
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PLANT DRAIN PUMP STATION

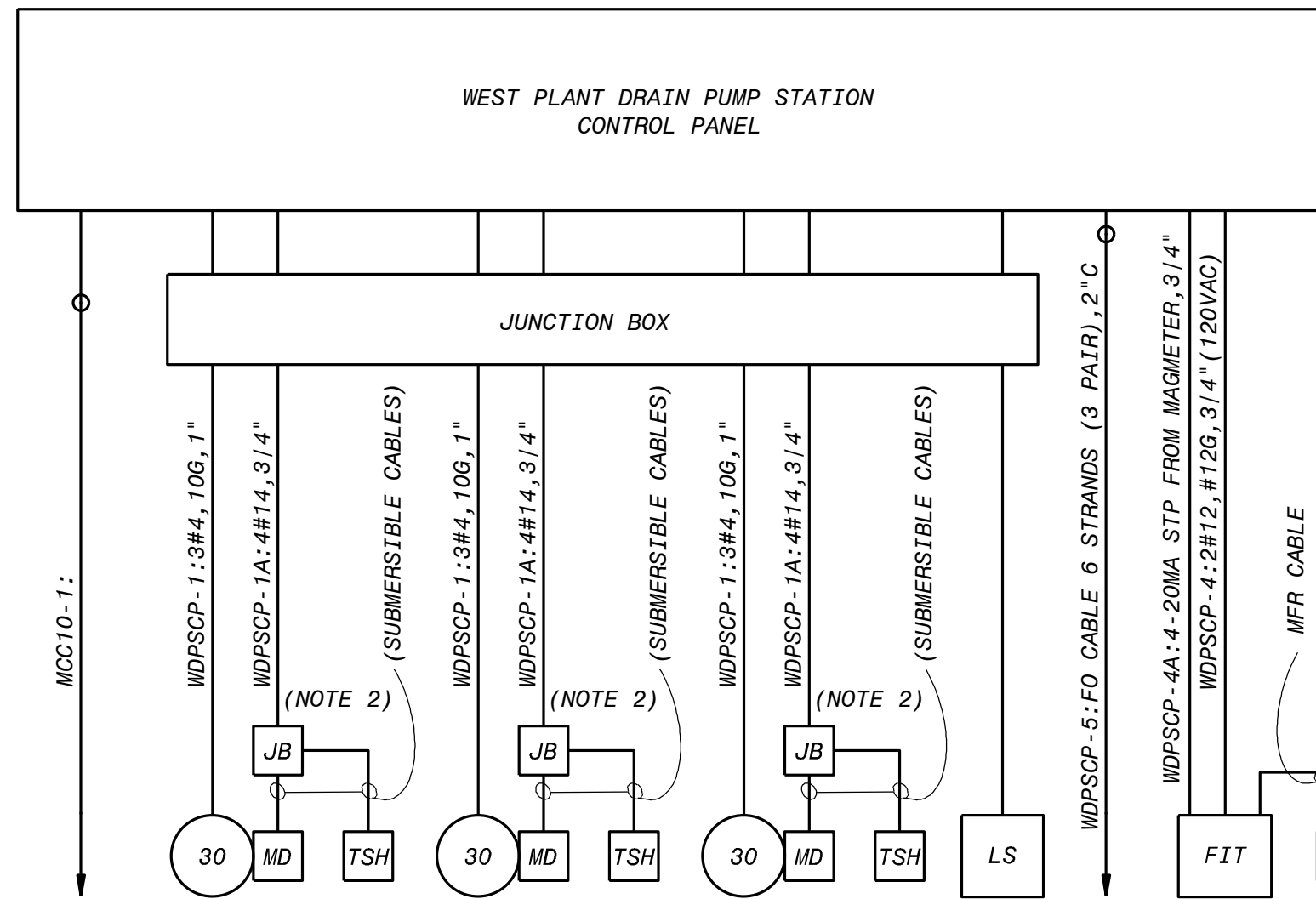
ELECTRICAL  
POWER ONE-LINE DIAGRAMS

DESIGNED: RDT  
 DETAILED: AD  
 CHECKED: LB  
 APPROVED: MT  
 DATE: FEB 2019

0 1/2 1  
 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.  
198896

**E-05**  
SHEET  
27 OF 42



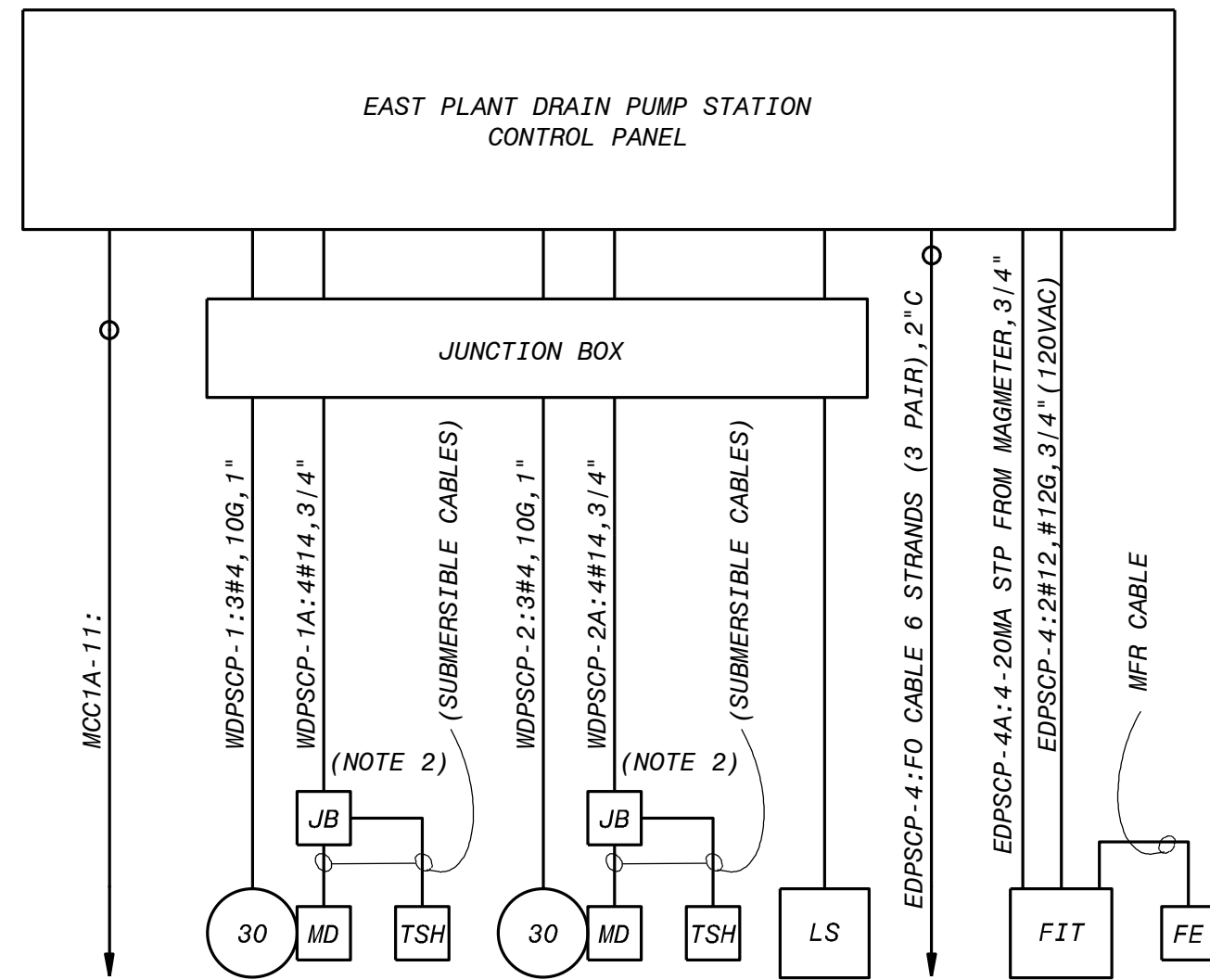
480VAC FROM  
MCC 1A

PCL-101  
MD-101  
TSH-101  
PCL-102  
MD-102  
TSH-102  
PCL-103  
MD-103  
TSH-103

(LSH-101, LSH-102,  
LSM-103, LSL-104, LSL-105)

PLC-SP1  
FIT-100  
FE-100

**WEST PLANT DRAIN PUMP STATION  
CONTROL PANEL**  
NTS



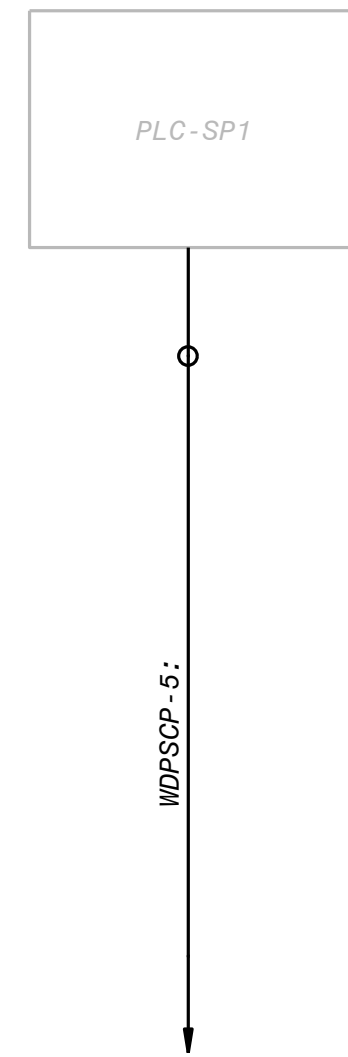
480VAC FROM  
MCC 1A

PCL-201  
MD-201  
TSH-201  
PCL-202  
MD-202  
TSH-202

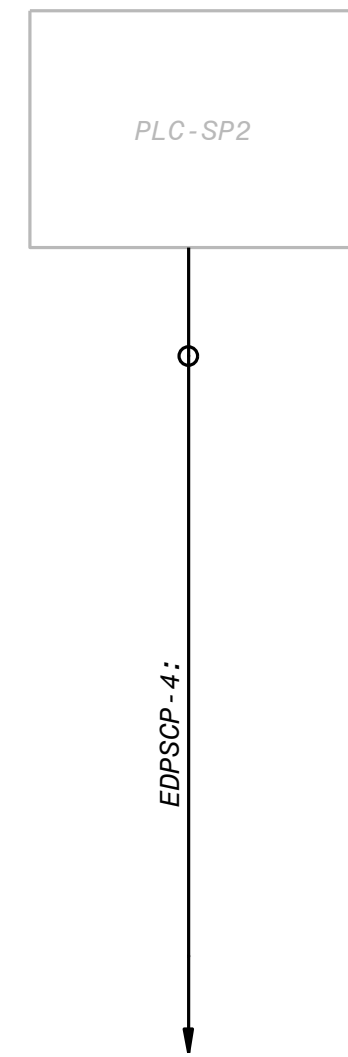
(LSH-201, LSM-202,  
LSL-203, LSL-204)

PLC-SP2  
FIT-200  
FE-200

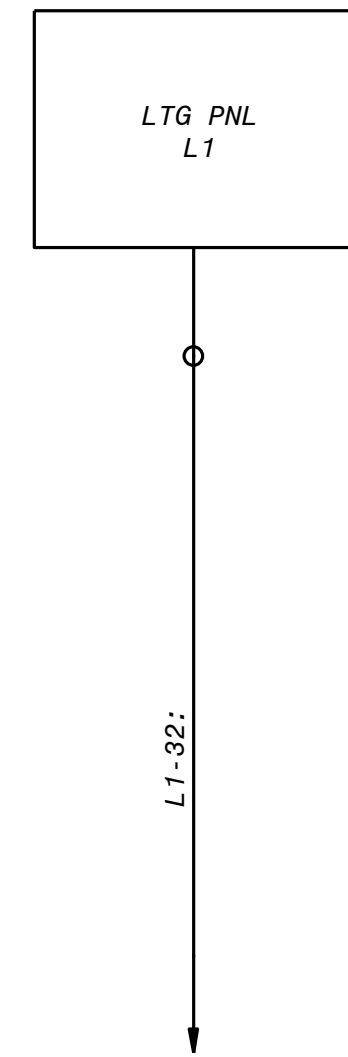
**EAST PLANT DRAIN PUMP STATION  
CONTROL PANEL**  
NTS



**PLC-SP1**  
ELECTRICAL BUILDING NO.1

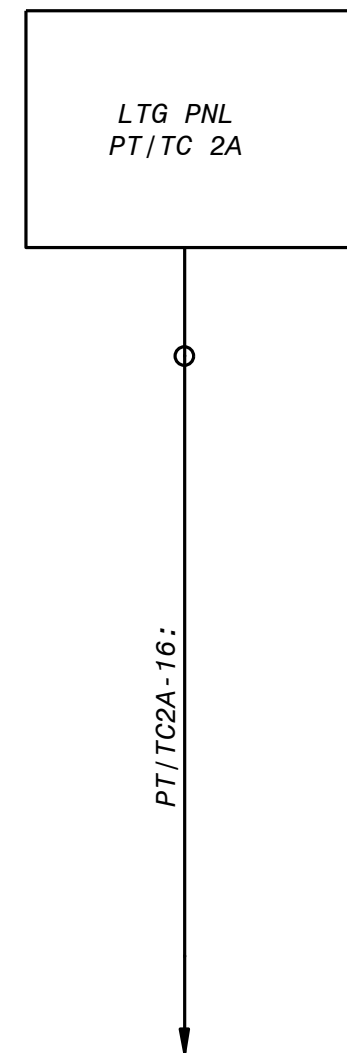


**PLC-SP2**  
ELECTRICAL BUILDING NO.2



**LIGHTING PANEL-L1**  
ELECTRICAL BUILDING NO.1

NEW LIGHT FIXTURE AT  
WEST PDRS



**LIGHTING PANEL  
PT/TC-2A**  
ELECTRICAL BUILDING NO.2

NEW LIGHT FIXTURE AT  
EAST PDRS

**NOTES:**

- SEE DRAWING E-01 AND E-02 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
- J.B. LOCATED BENEATH CONTROL PANEL FOR TERMINATION OF PUMP AND CONTROL CABLES FROM WET WELL.
- UMBILICAL CABLES FROM EACH FLOAT SWITCH & PUMP MOTOR STATUS CABLES TO INTRINSIC SAFETY BARRIERS IN LOCAL STATUS PANEL (TYPICAL FOR FLOAT SWITCHES, PUMPS CABLES.)
- 4" CONDUIT FROM WET WELL WALL TO PUMP POWER TERMINATION J.B.FOR SUBMERSIBLE PUMP POWER & MOTOR STATUS UMBILICAL CABLES.

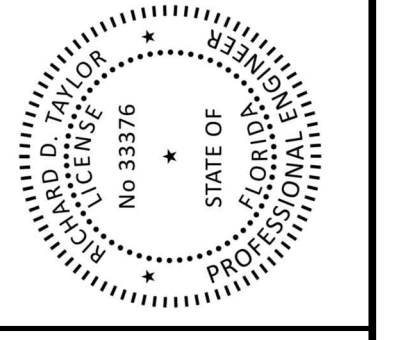
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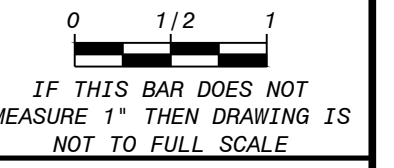
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PLANT DRAIN PUMP STATION**

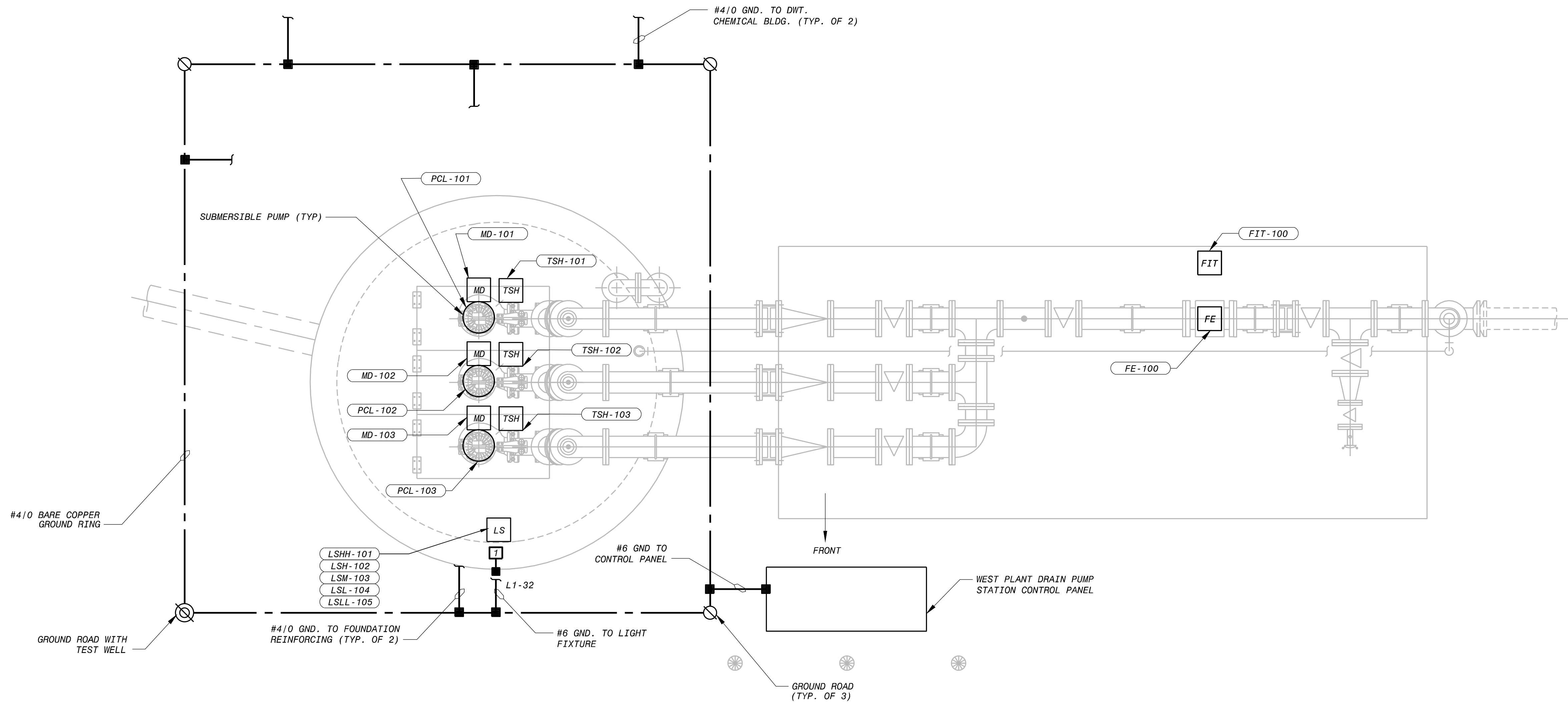
**ELECTRICAL  
CONTROL ONE LINES**

DESIGNED: RD
DETAILED: AD
CHECKED: LB
APPROVED: MT
DATE: FEB 2019



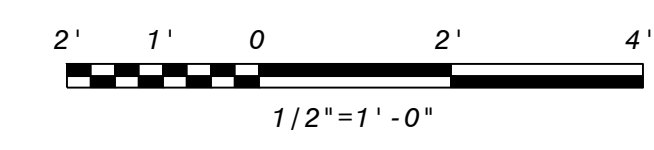
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**198896**

**E-06**  
SHEET  
28 OF 42

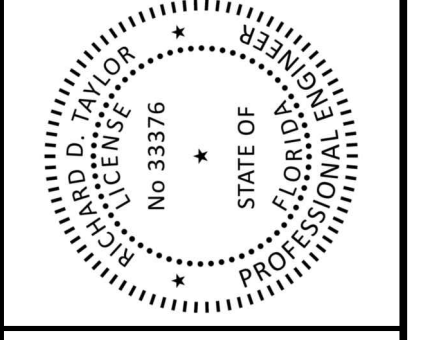


**WEST PLANT DRAIN PUMP STATION POWER AND GROUNDING PLAN**  
 1/2" = 1' - 0"

**NOTE:**  
 1. SEE DRAWING E-01 AND E-02 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.



DATE	DESCRIPTION	BY	CHK	APP
FEB 2019	100% SUBMITTAL	C	AD	MT
DEC 2018	90% SUBMITTAL	B	AD	RD
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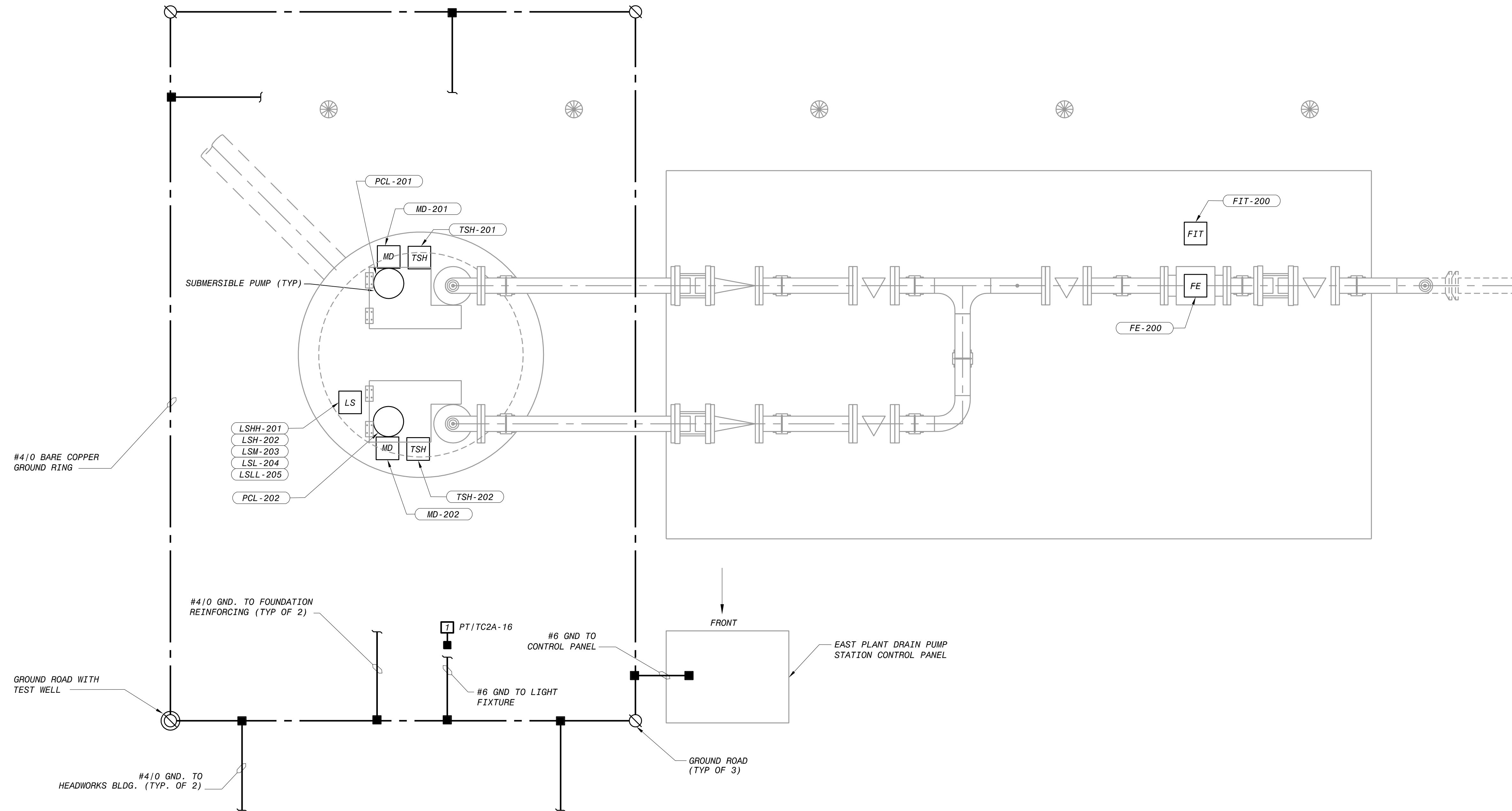
MANATEE COUNTY, FLORIDA  
 SOUTHEAST WATER RECLAMATION FACILITY  
 PLANT DRAIN PUMP STATION

ELECTRICAL  
 WEST PLANT DRAIN PUMP STATION  
 POWER AND GROUNDING PLAN

DESIGNED: RD  
 DETAILED: AD  
 CHECKED: LB  
 APPROVED: MT  
 DATE: FEB 2019

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

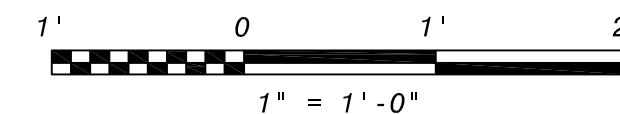
PROJECT NO.  
 198896  
**E-07**  
 SHEET  
 29 OF 42



**EAST PLANT DRAIN PUMP STATION POWER AND GROUNDING PLAN**  
1" = 1'-0"

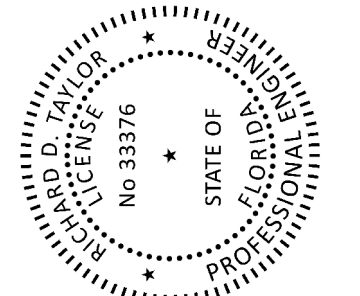
**NOTES:**

- SEE DRAWING E-01 AND E-02 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL NOTES.
- MECHANICAL BACKGROUND SHOWN FOR INFORMATIONAL USE ONLY. CONTRACTOR SHALL FOLLOW THE REQUIREMENTS IN SPECIFICATION 11150.



DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CHK	APP
FEB 2019	100% SUBMITTAL	C	AD	MT	
DEC 2018	90% SUBMITTAL	B	AD	ROT	MT
SEPT 2018	60% SUBMITTAL	A	AD	MM	ROT

60-3060 - Electrical Diagrams Drawings  
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PLOTTED: GAW78713, 9/11/2018 4:53:  
USER: ACH95836 DWS VER: 1003



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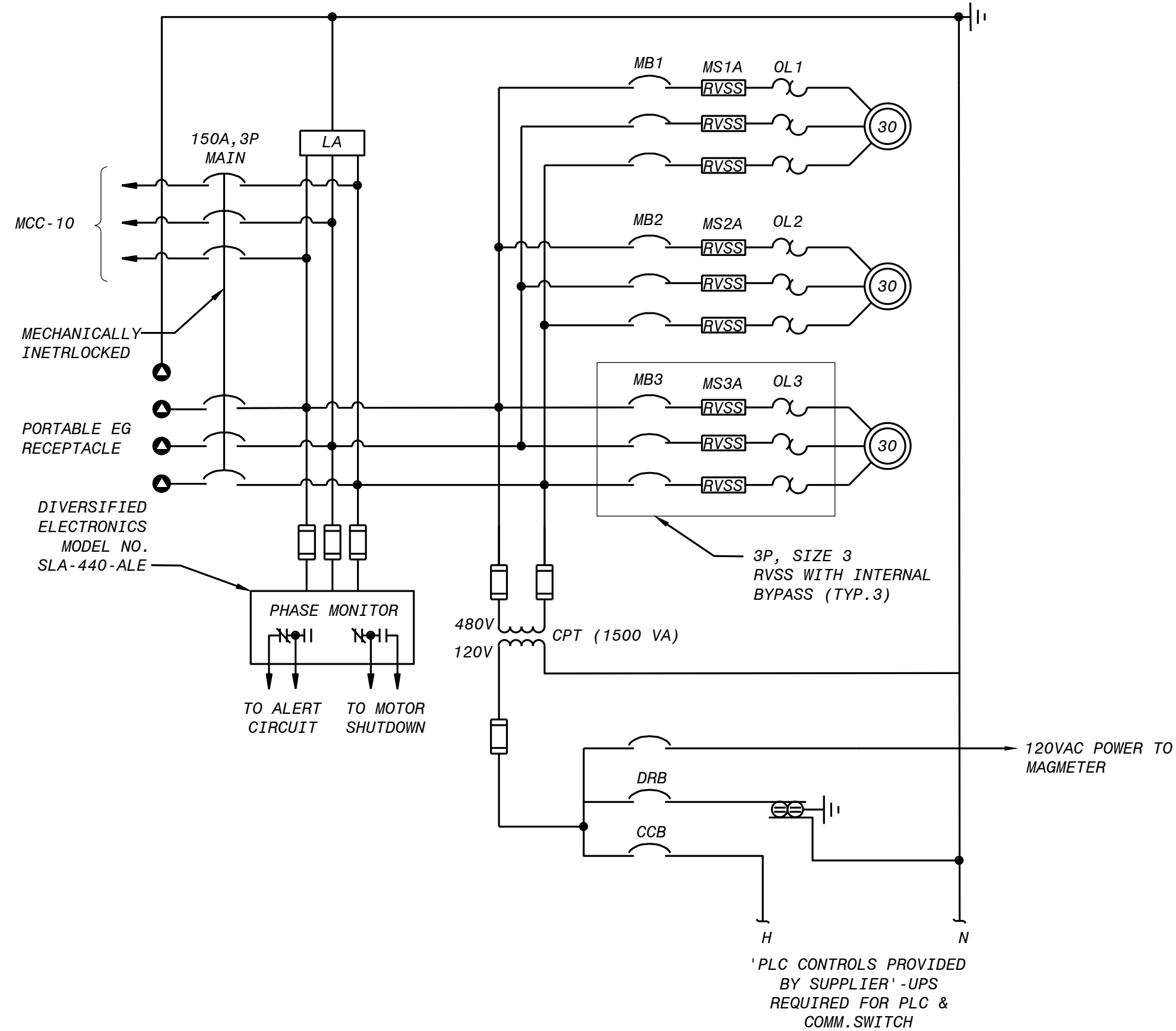
MANATEE COUNTY, FLORIDA  
SOUTHEAST WATER RECLAMATION FACILITY  
PLANT DRAIN PUMP STATION

ELECTRICAL  
EAST PLANT DRAIN PUMP STATION  
POWER AND GROUNDING PLAN

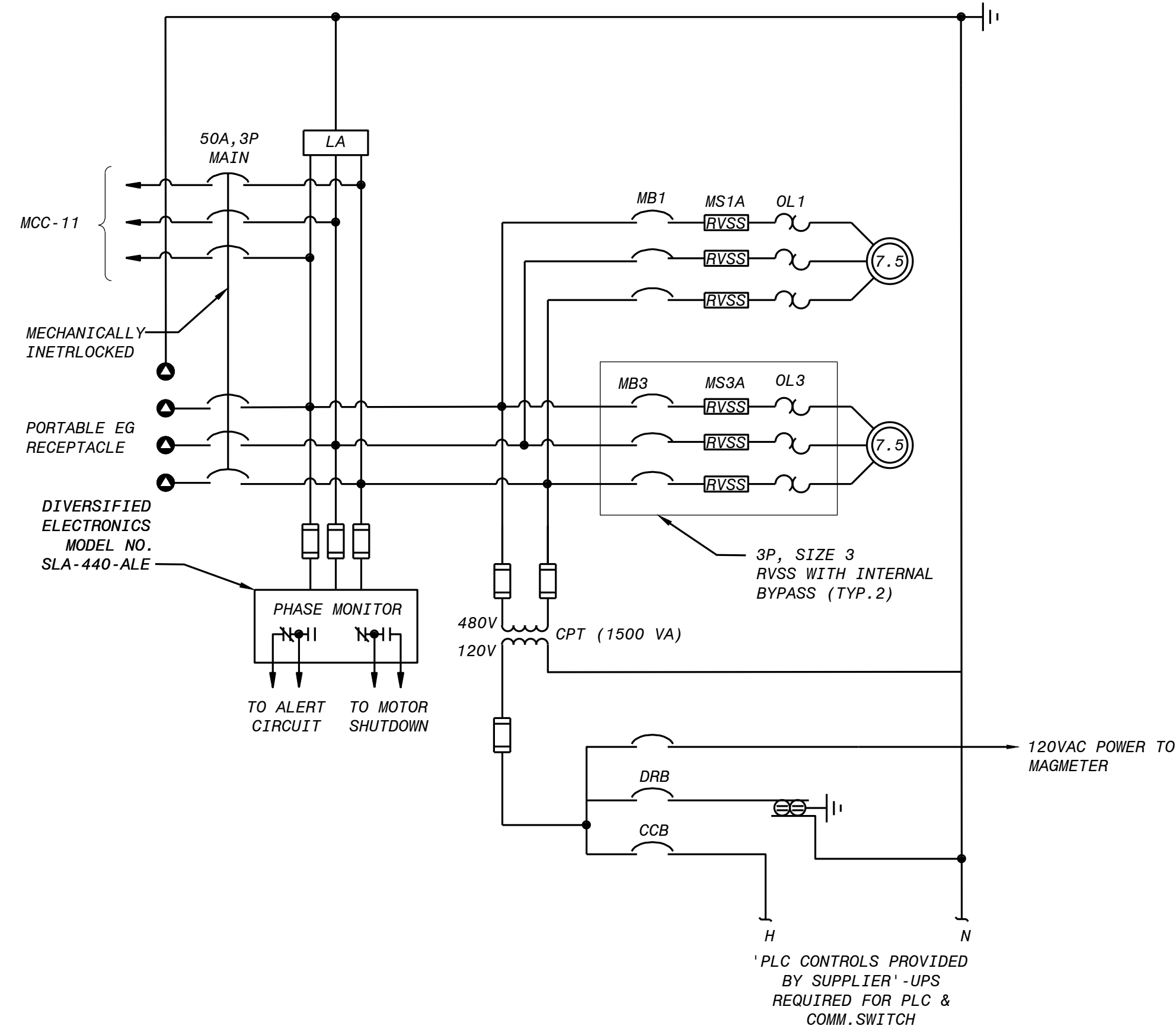
DESIGNED: ROT  
DETAILED: AD  
CHECKED: LB  
APPROVED: MT  
DATE: FEB 2019

PROJECT NO.  
198896

**E-08**  
SHEET  
30 OF 42



480V, 3 PHASE, 4W POWER DIAGRAM  
FOR TRIPLEX WEST PLANT DRAIN PUMP STATION  
NTS



480V, 3 PHASE, 4W POWER DIAGRAM  
FOR DUPLEX EAST PLANT DRAIN PUMP STATION  
NTS

**NOTE:**

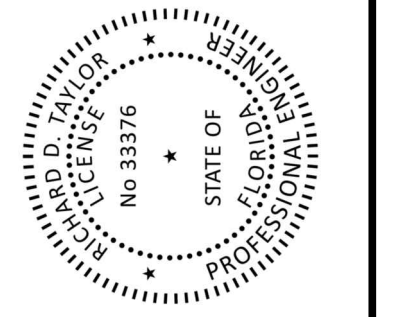
1. SEE DRAWING E-01 AND E-02 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.

NO.	BY	CHK	APP
C	AD	DH	MT
B	AD	RD	MT
A	AD	MM	RD

DATE	REVISIONS AND RECORD OF ISSUE
FEB 2019	100% SUBMITTAL
DEC 2018	90% SUBMITTAL
SEPT 2018	60% SUBMITTAL

50.3060 - Electrical Diagrams Drawings  
E-09.dwg  
XREF1:  
XREF2:  
XREF3:  
XREF4:  
USER:ACH95836 DWG VER:1001



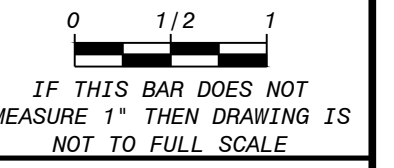
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SOUTHEAST WATER RECLAMATION FACILITY  
PLANT DRAIN PUMP STATION

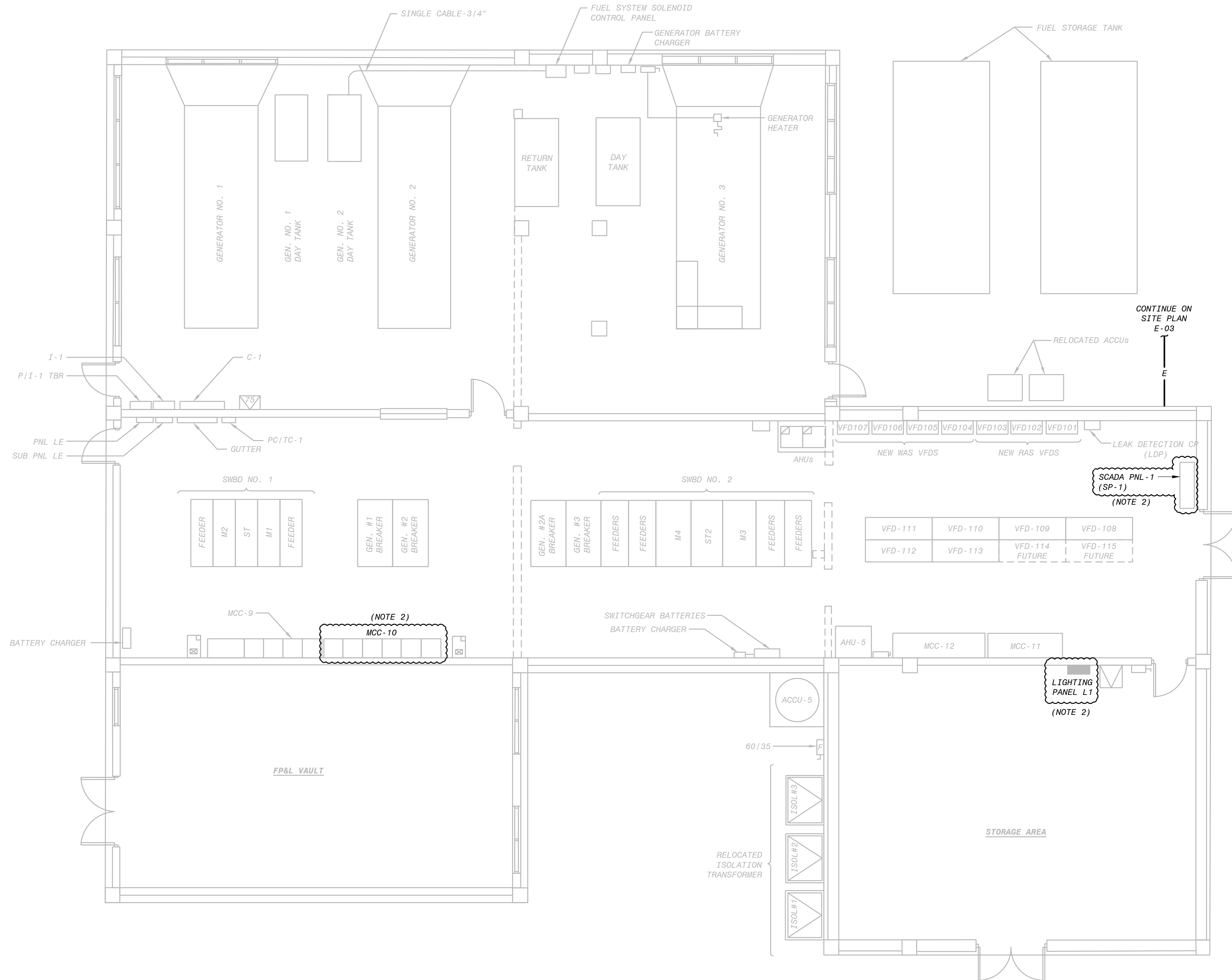
ELECTRICAL  
SCHEMATICS

DESIGNED: RD
DETAILED: AD
CHECKED: LB
APPROVED: MT
DATE: FEB 2019



PROJECT NO.  
198896

**E-09**  
SHEET  
31 OF 42

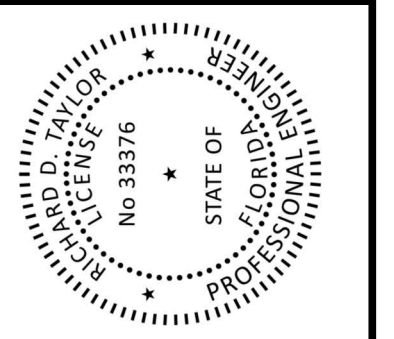


**ELECTRICAL BUILDING NO. 1 POWER PLAN**  
NTS

**NOTES:**

- SEE DRAWING E-01 AND E-02 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL NOTES.
- MCCs/PANELS INDICATED WITH CLOUD MARK WILL BE USED FOR POWERING NEW EQUIPMENT INCLUDING WEST PLANT DRAIN PUMP STATION CONTROL PANEL AND A NEW POLE MOUNTED LIGHT FIXTURE. REFER TO ELECTRICAL DRAWINGS FOR ADDITIONAL DETAILS.

FEB 2019	100% SUBMITTAL	C	AD	DH	MT
DEC 2018	90% SUBMITTAL	B	AD	RD	MT
SEPT 2018	60% SUBMITTAL	A	AD	IM	RD
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CHK	APP
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SAVED: RANG6017_29-01-2019 14:00:23	XREF1:				
PLOTTED: RANG6017_9/11/2018 11:49	XREF2:				
USER: RANG6017	XREF3:				
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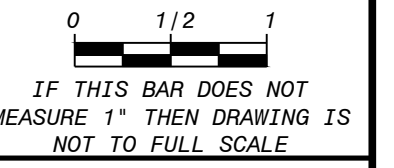
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MANATEE COUNTY, FLORIDA  
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PLANT DRAIN PUMP STATION

ELECTRICAL BUILDING NO. 1 POWER PLAN

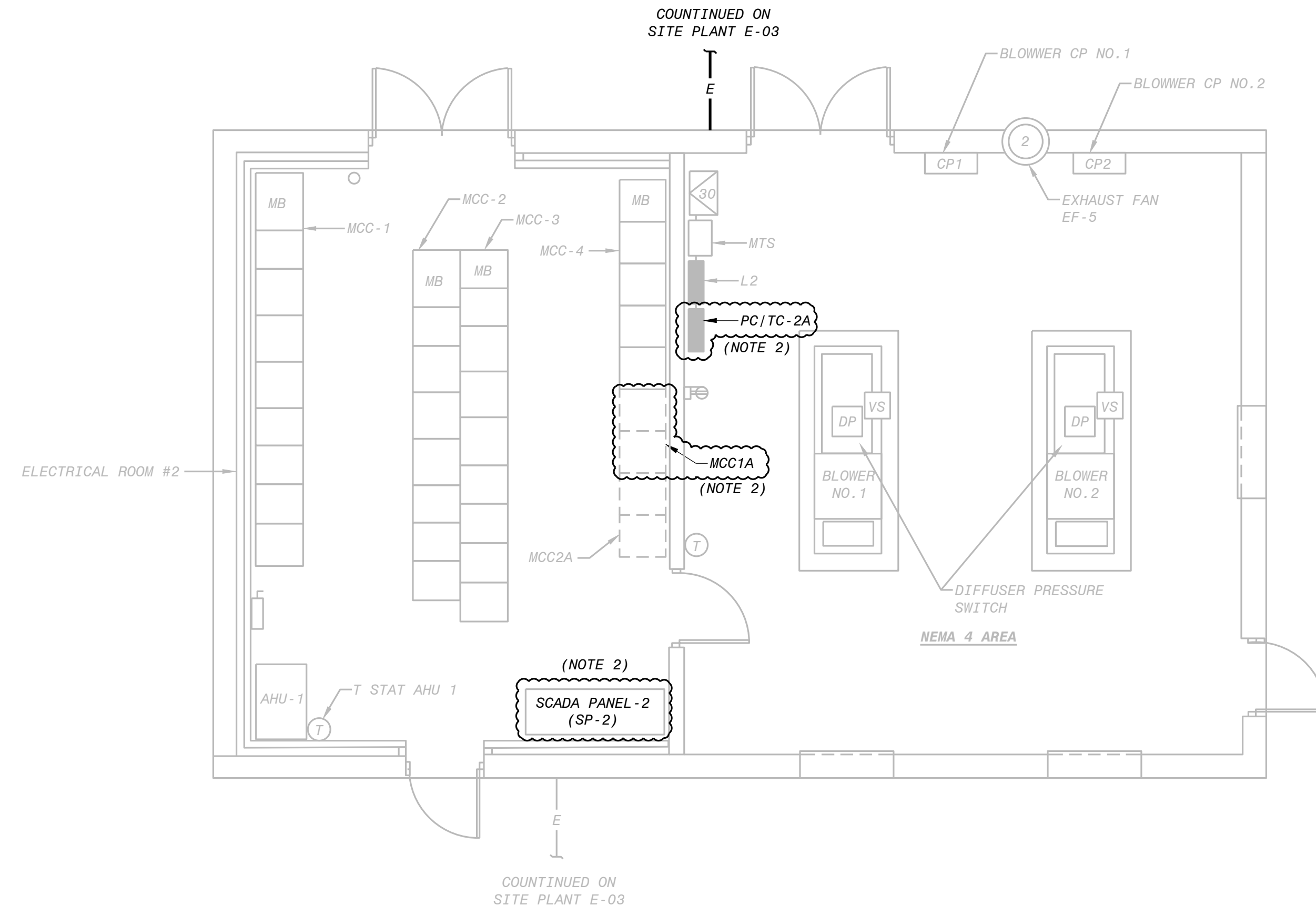
DESIGNED: RDT
DETAILED: AD
CHECKED: LB
APPROVED: MT
DATE: FEB 2019



PROJECT NO.  
**198896**

**E-10**  
SHEET  
32 OF 42





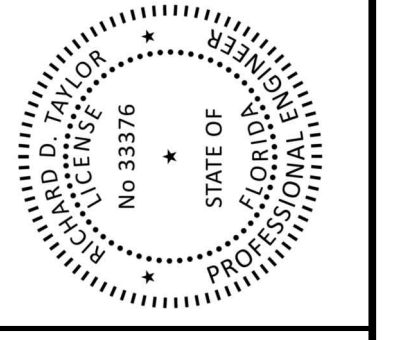
**ELECTRICAL BUILDING NO. 2 POWER PLAN**  
NTS

**NOTES:**

- SEE DRAWING E-01 AND E-02 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL NOTES.
- MCCs/PANELS INDICATED WITH CLOUD MARK WILL BE USED FOR POWERING NEW EQUIPMENT INCLUDING EAST PLANT DRAIN PUMP STATION CONTROL PANEL, AND A NEW POLE MOUNTED LIGHT FIXTURE. REFER TO ELECTRICAL DRAWINGS FOR ADDITIONAL DETAILS.

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CHK	APP
FEB 2019	100% SUBMITTAL	C	AD	DH	MT
DEC 2018	90% SUBMITTAL	B	AD	RD	MT
SEPT 2018	60% SUBMITTAL	A	AD	IM	RD

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PLOTTED: RANG6017, 9/11/2018 11:51  
USER: RANG6017 DWG VER: 1004



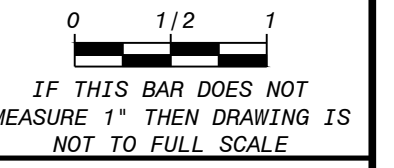
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MANATEE COUNTY, FLORIDA  
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PLANT DRAIN PUMP STATION

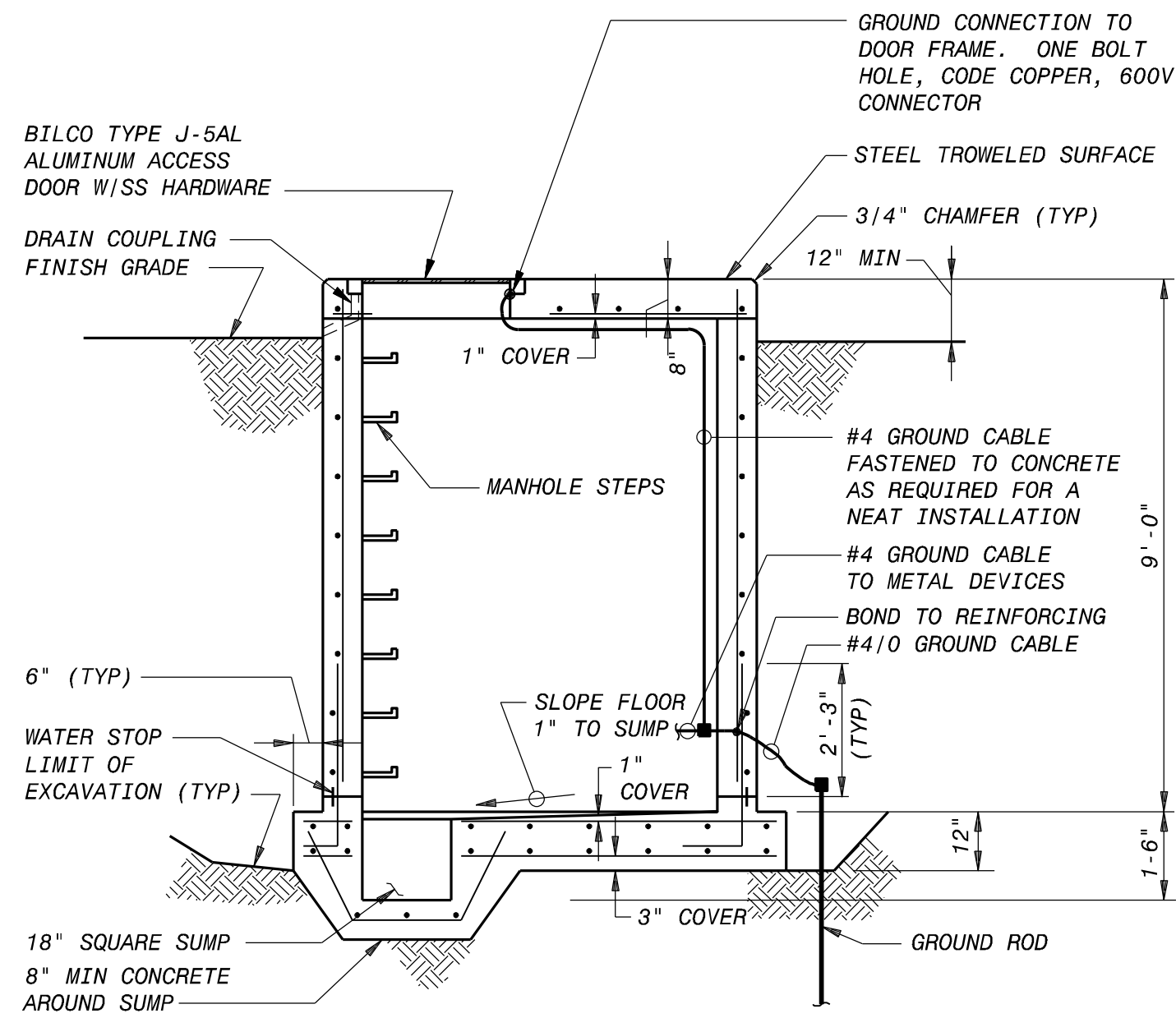
ELECTRICAL  
ELECTRICAL BUILDING NO. 2 POWER PLAN

DESIGNED: RD  
DETAILED: AD  
CHECKED: LB  
APPROVED: MT  
DATE: FEB 2019



PROJECT NO.  
198896

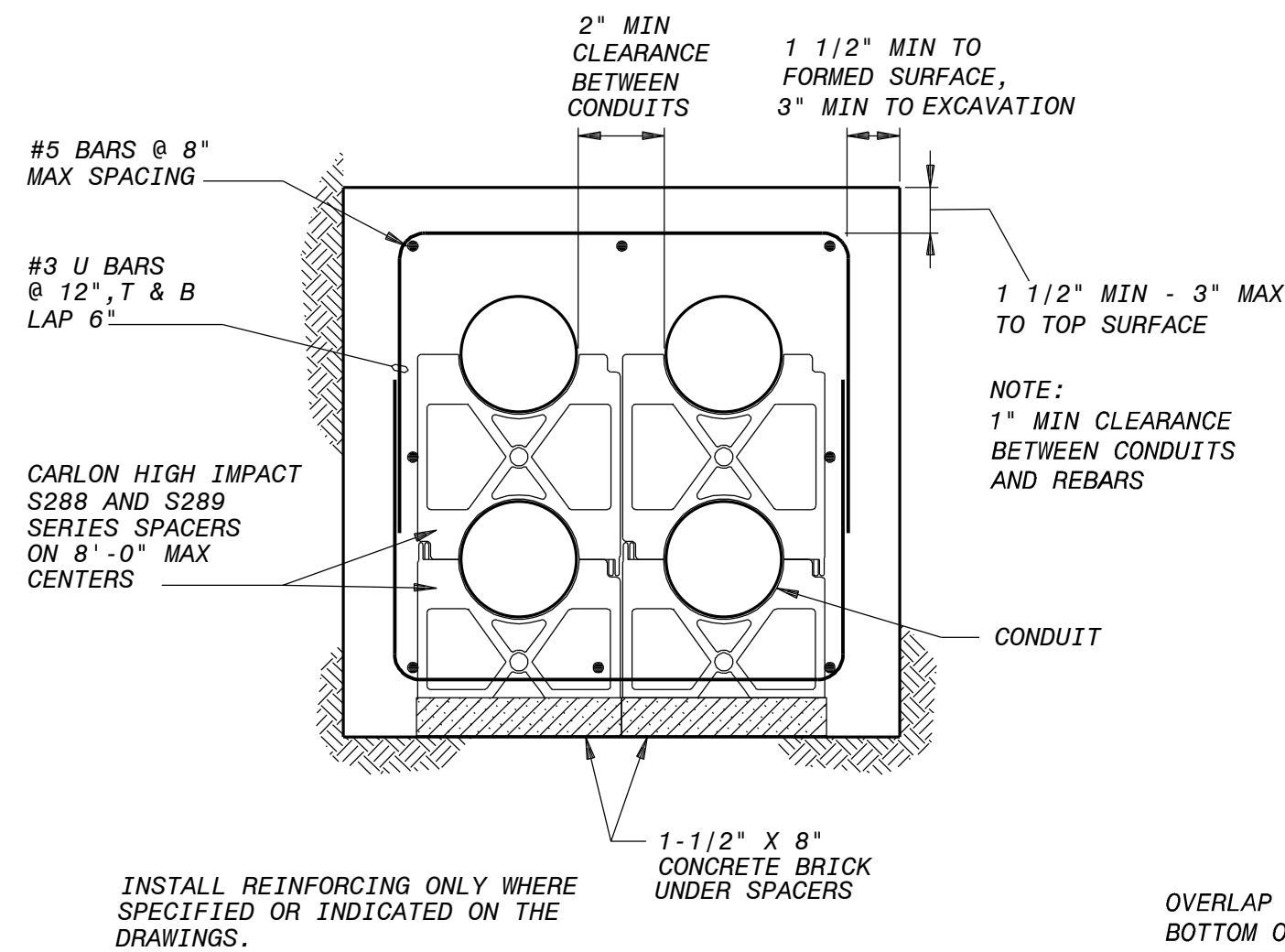
**E-11**  
SHEET  
33 OF 42



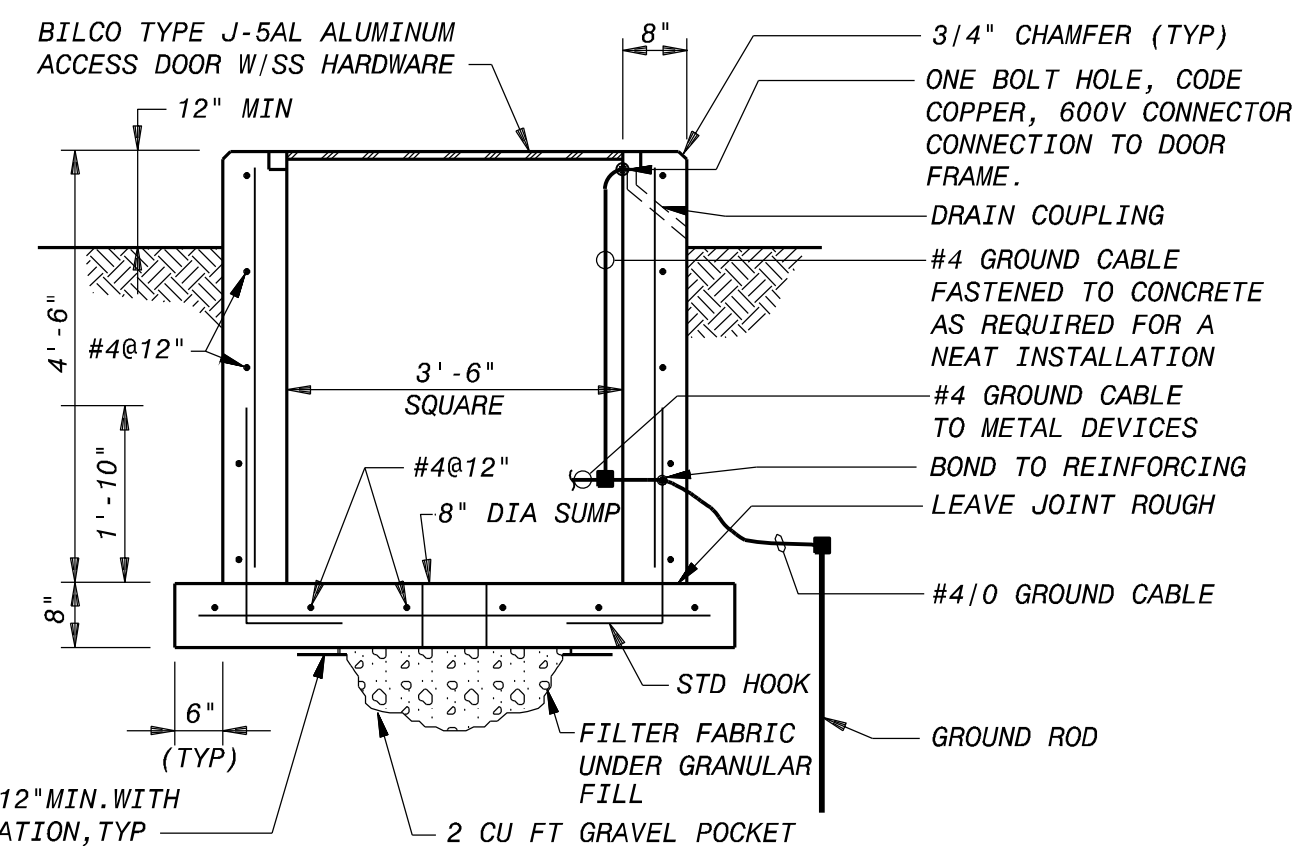
**ELECTRICAL MANHOLE NOTES:**

1. CABLE AND CONDUIT SUPPORTS SHALL BE SPACED AT 2'-0" HORIZONTAL CENTERS IN WALLS AND SHALL BEGIN 2'-0" FROM FLOOR.
2. SUPPORTS IN CEILINGS SHALL RUN FROM WALL TO WALL.
3. OPENING SHALL BE PROVIDED IN MANHOLE WALLS FOR CONDUIT BANK ENTRANCE AS REQUIRED.
4. ALL REINFORCING ON THIS DETAIL SHALL BE #5@12" UNLESS NOTED OTHERWISE. CENTER VERTICAL REINFORCING IN THE WALLS.
5. CONCRETE TO BE ROUGH AND CLEAN AT CONSTRUCTION JOINT FACES.

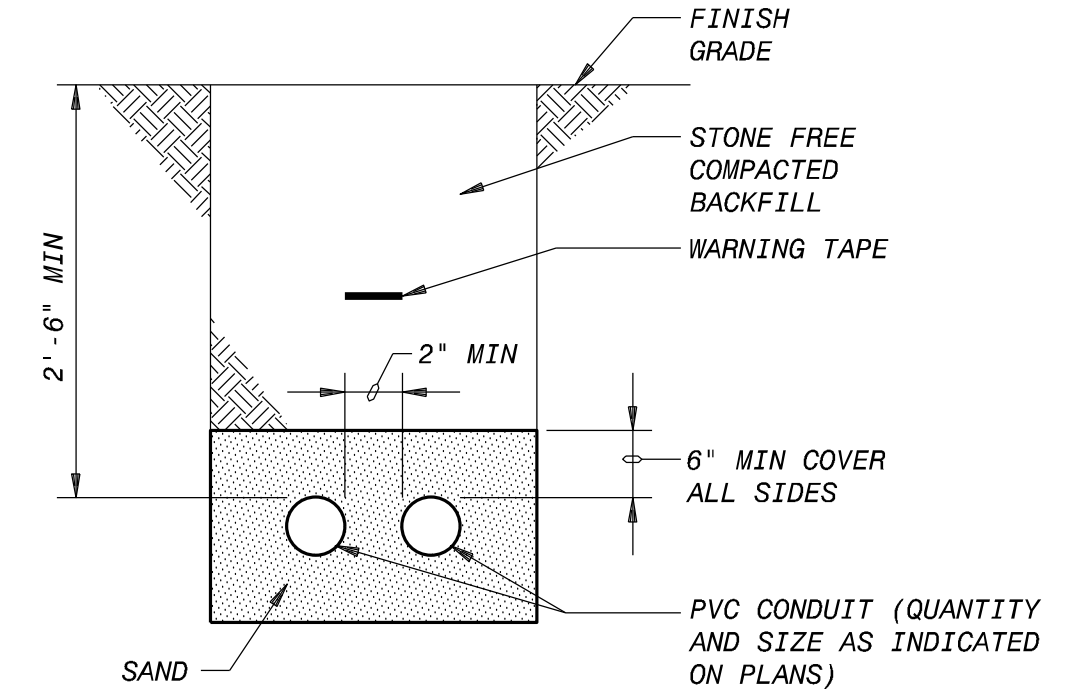
**ELECTRICAL MANHOLE SECTION**  
NO SCALE NOT SUITABLE FOR ROADWAY LOCATIONS



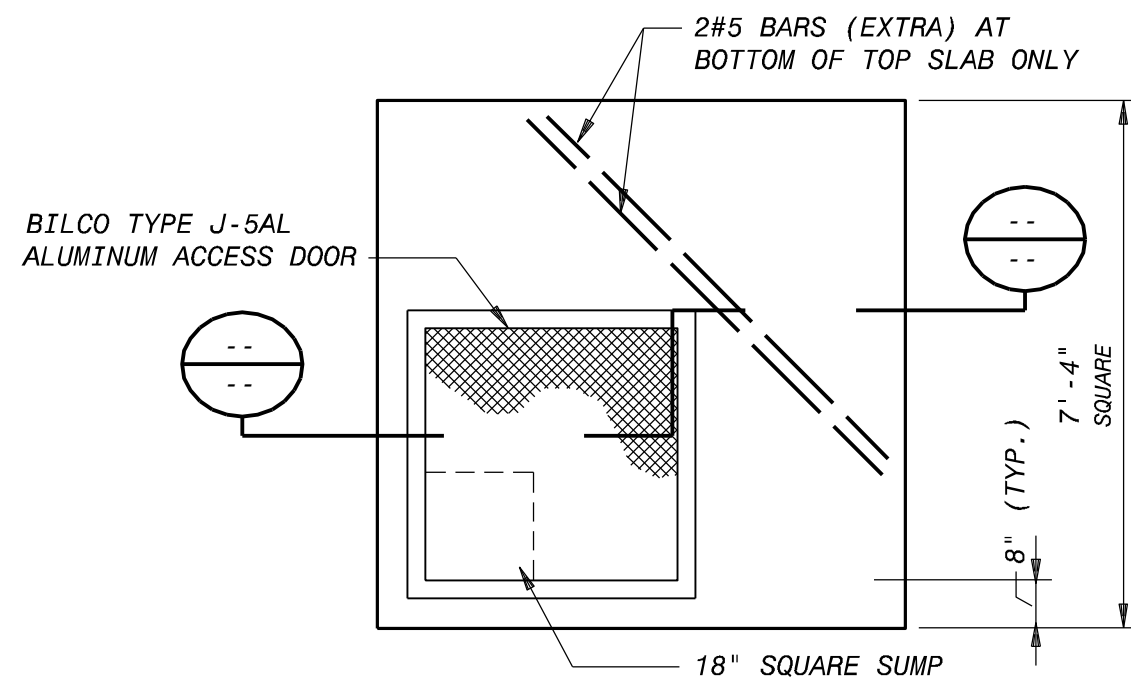
**TYPICAL DUCT BANK SECTION**  
NO SCALE



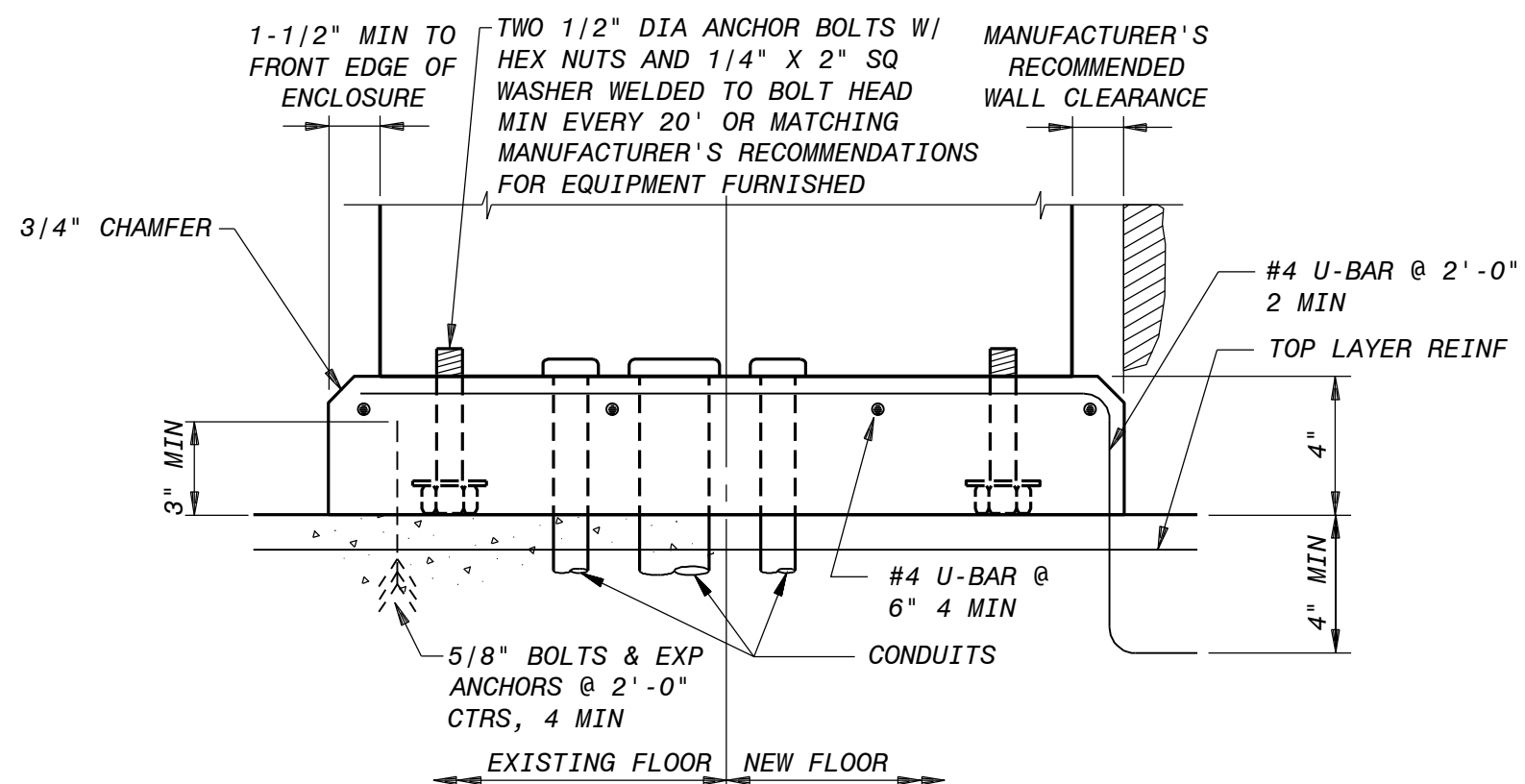
**TYPICAL ELECTRICAL HANDHOLE DETAIL**  
NO SCALE NOT SUITABLE FOR ROADWAY LOCATIONS



**TYPICAL DIRECT BURIED CONDUIT SECTION**  
NO SCALE



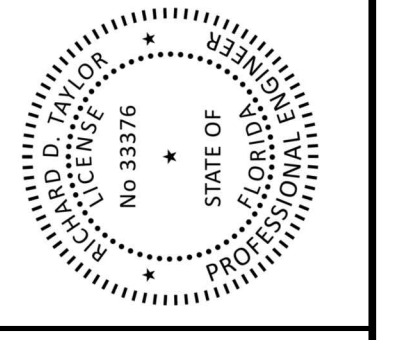
**TYPICAL ELECTRICAL MANHOLE (SINGLE CHAMBER)**  
NO SCALE NOT SUITABLE FOR ROADWAY LOCATIONS



**ELECTRICAL EQUIPMENT BASE**  
NO SCALE

**NOTE:**  
1. SEE DRAWING E-01 AND E-02 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.

FEB 2019	100% SUBMITTAL	C	AD	DH	MT
DEC 2018	90% SUBMITTAL	B	AD	RD	MT
SEPT 2018	60% SUBMITTAL	A	AD	IM	RD
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60-3060 - Electrical Diagrams Drawings					
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SAVED:RANG6017_29-01-2019 14:02:59	XREF1:				
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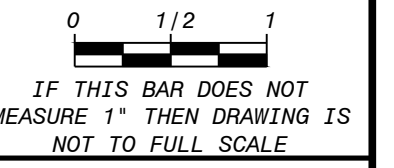
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**MANATEE COUNTY, FLORIDA**  
**SOUTHEAST WATER RECLAMATION FACILITY**  
**PLANT DRAIN PUMP STATION**

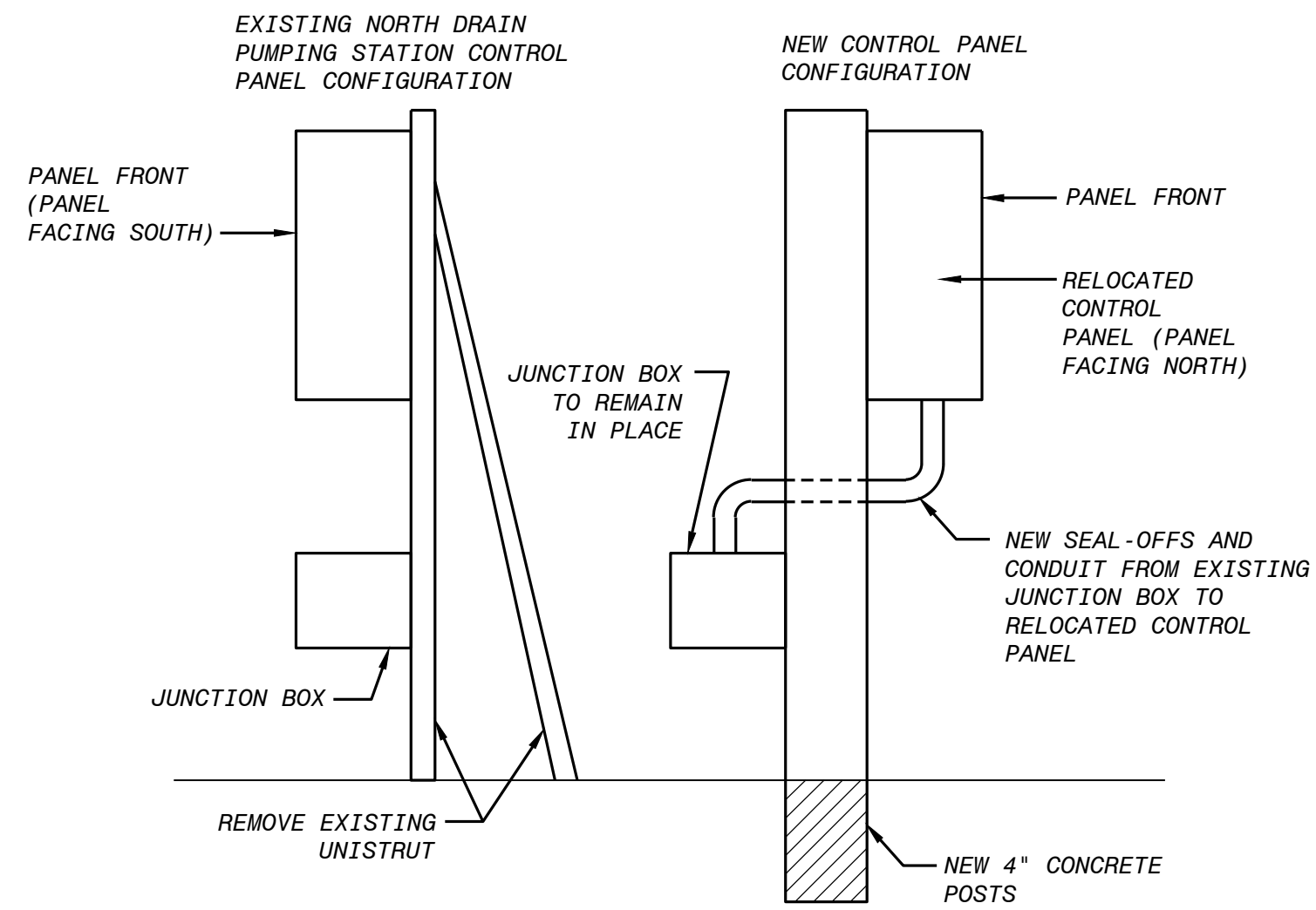
**ELECTRICAL**  
**TYPICAL DETAILS (SHEET 1 OF 2)**

DESIGNED: RDT
DETAILED: AD
CHECKED: LB
APPROVED: MT
DATE: FEB 2019

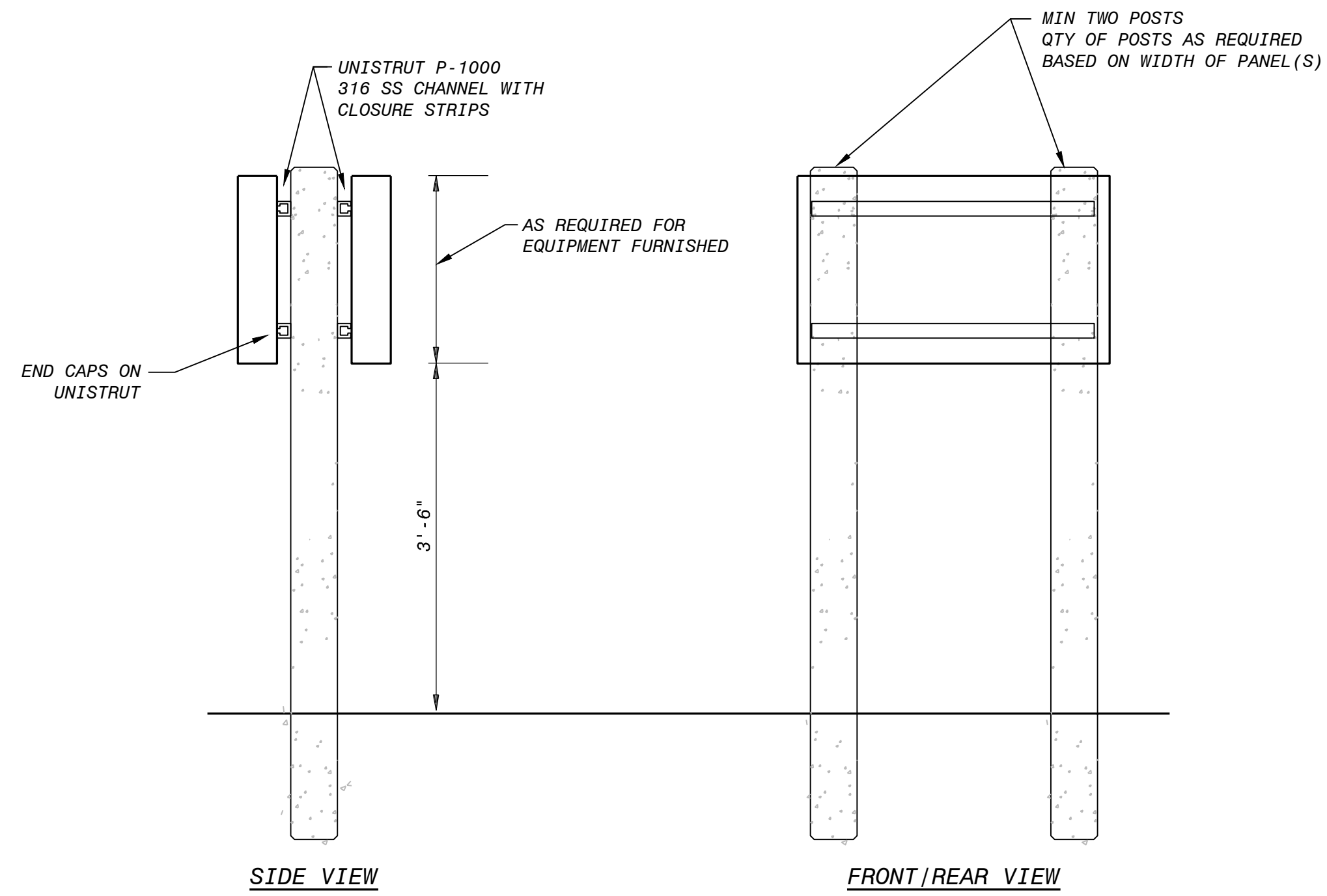


PROJECT NO.  
**198896**

**E-12**  
SHEET  
34 OF 42

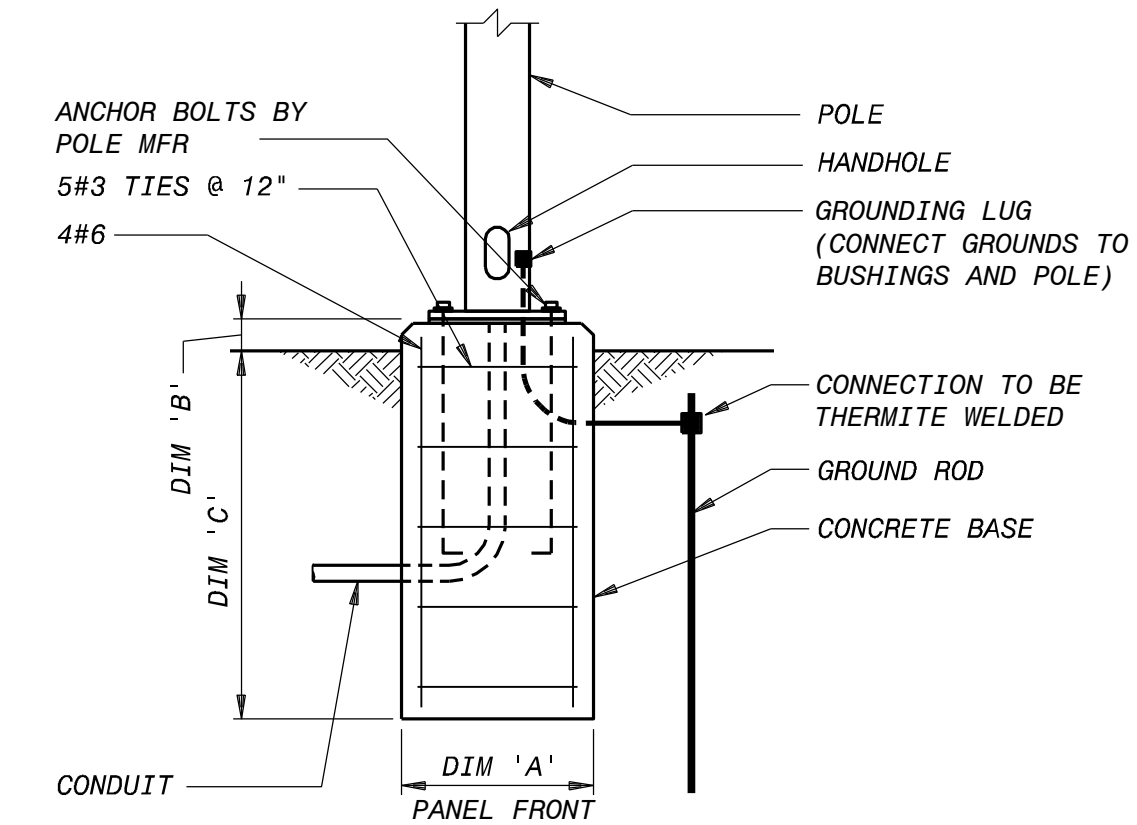


**CONCRETE POSTS  
CONTROL PANEL MOUNTING DETAILS  
FOR NORTH PLANT DRAIN PUMP STATION**  
NO SCALE INSTALLATION DETAILS



- NOTES:**
1. ALL INSTRUMENT MOUNTING HARDWARE SHALL BE 316 STAINLESS STEEL.
  2. POSITION PANEL BOXES SO OPERATOR'S BACK IS NOT TO WET WELL WHILE FACING BOX
  3. PANEL BOXES TO BE LOCATED TO ALLOW UNOBSTRUCTED ACCESS TO WET WELL.

**TYPICAL EQUIPMENT MOUNTING DETAIL**  
NO SCALE

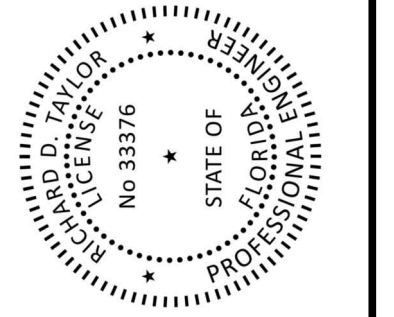


**TYPICAL POLE  
MOUNTING DETAIL**  
NO SCALE

A	B	C	POLE LENGTH
1'-0"	2"	3'-0"	10' TO 12'
1'-6"	2"	4'-0"	12' TO 20'
2'-0"	2"	5'-0"	20' TO 40'
2'-0"	2'-6"	5'-0"	20' TO 40'

**NOTE:**  
1. SEE DRAWING E-01 AND E-02 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.

DATE	DESCRIPTION	BY	CHK	APP
FEB 2019	100% SUBMITTAL	C	AD	MT
DEC 2018	90% SUBMITTAL	B	AD	MT
SEPT 2018	60% SUBMITTAL	A	AD	MT
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	PLOTTED: GAW78713, 9/11/2018 2:46:20 PM			
	USER: ACH95836			
	DWG. VER: 1001			



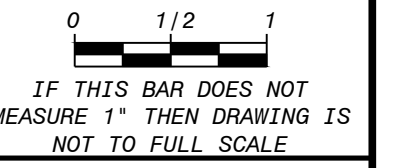
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SOUTHEAST WATER RECLAMATION FACILITY  
PLANT DRAIN PUMP STATION**

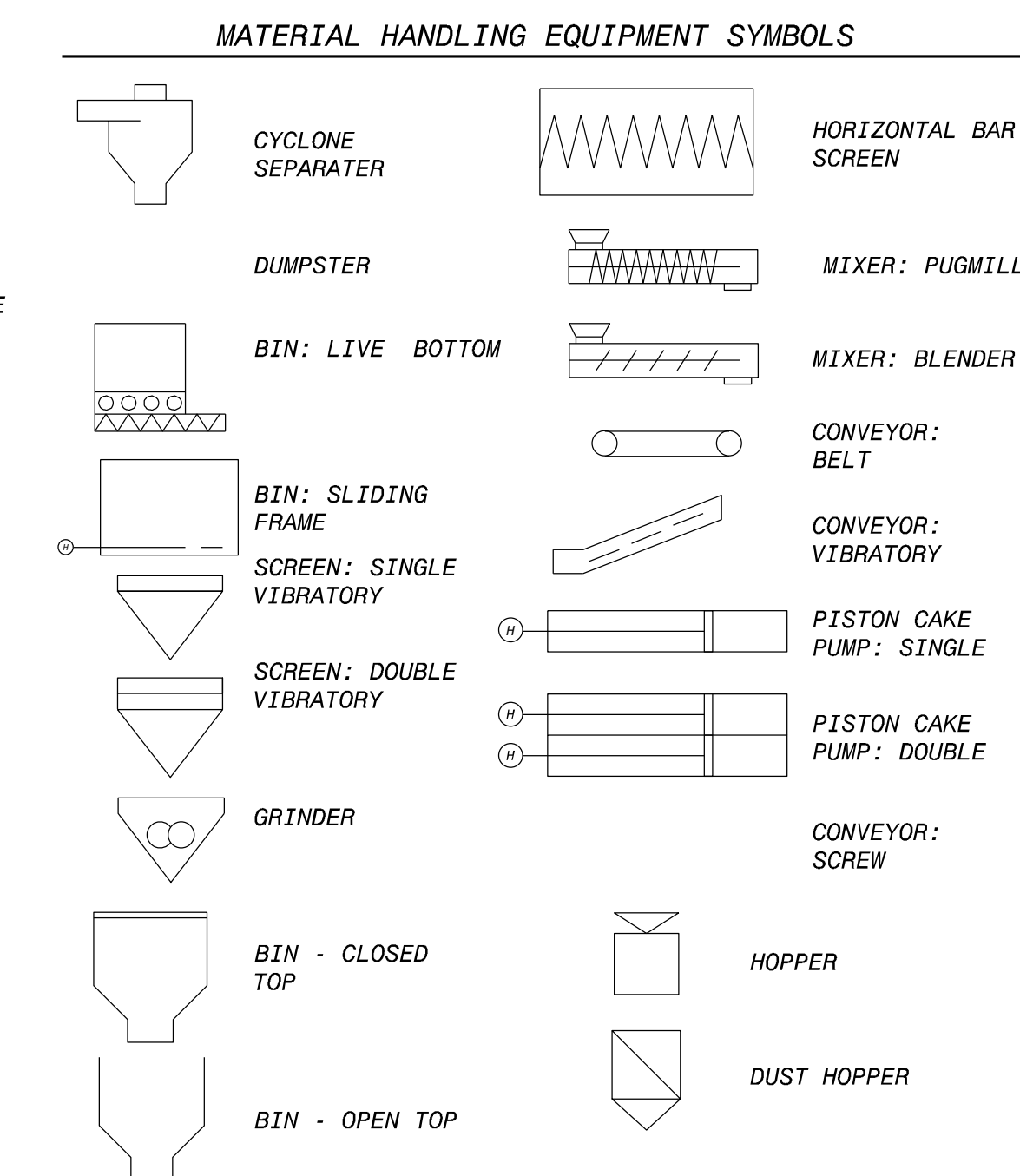
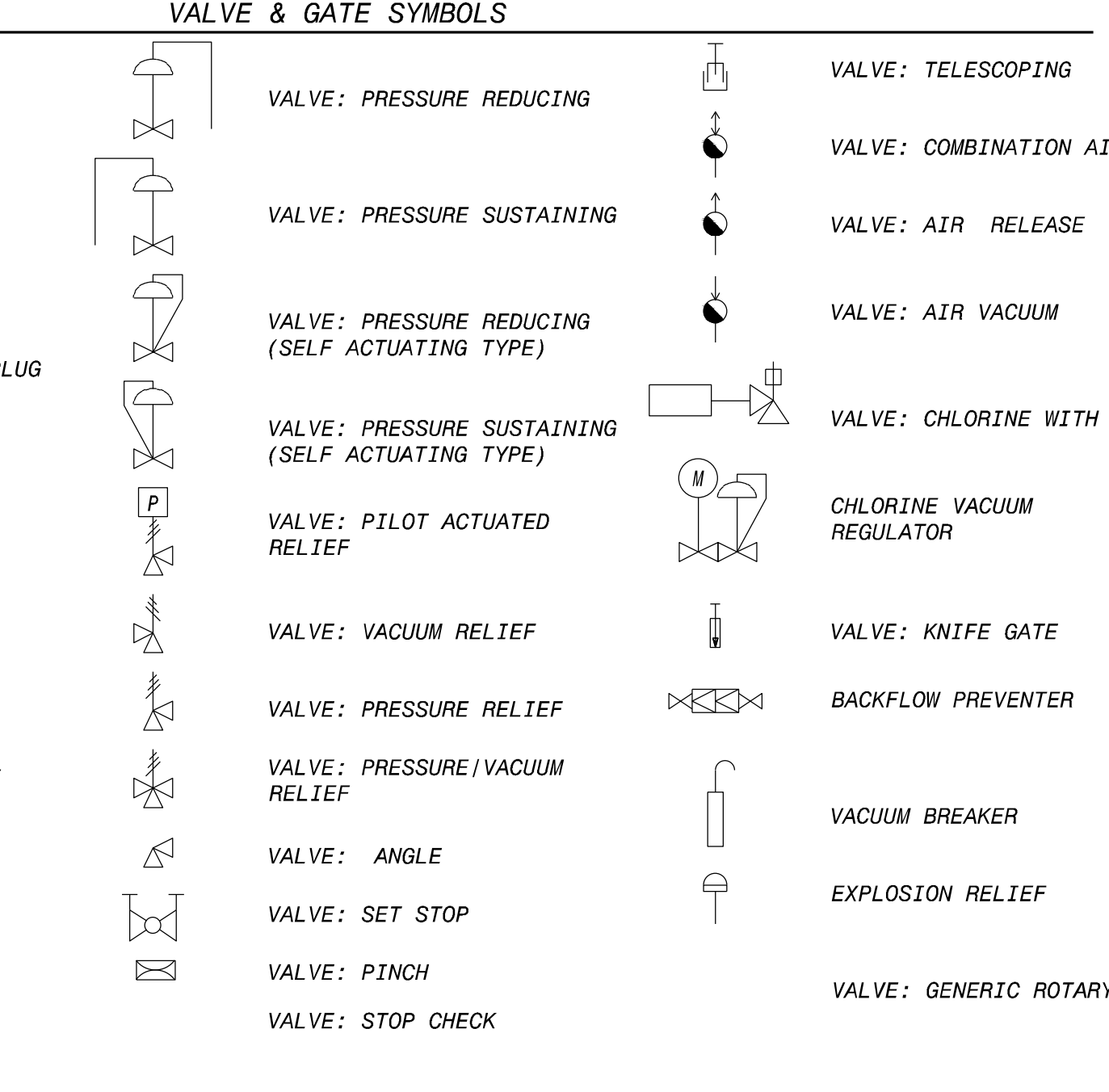
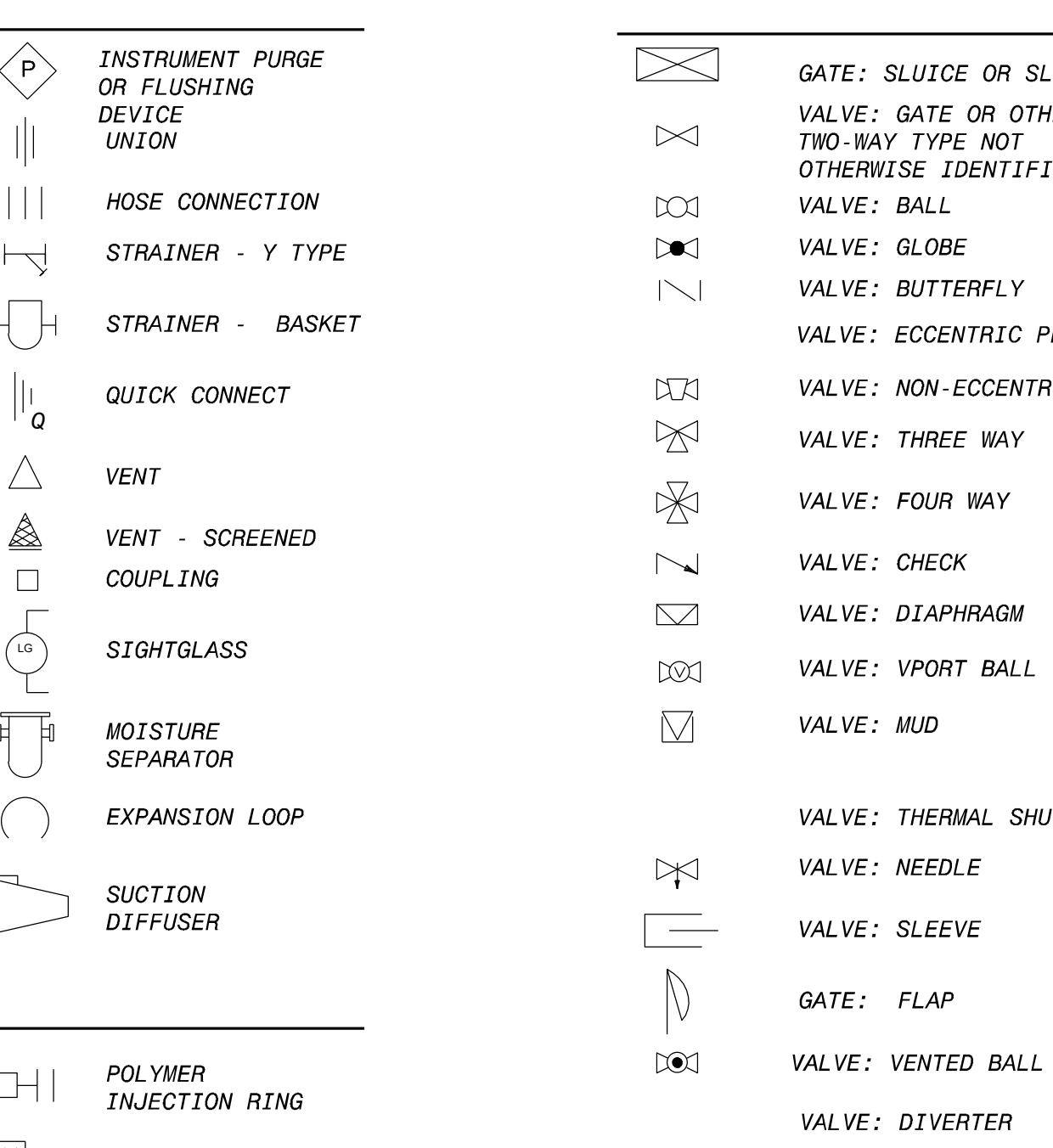
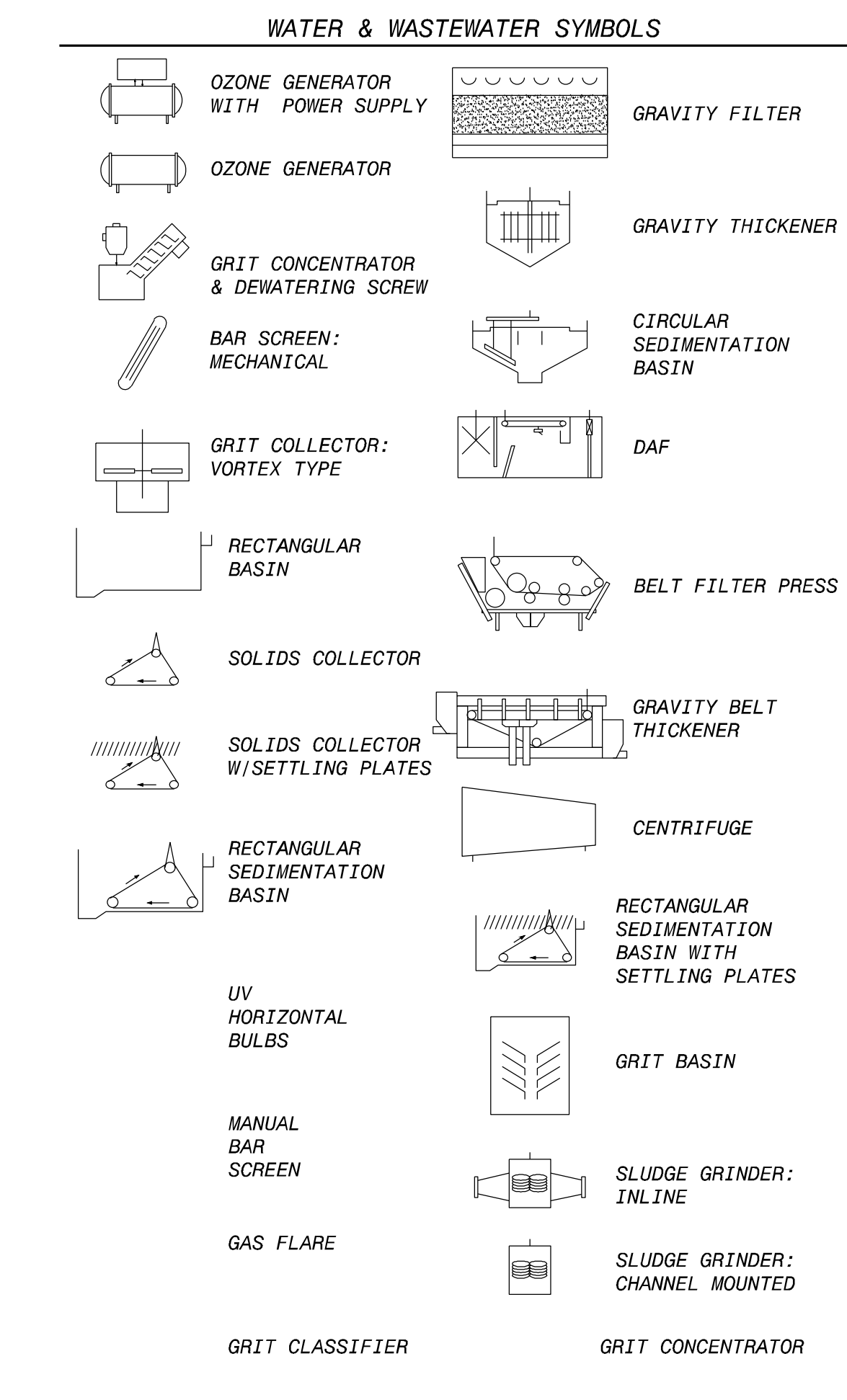
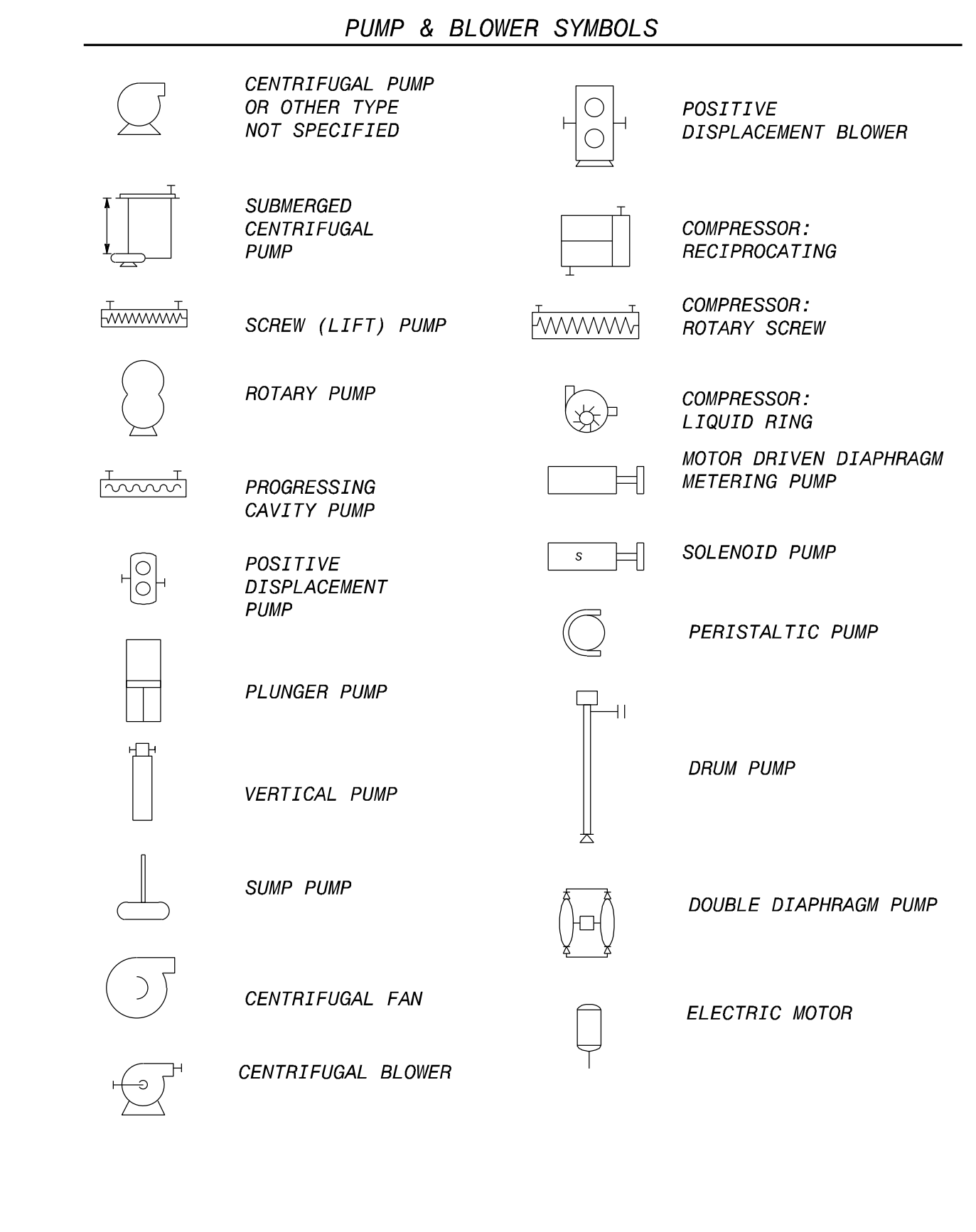
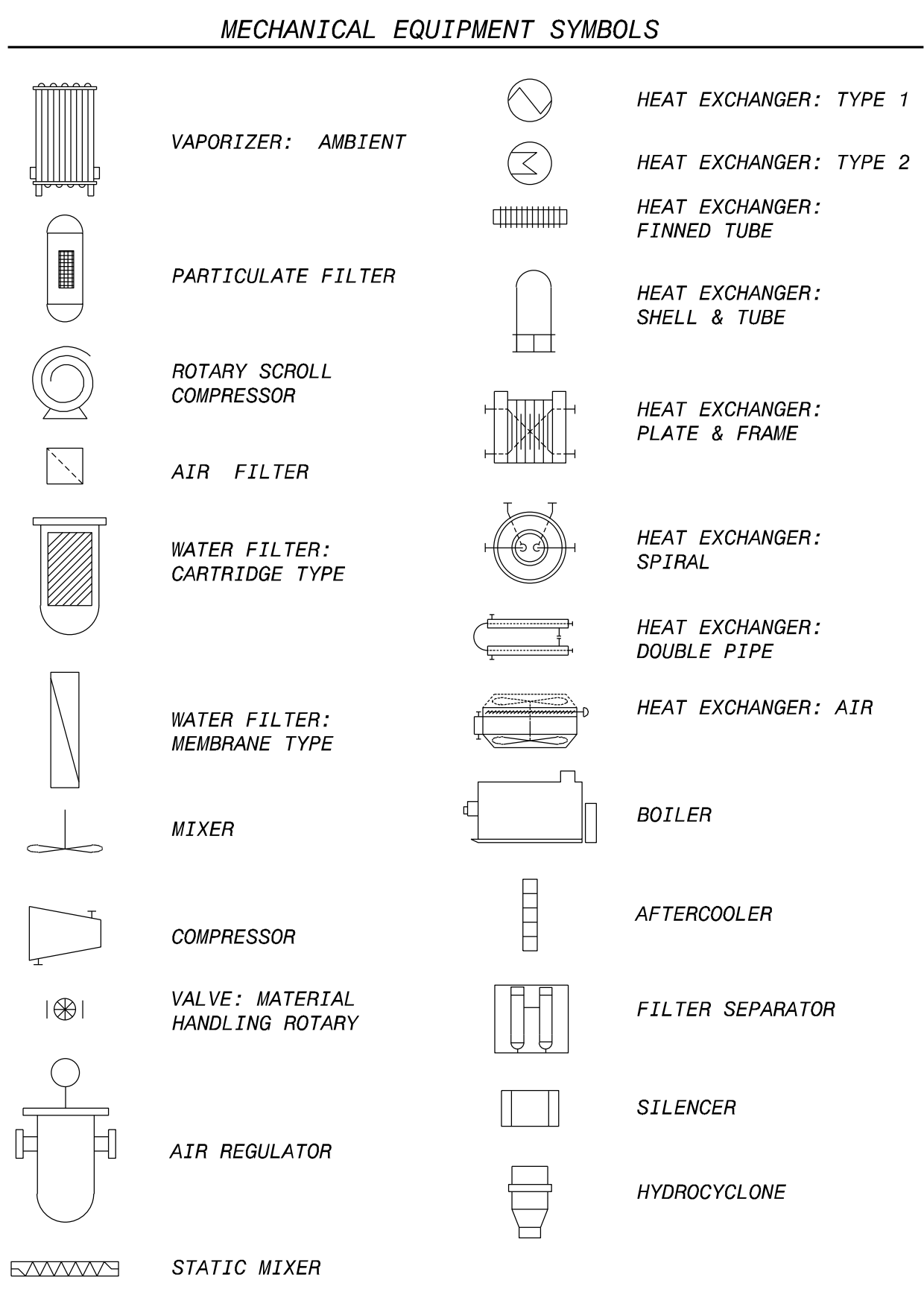
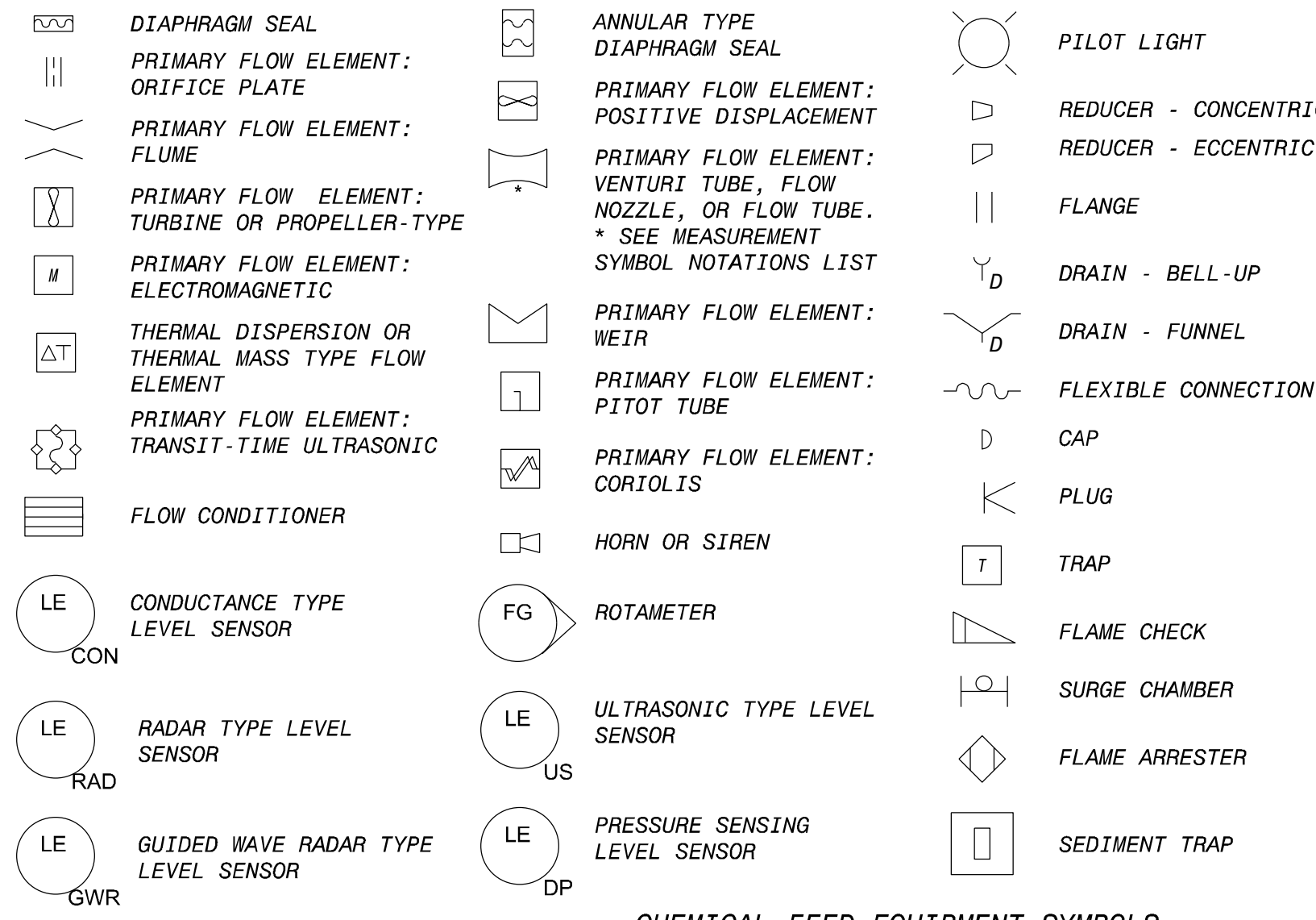
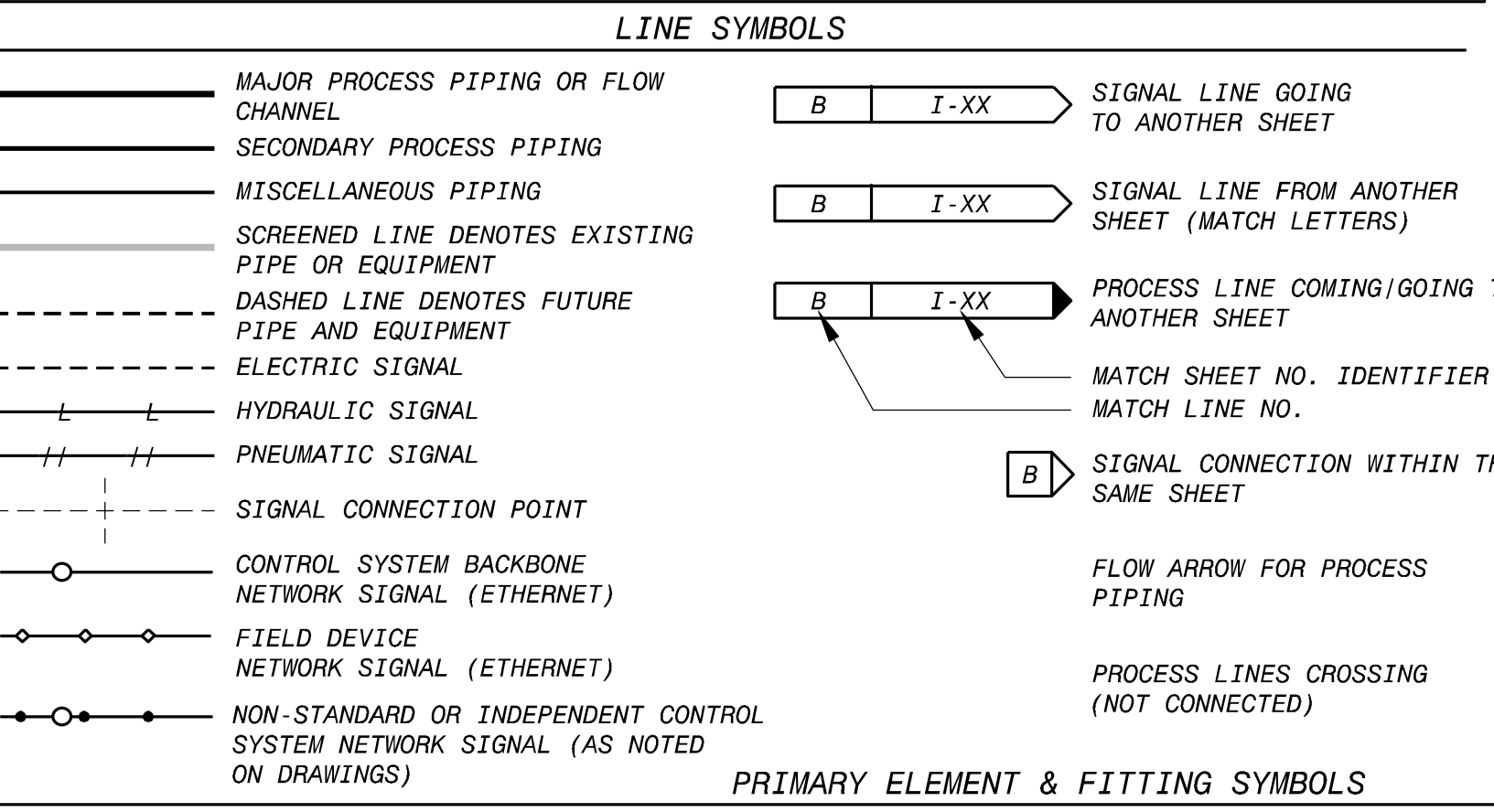
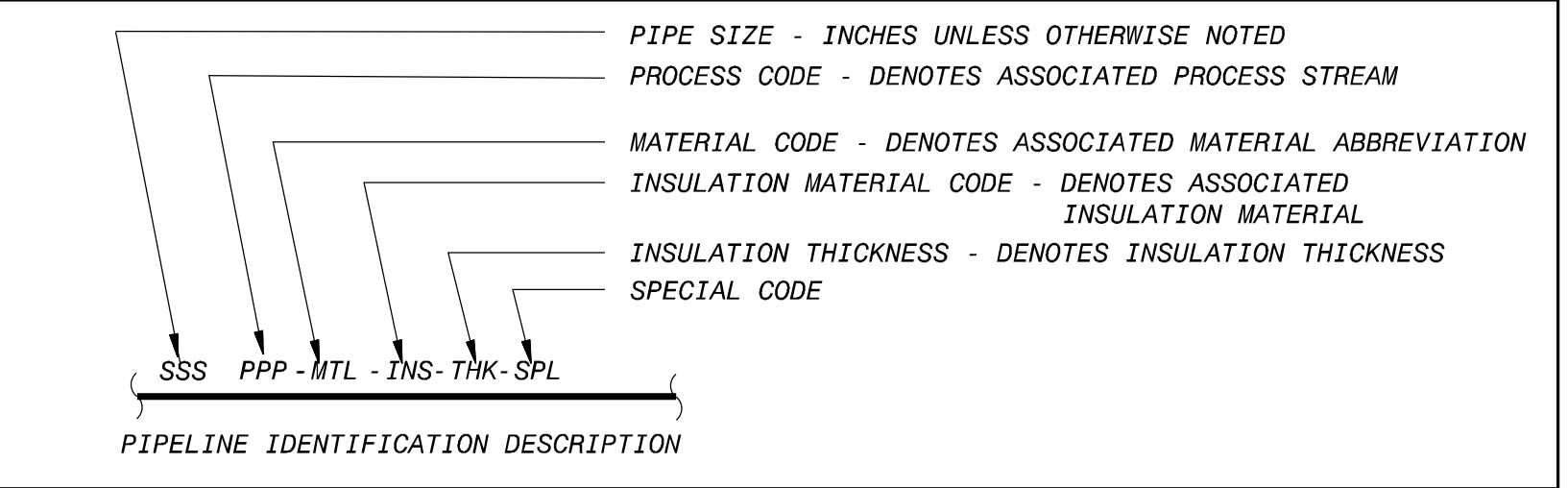
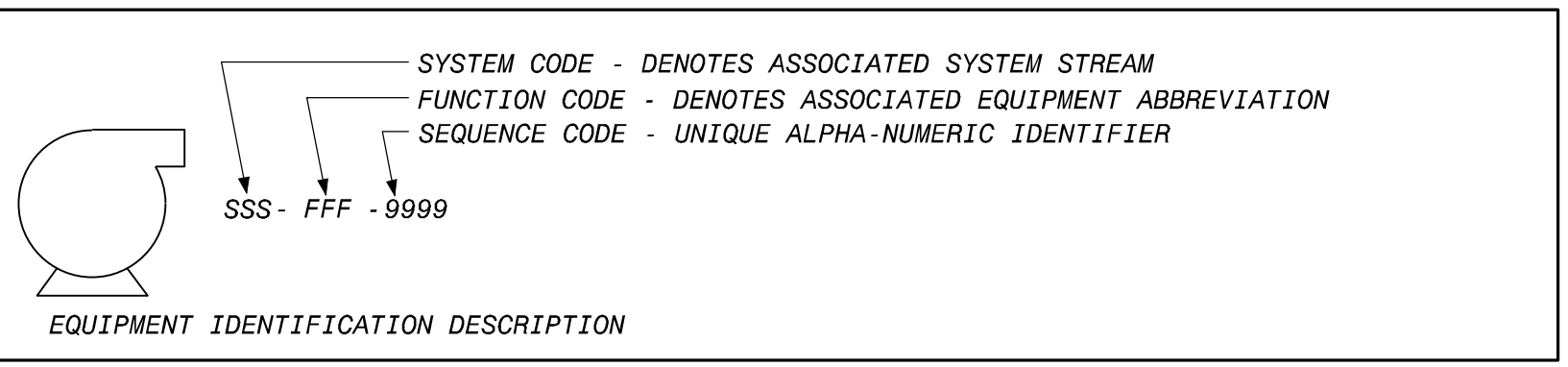
ELECTRICAL  
TYPICAL DETAILS (SHEET 2 OF 2)

DESIGNED: ADT  
DETAILED: AD  
CHECKED: LB  
APPROVED: MT  
DATE: FEB 2019



PROJECT NO.  
**198896**

**E-13**  
SHEET  
35 OF 42



**GENERAL NOTES**

- IN GENERAL, THE P&ID SYMBOLS AND DEVICE IDENTIFICATIONS ARE BASED ON INTERNATIONAL SOCIETY OF AUTOMATION, STANDARD PRACTICE ANSI/ISA-5.1 (2009). SOME MODIFICATIONS, ADDITIONS, AND ALTERATIONS HAVE BEEN MADE AS NEEDED TO ACCOMMODATE THE PROJECT REQUIREMENTS.
- SOME CONTROL AND INTERLOCK REQUIREMENTS WHICH CAN BE MORE CLEARLY ILLUSTRATED ON SCHEMATIC DRAWINGS HAVE BEEN OMITTED FROM THE P&ID DRAWINGS.
- THIS IS A GENERAL LEGEND SHEET. SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE UTILIZED ON THIS SPECIFIC PROJECT.
- PIPING AND EQUIPMENT LEGEND APPLIES TO P&ID SHEETS ONLY AND MAY DIFFER FROM LEGENDS FOR OTHER SHEETS.

**MANATEE COUNTY, FLORIDA**  
**SOUTHEAST WATER RECLAMATION FACILITY**  
**PLANT DRAIN PUMP STATION**

**INSTRUMENTATION**  
**LEGEND & ABBREVIATIONS**  
**SHEET 1 OF 3**

DESIGNED: RDT  
 DETAILED: VD  
 CHECKED: LB  
 APPROVED: MT  
 DATE: FEB 2019

0 1/2 1  
 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.  
**198896**

**I-01**  
 SHEET  
 36 OF 42

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REVISIONS AND RECORD OF ISSUE

NO.	BY	CHK	APP	DATE	REVISIONS
1	AD	UB	RDY		
2	B	AD	UB		
3	A	AD	UB		
4	A	AD	UB		
5	A	AD	UB		

90-3050 - Process - Instrumentation Diagrams Drawings  
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**INSTRUMENT AND I/O ABBREVIATIONS**  
MEANINGS OF IDENTIFICATION LETTERS

LETTER	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	VARIABLE MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT OR ACTIVE FUNCTION	FUNCTION MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	USER'S CHOICE			CONTROL	CLOSE
D	USER'S CHOICE	DIFFERENTIAL			DEVIATION
E	VOLTAGE (EMF)		SENSOR, PRIMARY ELEMENT		
F	FLOW, FLOW RATE	RATIO (FRACTION)			
G	USER'S CHOICE		GLASS, GAUGE, VIEWING DEVICE		
H	HAND (MANUALLY INITIATED)				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER		SCAN		
K	TIME OR TIME-SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	USER'S CHOICE	MOMENTARY			MIDDLE OR INTERMEDIATE
N	USER'S CHOICE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE (RESTRICTION)		OPEN
P	PRESSURE OR VACUUM		POINT (TEST CONNECTION)		
Q	QUANTITY	INTEGRATE OR TOTALIZE	INTEGRATE OR TOTALIZE		
R	RADIATION		RECORD		RUN
S	SPEED OR FREQUENCY	SAFETY		SWITCH	STOP
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	
V	VIBRATION OR MECHANICAL ANALYSIS			VALVE, DAMPER OR LOUVER	
W	WEIGHT OR FORCE		WELL, PROBE		
X	UNCLASSIFIED	X-AXIS	ACCESSORY DEVICES OR UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE, OR PRESENCE	Y-AXIS		AUXILIARY DEVICES	
Z	POSITION, DIMENSION	Z-AXIS		DRIVE, ACTUATOR OR FINAL CTRL ELEMENT	

**GENERAL NOTES**

- IN GENERAL, THE P&ID SYMBOLS AND DEVICE IDENTIFICATIONS ARE BASED ON INTERNATIONAL SOCIETY OF AUTOMATION, STANDARD PRACTICE ANSI/ISA-5.1 (2009). SOME MODIFICATIONS, ADDITIONS, AND ALTERATIONS HAVE BEEN MADE AS NEEDED TO ACCOMMODATE THE PROJECT REQUIREMENTS.
- SOME CONTROL AND INTERLOCK REQUIREMENTS WHICH CAN BE MORE CLEARLY ILLUSTRATED ON SCHEMATIC DRAWINGS HAVE BEEN OMITTED FROM P&ID DRAWINGS.
- THIS IS A GENERAL LEGEND SHEET. SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE UTILIZED ON THIS SPECIFIC PROJECT. PIPING AND EQUIPMENT LEGEND APPLIES TO P&ID SHEETS.

**PIPELINE MATERIAL CODE ABBREVIATIONS**

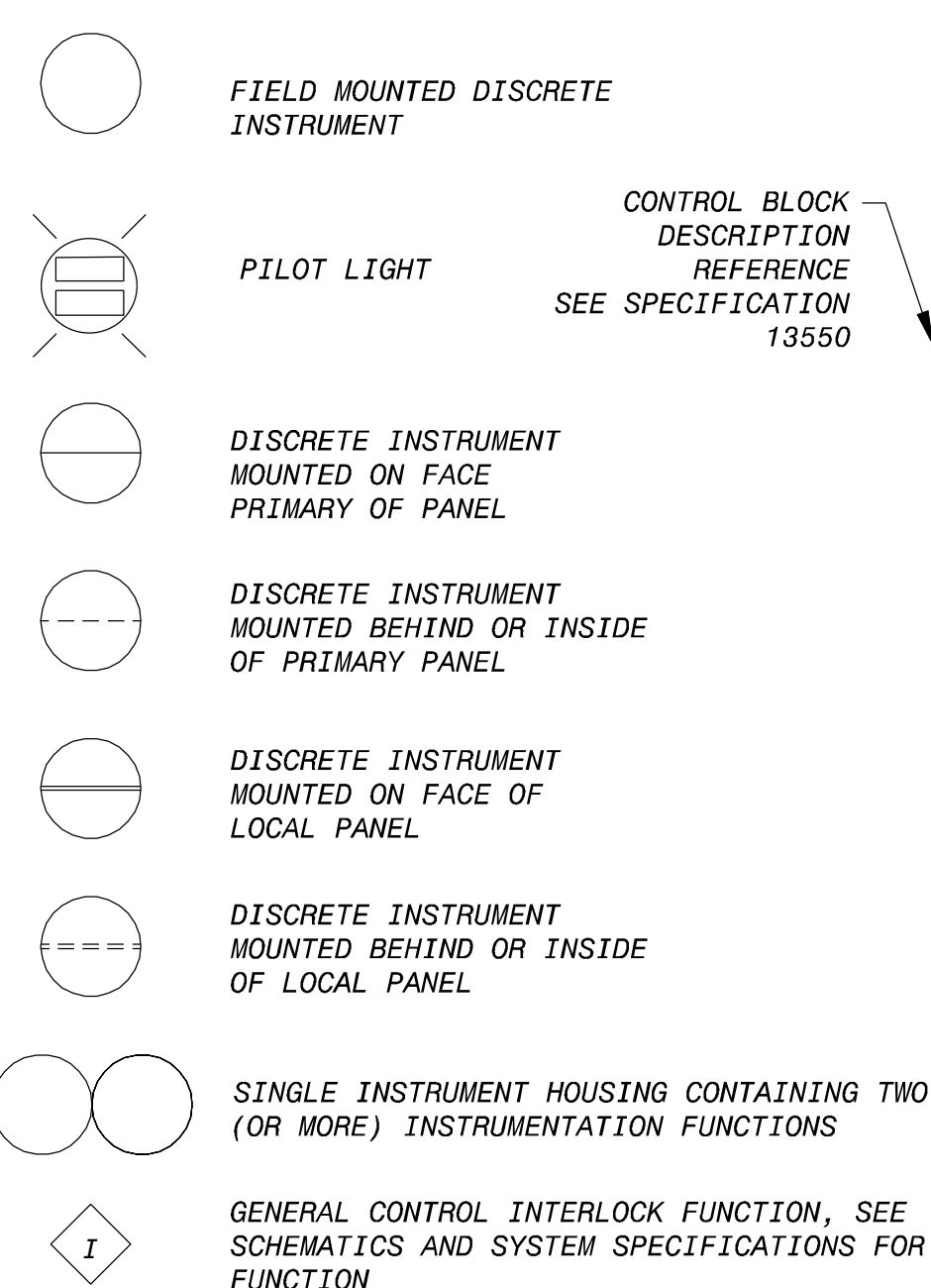
PCCP	SECTION 40 05 39.14, PRESTRESSED CONCRETE CYLINDER PIPE
CBWS	SECTION 40 05 39.16, CONCRETE BAR-WRAPPED, STEEL CYLINDER PIPE
RCP	SECTION 40 05 39.24, CONCRETE PIPE
PVC	SECTION 40 05 31.12, POLYVINYL CHLORIDE PIPE
DIP	SECTION 40 05 19, DUCTILE IRON PIPE
SP	SECTION 40 05 24, STEEL PIPE
SS-XX1	SECTION 40 05 23, STAINLESS STEEL PIPE, TUBING, AND ACCESSORIES
CSG-XX	SECTION 40 05 24.43, MISC. STEEL PIPE, TUBING, AND ACCESSORIES
CS-XX	SECTION 40 05 24.43, MISC. STEEL PIPE, TUBING, AND ACCESSORIES
FRPE-XX	SECTION 40 05 36.11, FIBERGLASS REINFORCED PLASTIC PIPE (EXHAUST AIR SERVICE)
FRP-XX	SECTION 40 05 32, MISCELLANEOUS PLASTIC PIPE, TUBING, AND ACCESSORIES
PVC-XX	SECTION 40 05 32, MISCELLANEOUS PLASTIC PIPE, TUBING, AND ACCESSORIES
CPVC-XX	SECTION 40 05 32, MISCELLANEOUS PLASTIC PIPE, TUBING, AND ACCESSORIES
PE-XX	SECTION 40 05 32, MISCELLANEOUS PLASTIC PIPE, TUBING, AND ACCESSORIES
PP-XX	SECTION 40 05 32, MISCELLANEOUS PLASTIC PIPE, TUBING, AND ACCESSORIES
PVDF-XX	SECTION 40 05 32, MISCELLANEOUS PLASTIC PIPE, TUBING, AND ACCESSORIES
RPT-XX	SECTION 40 05 32, MISCELLANEOUS PLASTIC PIPE, TUBING, AND ACCESSORIES
CI-XX	SECTION 22 13 17, CAST IRON SOIL PIPE AND ACCESSORIES
CU-XX	SECTION 40 05 17, COPPER TUBING AND ACCESSORIES
BR-XX	SECTION 40 05 41, MISCELLANEOUS PIPING AND PIPE ASSEMBLY
HS-XX	SECTION 40 05 41, MISCELLANEOUS PIPING AND PIPE ASSEMBLY
TG-XX	SECTION 40 05 41, MISCELLANEOUS PIPING AND PIPE ASSEMBLY
CRP-XX	SECTION 40 05 41, MISCELLANEOUS PIPING AND PIPE ASSEMBLY

1. XX= numbers 01-20

**INSTRUMENT AND I/O ABBREVIATION DEFINITIONS**

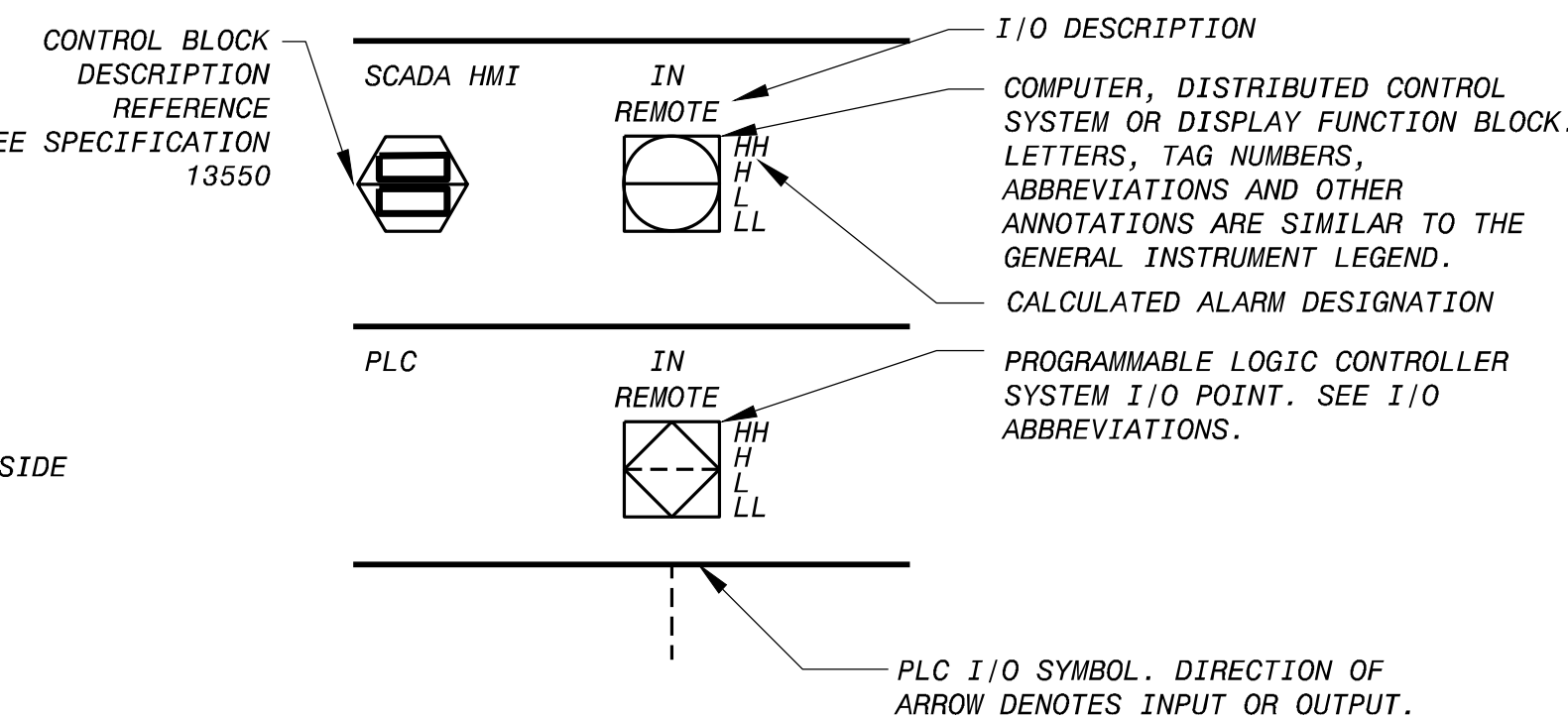
AAH ANALYZER ALARM HIGH	PDIT DIFFERENTIAL PRESSURE INDICATING TRANSMITTER
AAHH ANALYZER ALARM HIGH-HIGH	PDAAH DIFFERENTIAL PRESSURE ALARM HIGH
AAL ANALYZER ALARM LOW	PDAAH DIFFERENTIAL PRESSURE ALARM HIGH-HIGH
AALL ANALYZER ALARM LOW-LOW	PDSH DIFFERENTIAL PRESSURE SWITCH HIGH
AAX ALARM HORN	PDSHH DIFFERENTIAL PRESSURE SWITCH HIGH-HIGH
AAL STROBE ALARM LIGHT	PDSL DIFFERENTIAL PRESSURE SWITCH LOW
AE ANALYZER SENSOR	PDSLL DIFFERENTIAL PRESSURE SWITCH LOW-LOW
AI ANALYZER INDICATION	PE PRESSURE SENSOR
AIT ANALYZER INDICATING TRANSMITTER	PG PRESSURE GAUGE
ASH ANALYZER SWITCH HIGH	PI PRESSURE INDICATOR (LED OR SCREEN)
ASHH ANALYZER SWITCH HIGH-HIGH	PIT PRESSURE INDICATING TRANSMITTER
CB CONTROL BLOCK REFERENCE (SCADA LEVEL)	PSL PRESSURE SWITCH LOW
FAL FLOW ALARM LOW	PSH PRESSURE SWITCH HIGH
FAH FLOW ALARM HIGH	SI SPEED INDICATION (LED OR SCREEN)
FC FLOW CONTROLLER	SC SPEED CONTROL
FI FLOW DIGITAL INDICATOR (LED OR SCREEN)	SIT SPEED INDICATING TRANSMITTER
FIC FLOW INDICATING CONTROLLER	SSL SPEED SWITCH LOW
FE PRIMARY FLOW ELEMENT/SENSOR	SIT SPEED INDICATING TRANSMITTER
FG FLOW SIGHT GAUGE	TAH TEMPERATURE ALARM HIGH
FIT FLOW INDICATING TRANSMITTER	TAHH TEMPERATURE ALARM HIGH-HIGH
FOG FLOW TOTALIZING GAUGE	TAL TEMPERATURE ALARM LOW
FOIT FLOW TOTALIZING INDICATING TRANSMITTER	TDI DIFFERENTIAL TEMPERATURE INDICATOR (LED OR SCREEN)
FSH FLOW SWITCH HIGH	TE DIFFERENTIAL TEMPERATURE TRANSMITTER
FSL FLOW SWITCH LOW	TE TEMPERATURE SENSOR/RESISTANCE
FY FLOW SIGNAL CONVERTER, REPEATER, OR ISOLATOR	TDIT TEMPERATURE DETECTOR
HIC HAND INDICATING CONTROLLER	TSH TEMPERATURE SWITCH HIGH
HMS MOMENTARY PUSHBUTTON OR SELECTOR SWITCH	TSHH TEMPERATURE SWITCH HIGH-HIGH
HS HAND SWITCH	TSLL TEMPERATURE SWITCH LOW
IE CURRENT ELEMENT/SENSOR	TG TEMPERATURE GAUGE
IAH CURRENT ALARM HIGH (MOTOR OVERLOAD)	TI TEMPERATURE INDICATOR (LED OR SCREEN)
ISH CURRENT SWITCH HIGH USED TO DETECT HIGH TORQUE)	TIT TEMPERATURE INDICATING TRANSMITTER
JA POWER FAILURE ALARM	UA MULTIVARIABLE/COMMON ALARM/COMMON FAULT
JL POWER INDICATOR	UCR RUN COMMAND
JL POWER INDICATING LIGHT	UCS STOP COMMAND
JIT POWER INDICATING TRANSMITTER	VAH VIBRATION ALARM HIGH
KOI TIME TOTALIZING INDICATOR	WAH TORQUE ALARM HIGH
LAL LEVEL ALARM LOW	WAHH TORQUE ALARM HIGH-HIGH
LALL LEVEL ALARM LOW-LOW	WSH TORQUE SWITCH HIGH
LALH LEVEL ALARM HIGH	WSHH TORQUE SWITCH HIGH-HIGH
LAHH LEVEL ALARM HIGH-HIGH	WE PRIMARY WEIGHT SENSOR/LOAD CELL
LE PRIMARY LEVEL ELEMENT/SENSOR	WG WEIGHT GAUGE
LG LEVEL SIGHT GAUGE	WIT WEIGHT INDICATING TRANSMITTER
LI LEVEL INDICATOR (LED OR SCREEN)	YA GENERAL ALARM EVENT
LSL LEVEL SWITCH LOW	YI EVENT INDICATION (LED OR SCREEN)
LSLL LEVEL SWITCH LOW LOW	YIR RUNNING INDICATION
LSH LEVEL SWITCH HIGH	YIS STOPPED INDICATION
LSHH LEVEL SWITCH HIGH-HIGH	YL EVENT INDICATING LIGHT
LY LEVEL SIGNAL CONVERTER, ISOLATOR, OR REPEATER	YLR RUNNING INDICATING LIGHT
PAL PRESSURE ALARM LOW	YLS STOPPED INDICATING LIGHT
PALL PRESSURE ALARM LOW-LOW	ZI POSITION INDICATOR
PAH PRESSURE ALARM HIGH	ZIC CLOSED INDICATION
PAHH PRESSURE ALARM HIGH-HIGH	ZIO OPEN INDICATION
PDG DIFFERENTIAL PRESSURE GAUGE	ZLC CLOSED INDICATING LIGHT
PDI DIFFERENTIAL PRESSURE INDICATOR (LED OR SCREEN)	ZLO OPEN INDICATING LIGHT
	ZSC CLOSED POSITION SWITCH
	ZSO OPEN POSITION SWITCH
	ZIT POSITION INDICATING TRANSMITTER
	ZT POSITION TRANSMITTER

**GENERAL INSTRUMENT SYMBOLS**



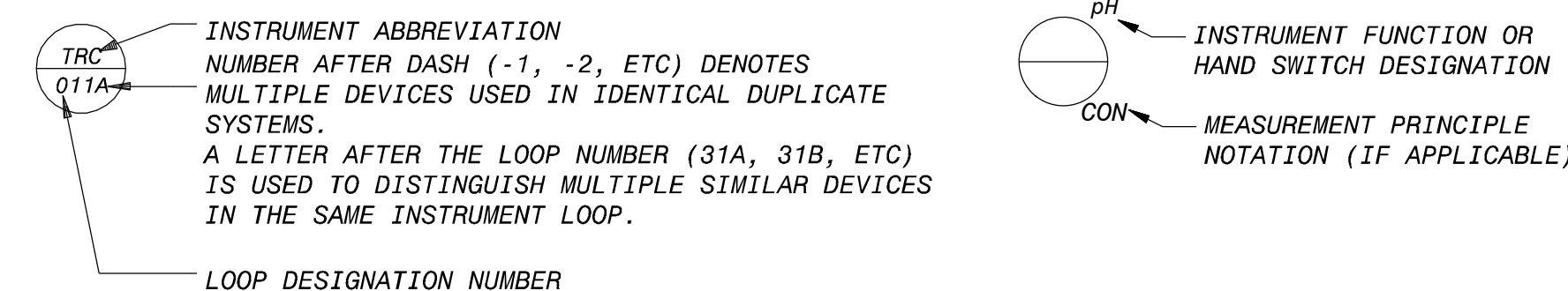
**DIGITAL SYSTEMS INTERFACE SYMBOLS**

NOTE: REFER TO DETAILED SYSTEM SPECIFICATIONS FOR FUNCTIONAL DESCRIPTION. ALSO SEE I/O SCHEDULES FOR COMPLETE INPUT AND OUTPUT LISTINGS.



- △ DISCRETE INPUT
- ▽ DISCRETE OUTPUT
- ▲ ANALOG INPUT
- ▼ ANALOG OUTPUT
- △ PULSE INPUT

**INSTRUMENTATION SYMBOLOGY AND DESIGNATIONS**



**FUNCTION DESIGNATIONS AND ABBREVIATIONS**

MEASUREMENT PRINCIPLE NOTATIONS	INSTRUMENT FUNCTIONS	HAND SWITCH DESIGNATIONS
CON CONDUCTANCE	K GAIN OR ATTENUATE (INPUT:OUTPUT)	FR FORWARD-REVERSE
DP DIFFERENTIAL	-K GAIN AND REVERSE	HOA HAND-OFF-AUTO
FLN PRESSURE SENSING	Σ ADD OR SUM (ADD AND SUBTRACT)	HOR HAND-OFF-REMOTE
FLT FLOW NOZZLE	Δ SUBTRACT (DIFFERENCE)	LOA LOCAL-OFF-AUTO
FTW FLOW TUBE	√ EXTRACT SQUARE	LOR LOCAL-OFF-REMOTE
GWR GUIDED WAVE RADAR	÷ DIVIDE	LR LOCAL REMOTE
RAD RADAR	F(X) CHARACTERIZE SIGNAL	OCA OPEN-CLOSE-AUTO
US ULTRASONIC	> HIGH-SELECT	OAA ON-OFF-AUTO
VENT VENTURI TUBE	< LOW-SELECT	OC OPEN-CLOSE
	X MULTIPLY	OO ON-OFF
	J INTEGRATE (TIME INTEGRAL)	OOR ON-OFF-REMOTE
	CH4 METHANE	OSC OPEN-STOP-CLOSE
	CL2 CHLORINE RESIDUAL	OO/R ON-OFF/RESET
	CO2 CARBON DIOXIDE	
	DO DISSOLVED OXYGEN	
	FL FLUORIDE	
	H2S HYDROGEN SULFIDE	
	LEL LOWER EXPLOSIVE LIMIT	
	MCC MOTOR CONTROL CENTER	
	MLSS MIXED LIQUOR SUSPENDED SOLIDS	
	O2 OXYGEN (PURITY)	
	O3 OZONE	
	PCN PARTICLE COUNTER	
	pH pH	
	SCD STREAMING CURRENT DETECTOR	
	TURB TURBIDITY	
	HI RNG HIGH RANGE TURBIDITY	

**TRANSDUCER & CONVERTER DESIGNATION**

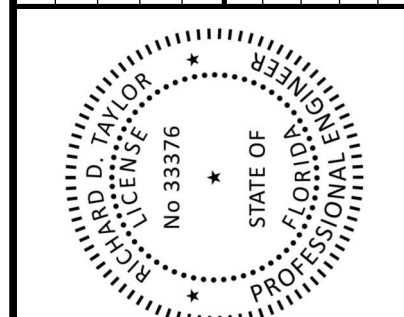
E VOLTAGE
FSK FREQUENCY SHIFT KEYING
H HYDRAULIC
I CURRENT
P PNEUMATIC PULSE
PD PULSE DURATION
PF PULSE FREQUENCY
R RESISTANCE (ELECTRICAL)

**POWER SUPPLY ABBREVIATIONS**

AS AIR SUPPLY
ES ELECTRIC SUPPLY
GS GAS SUPPLY
HS HYDRAULIC SUPPLY
NS NITROGEN SUPPLY
SS STEAM SUPPLY
WS WATER SUPPLY
120V 120VAC

POWER SUPPLY SOURCE LABEL. USED ONLY WHERE NECESSARY TO HELP CLARIFY AN INSTRUMENT OR SYSTEM FUNCTION.

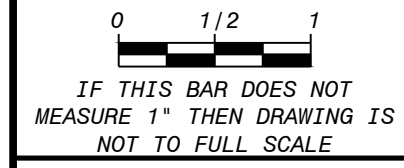
DATE	REVISED AND RECORD OF ISSUE
FEB 2019 100% SUBMITTAL	
DEC 2018 90% SUBMITTAL	
SEPT 2018 60% SUBMITTAL	
JULY 2018 30% SUBMITTAL	



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MANATEE COUNTY, FLORIDA  
SOUTHEAST WATER RECLAMATION FACILITY  
PLANT DRAIN PUMP STATION  
INSTRUMENTATION  
LEGEND & ABBREVIATIONS  
SHEET 2 OF 3

DESIGNED: RDT
DETAILED: AD
CHECKED: LB
APPROVED: MT
DATE: FEB 2019



PROJECT NO.  
198896  
I-02  
SHEET  
37 OF 42

SYSTEM CODE ABBREVIATIONS

Table with 2 columns: SYSTEM CODE, ABBREVIATIONS. Lists various codes like ACE, ACT, GAC, etc. and their corresponding descriptions.

PROCESS CODE ABBREVIATIONS

Table with 2 columns: PROCESS CODE, ABBREVIATIONS. Lists various codes like ACE\_X, ACT\_X, GAC\_X, etc. and their corresponding descriptions.

PROCESS CODE ABBREVIATIONS

Table with 2 columns: PROCESS CODE, ABBREVIATIONS. Lists various codes like RES\_X, RAS\_X, ROS\_X, etc. and their corresponding descriptions.

FUNCTION CODE ABBREVIATIONS

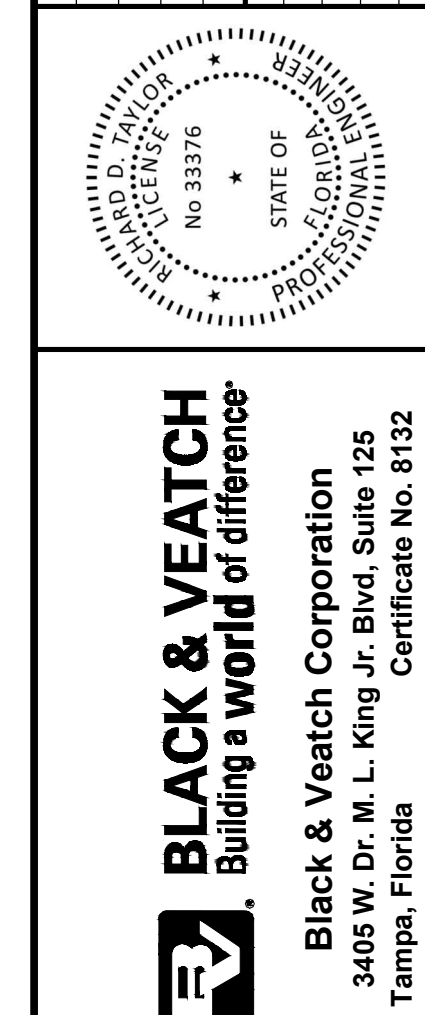
Table with 2 columns: FUNCTION CODE, ABBREVIATIONS. Lists various codes like ACMB, AFD, ACD, etc. and their corresponding descriptions.

FUNCTION CODE ABBREVIATIONS

Table with 2 columns: FUNCTION CODE, ABBREVIATIONS. Lists various codes like RSV, RCO, RM, etc. and their corresponding descriptions.

SEQUENCE CODES

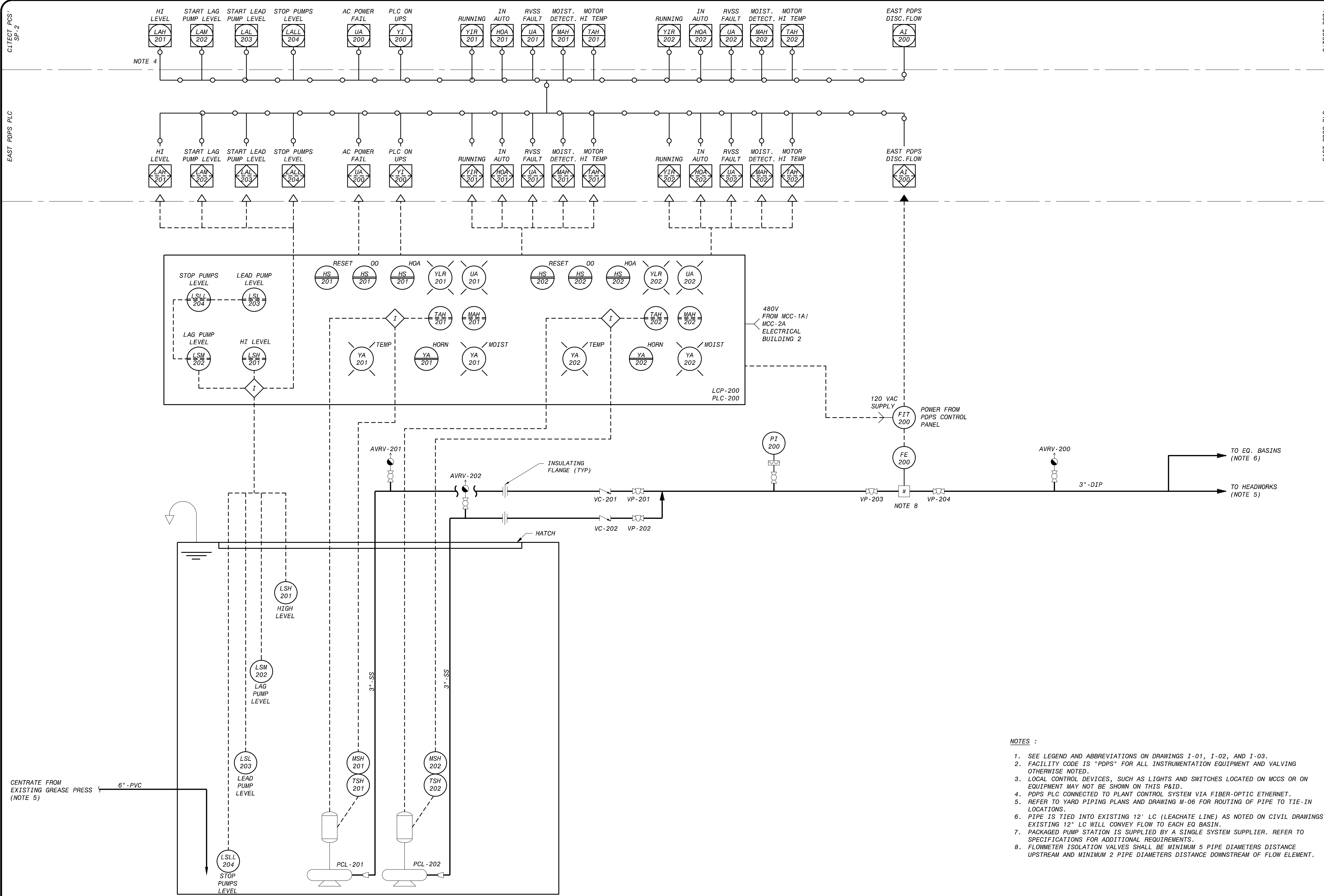
Table with 2 columns: SEQUENCE CODES, ABBREVIATIONS. Lists various codes like 00XX, 15XX, 20XX, etc. and their corresponding descriptions.



MANATEE COUNTY, FLORIDA SOUTHSEAS WATER RECLAMATION FACILITY PLANT DRAIN PUMP STATION INSTRUMENTATION LEGEND & ABBREVIATIONS SHEET 3 OF 3

DESIGNED: RDT
DETAILED: AD
CHECKED: LB
APPROVED: MT
DATE: FEB 2019
PROJECT NO. 198896
I-03 SHEET 38 OF 42

02/20/2019 12:00:00



CENTRATE FROM EXISTING GREASE PRESS (NOTE 5)

6" -PVC

TNK-200 EAST PLANT DRAIN PUMP STATION

- NOTES :
- SEE LEGEND AND ABBREVIATIONS ON DRAWINGS I-01, I-02, AND I-03.
  - FACILITY CODE IS "PDPS" FOR ALL INSTRUMENTATION EQUIPMENT AND VALVING OTHERWISE NOTED.
  - LOCAL CONTROL DEVICES, SUCH AS LIGHTS AND SWITCHES LOCATED ON MCCS OR ON EQUIPMENT MAY NOT BE SHOWN ON THIS P&ID.
  - PDPS PLC CONNECTED TO PLANT CONTROL SYSTEM VIA FIBER-OPTIC ETHERNET.
  - REFER TO YARD PIPING PLANS AND DRAWING M-06 FOR ROUTING OF PIPE TO TIE-IN LOCATIONS.
  - PIPE IS TIED INTO EXISTING 12" LC (LEACHATE LINE) AS NOTED ON CIVIL DRAWINGS. EXISTING 12" LC WILL CONVEY FLOW TO EACH EQ BASIN.
  - PACKAGED PUMP STATION IS SUPPLIED BY A SINGLE SYSTEM SUPPLIER. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
  - FLOWMETER ISOLATION VALVES SHALL BE MINIMUM 5 PIPE DIAMETERS DISTANCE UPSTREAM AND MINIMUM 2 PIPE DIAMETERS DISTANCE DOWNSTREAM OF FLOW ELEMENT.

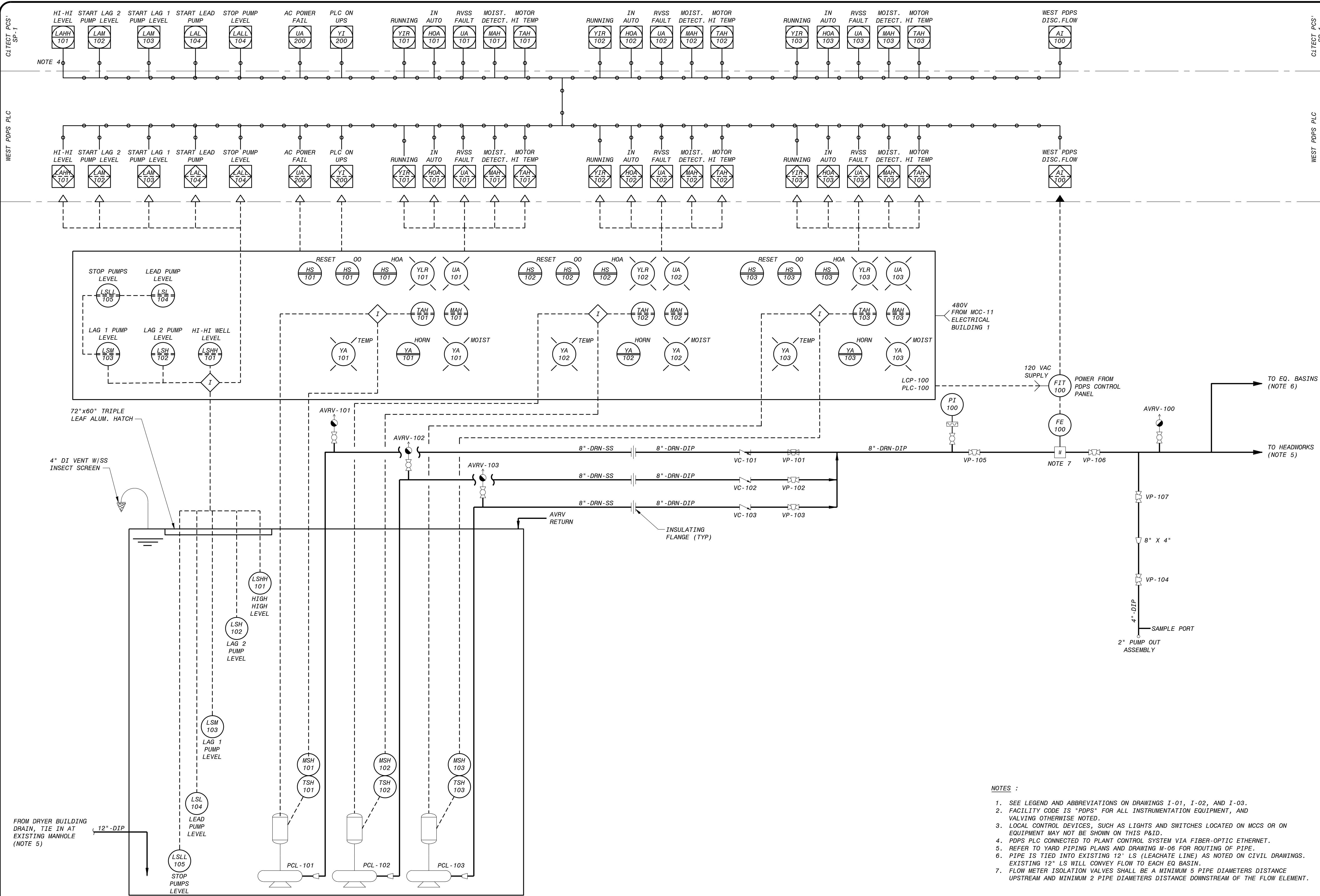
C:\ELECT_PCS\ SP-2 EAST PDPS PLC C:\ELECT_PCS\ SP-2 EAST PDPS PLC	D AD DN MT C VD UB RDT B AD UB RDT A AD IM RDT NO. BY CK APP
	FEB 2019 100% SUBMITTAL DEC 2018 90% SUBMITTAL SEPT 2018 60% SUBMITTAL JULY 2018 30% SUBMITTAL
	REVISIONS AND RECORD OF ISSUE DATE I-04.dwg 60.3050 - Process-Instrumentation Drawings I-04.dwg XREF1: XREF2: XREF3: XREF4:
	PROJECT NO. <b>198896</b> <b>I-04</b> SHEET 39 OF 42

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**MANATEE COUNTY, FLORIDA**  
**SOUTHEAST WATER RECLAMATION FACILITY**  
**PLANT DRAIN PUMP STATION**

P&ID  
**EAST PLANT DRAIN PUMP STATION**



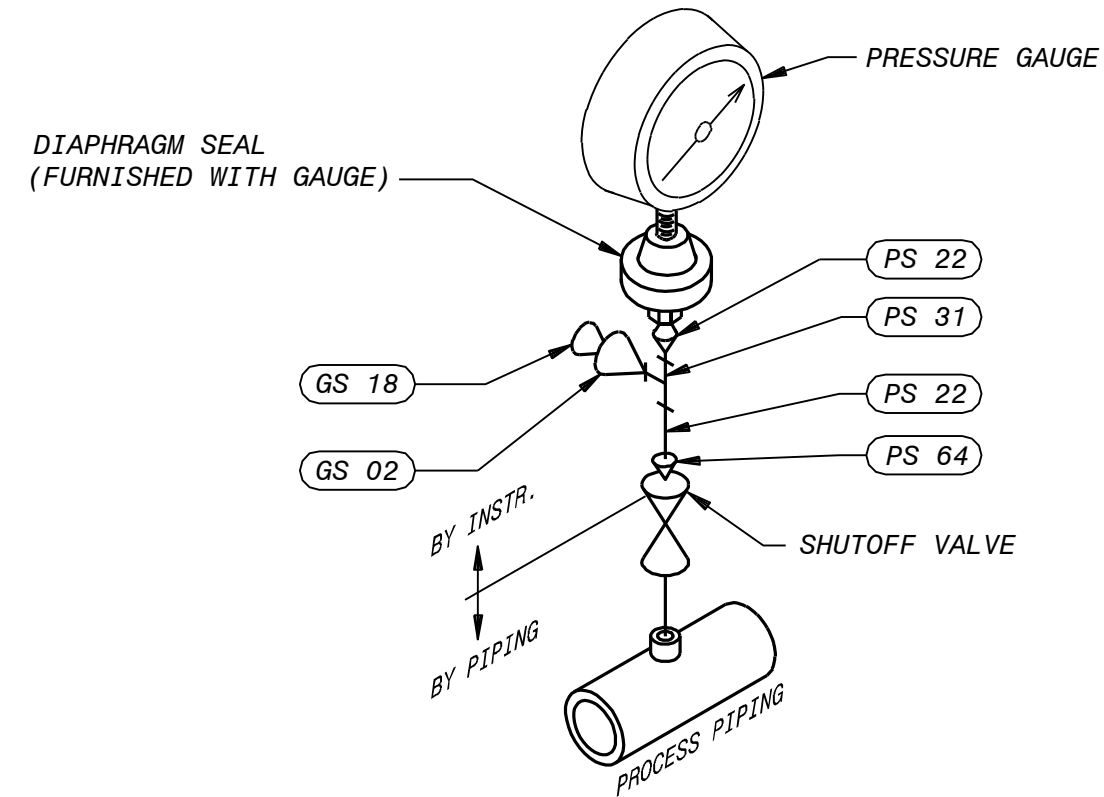
FROM DRYER BUILDING DRAIN, TIE IN AT EXISTING MANHOLE (NOTE 5)  
 12" - DIP  
 LSHH 101 HIGH HIGH LEVEL  
 LSH 102 LAG 2 PUMP LEVEL  
 LSM 103 LAG 1 PUMP LEVEL  
 LSL 104 LEAD PUMP LEVEL  
 LSL 105 STOP PUMPS LEVEL  
 MSH 101 MSH 102 MSH 103  
 TSH 101 TSH 102 TSH 103  
 PCL-101 PCL-102 PCL-103  
 AVR-101 AVR-102 AVR-103  
 INSULATING FLANGE (TYP)  
 AVRV RETURN  
 VC-101 VC-102 VC-103  
 VP-101 VP-102 VP-103  
 VP-105 VP-106 VP-107 VP-104  
 8" - DRN - SS 8" - DRN - DIP  
 8" - DRN - DIP  
 4" - DIP  
 2" PUMP OUT ASSEMBLY  
 SAMPLE PORT  
 8" X 4"  
 NOTE 7  
 FE 100  
 FIT 100  
 120 VAC SUPPLY  
 POWER FROM PDPS CONTROL PANEL  
 TO EQ. BASINS (NOTE 6)  
 TO HEADWORKS (NOTE 5)  
 PI 100  
 LCP-100 PLC-100  
 480V FROM MCC-11 ELECTRICAL BUILDING 1  
 WEST PDPS DISC. FLOW  
 WEST PDPS PLC  
 WEST PDPS PLC  
 WEST PDPS DISC. FLOW  
 C/TECT PCS SP-1  
 C/TECT PCS SP-1  
 NOTE 4  
 HI-HI LEVEL LAHH 101  
 START LAG 2 PUMP LEVEL LAM 102  
 START LAG 1 PUMP LEVEL LAM 103  
 START LEAD PUMP LEVEL LAL 104  
 STOP PUMP LEVEL LALL 104  
 AC POWER FAIL UA 200  
 PLC ON UPS YI 200  
 RUNNING YIR 101  
 IN AUTO HOA 101  
 RVSS FAULT UA 101  
 MOIST. DETECT. MAH 101  
 MOTOR HI TEMP TAH 101  
 RUNNING YIR 102  
 IN AUTO HOA 102  
 RVSS FAULT UA 102  
 MOIST. DETECT. MAH 102  
 MOTOR HI TEMP TAH 102  
 RUNNING YIR 103  
 IN AUTO HOA 103  
 RVSS FAULT UA 103  
 MOIST. DETECT. MAH 103  
 MOTOR HI TEMP TAH 103  
 RESET HS 101 HS 102 HS 103  
 HOA YLR 101 YLR 102 YLR 103  
 UA 101 UA 102 UA 103  
 TEMP YA 101 YA 102 YA 103  
 HORN YA 101 YA 102 YA 103  
 MOIST YA 101 YA 102 YA 103  
 STOP PUMPS LEVEL LSL 105  
 LEAD PUMP LEVEL LSL 104  
 LAG 1 PUMP LEVEL LSM 103  
 LAG 2 PUMP LEVEL LSH 102  
 HI-HI WELL LEVEL LSHH 101  
 72" x 60" TRIPLE LEAF ALUM. HATCH  
 4" DI VENT W/SS INSECT SCREEN

- NOTES :
- SEE LEGEND AND ABBREVIATIONS ON DRAWINGS I-01, I-02, AND I-03.
  - FACILITY CODE IS "PDPS" FOR ALL INSTRUMENTATION EQUIPMENT, AND VALVING OTHERWISE NOTED.
  - LOCAL CONTROL DEVICES, SUCH AS LIGHTS AND SWITCHES LOCATED ON MCCS OR ON EQUIPMENT MAY NOT BE SHOWN ON THIS P&ID.
  - PDPS PLC CONNECTED TO PLANT CONTROL SYSTEM VIA FIBER-OPTIC ETHERNET.
  - REFER TO YARD PIPING PLANS AND DRAWING M-06 FOR ROUTING OF PIPE.
  - PIPE IS TIED INTO EXISTING 12" LS (LEACHATE LINE) AS NOTED ON CIVIL DRAWINGS. EXISTING 12" LS WILL CONVEY FLOW TO EACH EQ BASIN.
  - FLOW METER ISOLATION VALVES SHALL BE A MINIMUM 5 PIPE DIAMETERS DISTANCE UPSTREAM AND MINIMUM 2 PIPE DIAMETERS DISTANCE DOWNSTREAM OF THE FLOW ELEMENT.

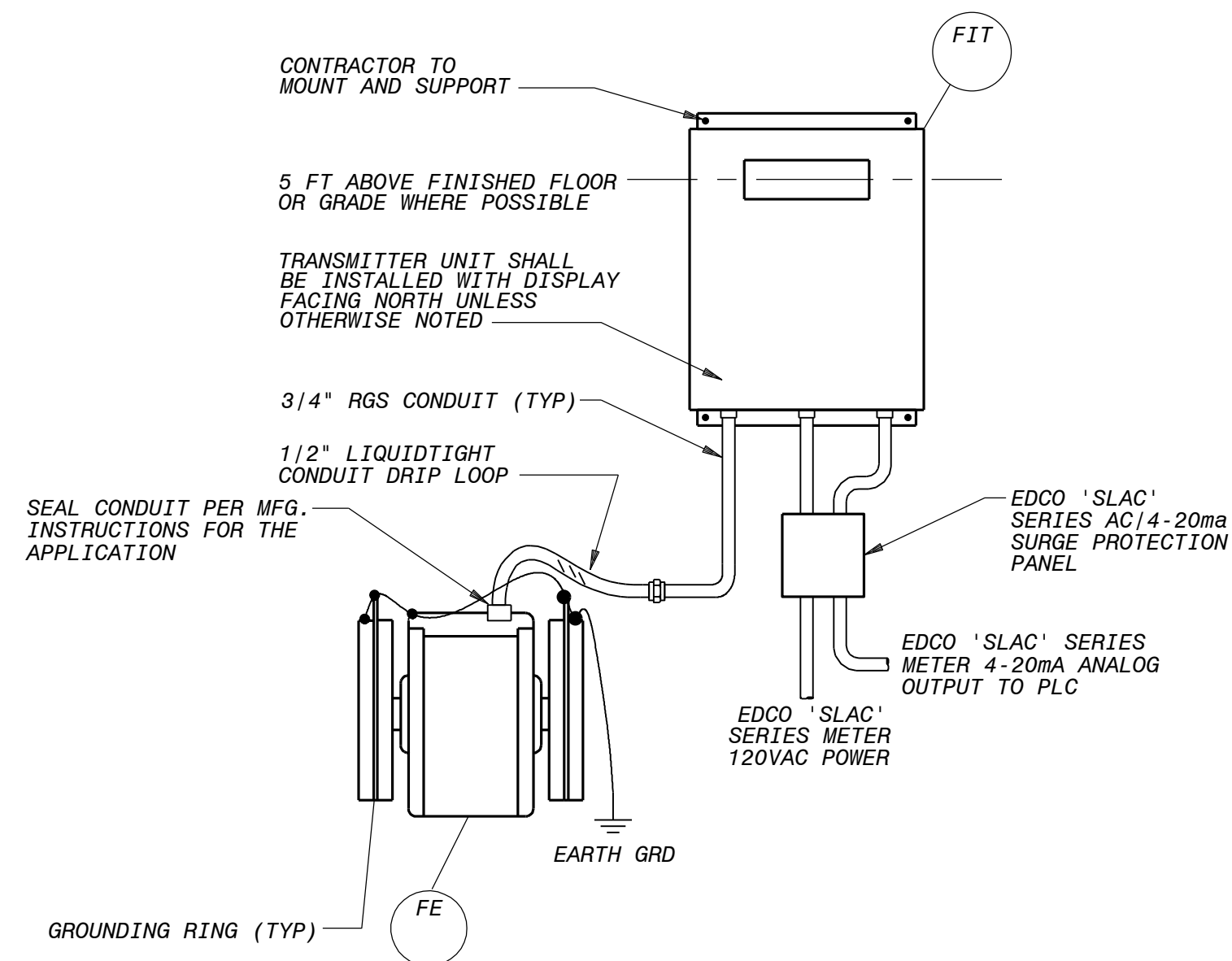
DESIGNED: RDT	DATE: FEB 2019
DETAILED: VD	
CHECKED: LB	
APPROVED: MT	
PROJECT NO. 198896	
I-05 SHEET 40 OF 42	

MANATEE COUNTY, FLORIDA  
 SOUTHEAST WATER RECLAMATION FACILITY  
 PLANT DRAIN PUMP STATION  
 WEST PLANT DRAIN PUMP STATION  
 P&ID  
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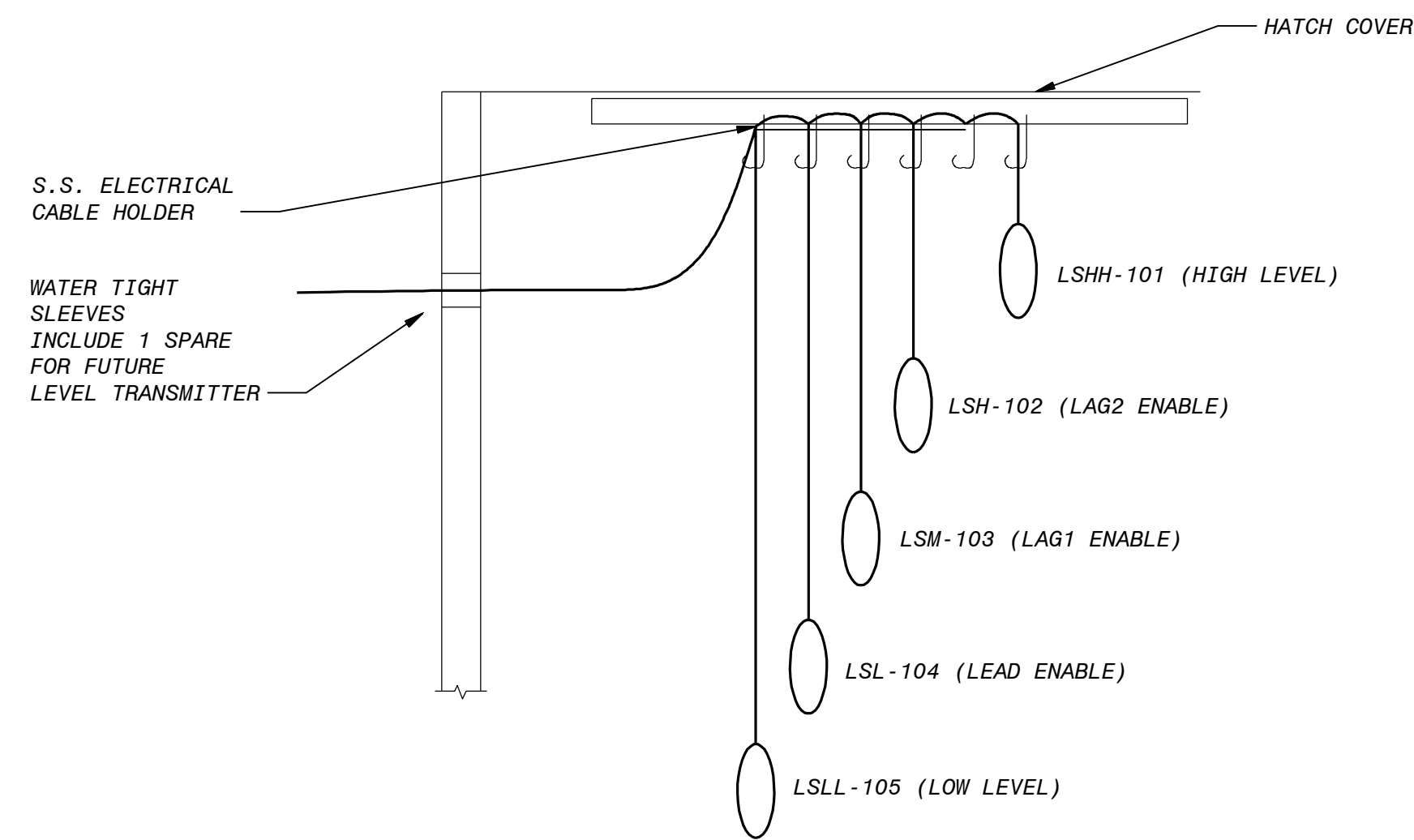
**PRESSURE SWITCH & GAUGE WITH ANNULAR TYPE  
DIAPHRAGM SEAL INSTALLATION DETAIL**  
NO SCALE  
(PI-100)



**MAGNETIC FLOWMETER INSTALLATION DETAIL**  
NO SCALE  
NOTE: PIPE TO BE SUPPORTED ON BOTH SIDES OF METER.  
(FE/FIT-100, FE/FIT-200)

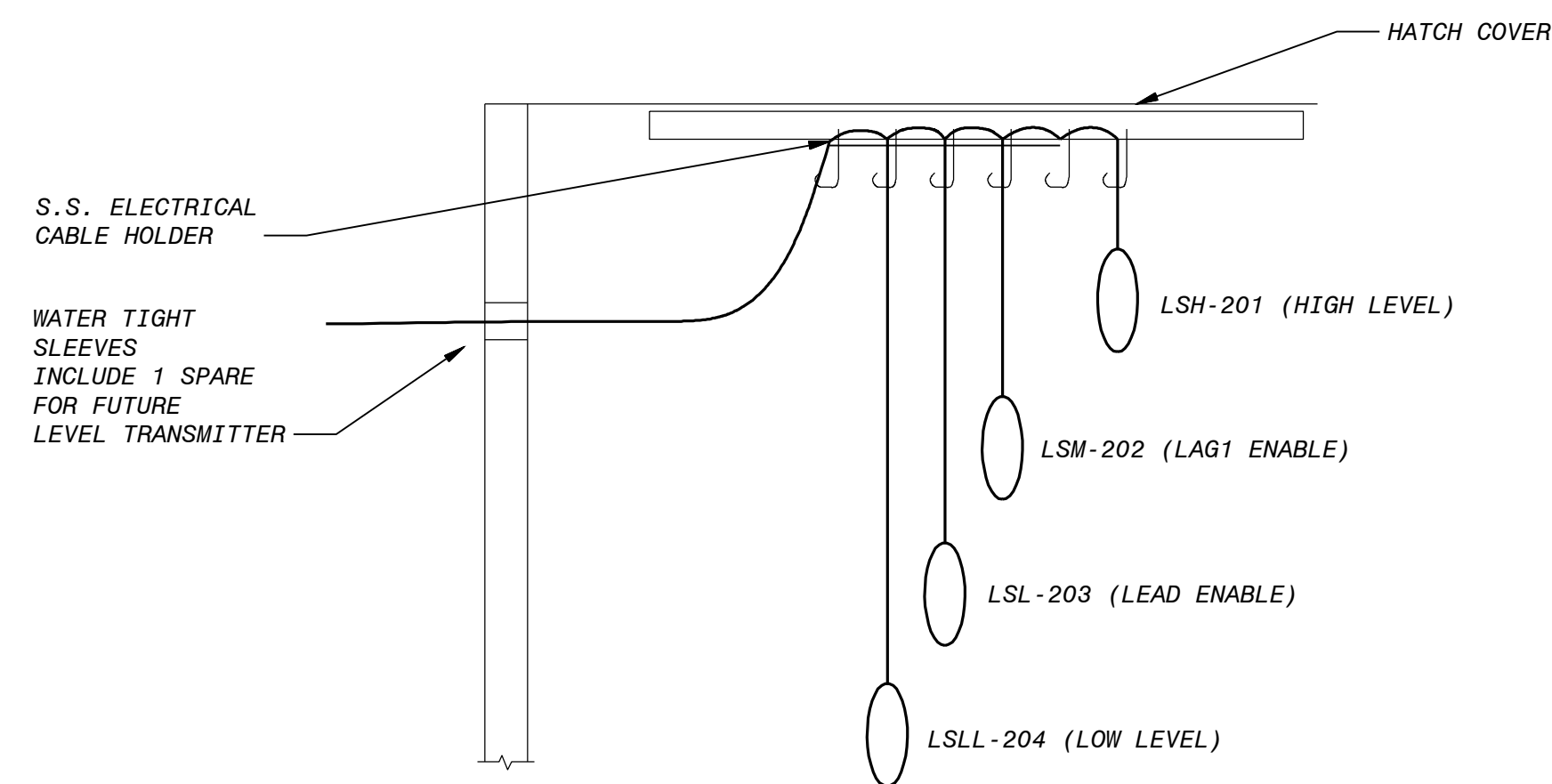
BILL OF MATERIAL				
ITEM NO.	DESCRIPTION	SIZE	MFG / PART NO.	QTY.
GS 02	MALE CONNECTION	1/4 TUBE X 1/2 MNPT	SWAGELOK SS-400-1-8	1
GS 18	TUBE PLUG	1/4 TUBE	SWAGELOK SS-400-P	1
PS 22	HEX LONG NIPPLE	1/2 MNPT X 3	SWAGELOK SS-8-HLN-3.00	2
PS 31	PIPE TEE	1/2 FNPT	SWAGELOK SS-8-T	1
PS 64	REDUCER	1/2 FNPT X 1 MNPT	SWAGELOK SS-16-RB-8	1

THE MATERIALS AND QUANTITIES NOTED ABOVE ARE FOR ONLY ONE INSTALLATION.



NOTE :  
1. INDIVIDUAL WET WELL PENETRATION SLEEVES SHALL BE PROVIDED FOR EACH PUMP CABLE.

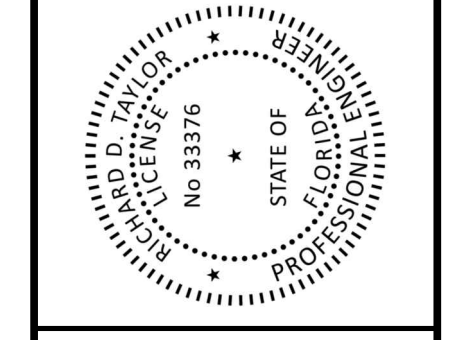
**LEVEL FLOAT MOUNTING DETAIL - TRIPLEX STATION**  
NO SCALE



NOTE :  
1. INDIVIDUAL WET WELL PENETRATION SLEEVES SHALL BE PROVIDED FOR EACH PUMP CABLE.

**LEVEL FLOAT MOUNTING DETAIL - DUPLEX STATION**  
NO SCALE

FEB 2019	100% SUBMITTAL	C	AD	DH	MT
DEC 2018	90% SUBMITTAL	B	VD	UB	BDT
SEPT 2018	60% SUBMITTAL	A	AD	UB	BDT
DATE	REV	NO.	BY	CHK	APP
60-3050 - Process Instrumentation Drawings	REVISIONS AND RECORD OF ISSUE				
I-06.dwg	XREF 1:				
SAVED:ACH95836, 2/15/2019 3:10:34 PM	XREF 2:				
PLOTTED:DUT48884, 1/25/2019 7:25:05 PM	XREF 3:				
USER:ACH95836	XREF 4:				



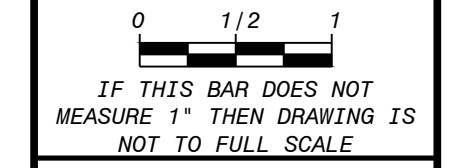
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PLANT DRAIN PUMP STATION

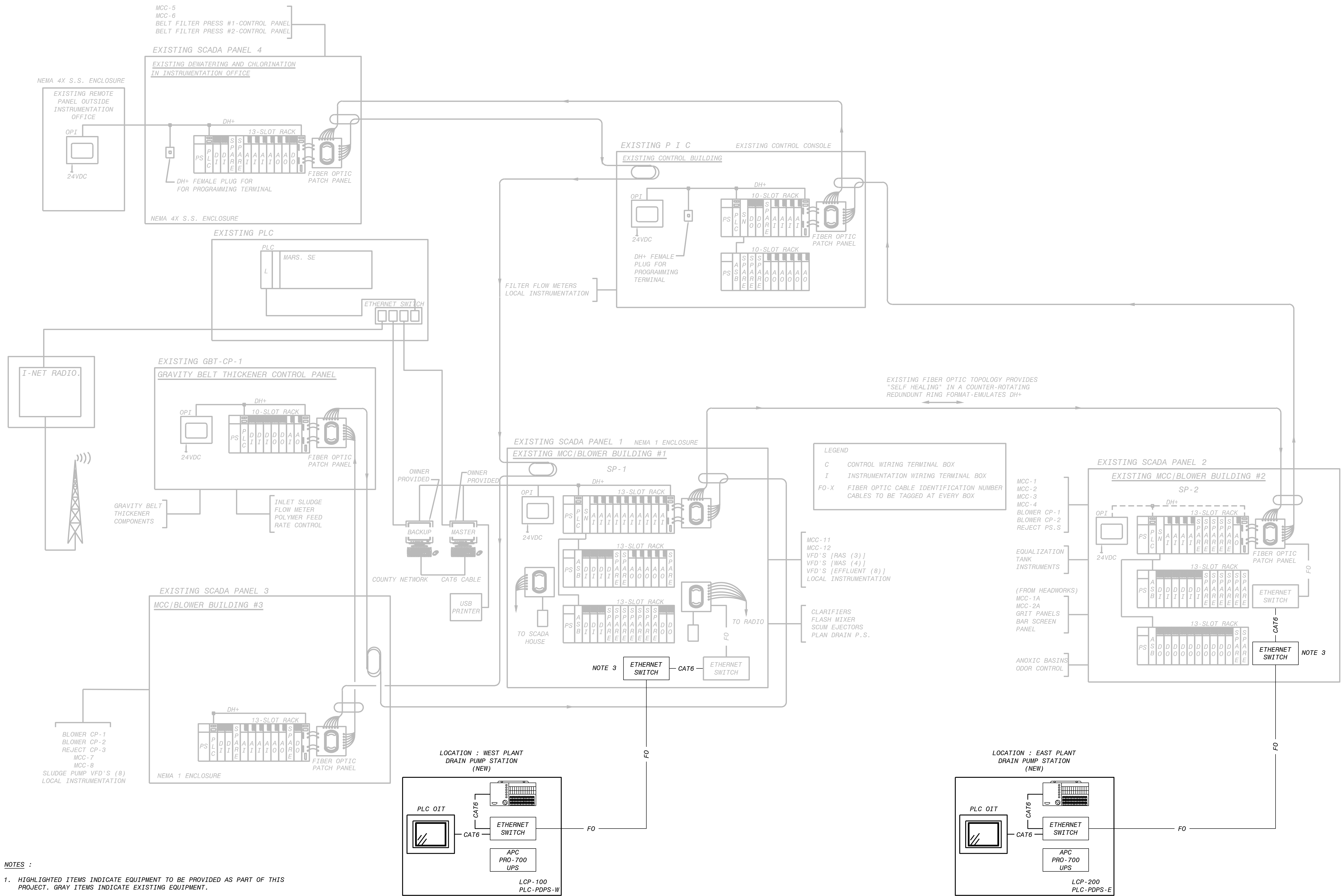
INSTRUMENTATION  
INSTRUMENT INSTALLATION DETAILS

DESIGNED: RDT
DETAILED: VD
CHECKED: LB
APPROVED: MT
DATE: FEB 2019

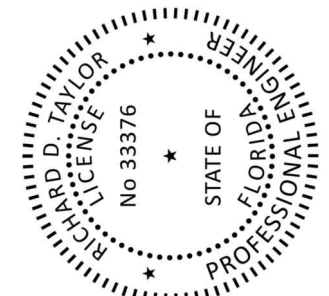


PROJECT NO.  
**198896**

**I-06**  
SHEET  
41 OF 42



FEB 2019	100% SUBMITTAL	
DEC 2018	90% SUBMITTAL	
SEPT 2018	60% SUBMITTAL	
DATE	REV	DESCRIPTION
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I-07.dwg		
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PLOTTED:DU44884, 1/25/2019 7:20:28 PM		
USER:ACH95836		



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 PLANT DRAIN PUMP STATION**

INSTRUMENTATION  
 NETWORK BLOCK DIAGRAM

DESIGNED:	RDY
DETAILED:	VD
CHECKED:	LB
APPROVED:	MT
DATE:	FEB 2018

