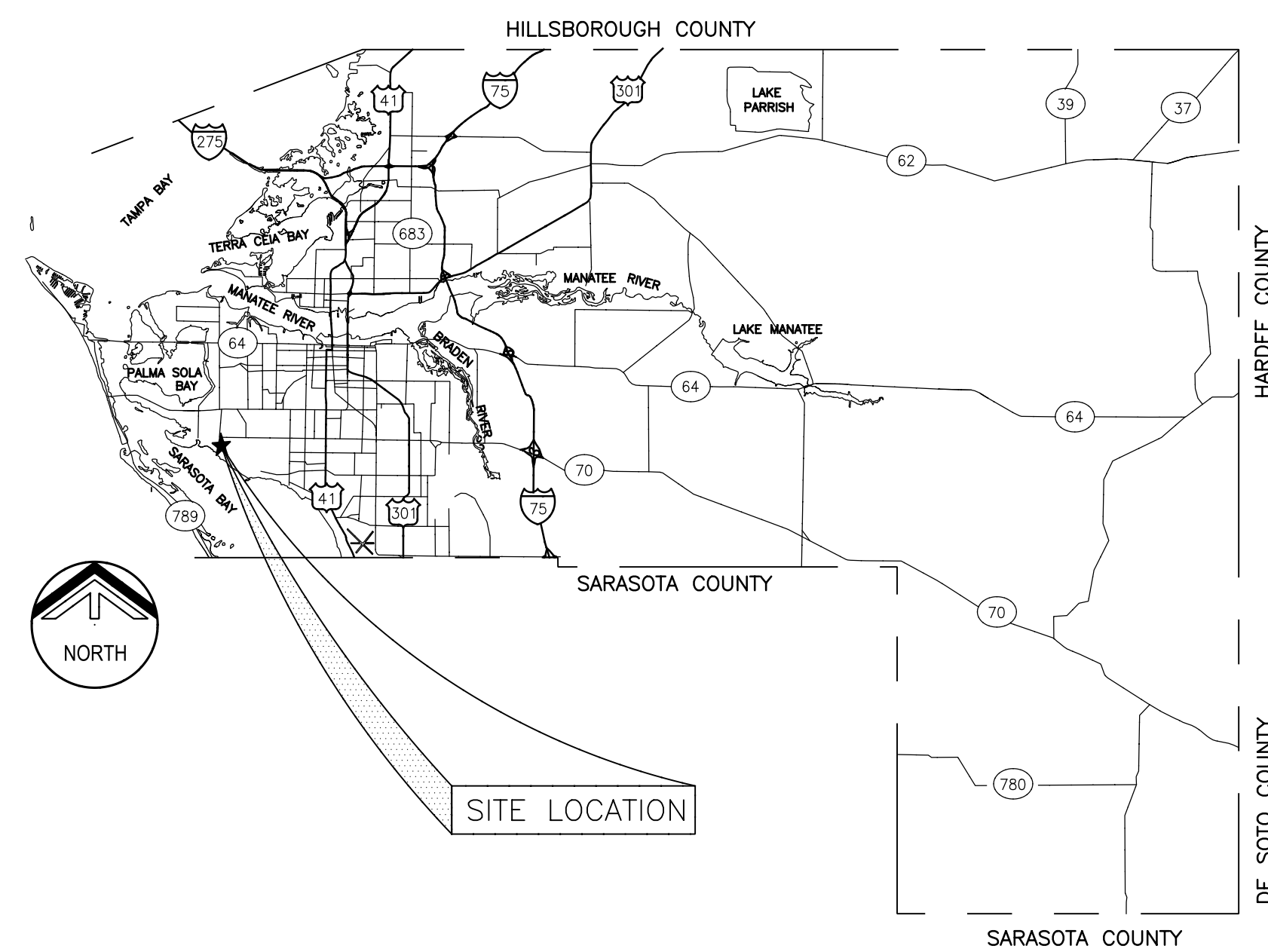


MANATEE COUNTY GOVERNMENT PUBLIC WORKS DEPARTMENT (MANATEE COUNTY, FLORIDA)

SOUTHWEST WATER RECLAMATION FACILITY CLARIFIER 3 & 4 REHABILITATION

MANATEE COUNTY PROJECT NO. 6078981

MARCH 2013



LOCATION MAP

DWG	DISCIPLINE / TITLE
	GENERAL
G-01	COVER SHEET AND DRAWING INDEX
G-02	EXISTING SITE PLAN
G-03	PIPE SCHEDULE AND MECHANICAL SYMBOLS
	DEMOLITION
D-01	DEMO PLAN AND SECTIONS
D-02	SCUM EJECTORS AND RAS PUMP DEMOLITION PLAN
	MECHANICAL
M-01	CLARIFIER PLAN AND SECTIONS
M-02	CLARIFIER DETAILS
M-03	SCUM AND RAS PUMPS PLAN
M-04	SCUM AND RAS PUMPS SECTIONS
	ELECTRICAL
E-01	ELECTRICAL LEGEND AND SYMBOLS
E-02	ELECTRICAL GENERAL NOTES
E-03	MCC-HW1 ONE LINE AND ELEVATION
E-04	MCC-HW2 ONE LINE AND ELEVATION
E-05	NEW POWER PANEL PP-1 ONE LINE DIAGRAM
E-06	CLARIFIER CONTROL PANEL SCHEMATIC DIAGRAM
E-07	RAS AND SCUM PUMP SCHEMATIC DIAGRAMS
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E-10	ELECTRICAL SITE PLAN
E-11	CLARIFIER ELECTRICAL PLAN
E-12	MODIFIED RAS/WAS PUMP STATION - ELECTRICAL PLAN
E-13	HEADWORKS LOWER LEVER - ELECTRICAL PLAN
E-14	SCHEDULES
E-15	ELECTRICAL DETAILS - SHEET 1
E-16	ELECTRICAL DETAILS - SHEET 2
E-17	ELECTRICAL DETAILS - SHEET 3
	INSTRUMENTATION
N-01	INSTRUMENTATION LEGEND AND SYMBOLS
N-02	P&ID CLARIFIER 3 AND 4
N-03	P&ID - RAS PUMP STATION
N-04	P&ID - SCUM PUMPS
N-05	PLC PANEL AND INSTRUMENTATION DETAILS
	DETAILS
T-01	TYPICAL DETAILS



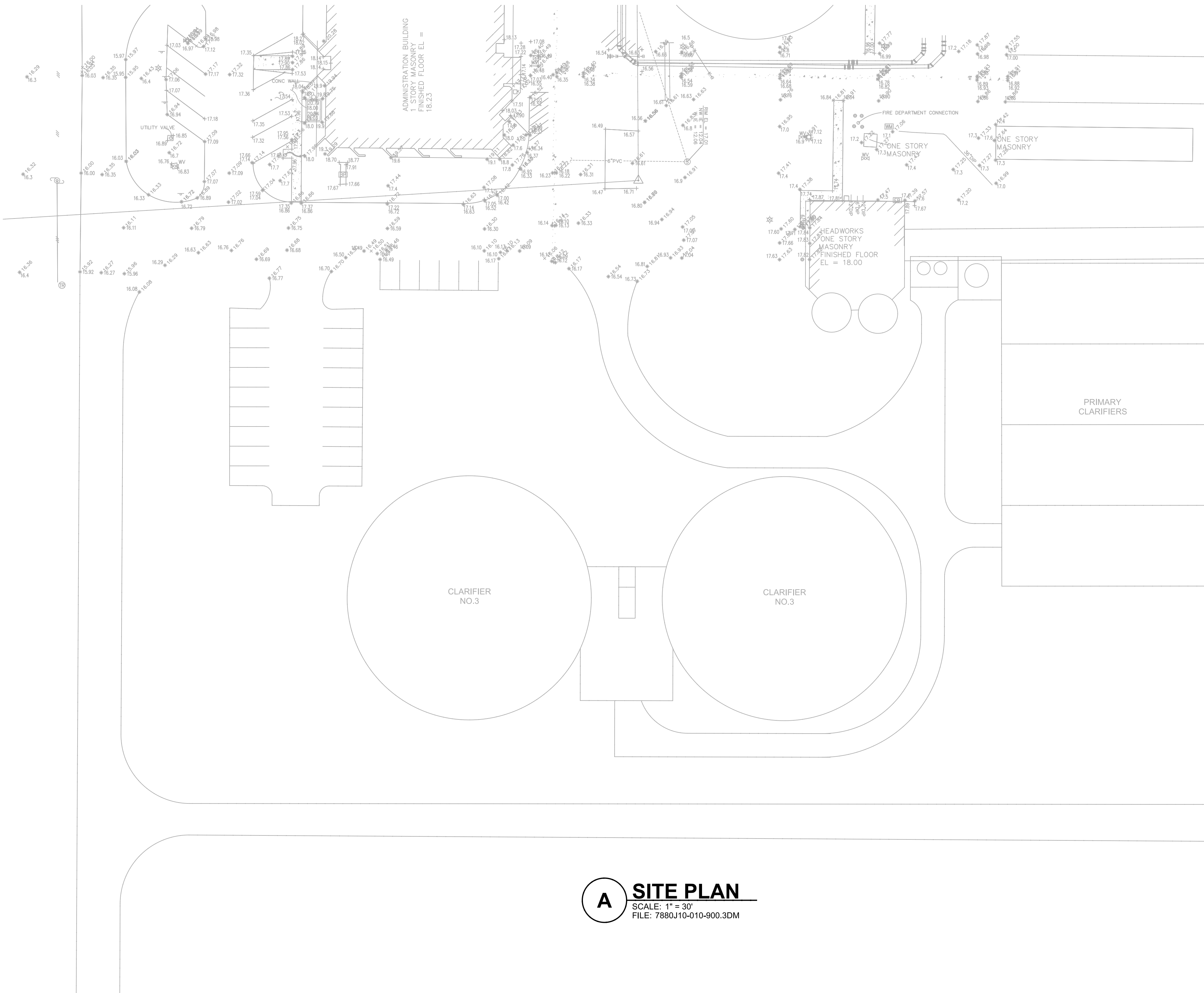
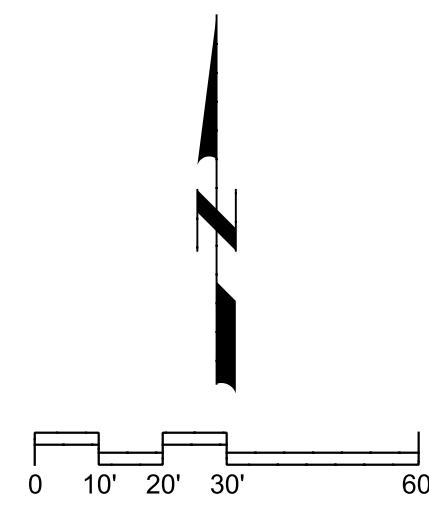
401 NORTH CATTLEMEN ROAD, SUITE 306
SARASOTA, FL 34232
PHONE: (941) 371-9832 FAX: (941) 371-9873
CA 00008571

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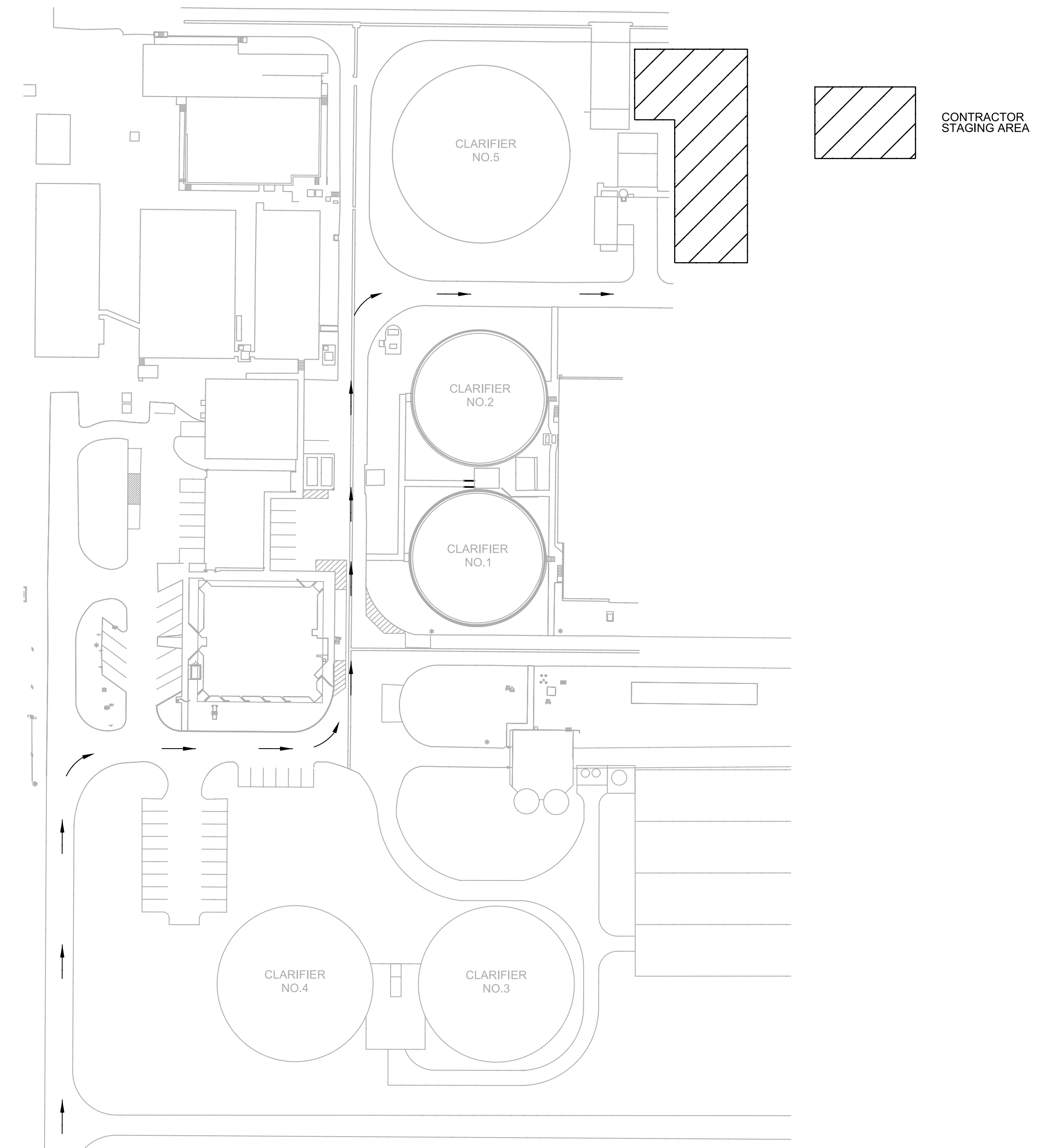
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A SITE PLAN
SCALE: 1" = 30"
FILE: 7880J10-010-900.3DM

GENERAL NOTES:

1. ALL WORK TO BE IN ACCORDANCE WITH MANATEE COUNTY PUBLIC WORKS UTILITY STANDARDS, LATEST EDITION IN AFFECT AT TIME OF BID.
2. CONTRACTOR SHALL COORDINATE WITH OWNER ON ACCESSING THE PLANT SITE AND MOVEMENT WITHIN THE PLANT SITE. OTHER CONSTRUCTION PROJECTS WILL BE ON GOING DURING WORK UNDER THIS CONTRACT.
3. EXISTING FACILITY AND UTILITY INFORMATION SHOWN ON THE DRAWINGS WAS OBTAINED FROM EXISTING OWNER'S RECORDS. NEITHER THE OWNER NOR ENGINEER ASSUMES ANY RESPONSIBILITY FOR FACILITIES AND UTILITIES NOT SHOWN OR NOT IN THE LOCATION SHOWN. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL LOCATIONS, MATERIALS, AND ELEVATIONS IN THE AREAS OF CONSTRUCTION.
4. THE CONTRACTOR SHALL CONTACT THE ENGINEER IMMEDIATELY CONCERNING ANY CONFLICTS ARISING DURING CONSTRUCTION OF ANY IMPROVEMENTS SHOWN ON THESE DRAWINGS.
5. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING FACILITIES AND UTILITIES SHOWN OR NOT SHOWN WHICH ARE TO REMAIN IN PLACE FROM DAMAGE. ALL FACILITIES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED IMMEDIATELY TO THE ENGINEER'S SATISFACTION AT THE CONTRACTOR'S EXPENSE WITHOUT ADDITIONAL COMPENSATION.
6. CONTRACTOR SHALL RESTORE STAGING AREA TO ORIGINAL CONDITION. SOD ALL AREAS DISTURBED BY CONSTRUCTION.
7. ELEVATIONS ARE BASED ON SITE DATUM NATIONAL GEODETIC VERTICAL DATUM 1929 (NGVD 29).



B SITE PLAN DETAIL
SCALE: NTS
FILE: 7880J10-010-900.3DM

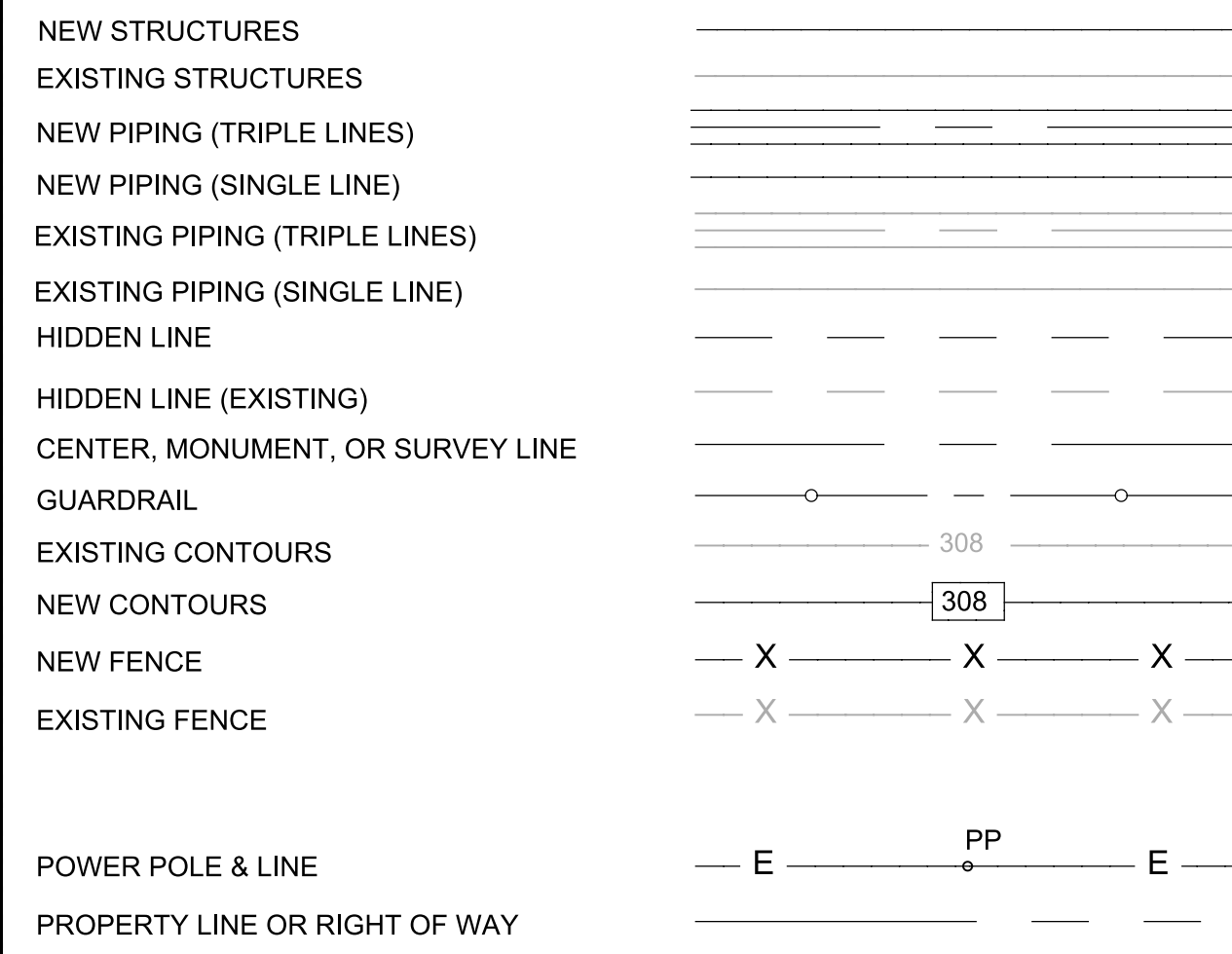
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DESIGNED	MV
DRAWN	DVP
CHECKED	EP
DATE	MARCH 2013

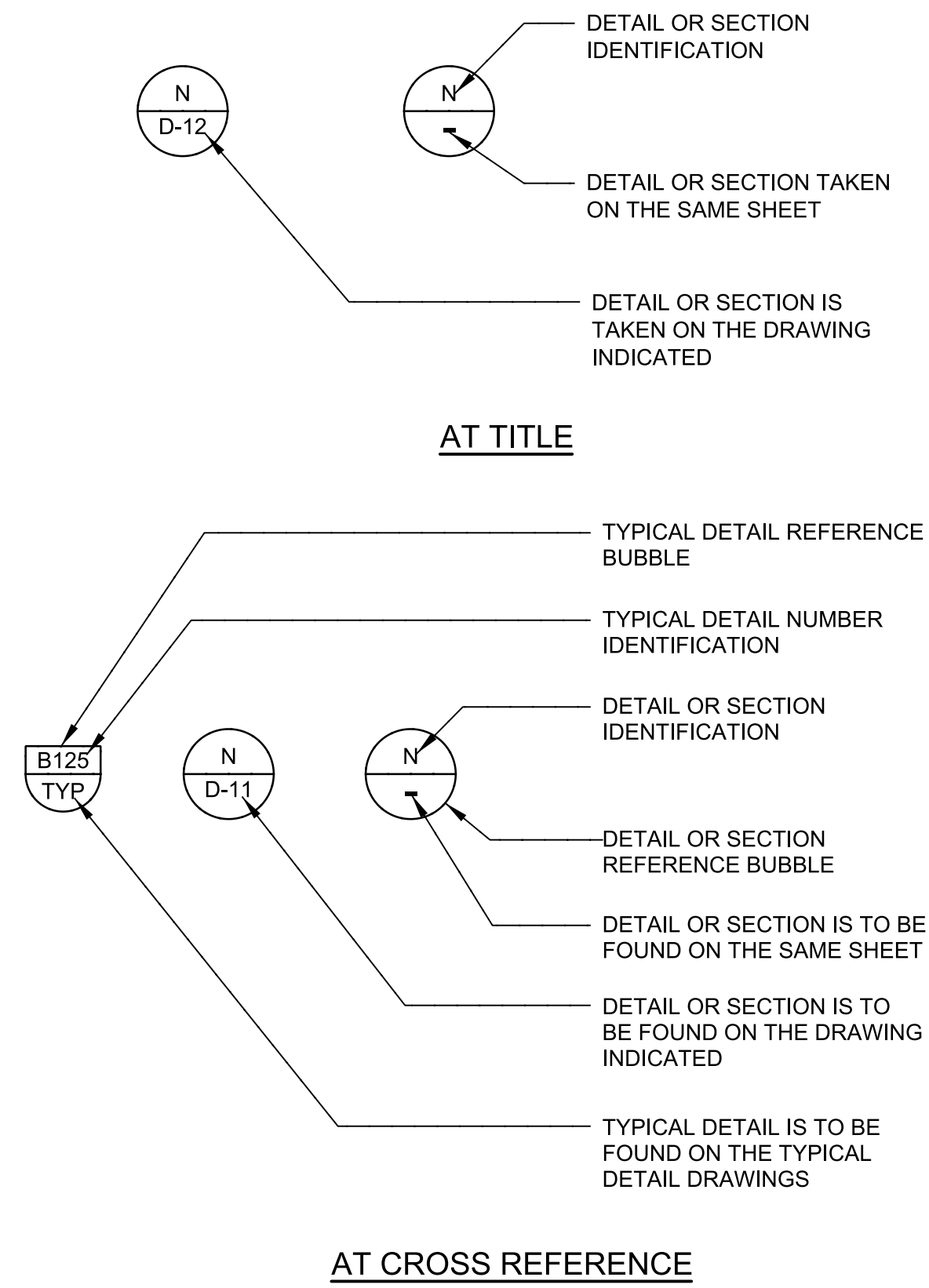


MANATEE COUNTY		VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	JOB NO. 7880J10
SWWRF CLARIFIER 3&4 REHABILITATION			DRAWING NO. G-02
GENERAL EXISTING SITE PLAN			

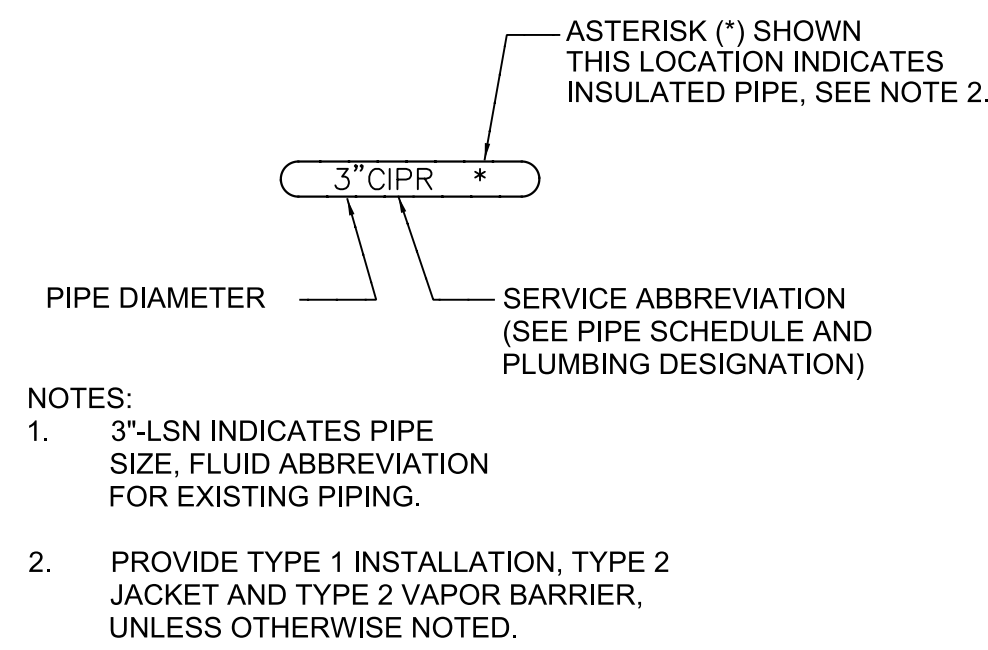
CIVIL



DRAWING CROSS REFERENCE



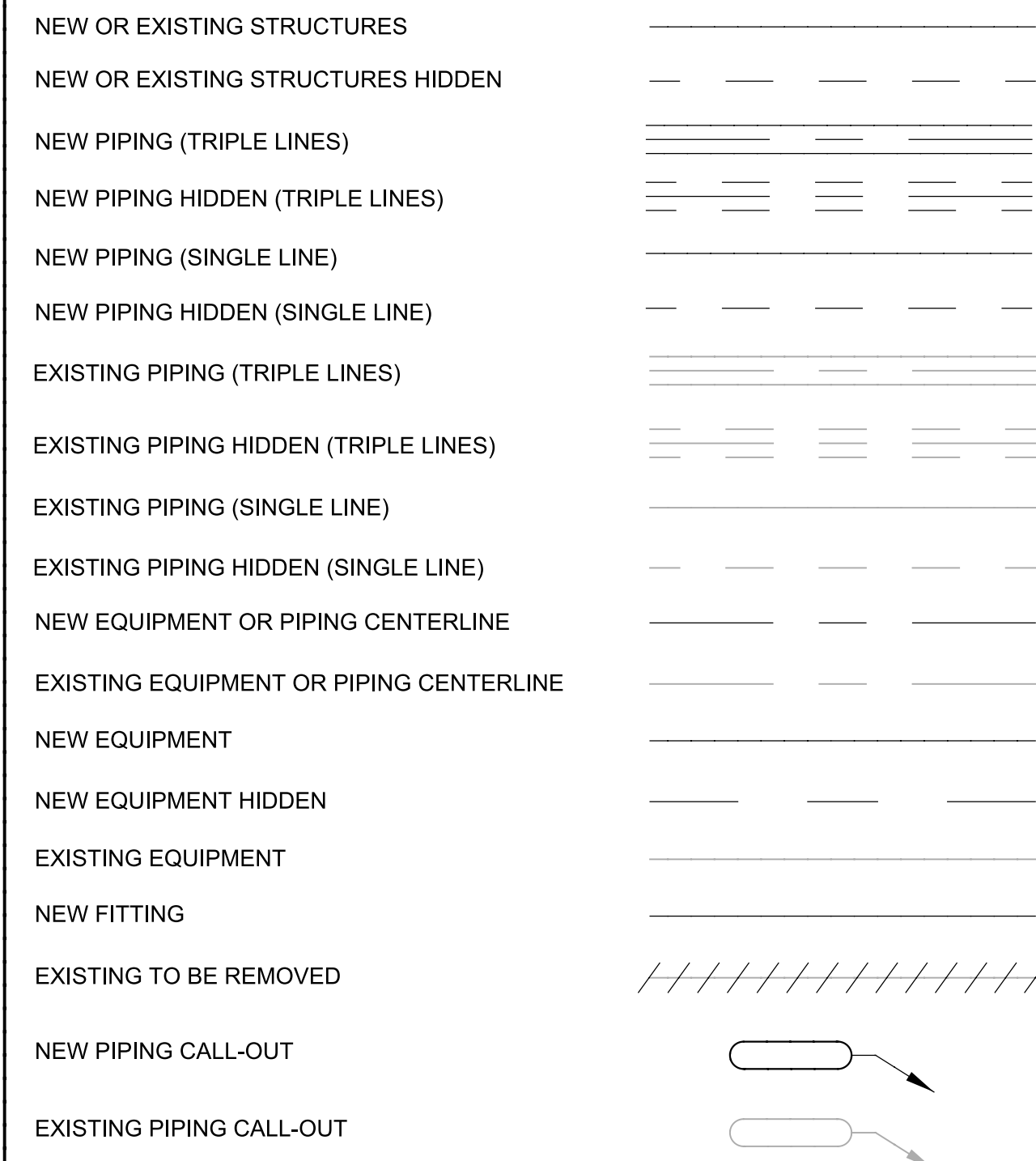
PIPE DESIGNATION LEGEND



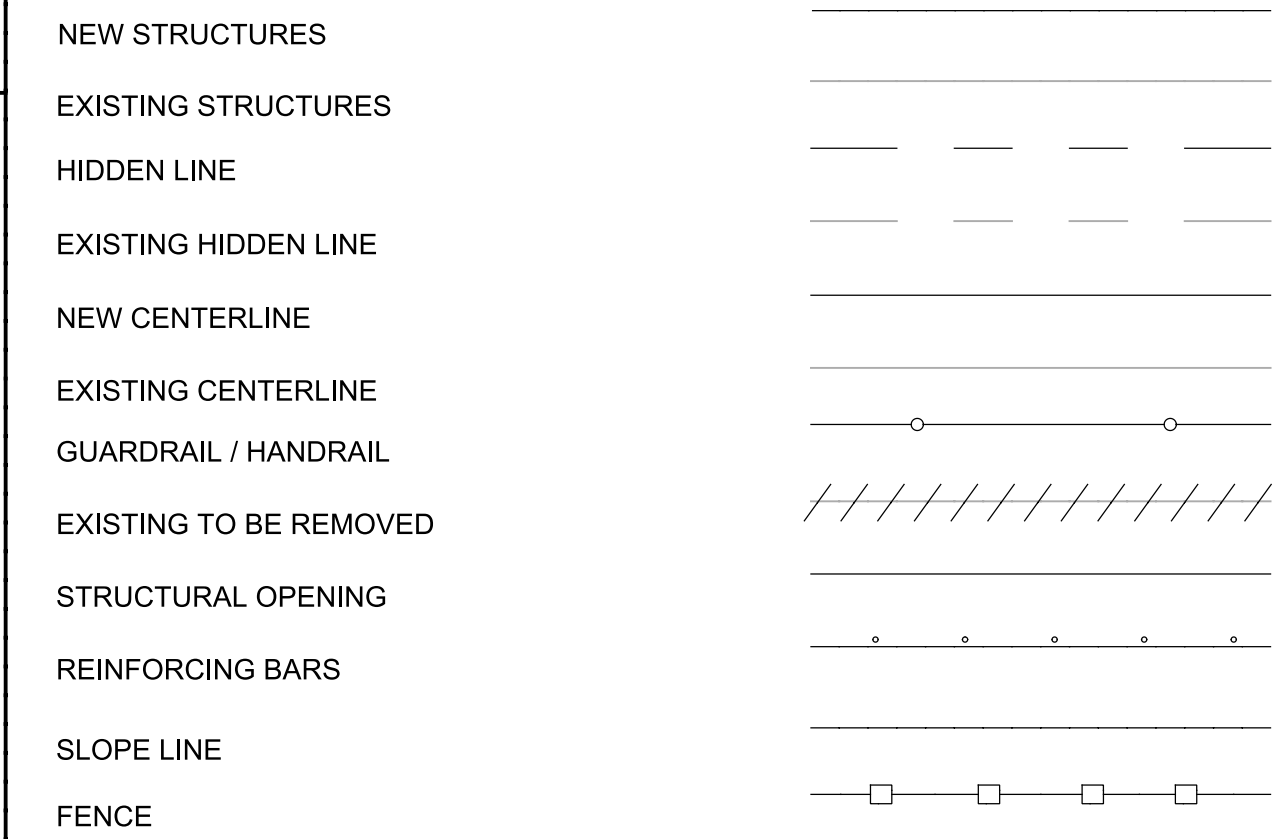
PIPE SCHEDULE

CE	CLARIFIER EFFLUENT
CI	CLARIFIER INFLUENT
RAS	RETURN ACTIVATED SLUDGE
S	SCUM
SW	PLANT SERVICE WATER
WAS	WASTE ACTIVATED SLUDGE

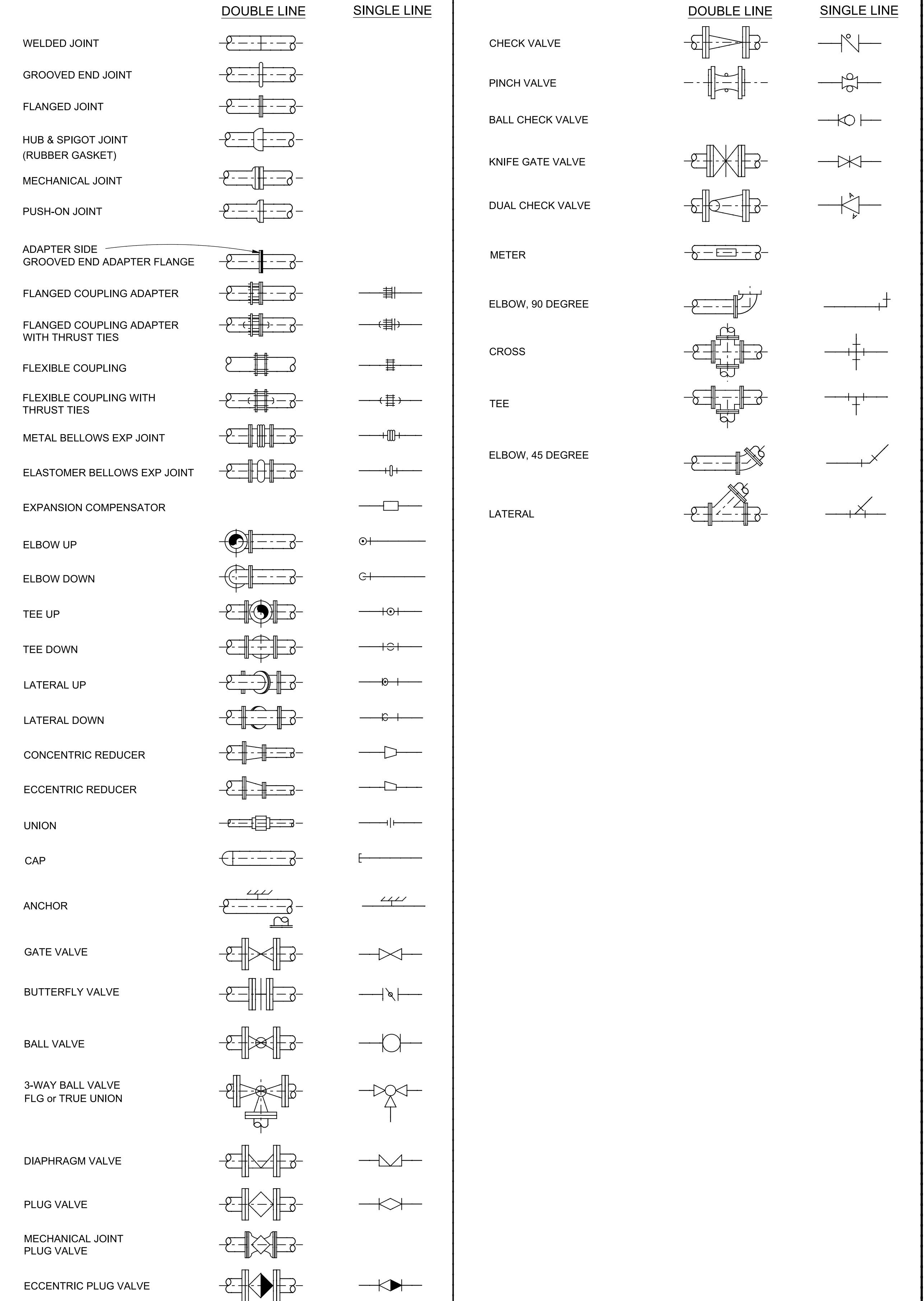
MECHANICAL AND HVAC



STRUCTURAL



PIPE JOINTS AND COUPLER

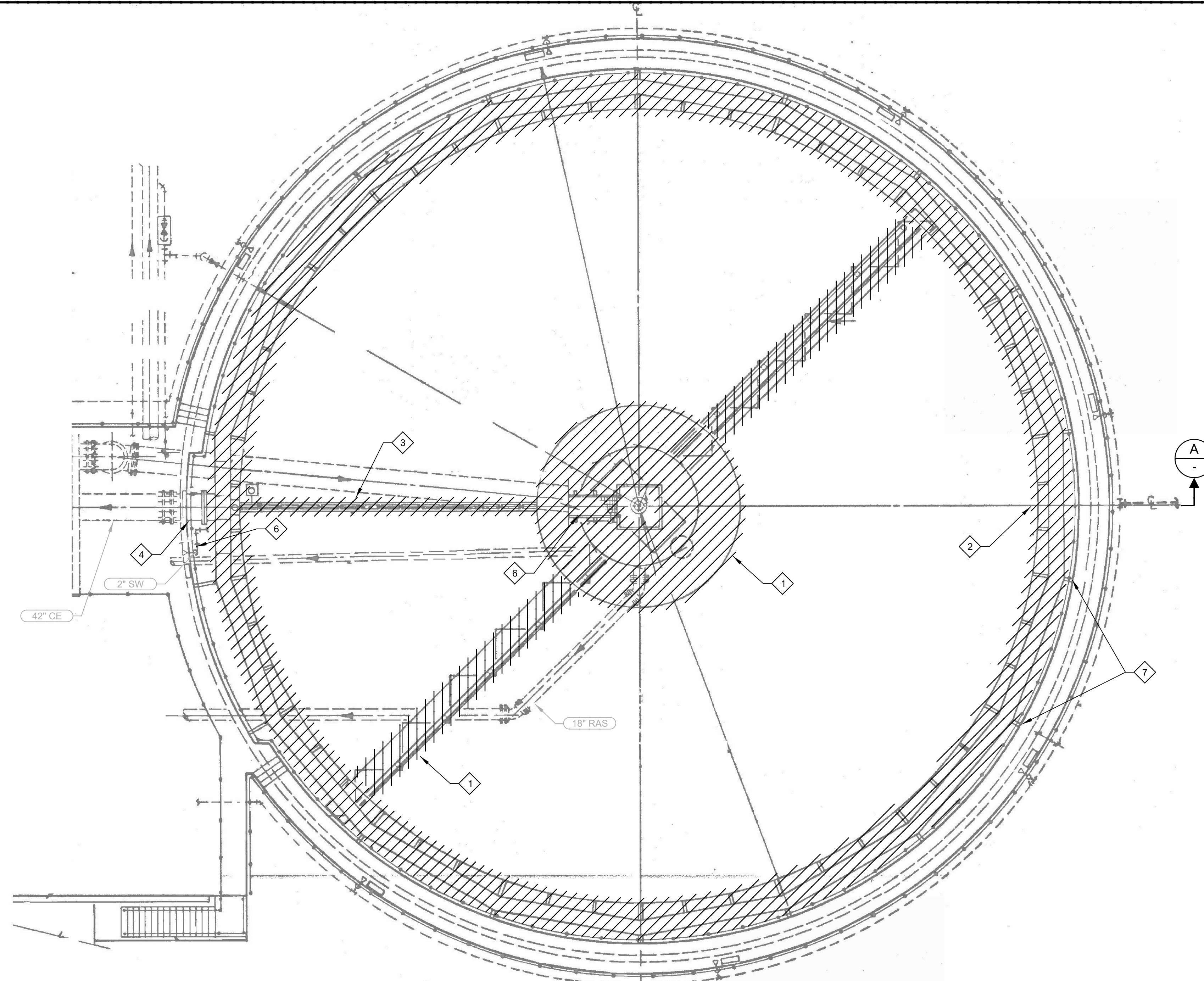


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DRAWN	DVP
CHECKED	EP
DATE	MARCH 2013
DESCRIPTION	

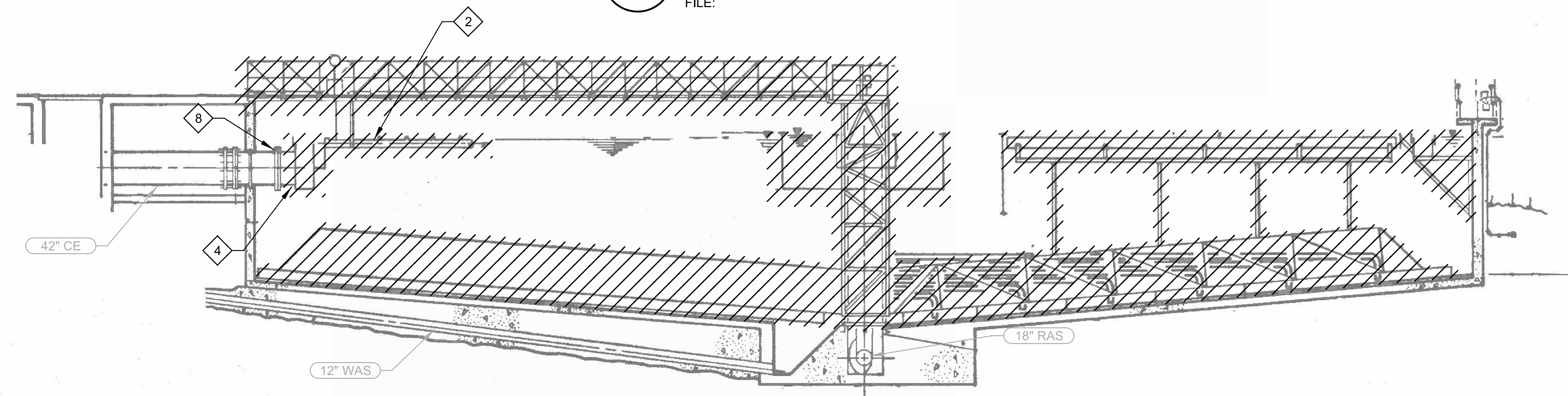


MANATEE COUNTY
 SWWRF CLARIFIER 3&4 REHABILITATION
 GENERAL
 PIPE SCHEDULE AND SYMBOLS

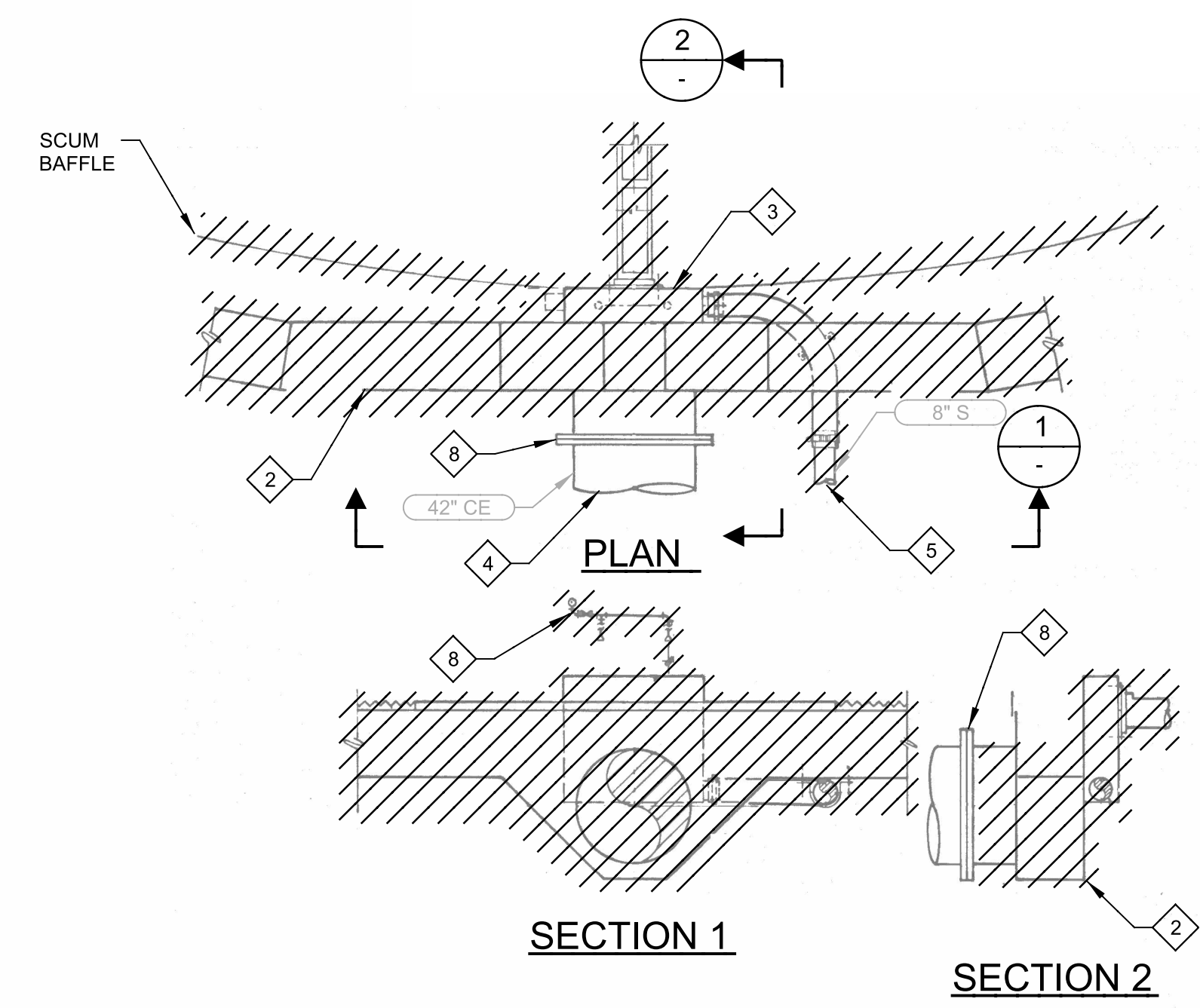
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 JOB NO. 7880J10
 DRAWING NO. G-03



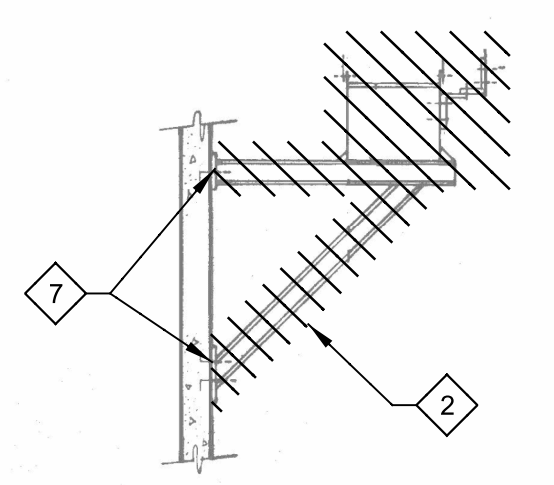
A CLARIFIER 3&4 DEMOLITION PLAN
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A SECTION
 SCALE: N.T.S.
 FILE:



A DETAILS
 SCALE: N.T.S.
 FILE:



TROUGH SECTION

- GENERAL NOTES:**
1. DEMOLITION INSIDE CLARIFIER IS TYPICAL FOR CLARIFIER NO.'S 3 & 4. POSITION OF PIPES ARE FOR CLARIFIER NO.3. POSITION OF PIPES FOR CLARIFIER NO.4 ARE ON THE OPPOSITE SIDE.
 2. DO NOT DAMAGE OR REMOVE EXISTING DRIVE UNIT, MOTOR AND CENTER COLUMN ANCHOR BOLTS.
 3. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF ANY DISCREPANCIES.
 4. CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF DEMOLISHED MATERIAL.
 5. CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING EQUIPMENT. ALL EXISTING EQUIPMENT DAMAGED BY CONTRACTOR SHALL BE EXPEDITIOUSLY REPAIRED OR REPLACED AT EXPENSE OF CONTRACTOR WITHOUT ADDITIONAL COMPENSATION.

- KEY NOTES:**
- 1 REMOVE RAKE ARMS, INFLUENT COLUMN, INFLUENT FEEDWELL, DRIVE PLATFORM AND WALKWAY, HANDRAIL, CONTROLS, LIGHTING, ELECTRICAL WIRING AND CONDUIT AND PLANT WATER PIPING TO THE LIMITS SHOWN.
 - 2 REMOVE INBOARD SCUM BAFFLE, EFFLUENT LAUNDERS AND SUPPORTS.
 - 3 REMOVE SCUM SKIMMING ARMS AND SCUM BOX.
 - 4 REMOVE EXISTING 42" CLARIFIER EFFLUENT LINE AS REQUIRED TO CONNECTION TO EFFLUENT DROP BOX.
 - 5 REMOVE EXISTING FLEXIBLE HOSE AND 8" SCUM LINE AS REQUIRED FOR CONNECTION TO NEW SCUM DROP BOX.
 - 6 REMOVE EXISTING WATERLINE ON CLARIFIER WALKWAY, HOSE BIB, AND REPLACE PER DRAWING M-01.
 - 7 DO NOT DAMAGE OR REMOVE EXISTING ANCHOR BOLTS FOR TROUGH BRACKETS. (TYP. OF 18)
 - 8 COORDINATE WITH PLANT STAFF ON LOWERING WATER LEVEL IN CLARIFIERS. INSTALL INFLATABLE PLUG IN 42" EFFLUENT PIPE TO PREVENT BACKFLOW. MAINTAIN PLUG UNTIL NEW MECHANISM IS INSTALLED AND READY FOR TESTING.

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DESIGNED	MV
DRAWN	DVP
CHECKED	EP
DATE	MARCH 2013



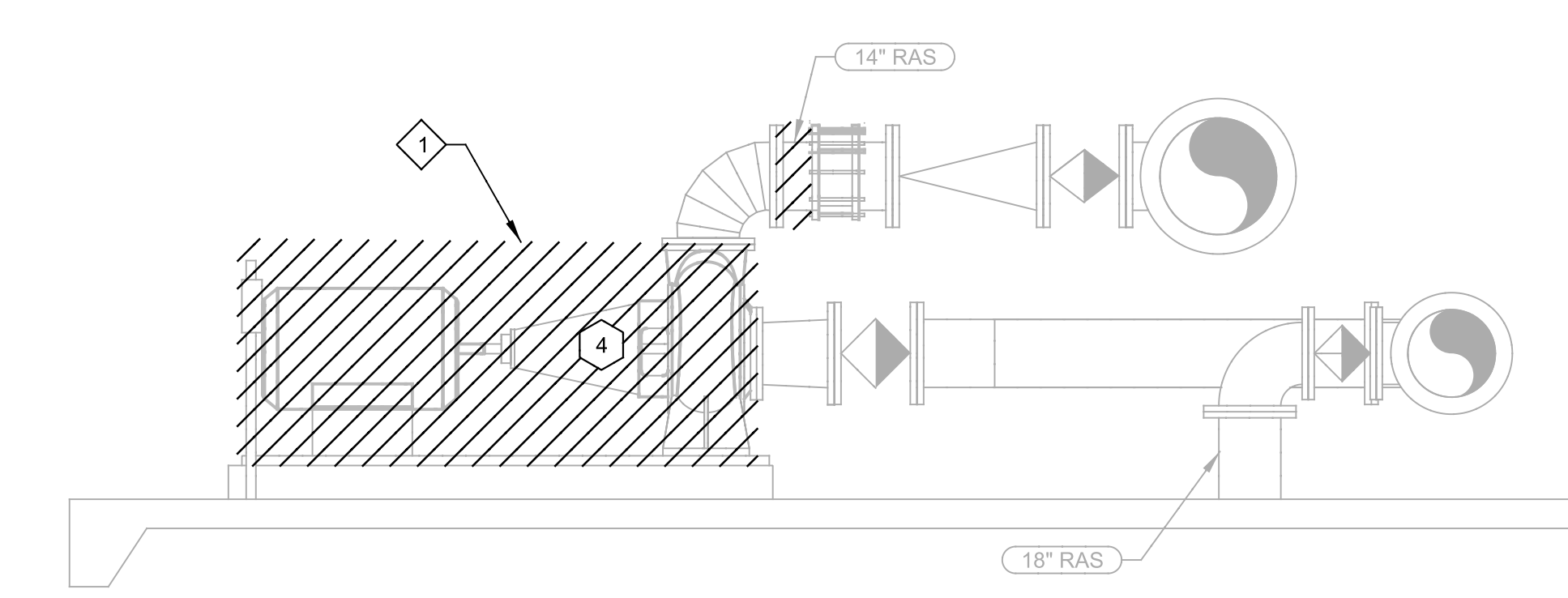
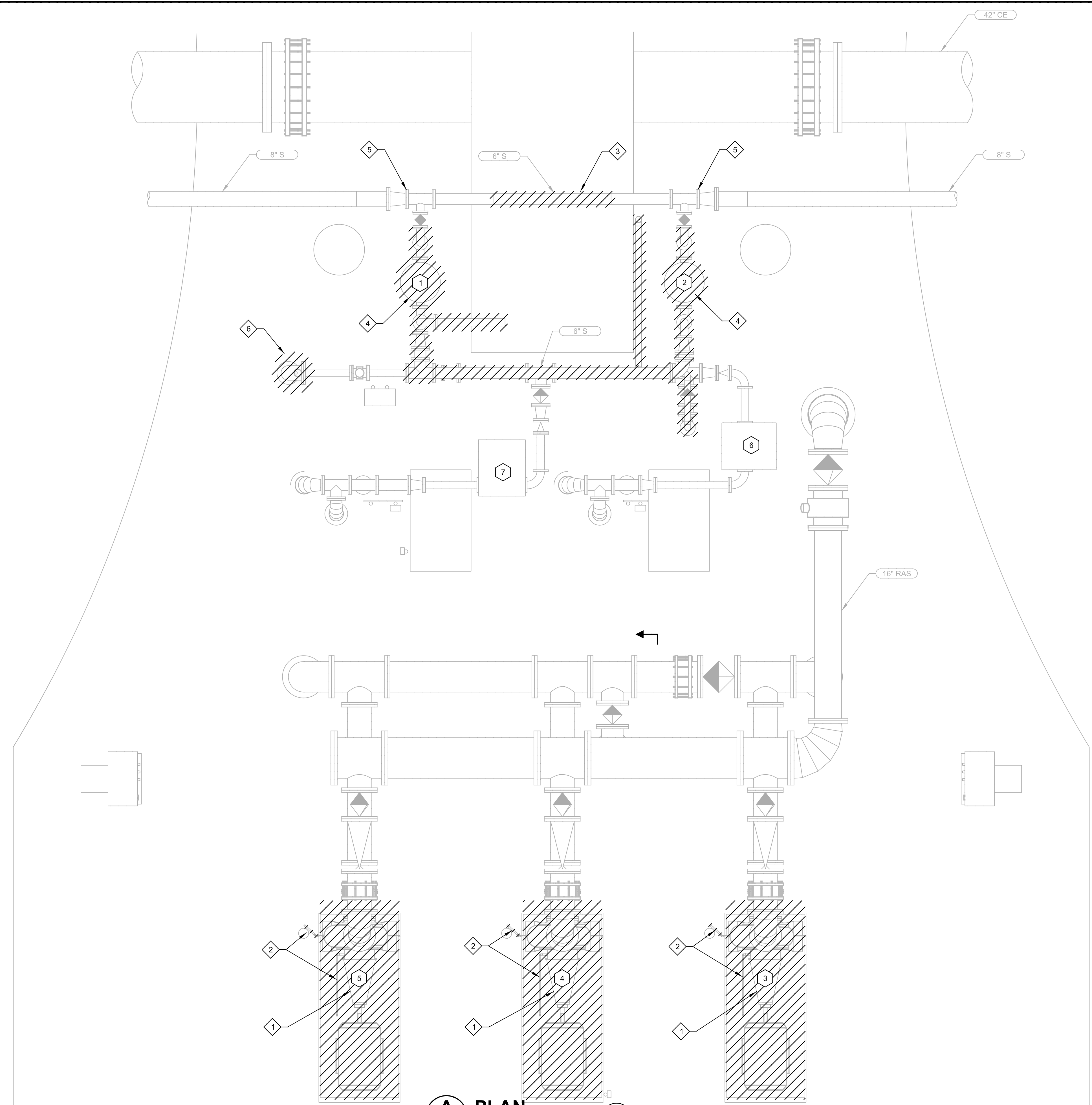
MANATEE COUNTY
SWWRF CLARIFIER 3&4 REHABILITATION
DEMOLITION
DEMO PLAN AND SECTIONS

VERIFY SCALES	JOB NO. 7880J10
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IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	

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LAST SAVED BY: djerry



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

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

- GENERAL NOTES:**
1. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF ANY DISCREPANCIES.
 2. CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF DEMOLISHED MATERIAL.
 3. CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING EQUIPMENT. ALL EXISTING EQUIPMENT DAMAGED BY CONTRACTOR SHALL BE EXPEDITIOUSLY REPAIRED OR REPLACED AT EXPENSE OF CONTRACTOR WITHOUT ADDITIONAL COMPENSATION.

- KEY NOTES:**
- ◇ 1 EXISTING RAS PUMP, AND PIPING TO BE REMOVED.
 - ◇ 2 EXISTING WATER SEAL PIPING TO BE REMOVED.
 - ◇ 3 EXISTING 6" SCUM LINE TO BE REMOVED.
 - ◇ 4 EXISTING SCUM EJECTORS AND PIPING TO BE REMOVED.
 - ◇ 5 EXISTING REDUCER, TEE AND VALVE TO BE REUSED.
 - ◇ 6 ONLY 8" 90° BEND TO BE REMOVED. RELOCATE AIR RELEASE VALVE.

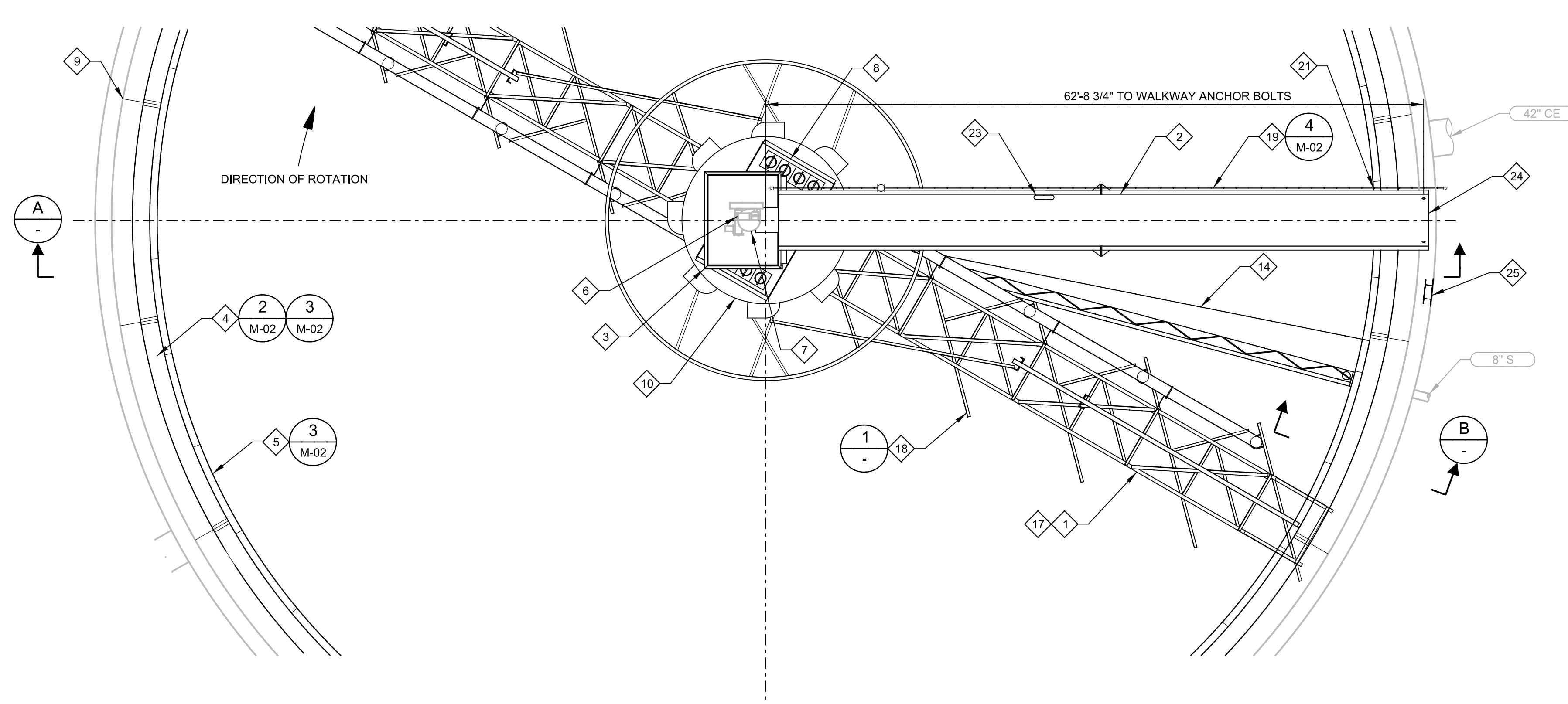
- KEY TAGS:**
- ① SCUM EJECTOR NO.3
 - ② SCUM EJECTOR NO.4
 - ③ RAS PUMP NO.4 RAS-1040
 - ④ RAS PUMP NO.5 RAS-1050
 - ⑤ RAS PUMP NO.6 RAS-1060
 - ⑥ WAS PUMP NO.3
 - ⑦ WAS PUMP NO.4

REV	DATE	BY	DESCRIPTION

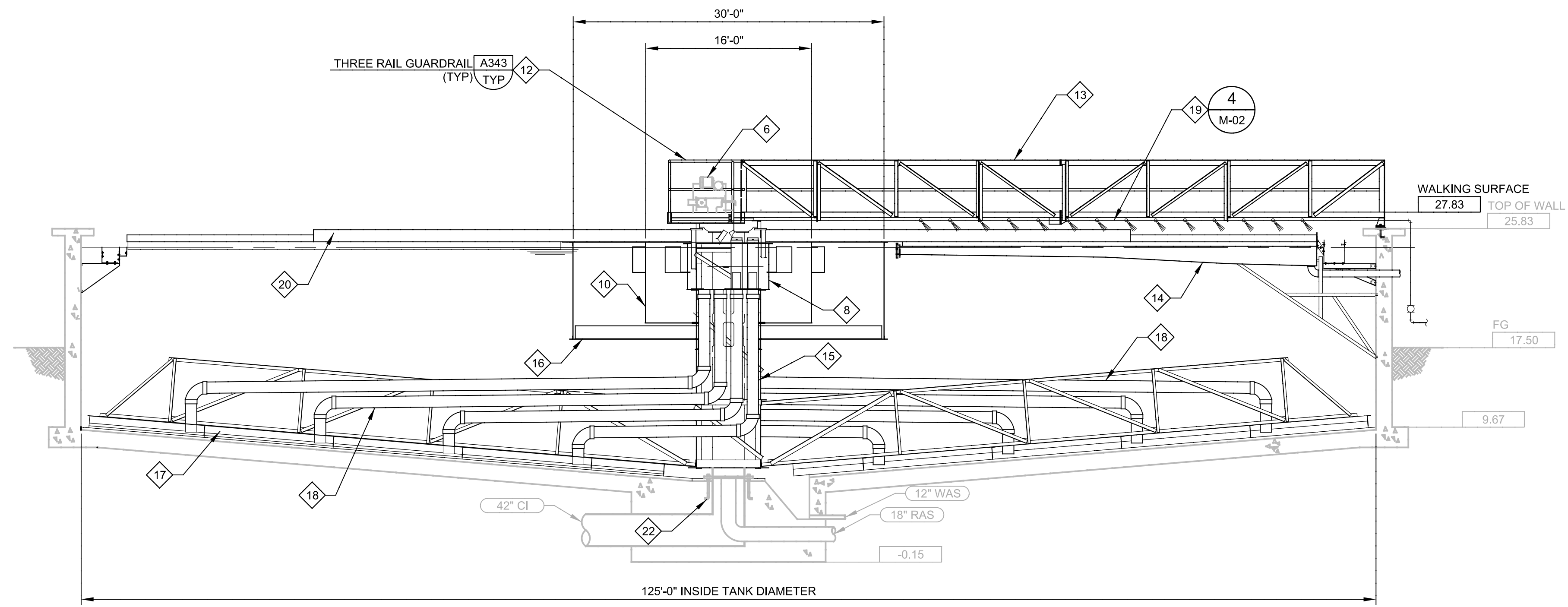
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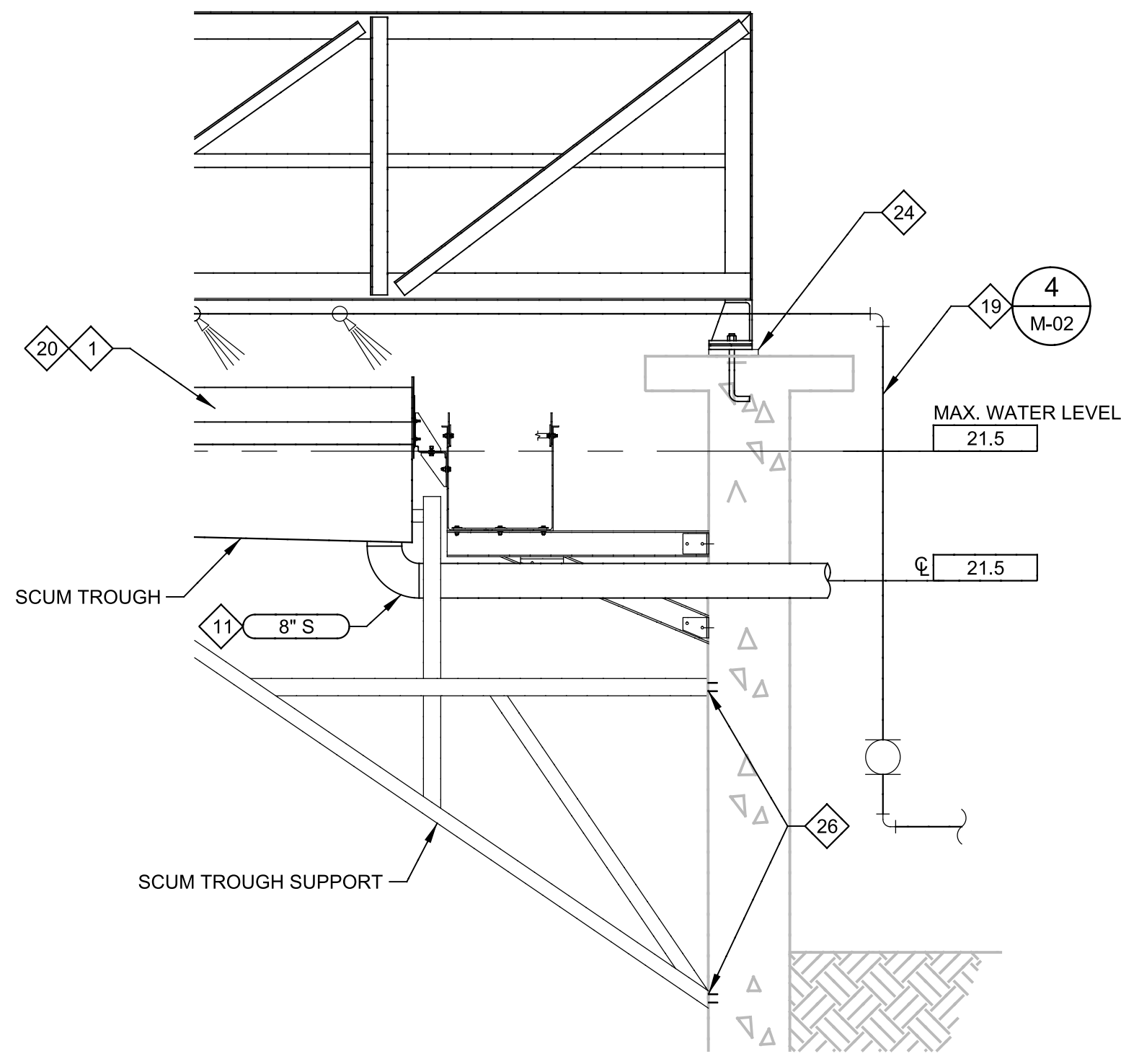
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SWWRF CLARIFIER 3&4 REHABILITATION		BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO.
DEMOLITION		0 1"	D-02
SCUM EJECTORS AND RAS PUMP DEMOLITION PLAN		IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	



A PLAN
SCALE: 1/8" = 1'-0"
FILE:



A SECTION
SCALE: NOT TO SCALE
FILE:



B SECTION
SCALE: 1/8" = 1'-0"
FILE:

- GENERAL NOTES:**
- DRAWING SHOWN IS A PICTORIAL REPRESENTATION AND IS NOT TO SCALE.
 - DO NOT DAMAGE OR REMOVE EXISTING DRIVE UNIT AND CENTER COLUMN ANCHOR BOLTS.
 - CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF ANY DISCREPANCIES.
 - CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING EQUIPMENT. ALL EXISTING EQUIPMENT DAMAGED BY CONTRACTOR SHALL BE EXPEDITIOUSLY REPAIRED OR REPLACED AT EXPENSE OF CONTRACTOR WITHOUT ADDITIONAL COMPENSATION.
 - CONTRACTOR SHALL CONNECT EXISTING PLANT WATER PIPING TO SPRAY SYSTEM FOR CLARIFIER.
 - CONTRACTOR SHALL COORDINATE WITH TANK MANUFACTURER BEFORE MAKING NEW PENETRATIONS TO TANK FOR ANCHOR BOLTS.

- KEY NOTES:**
- ALL EQUIPMENT TO BE PROVIDED BY CLARIFIER MANUFACTURER UNLESS OTHERWISE NOTES. SEE SPECIFICATION 11353 FOR MATERIALS AND DIMENSIONS.
 - 3' WALKWAY
 - DRIVE PLATFORM WITH 24" MINIMUM CLEARANCE AROUND DRIVE.
 - EFFLUENT LAUNDERS
 - SCUM BAFFLE PLATE
 - DRIVE MOTOR
 - CENTER DRIVE MECHANISM
 - SLUDGE COLLECTION BOX WITH ADJUSTABLE VALVES.
 - EXISTING ANCHOR BOLTS FOR TROUGH BRACKETS (TYPICAL OF 18)
 - FEEDWELL WITH (4) BAFFLED SCUM PORTS
 - PROVIDE ADDITIONAL FITTINGS AND PIPING AS REQUIRED TO ALIGN TO EXISTING 8" SCUM PIPING. CONNECT NEW PIPING TO EXISTING WITH COUPLING DRESSER STYLE 38/138 OR EQUAL.
 - PLATFORM HANDRAIL WITH TOEBOARD
 - WALKWAY TRUSS MEMBERS SERVE AS HANDRAIL
 - FULL RADIUS SCUM TROUGH
 - INFLUENT COLUMN
 - FEEDWELL SUPPORTS
 - RAKEARM
 - (5) 8" PVC SLUDGE DRAW-OFF PIPES ON EACH RAKE ARM
 - SPRAY SYSTEM 13" NOZZLES WITH 3/4" DIAMETER PIPING
 - SKIMMER ARM WITH NEOPRENE WIPER
 - LIMIT SWITCH FOR SCUM THROUGH SPRAY SYSTEM & SCUM PUMP
 - CENTER COLUMN ANCHOR BOLTS.
 - LIFE RING, ROPE AND CABINET AS MANUFACTURED BY CHEYENNE MANUFACTURING, INC. MOUNT TO HANDRAIL
 - NEW CLARIFIER BRIDGE SHALL MATCH ELEVATION OF CURRENT BRIDGE. IF NECESSARY, ADD CONCRETE OF OTHER MATERIAL TO STRUCTURALLY SUPPORT THE NEW CLARIFIER BRIDGE. MANUFACTURER SHALL PROVIDE NECESSARY DETAILS FOR SUPPORTING CLARIFIER BRIDGE FROM TANK WALL. CONTRACTOR MUST COORDINATE ANY SUPPORT ON TANK WALL WITH EXISTING STAIRS AND LANDING WHICH LEADS TO THE CLARIFIER BRIDGE.
 - COORDINATE HOSE BIB AND RACK LOCATION WITH EXISTING PLANT SERVICE WATER PIPING.
 - 6,440LBS EACH SUPPORT LEG. (8) 3/4" ANCHORS. REINFORCE EXISTING TANK WALL AS REQUIRED.

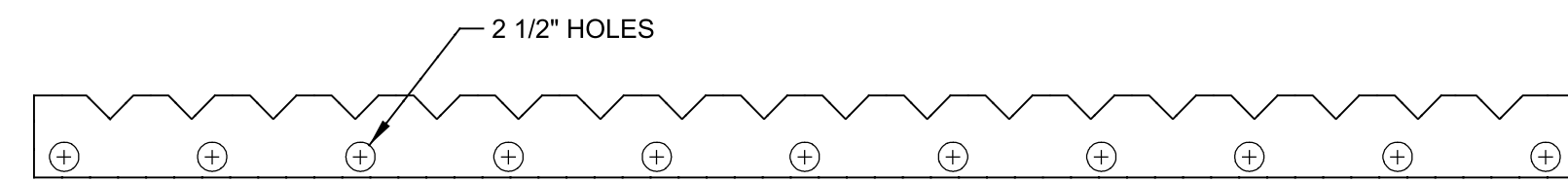
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DATE MARCH 2013	

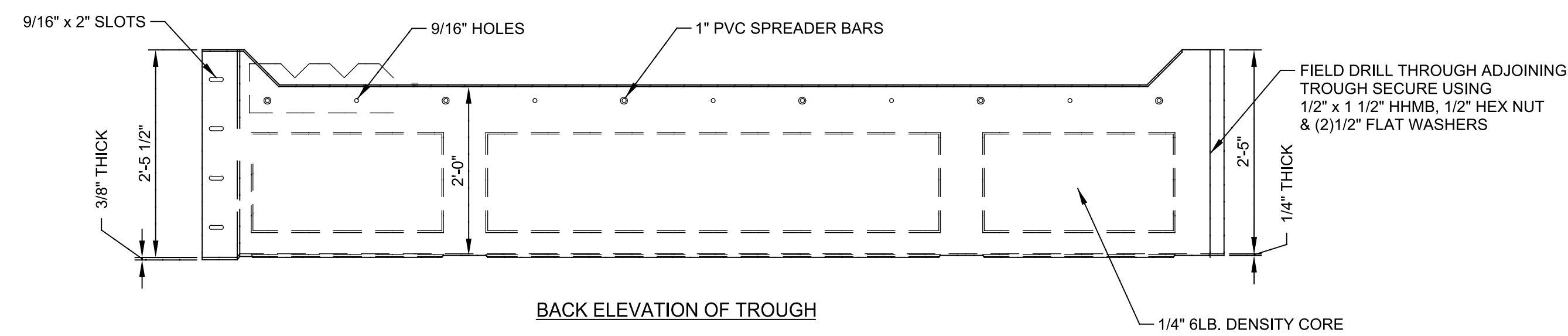


MANATEE COUNTY
SWWRF CLARIFIER 3&4 REHABILITATION
MECHANICAL
CLARIFIER PLAN & SECTIONS

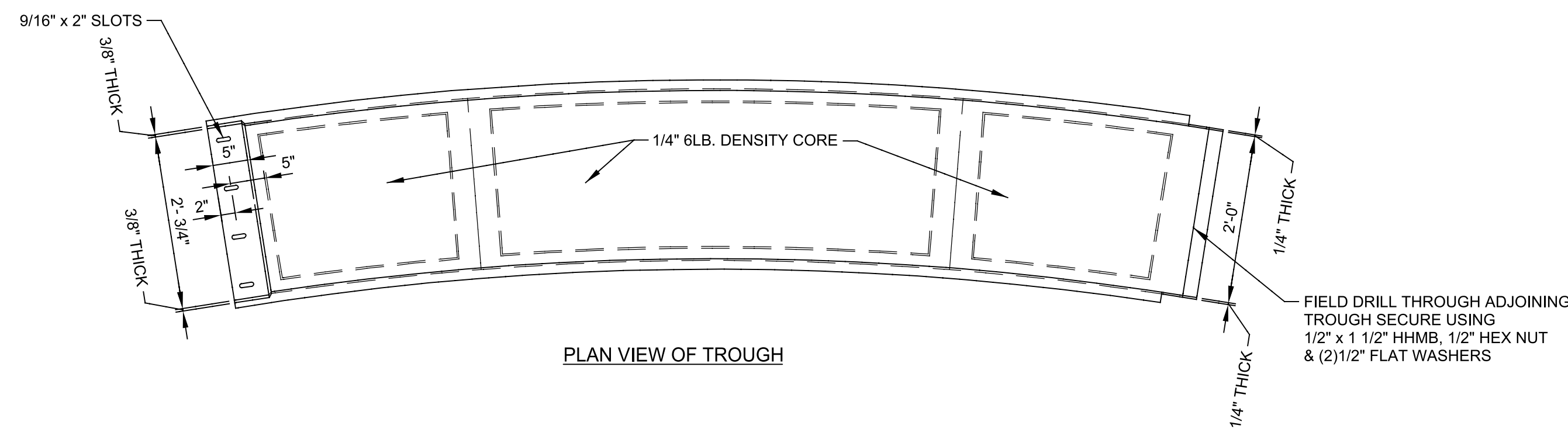
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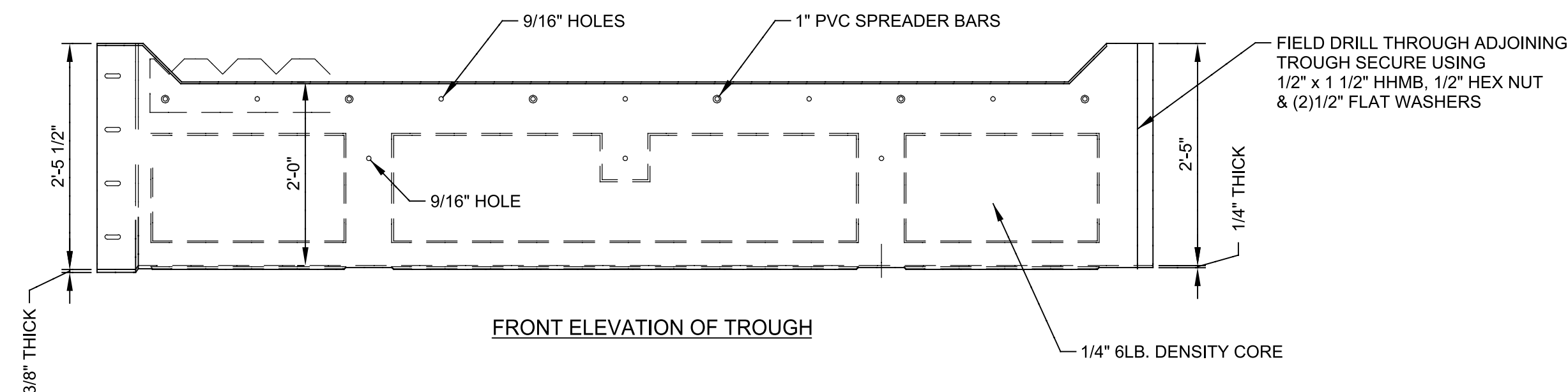
WEIR PLATE BACK OF TROUGH



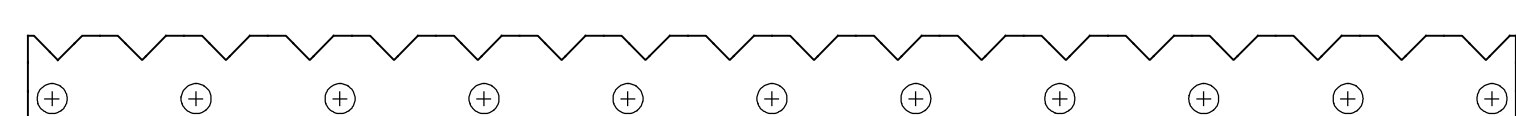
BACK ELEVATION OF TROUGH



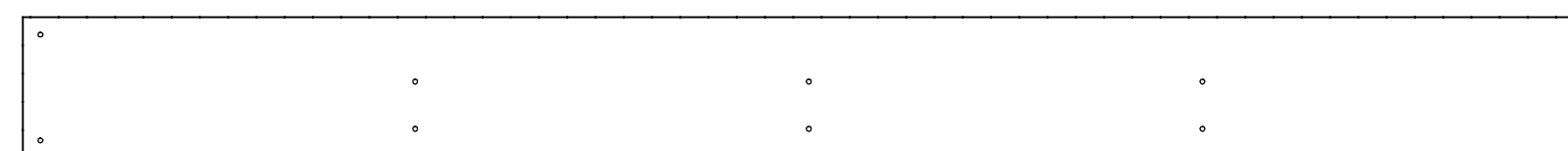
PLAN VIEW OF TROUGH



FRONT ELEVATION OF TROUGH



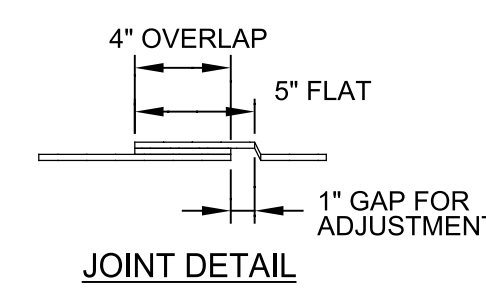
WEIR PLATE FRONT OF TROUGH



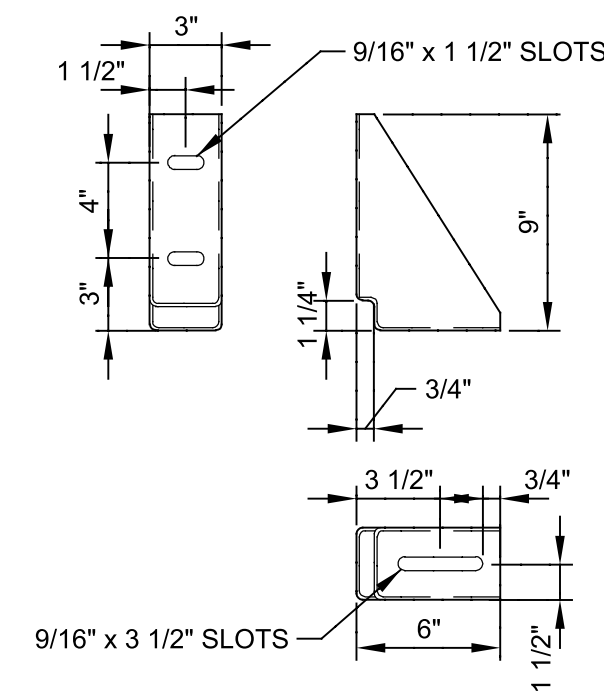
SCUM BAFFLE PLATE

3 EFFLUENT LAUNDERS, WEIR & SCUM BAFFLE DETAIL

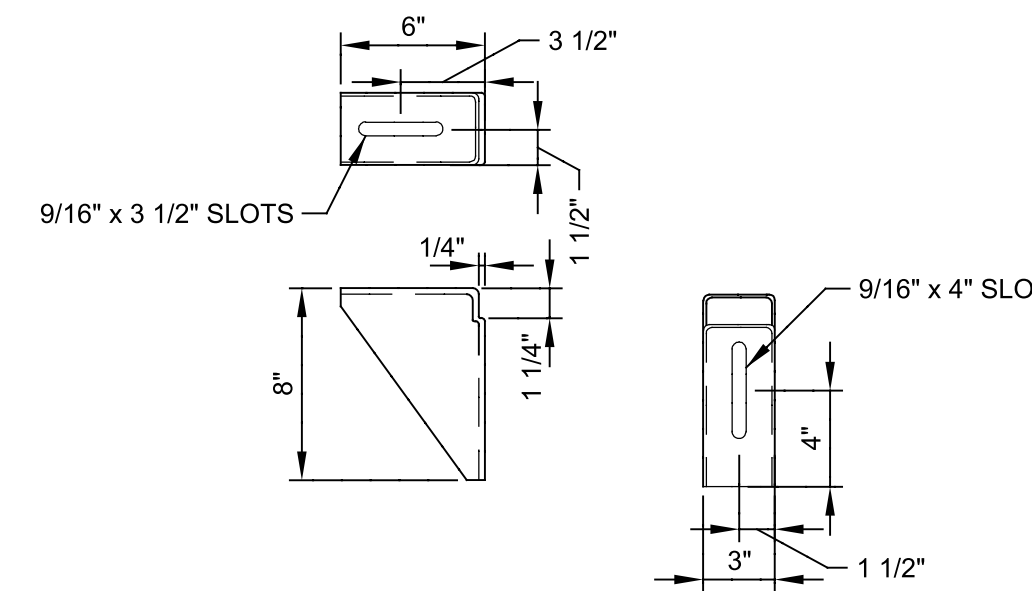
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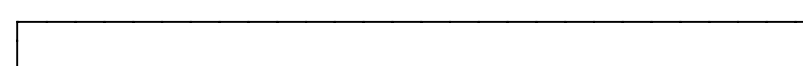
JOINT DETAIL



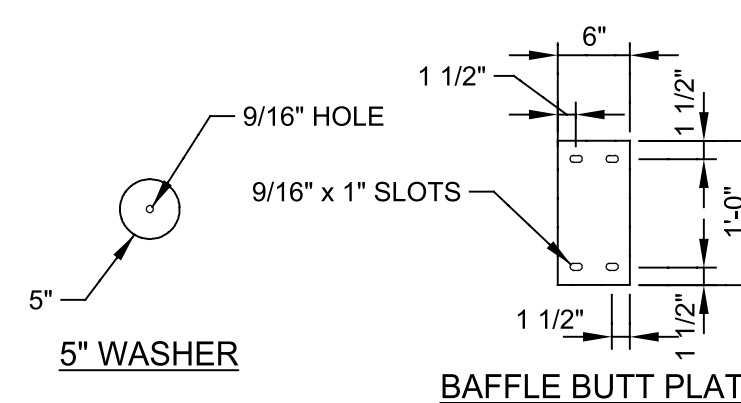
UPPER BAFFLE SUPPORT BRACKET



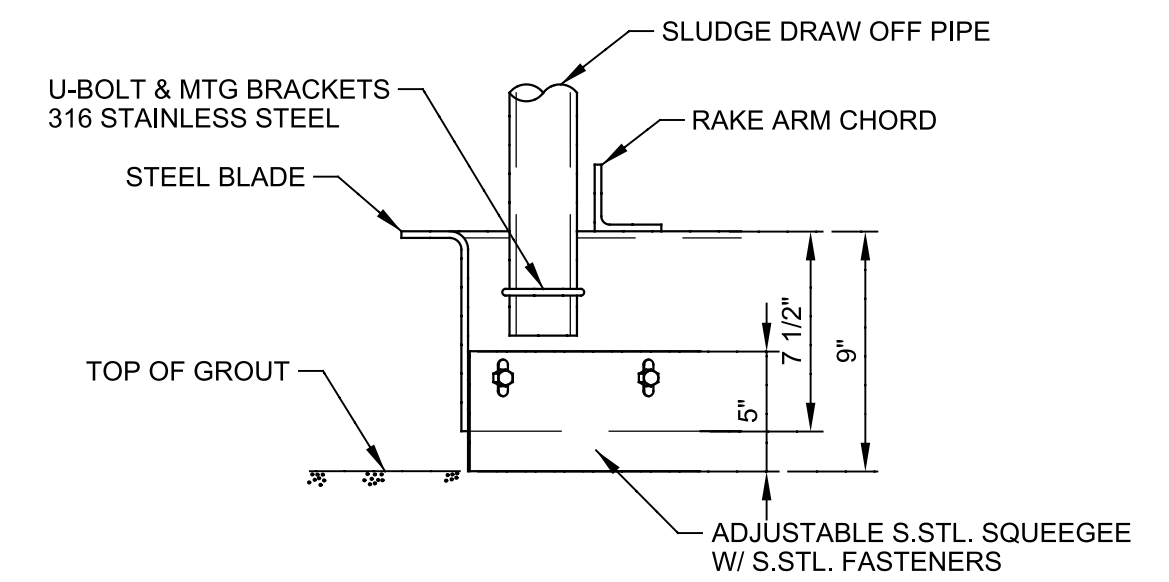
LOWER BAFFLE SUPPORT BRACKET



JOINT GASKET DETAIL 1/4" THICK

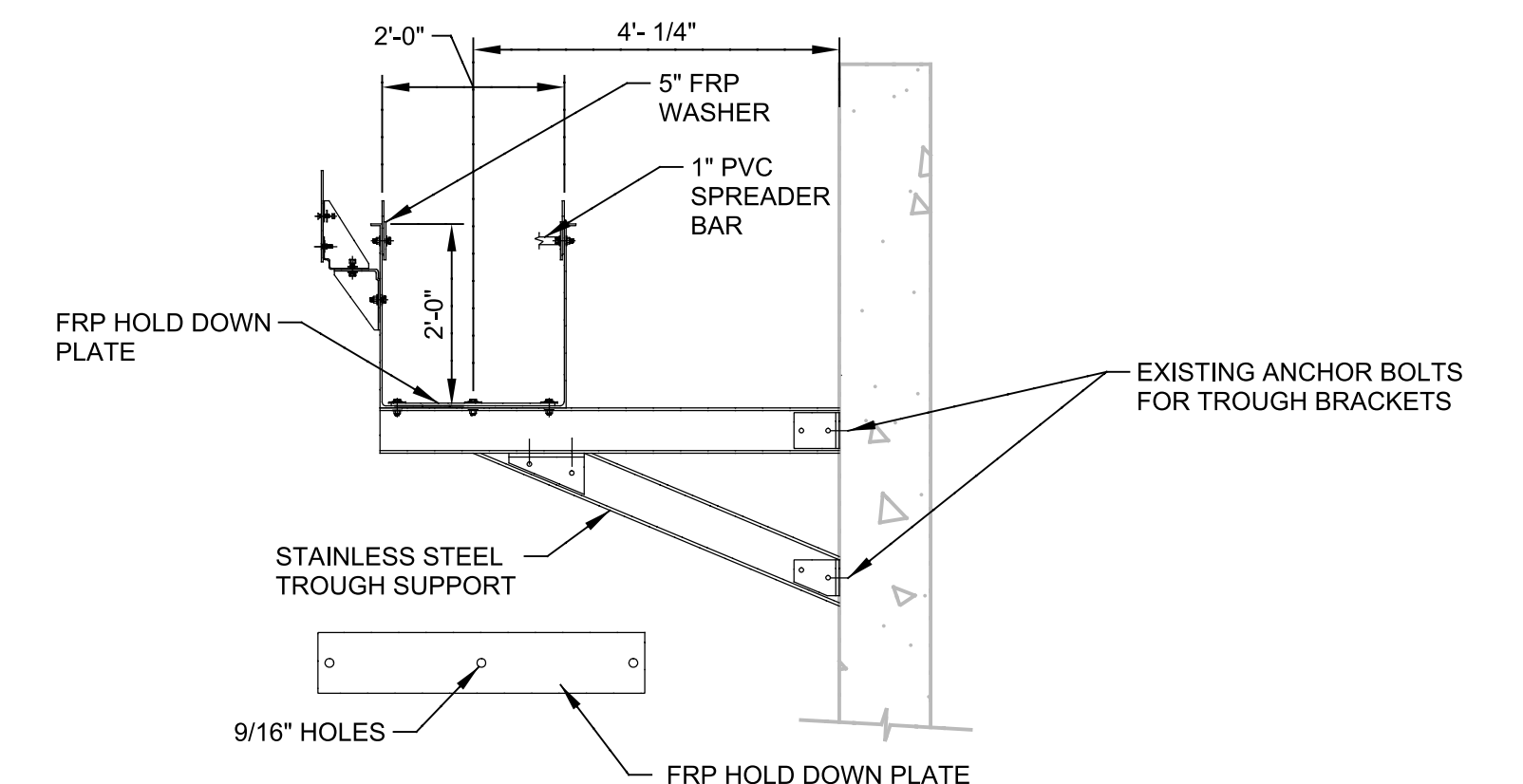


BAFFLE BUTT PLATE



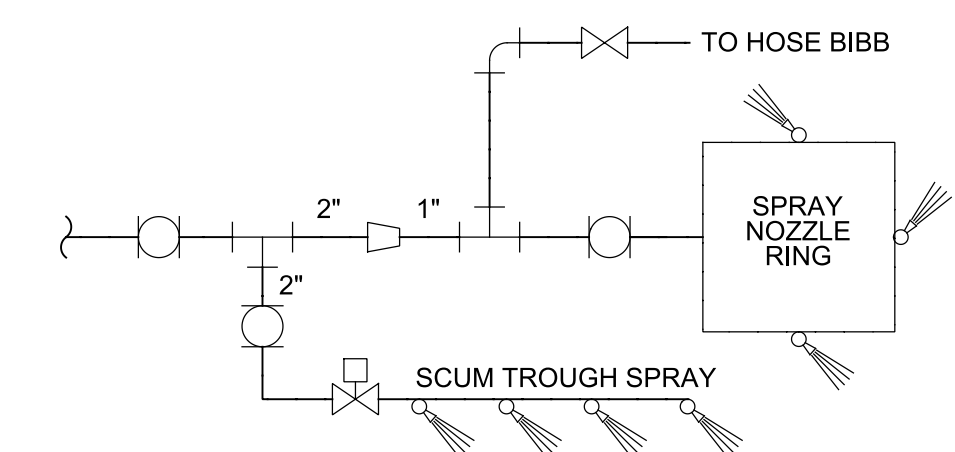
1 RAKE BLADE DETAIL

M-01 SCALE: 1 1/2" = 1'-0" FILE:



2 CROSS SECTION

M-01 SCALE: 1/2" = 1'-0" FILE:



4 CLARIFIER PLANT WATER SCHEMATIC

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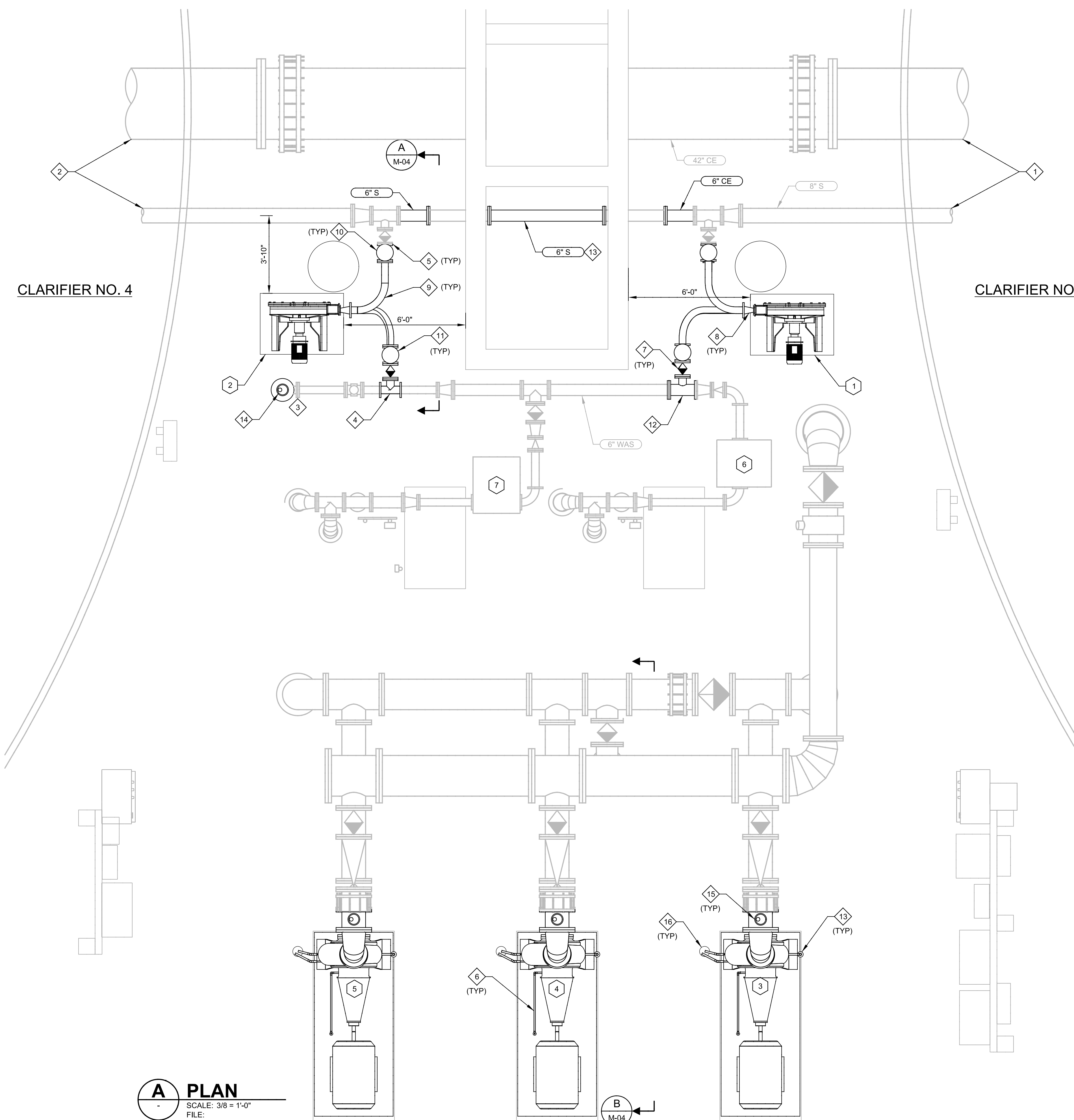
REV	DATE	BY	DESCRIPTION

DESIGNED MV	
DRAWN DVP	
CHECKED EP	
DATE MARCH 2013	

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MANATEE COUNTY	
SWWRF CLARIFIER 3&4 REHABILITATION	
MECHANICAL	
CLARIFIER DETAILS	

VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	JOB NO. 7880J10 DRAWING NO. M-02
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CLARIFIER NO. 4

CLARIFIER NO. 3

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

B
 M-04

- GENERAL NOTES:**
- ALL PIPE ROUTING SHALL BE REVIEWED BY OWNER AND ENGINEER IN THE FIELD PRIOR TO INSTALLATION.
 - CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF ANY DISCREPANCIES.
 - CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING EQUIPMENT. ALL EXISTING EQUIPMENT DAMAGED BY CONTRACTOR SHALL BE EXPEDITIOUSLY REPAIRED OR REPLACED AT EXPENSE OF CONTRACTOR WITHOUT ADDITIONAL COMPENSATION.

- KEY NOTES:**
- FROM CLARIFIER NO.3
 - FROM CLARIFIER NO.4
 - TO DISSOLVED AIR FLOTATION UNIT
 - CONNECT TO EXISTING 4" WAS LINE WITH 4"x 4" TEE
 - CONNECT TO EXISTING 6" S LINE. RELOCATED 6" x 4" TEE, 8" x 6" REDUCER AND VALVE
 - NEW 1/2" SCH 80 PVC SEAL WATER SYSTEM TO RAS PUMPS WITH BALL VALVE FOR ISOLATION.
 - 4" PLUG VALVE
 - PROVIDE A 2 1/2" x 4" REDUCING FLANGE ADAPTER AT SUCTION AND DISCHARGE PORTS
 - 4" FLEXIBLE HOSE MANUFACTURED BY PERAFLEX OR EQUAL
 - 4" x 4" x 2" REDUCING TEE FOR INLET PULSATION ACCUMULATOR. SEE SECTION 11301
 - 4" x 4" x 2" REDUCING TEE FOR DISCHARGE PULSATION DAMPENER. SEE SECTION 11301
 - CONNECT TO EXISTING 6" WAS LINE WITH 6" x 4" TEE.
 - SEAL DRAIN PIPE WITH BALL VALVE. SIZE TO MATCH PUMP.
 - RELOCATE EXISTING AIR RELEASE VALVE.
 - 2" AIR RELEASE VALVE.
 - STUFFING PUMP DRAIN SIZE TO MATCH PUMP.

- KEY TAGS:**
- | | | |
|---|----------------|----------|
| 1 | SCUM PUMP NO.1 | SP-1070 |
| 2 | SCUM PUMP NO.2 | SP-1080 |
| 3 | RAS PUMP NO.4 | RAS-1040 |
| 4 | RAS PUMP NO.5 | RAS-1050 |
| 5 | RAS PUMP NO.6 | RAS-1060 |
| 6 | WAS PUMP NO.3 | |
| 7 | WAS PUMP NO.4 | |

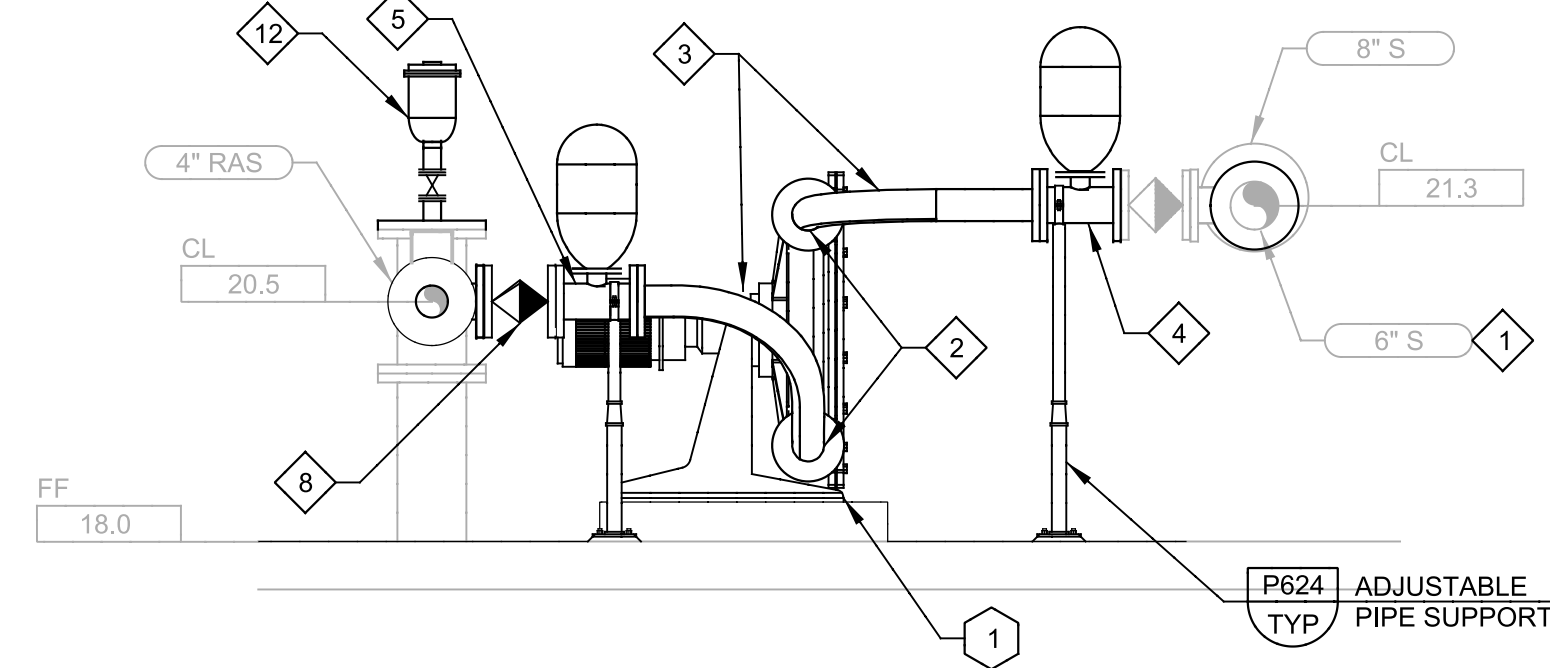


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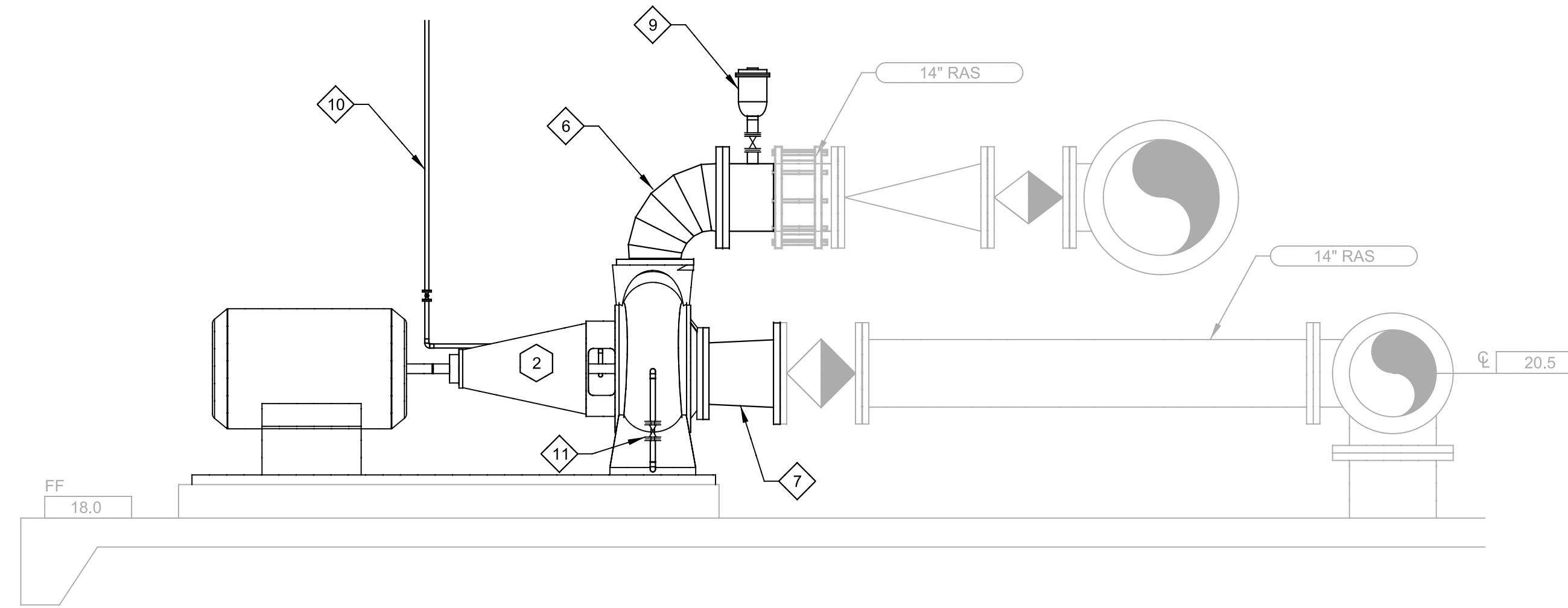
DESIGNED	MV
DRAWN	DVP
CHECKED	EP
DATE	MARCH 2013

MANATEE COUNTY
SWWRF CLARIFIER 3&4 REHABILITATION
MECHANICAL
SCUM AND RAS PUMPS
PLAN

VERIFY SCALES	JOB NO. 7880J10
BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO. M-03
0 1"	
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	



A SECTION
M-03 SCALE: 1/2" = 1'-0"
FILE:



B SECTION
M-03 SCALE: 1/2" = 1'-0"
FILE:

GENERAL NOTES:

1. ALL PIPE ROUTING SHALL BE REVIEWED BY OWNER AND ENGINEER IN THE FIELD PRIOR TO INSTALLATION.
2. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF ANY DISCREPANCIES.
3. CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING EQUIPMENT. ALL EXISTING EQUIPMENT DAMAGED BY CONTRACTOR SHALL BE EXPEDITIOUSLY REPAIRED OR REPLACED AT EXPENSE OF CONTRACTOR WITHOUT ADDITIONAL COMPENSATION.

KEY NOTES:

- 1 FROM CLARIFIER NO.4
- 2 PROVIDE A 2 1/2" x 4" REDUCING FLANGE ADAPTER AT SUCTION AND DISCHARGE PORTS.
- 3 4" FLEXIBLE HOSE MANUFACTURED BY PERAFLEX OR EQUAL.
- 4 4" x 4" x 2" REDUCING TEE FOR INLET PULSATION ACCUMULATOR. SEE SECTION 11301.
- 5 4" x 4" x 2" REDUCING TEE FOR DISCHARGE PULSATION DAMPENER. SEE SECTION 11301.
- 6 REUSE EXISTING 14" x 10" 90° REDUCING ELBOW TO CONNECT TO EXISTING 14" RAS DISCHARGE LINE.
- 7 REUSE EXISTING 14" x 10" REDUCER TO CONNECT TO EXISTING 14" RAS SUCTION LINE.
- 8 4" PLUG VALVE
- 9 2" AIR RELEASE VALVE
- 10 NEW 1/2" SCH 80 PVC SEAL WATER CONNECTION TO RAS PUMPS WITH BALL VALVE FOR ISOLATION.
- 11 SEAL DRAIN PIPE WITH BALL VALVE. SIZE TO MATCH PUMP.
- 12 RELOCATE EXISTING AIR RELEASE VALVE.

KEY TAGS:

- | | | |
|---|----------------|----------|
| 1 | SCUM PUMP NO.2 | SP-1080 |
| 2 | RAS PUMP NO.5 | RAS-1050 |

REV	DATE	BY	DESCRIPTION

DESIGNED	MV
DRAWN	DVP
CHECKED	EP
DATE	MARCH 2013



--

MANATEE COUNTY
SWWRF CLARIFIER 3&4 REHABILITATION
 MECHANICAL
SCUM AND RAS PUMPS SECTIONS

VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	JOB NO. 7880J10 DRAWING NO. M-04
---	---

GENERAL NOTES AND SPECIFICATIONS:

- THE SCOPE OF WORK IS DESCRIBED IN SPECIFICATION SECTION 16010 AND AS SHOWN ON DRAWINGS.
- THE CONTRACTOR SHALL PROVIDE ALL MATERIALS AND LABOR TO INSTALL THE ELECTRICAL SYSTEMS AS INDICATED ON THE DRAWINGS. ITEMS NOT SHOWN BUT OBVIOUSLY NECESSARY FOR COMPLETION OF THE WORK SHALL BE INCLUDED.
- THE INSTALLATION SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NFPA 70), ELECTRICAL SAFETY IN THE WORKPLACE (NFPA 70E), ALL MANATEE COUNTY CODES AND FLORIDA BUILDING CODE WITH ALL AMENDMENT.
- THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS, INSPECTIONS AND APPROVALS AND TO INCLUDE ALL FEES AS PART OF HIS BID IF NOT OTHERWISE NOTED.
- THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE ENGINEER AND OWNER.
- THE CONTRACTOR SHALL, BEFORE SUBMITTING HIS BID, VISIT THE SITE OF THE PROJECT AND BECOME FAMILIAR WITH THE EXISTING CONDITIONS. NO ALLOWANCE WILL BE MADE FOR EXISTING CONDITIONS OR FAILURE OF THE CONTRACTOR TO OBSERVE THEM.
- ALL EQUIPMENT AND MATERIAL SHALL BE NEW AND U.L. LISTED WHERE APPLICABLE.
- THE CONTRACTOR IS RESPONSIBLE TO TEST ALL SYSTEMS INSTALLED OR MODIFIED UNDER THIS PROJECT AND REPAIR OR REPLACE ALL DEFECTIVE WORK TO THE SATISFACTION OF THE ENGINEER AND OWNER.
- ALL EQUIPMENT FURNISHED AND INSTALLED BY THE CONTRACTOR SHALL BE GUARANTEED AGAINST DEFECTS IN MATERIAL AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM DATE OF ACCEPTANCE.
- ALL CONDUCTORS SHALL BE COPPER. NO ALUMINUM ALLOWED UNLESS SPECIFICALLY INDICATED ON DRAWINGS.
- SHOP DRAWINGS SHALL BE SUBMITTED FOR ALL ELECTRICAL & CONTROL EQUIPMENT AND MATERIAL.
- ALL CONTROL PANELS SHALL BE CONSTRUCTED BY A UL 508A APPROVED PANEL VENDOR AND SHALL BEAR A UL 508A LABEL ON THE PANEL.
- THE DRAWINGS ARE NOT INTENDED TO SHOW THE EXACT LOCATION OF CONDUIT RUNS. THESE ARE TO BE COORDINATED WITH THE OTHER TRADES SO THAT CONFLICTS ARE AVOIDED PRIOR TO INSTALLATIONS.
- ALL LOCATIONS OF EQUIPMENT, PANELS ETC. ARE SHOWN FOR ILLUSTRATION PURPOSES. CONTRACTOR SHALL VERIFY AND COORDINATE EXACT LOCATION AND SIZE WITH ALL SUBCONTRACTORS AND EQUIPMENT SUPPLIERS PRIOR TO ANY INSTALLATION AND THEN INSTALL AS SUCH WITH CORRESPONDING CONDUIT STUB-UPS.
- SEE OTHER DISCIPLINE DRAWINGS FOR COORDINATION OF ALL DRAWINGS. ANY CONFLICTS SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION AND MOVEMENT OF CONDUITS OR OTHER ELECTRICAL EQUIPMENT SHALL BE ACCOMPLISHED WITHOUT ANY ADDITIONAL COST FOR THE OWNER.
- LOCATIONS OF MANHOLES, HANDHOLES AND PULL BOXES ARE APPROXIMATE. CONTRACTOR SHALL COORDINATE EXACT LOCATION WITH EXISTING AND NEW PIPING OR CONDUIT AND ADJUST ACCORDINGLY.
- NOT ALL CONDUITS SHOWN ON RISER AND ONE-LINE DIAGRAMS ARE SHOWN ON BUILDING LAYOUTS. CONTRACTOR SHALL SUPPLY ALL CONDUITS AND CABLES AS SHOWN ON RISER AND ONE-LINE DIAGRAMS.
- ALL CIRCUITS SHALL BE IDENTIFIED IN JUNCTION BOXES, PULL BOXES, CONTROL PANELS, PANELBOARDS, LIGHTING POLES, CONTROLLERS AND SERVICE POINTS. IDENTIFICATION SHALL MATCH PANELBOARD SCHEDULES.
- EXPOSED RUNS OF CONDUITS SHALL BE INSTALLED WITH RUNS PARALLEL OR PERPENDICULAR TO WALLS, STRUCTURAL MEMBERS OR INTERSECTIONS OF VERTICAL PLANES AND CEILINGS, WITH RIGHT ANGLE TURNS CONSISTING OF SYMMETRICAL BENDS OR PULL BOXES AS INDICATED ON THE DRAWINGS. BENDS AND OFFSETS SHALL BE AVOIDED WHERE POSSIBLE.
- INSTRUMENTATION IS LOW VOLTAGE SIGNALS SUCH AS 4-20MA, TELEPHONE COMMUNICATION, FIRE ALARM COMMUNICATION. POWER CONDUIT SHALL ONLY CROSS INSTRUMENTATION CONDUIT PERPENDICULARLY AT RIGHT ANGLES WITH 6" SEPARATION.
- CONDUCTOR PULLING TENSIONS SHALL NOT EXCEED MANUFACTURER'S RECOMMENDATION. CONTRACTOR SHALL INSTALL PULL BOXES TO MEET MANUFACTURER'S REQUIREMENTS.
- MINIMUM DISTANCE ALLOWED BETWEEN POWER CONDUITS AND INSTRUMENTATION CONDUITS SHALL BE:

VOLTAGE	DISTANCE
480V TO INST. CONDUIT	2 FT
120V TO INST. CONDUIT	1 FT
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONDUIT AND WIRING INSTALLATION FOR ALL VENDOR PROVIDED EQUIPMENT (PACKAGE SYSTEMS). IF THE SHOP DRAWINGS DIFFER FROM THE DESIGNED FACILITIES, THE CONTRACTOR SHALL REDESIGN THE FACILITIES AND SUBMIT THE REVISED DESIGN FOR THE ENGINEER'S APPROVAL ALONG WITH THE SHOP DRAWINGS. THERE SHALL BE NO ADDITIONAL COST TO THE OWNER FOR THE REDESIGN NOR FOR ANY ADDITIONAL CONDUITS AND WIRING. DURING SUBMITTAL THE CONTRACTOR SHALL VERIFY ALL SUPPLIED BREAKER SIZES FOR ALL PACKAGED SYSTEMS SUCH AS HVAC, EXHAUST FANS, MIXERS, CHEMICAL PUMPS ETC. AND MODIFY ALL BREAKERS IN MCC'S AND PANELBOARDS ACCORDINGLY WITHOUT ANY ADDITIONAL COST TO THE OWNER.
- ALL EXCAVATIONS FOR CONDUITS, HANDHOLES, MANHOLES AND PULLBOXES NEAR EXISTING PIPING, CONDUIT AND EQUIPMENT SHALL BE HAND EXCAVATED AND COORDINATED WITH THE OWNER.
- MINIMUM DEPTH FROM TOP OF DUCTBANKS OR CONDUITS TO FINISHED GRADE SHALL BE 24" UNLESS OTHERWISE NOTED.
- COLORLED WARNING TAPE 6" WIDE SHALL BE INSTALLED 8" BELOW FINISHED GRADE DIRECTLY ABOVE ALL UNDERGROUND YARD CONDUITS ACCORDING TO THE FOLLOWING SCHEDULE:
 POWER: RED
 ALL OTHER CONDUITS: GREEN
- CONTRACTOR SHALL RESTORE SIDEWALKS, ROADWAYS, SOD AND SPRINKLER SYSTEM PIPING TO MATCH EXISTING, AFTER THE COMPLETION OF THE CONDUIT AND PULLBOX INSTALLATION.
- GROUNDING SHALL BE INSTALLED IN ACCORDANCE WITH NEC, ARTICLE 250. THE GROUNDING SYSTEM TEST SHALL NOT EXCEED A 48 HOUR SPAN DRY RESISTANCE OF 10 OHMS. ADDITIONAL GROUNDING TO MEET THIS REQUIREMENT SHALL BE INSTALLED AT NO EXTRA COST. GROUNDING AND BONDING CONNECTIONS SHALL NOT BE PAINTED. ALL GROUNDING CONNECTIONS SHALL BE EXOTHERMIC UNLESS SPECIFICALLY INDICATED OTHERWISE.
- AN EQUIPMENT GROUND WIRE SIZED PER NEC SHALL BE PULLED IN ALL ELECTRICAL CONDUITS, POWER AND CONTROL, WHETHER OR NOT INDICATED ON THE PLANS.
- ALL ENCLOSURES, TJB, WIREWAY, PULL BOXES (EXCEPT IN-GROUND PULL BOXES AND MANHOLES) ETC. SHALL CONTAIN A GROUNDING BUS. CONNECT ALL RACEWAY BONDS TO THIS BUS VIA GROUNDING BUSHING AND EXTEND BONDING JUMPER FROM THIS BUS TO THE ENCLOSURE.
- PRIMARY BUILDING GROUNDING SHALL BE AN EMBEDDED GRID OF MINIMUM #4/0 AWG WIRE INSTALLED IN THE FOUNDATION AND AROUND THE BUILDING PERIMETER TO FORM A COMPLETE LOOP. SECONDARY GROUND CONNECTIONS TO ALL METAL EQUIPMENT, HAND RAILS, STRUCTURAL STEEL, CONCRETE PADS, REBAR ETC. SHALL HAVE A MINIMUM #4 STRANDED COPPER CONDUCTOR BONDED USING APPROVED LUGS OR EXOTHERMIC CONNECTIONS. ALL EQUIPMENT GROUNDING CONDUCTORS PENETRATING CONCRETE SLABS OR FINISHED GRADE SHALL HAVE A 72" CONDUCTOR PIGTAIL AT EACH LOCATION FOR CONNECTION TO EQUIPMENT.
- GROUND SURROUNDING YARD FENCE AND ALL YARD LIGHTING FIXTURES WITH MINIMUM #4 STRANDED COPPER CONDUCTORS BELOW GRADE TO SITE GROUNDING GRID PER NFPA 54/70.
- ALL CONCRETE ENCASED DUCTBANKS SHALL CARRY A MINIMUM #4/0 AWG BARE COPPER GROUND WIRE, OVER THE ENTIRE LENGTH, WHICH SHALL BE CONNECTED TO THE SITE GROUNDING GRID AND GROUND RODS LOCATED CONNECTING MANHOLES, HANDHOLES OR PULL BOXES.
- CONTRACTOR SHALL CORE DRILL EXISTING CONCRETE WALLS, FLOORS, MANHOLES, HANDHOLES AND PULL BOXES FOR CONDUIT PENETRATIONS. SEAL PENETRATIONS WITH NON-SHRINK GROUT OR APPROPRIATE FIRE RATED DEVICES WHERE APPLICABLE.
- ALL CONDUITS PENETRATING RATED FIRE WALLS OR RATED FIRE FLOORS SHALL BE INSTALLED WITH U.L. APPROVED DEVICES TO MAINTAIN THE FIRE RATING OF THE WALL OR FLOOR PENETRATED.
- PROVIDE CONDUIT DUCT SEAL AT ALL CONDUIT ENDS.
- ALL SPARE CONDUITS SHALL BE SEALED WITH A CAP AT BOTH ENDS AND A PULL STRING INSTALLED WITH IDENTIFICATION ON BOTH ENDS.
- ALL RECEPTACLES SHALL BE INSTALLED 18" AFF UNLESS OTHERWISE NOTED. LIGHT SWITCHES SHALL BE MOUNTED 48" AFF UNLESS OTHERWISE NOTED.
- ALL RECEPTACLES WITHIN 6' OF A SINK SHALL BE GFI.
- FLEXIBLE CONDUITS SHALL BE USED TO TERMINATE ALL MOTORS AND OTHER VIBRATING EQUIPMENT AND SHALL BE BETWEEN 18" AND 3' IN LENGTH.
- TYPEWRITTEN PANEL SCHEDULES SHALL BE INSTALLED IN EACH PANELBOARD, AND TYPEWRITTEN TERMINAL BLOCK SCHEDULES IN EACH CONTROL CABINET.
- ALL SPD'S SHALL BE INTEGRAL TO THE NEW EQUIPMENT SHOWN AND SUPPLIED AS ONE UNIT AND ONE U.L. ENTITY.
- ALL MATERIAL IN DESIGNATED CORROSIVE AREAS SHALL BE NEMA 4X STAINLESS STEEL OR NON-METALLIC.
- ALL OUTDOOR LIGHTING FIXTURES SHALL BE OF COPPER FREE CONSTRUCTION.
- ALL REFERENCES TO SS OR STAINLESS STEEL SHALL BE 316 STAINLESS STEEL.
- CONTRACTOR SHALL BALANCE PANELBOARD LOADS AT THE END OF THE PROJECT.
- ALL CONDUIT CONNECTIONS TO NEMA 4X PANELS/ENCLOSURES SHALL USE MYERS HUBS (OR EQUAL) TO MAINTAIN 4X RATING.
- ALL YARD CONDUITS SHALL BE INSTALLED WITH CONCRETE SLAB ON TOP AS SHOWN ON DRAWING E-17 DETAIL NO. 23.
- PROVIDE ARMORED CABLE FOR ALL VFD'S FROM VFD TO MOTOR PER SPECIFICATION 16120. INSTALL ARMORED CABLE PER MANUFACTURER'S RECOMMENDATION AND SPECIFICATION 16120.
- PROVIDE AS-BUILT DRAWINGS AND MANUALS IN ACCORDANCE WITH THE FLORIDA BUILDING CODE 13-413.ABC.2.1 & 13-413.ABC.2.2

NOTE:

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

LAST SAVED BY: WIN

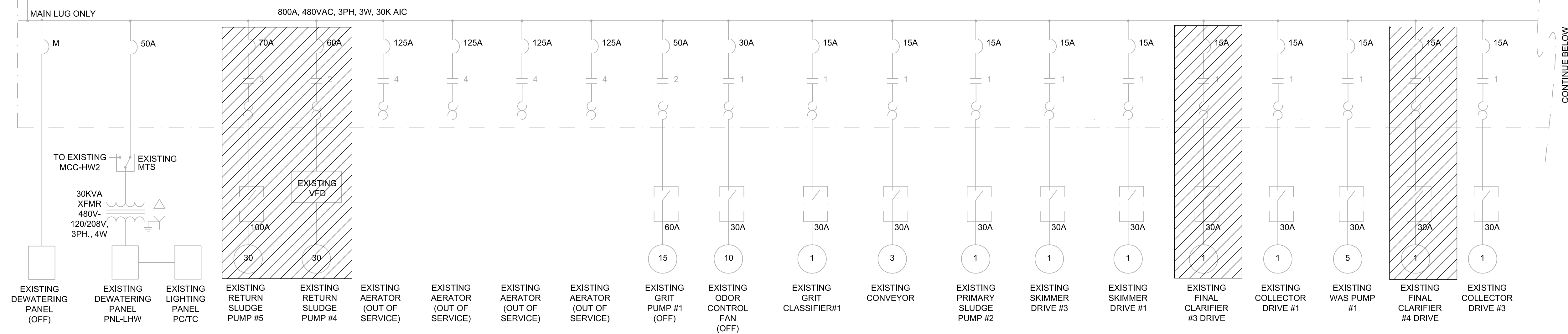
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DESIGNED	TW																						
DRAWN																							
CHECKED																							
PFH																							
DATE																							
MARCH 2013																							
REV	DATE	BY	DESCRIPTION																				
PROJECT NO: 7880J10				FILENAME: 7880J10-E-02.dwg																			

EXISTING 800A BREAKER
AT UNIT SUBSTATION#3
(LOCATION: HEADWORKS
ELECTRICAL ROOM)

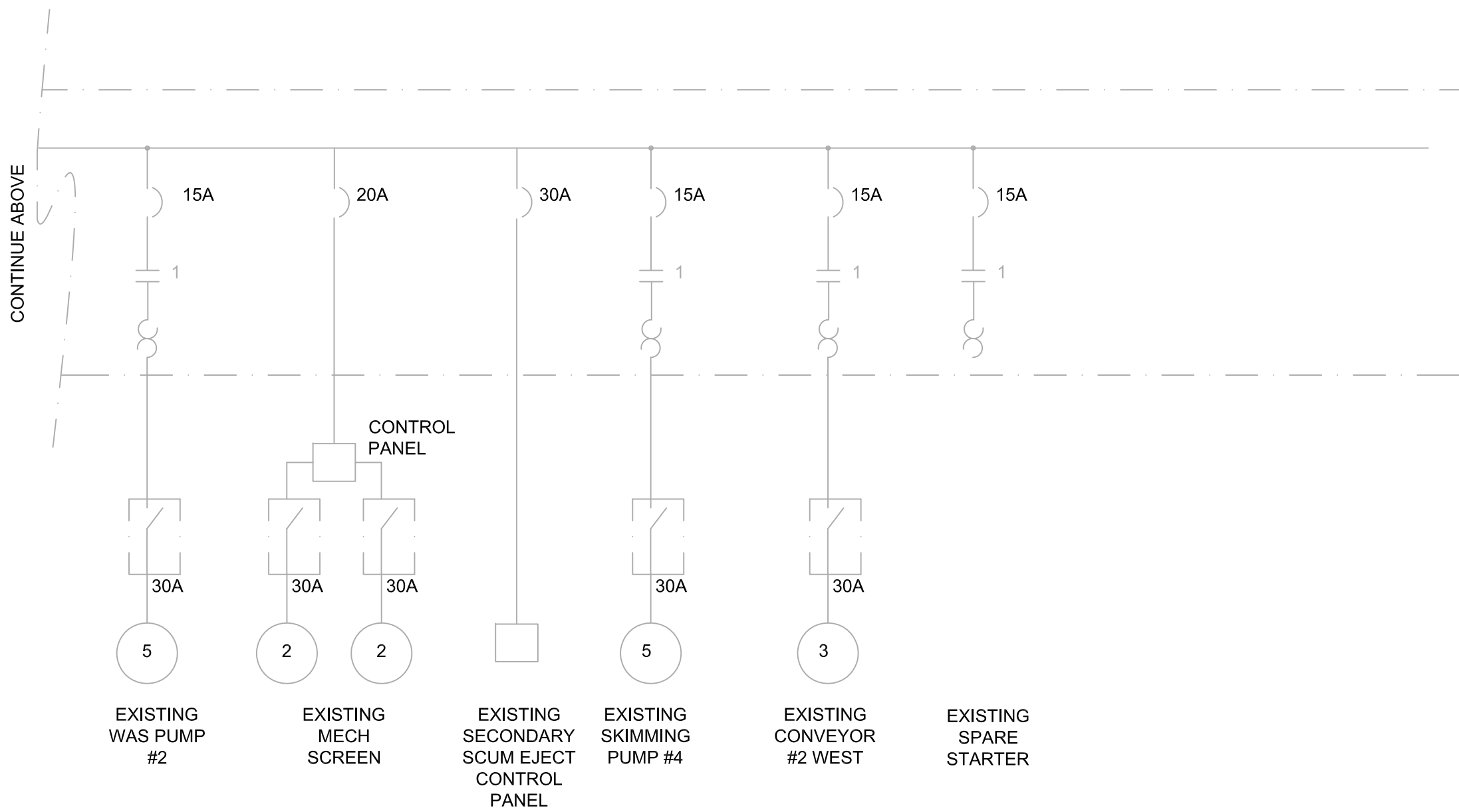
EXISTING 2 SET [3 1/2" C,
3-500KCM, 1#1/0 G]

EXISTING MOTOR CONTROL CENTER- HW1

LOCATION: HEADWORKS ELECTRICAL ROOM

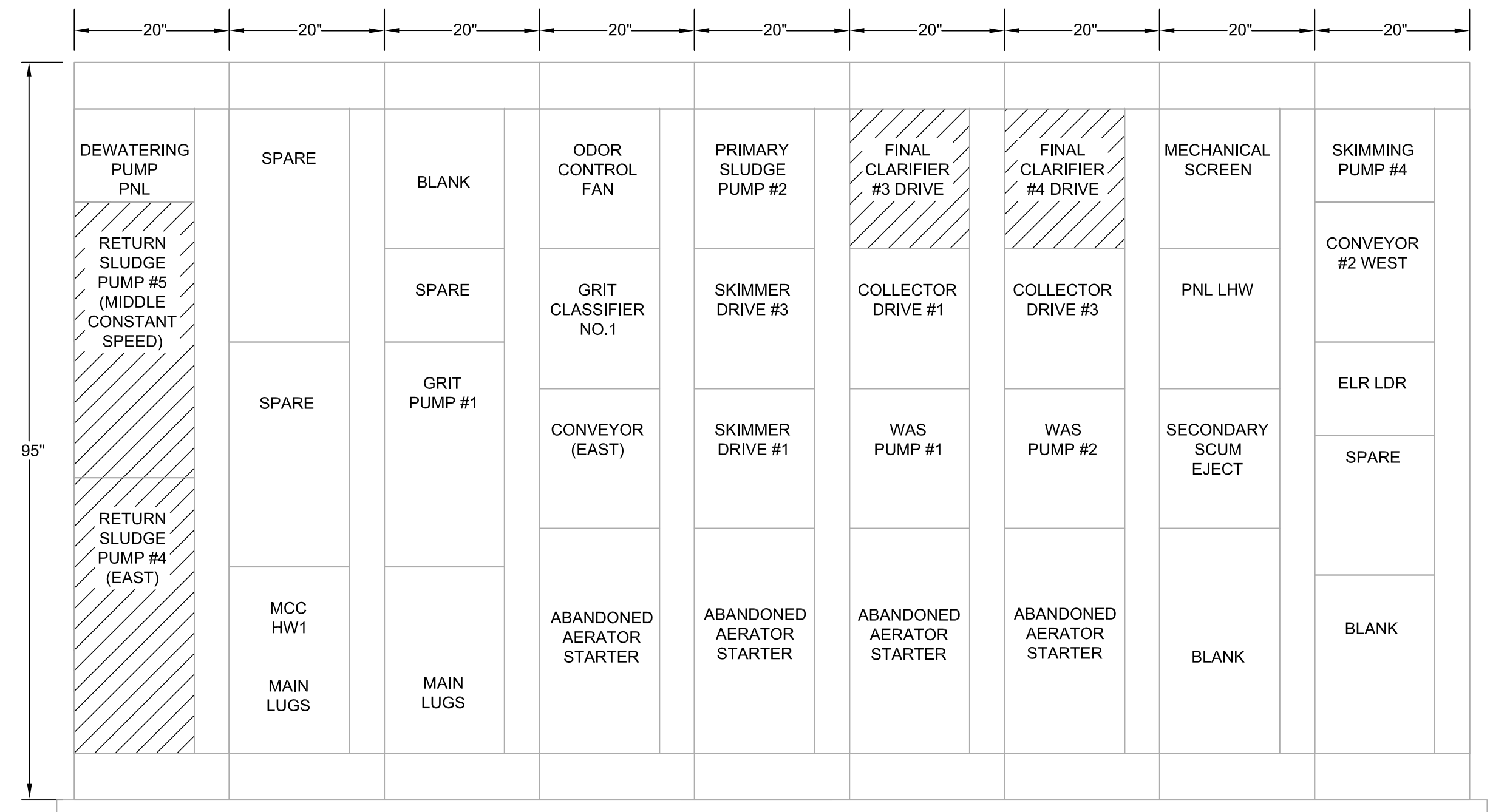


CONTINUE BELOW



CONTINUE ABOVE

EXISTING MCC- HW1 ONE LINE - DEMOLITION
SCALE: NONE



MCC- HW1 FRONT ELEVATION
SCALE: NONE

NOTE:

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

LAST SAVED BY: iwin

REV	DATE	BY	DESCRIPTION

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DRAWN DGO
CHECKED PFH
DATE MARCH 2013

HILLERS ELECTRICAL ENGINEERING, INC.
23257 STATE ROAD 7, SUITE 100
BOCA RATON, FLORIDA 33428
(561) 451-9165
(561) 451-4886 FAX
LICENSE NO: EB 0006877

THEIN WIN, P.E.
No. 65722



MANATEE COUNTY	
SWWRF CLARIFIER 3&4 REHABILITATION	
ELECTRICAL	
MCC-HW1 ONE LINE AND ELEVATION	

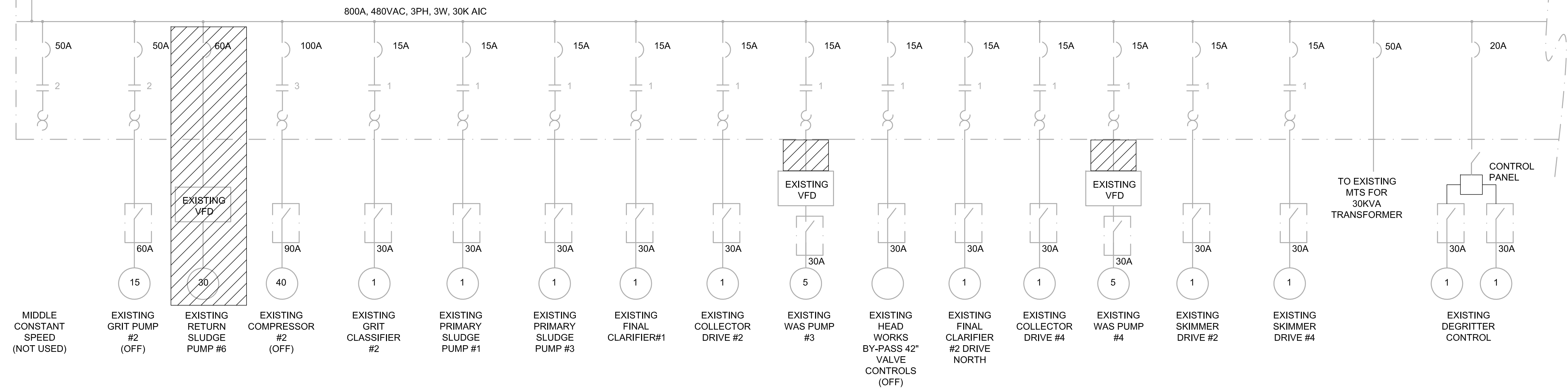
VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO.
7880J10
DRAWING NO.
E-3

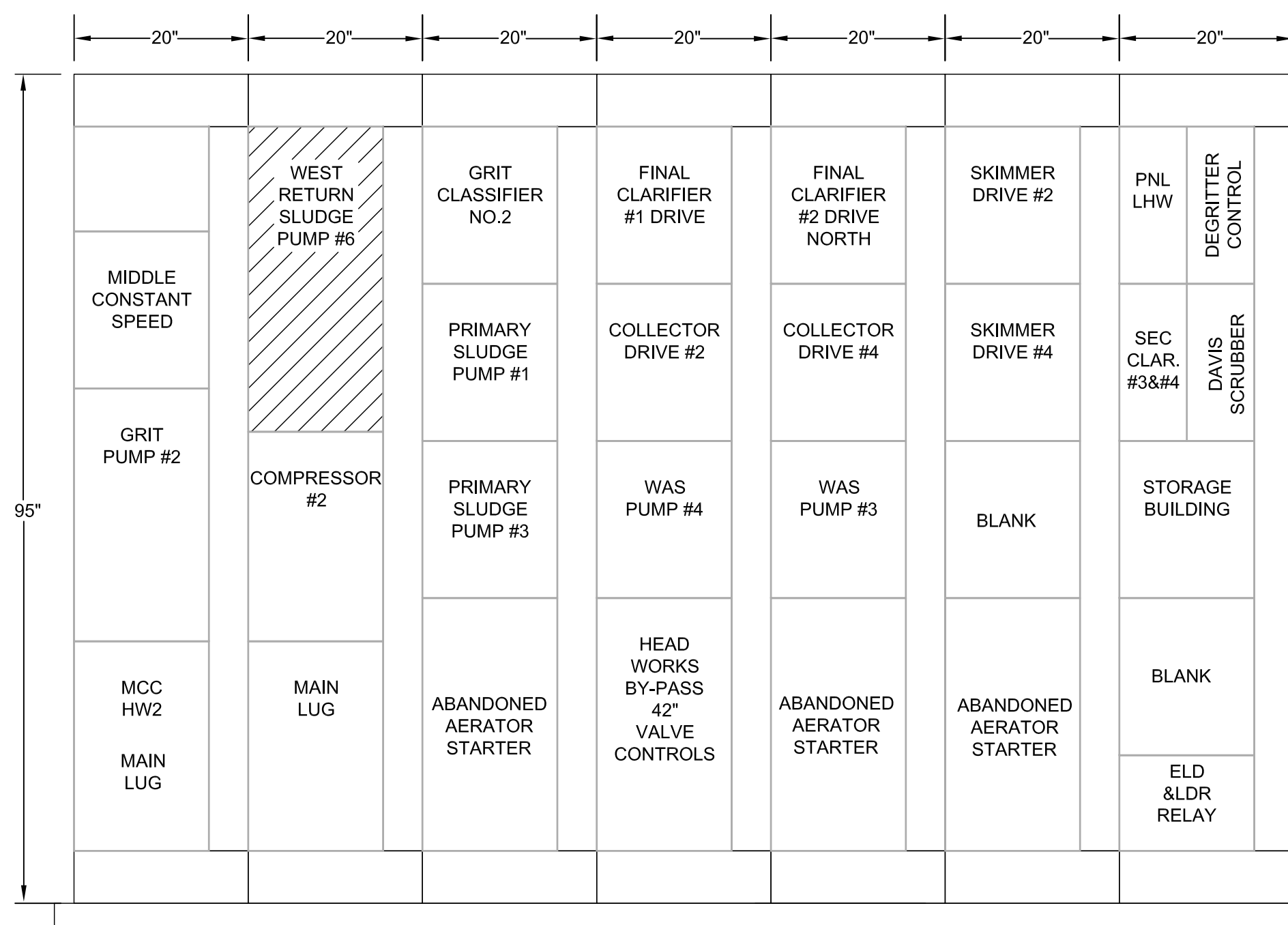
EXISTING 800A BREAKER
AT UNIT SUBSTATION#4
(LOCATION: HEADWORKS
ELECTRICAL ROOM)

EXISTING 2 SET [3 1/2" C,
3-500KCM, 1#1/0 G]

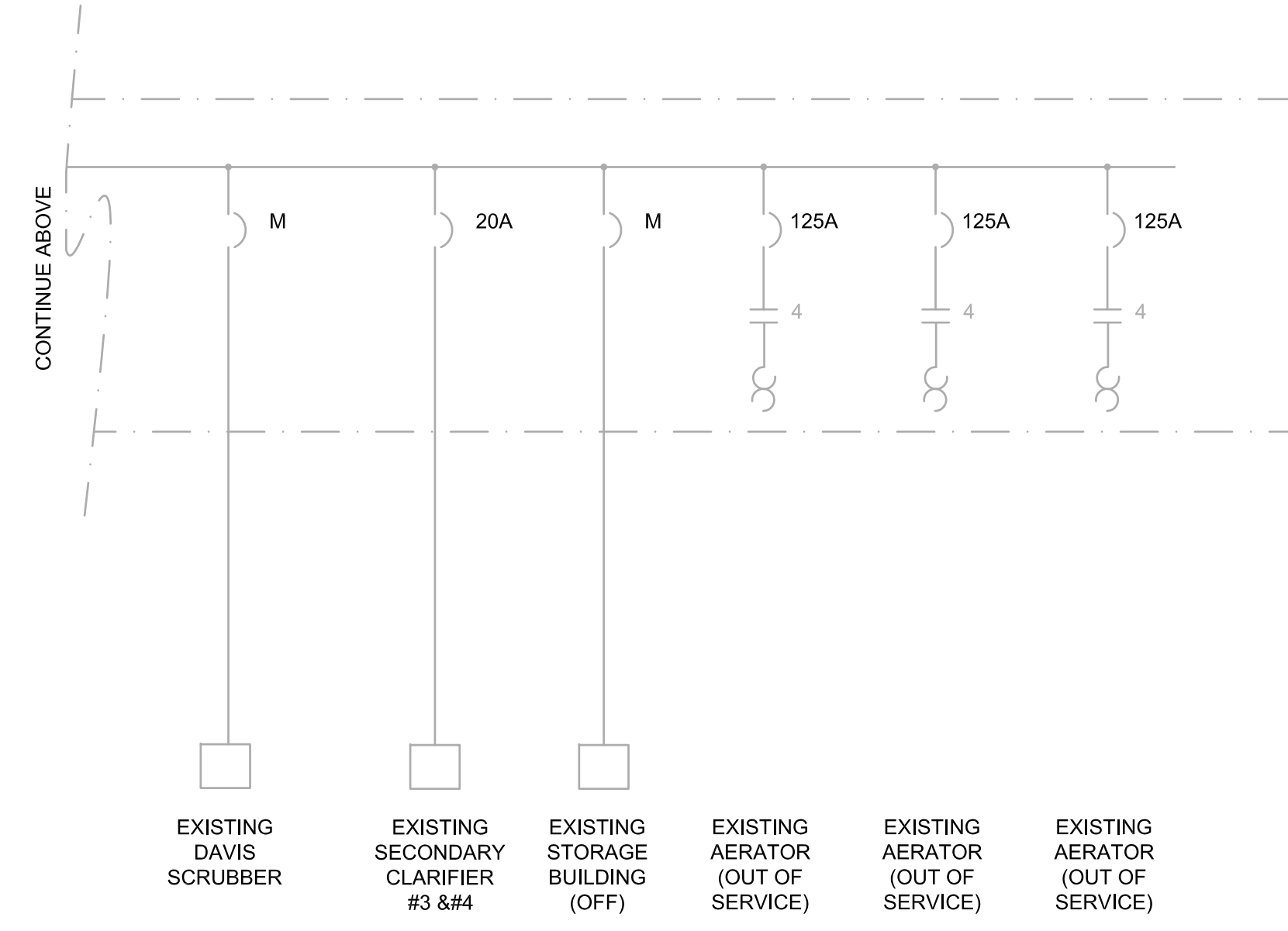
EXISTING MOTOR CONTROL CENTER- HW2
LOCATION: HEADWORKS ELECTRICAL ROOM



CONTINUE BELOW



MCC- HW2 FRONT ELEVATION
SCALE: NONE



EXISTING MCC- HW2 ONE LINE - DEMOLITION
SCALE: NONE

NOTE:

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LAST SAVED BY: win

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**HILLERS ELECTRICAL
ENGINEERING, INC.**
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THEIN WIN, P.E.
No. 65722



MANATEE COUNTY
SWWRF CLARIFIER 3&4 REHABILITATION
ELECTRICAL
MCC-HW2 ONE LINE AND ELEVATION

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

JOB NO.
7880J10
DRAWING NO.
E-4

EXISTING 800A BREAKER AT UNIT SUBSTATION#3 (LOCATION: HEADWORKS ELECTRICAL ROOM)

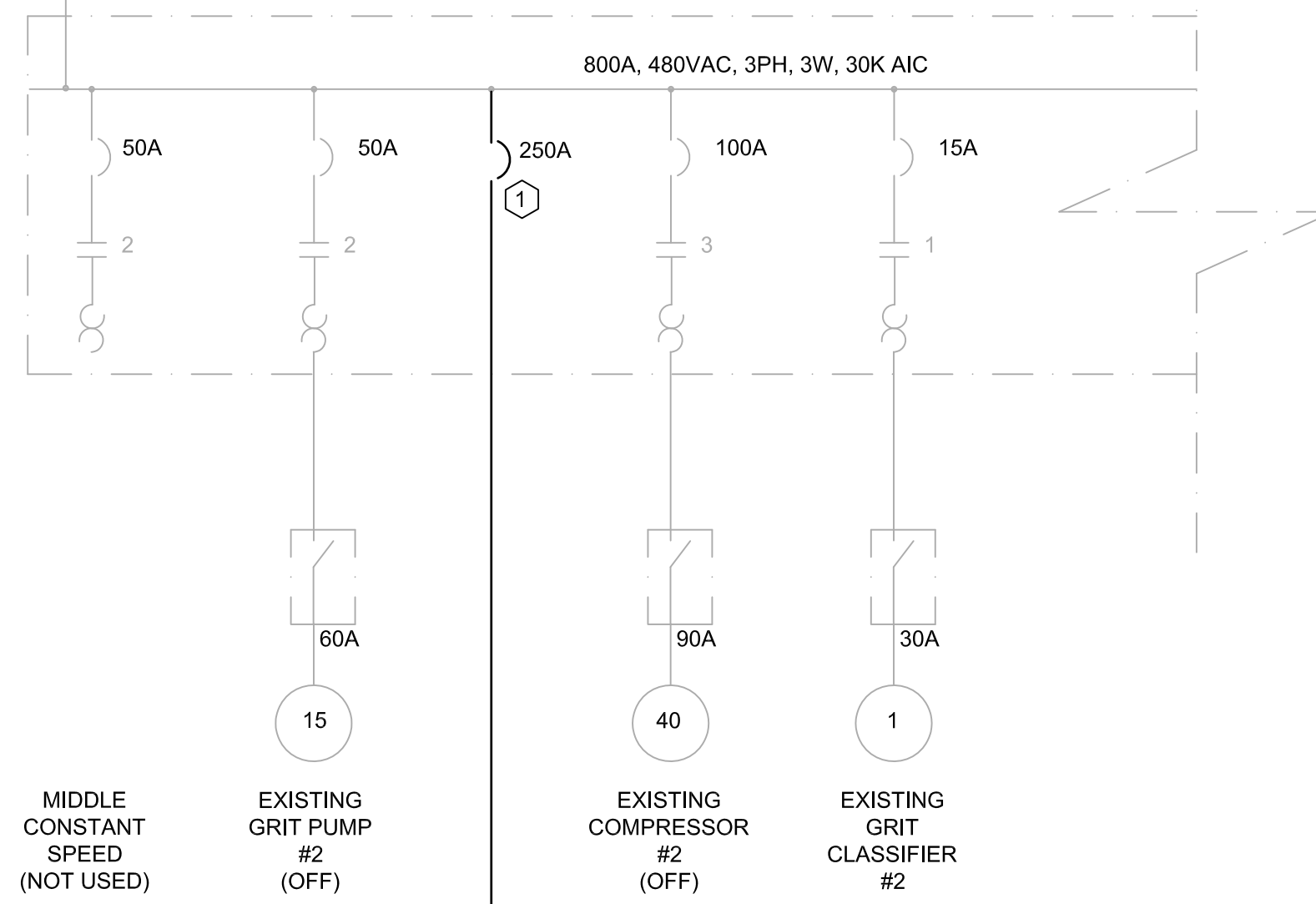
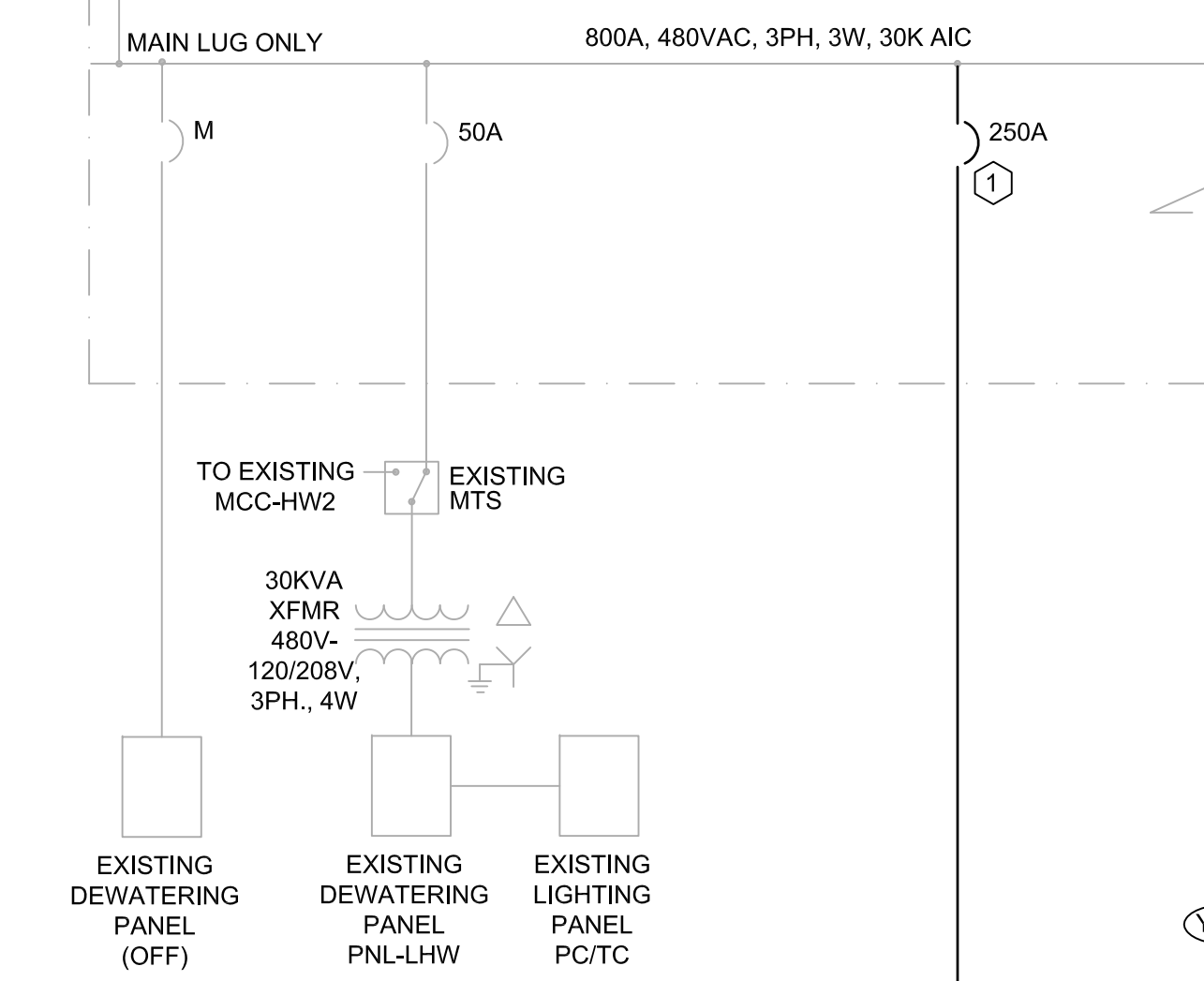
EXISTING 800A BREAKER AT UNIT SUBSTATION#4 (LOCATION: HEADWORKS ELECTRICAL ROOM)

EXISTING 2 SET [3 1/2" C, 3-500KCM, 1#1/0 G]

EXISTING 2 SET [3 1/2" C, 3-500KCM, 1#1/0 G]

EXISTING MOTOR CONTROL CENTER- HW1
LOCATION: HEADWORKS ELECTRICAL ROOM

EXISTING MOTOR CONTROL CENTER- HW2
LOCATION: HEADWORKS ELECTRICAL ROOM



LOAD SUMMARY MCC-HW1 (480V)

LOAD	CONNECTED LOAD (A)	RUNNING LOAD (A)
EXISTING LOADS	262.8 A	198.1 A
REMOVED LOADS	-84.2 A	-67.4 A
NEW PP-1 LOADS	164.4 A	128.8 A
TOTALS	343.0 A	259.5 A
KVA:	285.2 KVA	215.8 KVA

LOAD SUMMARY MCC-HW2 (480V)

LOAD	CONNECTED LOAD (A)	RUNNING LOAD (A)
EXISTING LOADS	236.2 A	147.4 A
REMOVED LOADS	-55.2 A	-44.2 A
NEW PP-1 LOADS	0.0 A*	0.0 A*
TOTALS	181.0 A	103.2 A
KVA:	150.5 KVA	85.8 KVA

NOTE: PP-1 WILL BE POWERED EITHER FROM MCC-HW1 OR MCC-HW2, NOT AT THE SAME TIME.

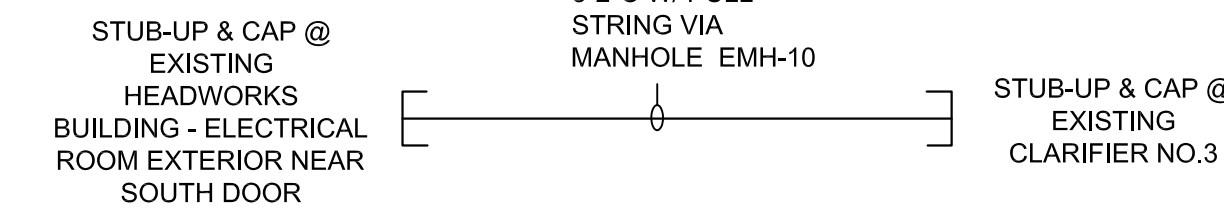
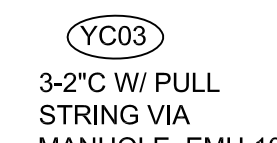
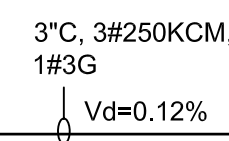
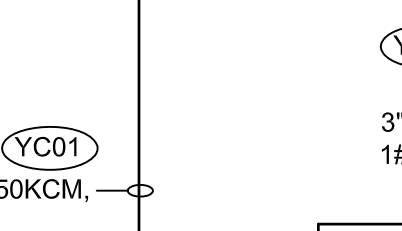
LOAD SUMMARY PP-1 (480V)

LOAD	CONNECTED LOAD (A)	RUNNING LOAD (A)
RAS#4	40.0 A	32.0 A
RAS#5	40.0 A	32.0 A
RAS#6	40.0 A	32.0 A
WAS#3	7.6 A	6.1 A
WAS#4	7.6 A	6.1 A
SCUM PUMP#1	7.6 A	6.1 A
SCUM PUMP#2	7.6 A	6.1 A
CLARIFIER#3	1.6 A	1.3 A
CLARIFIER#4	1.6 A	1.3 A
XFMR 15TX-3/PANEL 15LP-1	10.8 A	5.8 A
TOTALS	164.4 A	128.8 A
KVA:	136.7 KVA	107.1 KVA

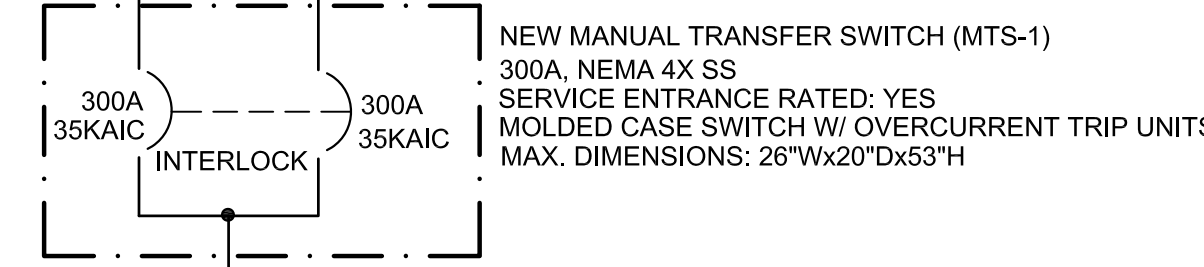
KEYED NOTE:

1 PROVIDE AND INSTALL NEW BREAKER BUCKETS IN EXISTING MCC-HW1 AND MCC-HW2 AT THE SPARE (BLANK) LOCATION. SEE DRAWING E-3 AND E-4 FOR EXISTING MCC ELEVATION AND FIELD VERIFY. NEW BREAKER SHALL MATCH EXISTING IN STYLE AND AIC RATING. PROVIDE AND INSTALL BLANK COVER IF NEEDED. MAKE ALL NECESSARY CONNECTIONS, TERMINATIONS, MODIFICATIONS, ETC. FOR A COMPLETE AND WORKING MCC SYSTEM IN PLACE.

2 NEW MOTOR FOR RAS PUMPS ARE LOW RPM MOTOR CONTRACTOR SHALL COORDINATE WITH RAS PUMP SUPPLIER (SPECIFICATION 11312) FOR ACTUAL FULL LOAD AMPS OF THE MOTOR BEFORE BIDDING AND ADJUST CONDUITS/CABLES, BREAKER, VFD, ETC. ACCORDINGLY WITHOUT ADDITIONAL COST TO THE OWNER.

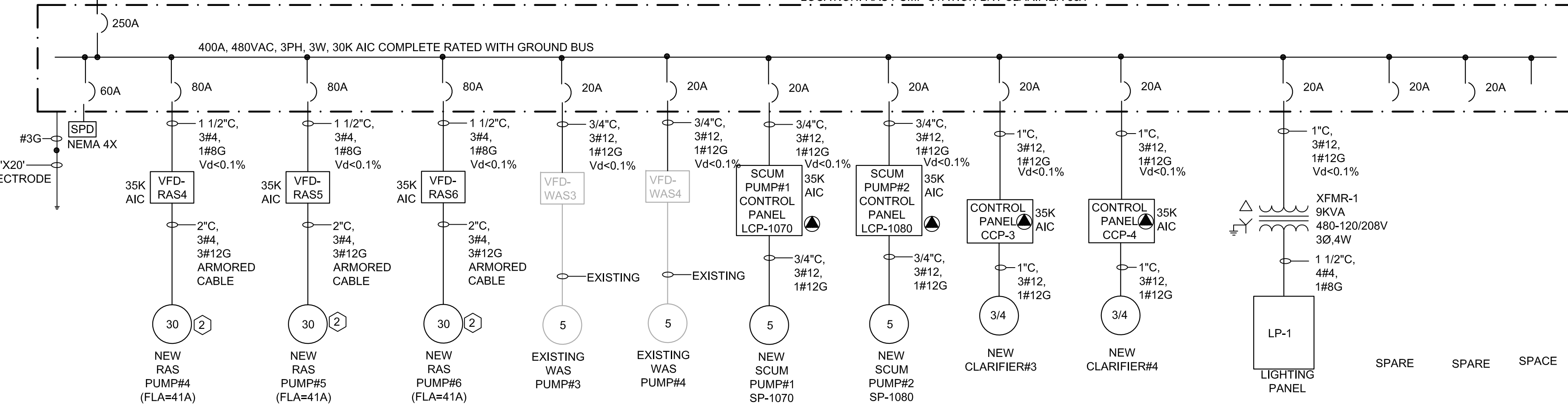


SPARE CONDUIT RISER
SCALE: NONE



NEW POWER PANEL PP-1

NEMA 4X S.S. ENCLOSURE
MAX. DIMENSIONS: 20"Wx8"Dx72"H
U.L. SERVICE ENTRANCE RATED: NO
LOCATION: RAS PUMP STATION B/W CLARIFIER 3&4



NEW POWER PANEL PP-1 ONE LINE DIAGRAM
SCALE: NONE

LAST SAVED BY: win

REV	DATE	BY	DESCRIPTION

DESIGNED	TW
DRAWN	DGU
CHECKED	PFH
DATE	MARCH 2013

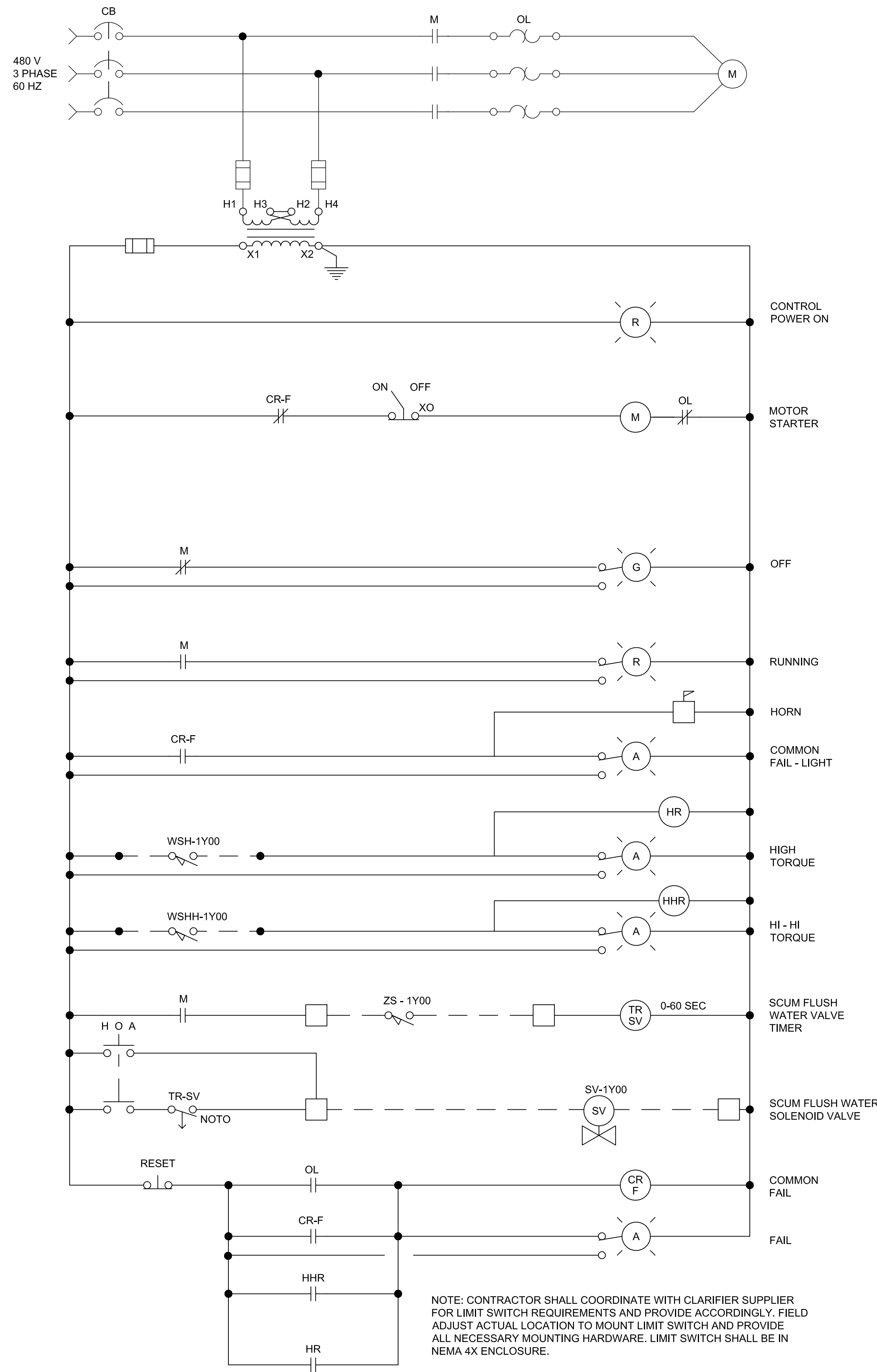
HILLERS ELECTRICAL ENGINEERING, INC.
23257 STATE ROAD 7, SUITE 100
BOCA RATON, FLORIDA 33428
(561) 451-6165
(561) 451-4886 FAX
LICENSE NO: EB 0006877

THEIN WIN, P.E.
No. 65722



MANATEE COUNTY
SWWRF CLARIFIER 3&4 REHABILITATION
ELECTRICAL
NEW POWER PANEL PP-1 ONE LINE DIAGRAM

VERIFY SCALES	JOB NO. 7880J10
BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO. E-5
0 1"	
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	

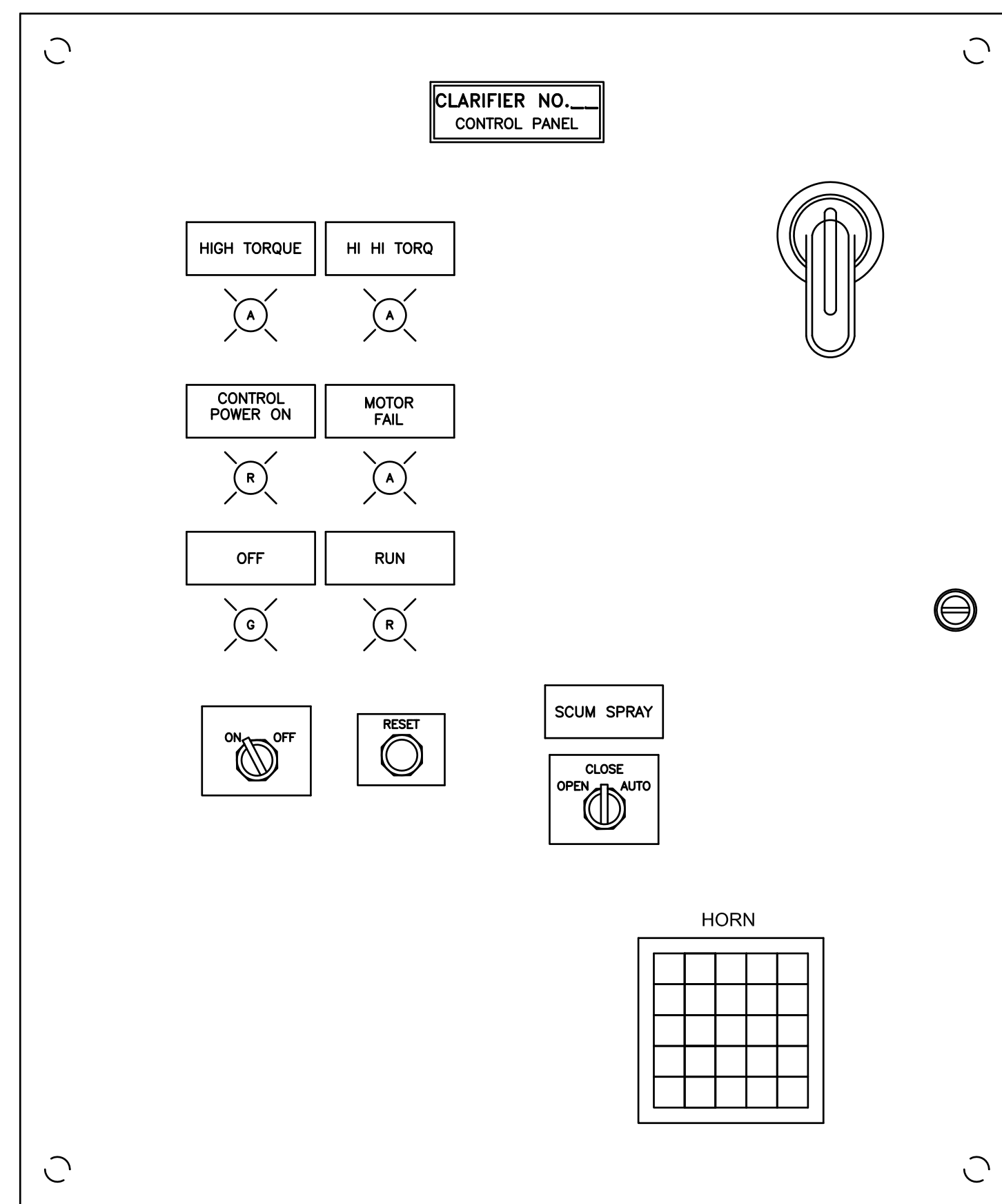
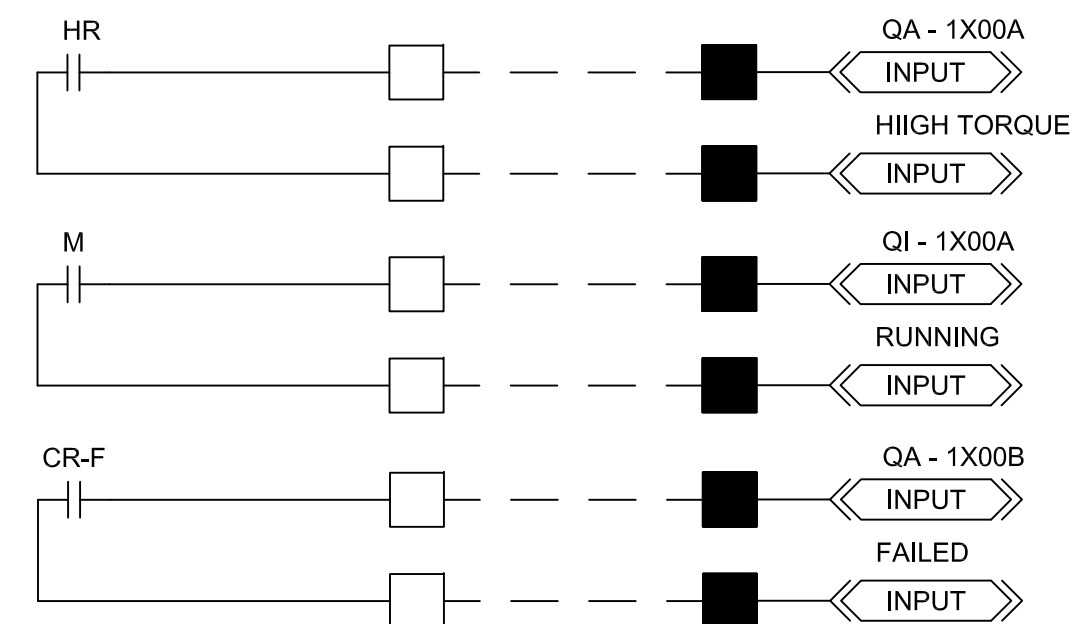


CLARIFIER NO. Y CONTROL PANEL SCHEMATIC DIAGRAM

NOT TO SCALE
Y=3,4

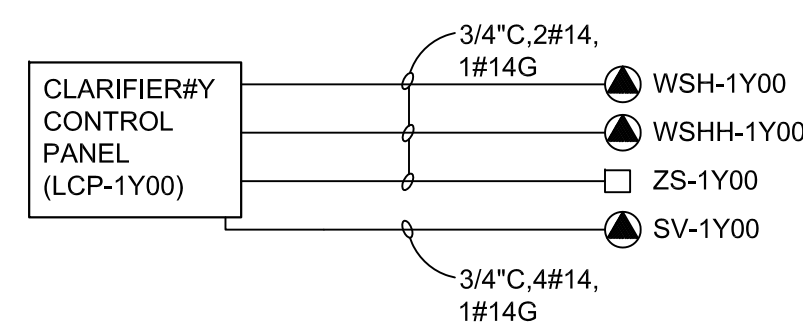
NOTE: CONTRACTOR SHALL COORDINATE WITH CLARIFIER SUPPLIER FOR LIMIT SWITCH REQUIREMENTS AND PROVIDE ACCORDINGLY. FIELD ADJUST ACTUAL LOCATION TO MOUNT LIMIT SWITCH AND PROVIDE ALL NECESSARY MOUNTING HARDWARE. LIMIT SWITCH SHALL BE IN NEMA 4X ENCLOSURE.

CLARIFIER CONTROL PANEL IS PROVIDED AS PER SPECIFICATION 11353.



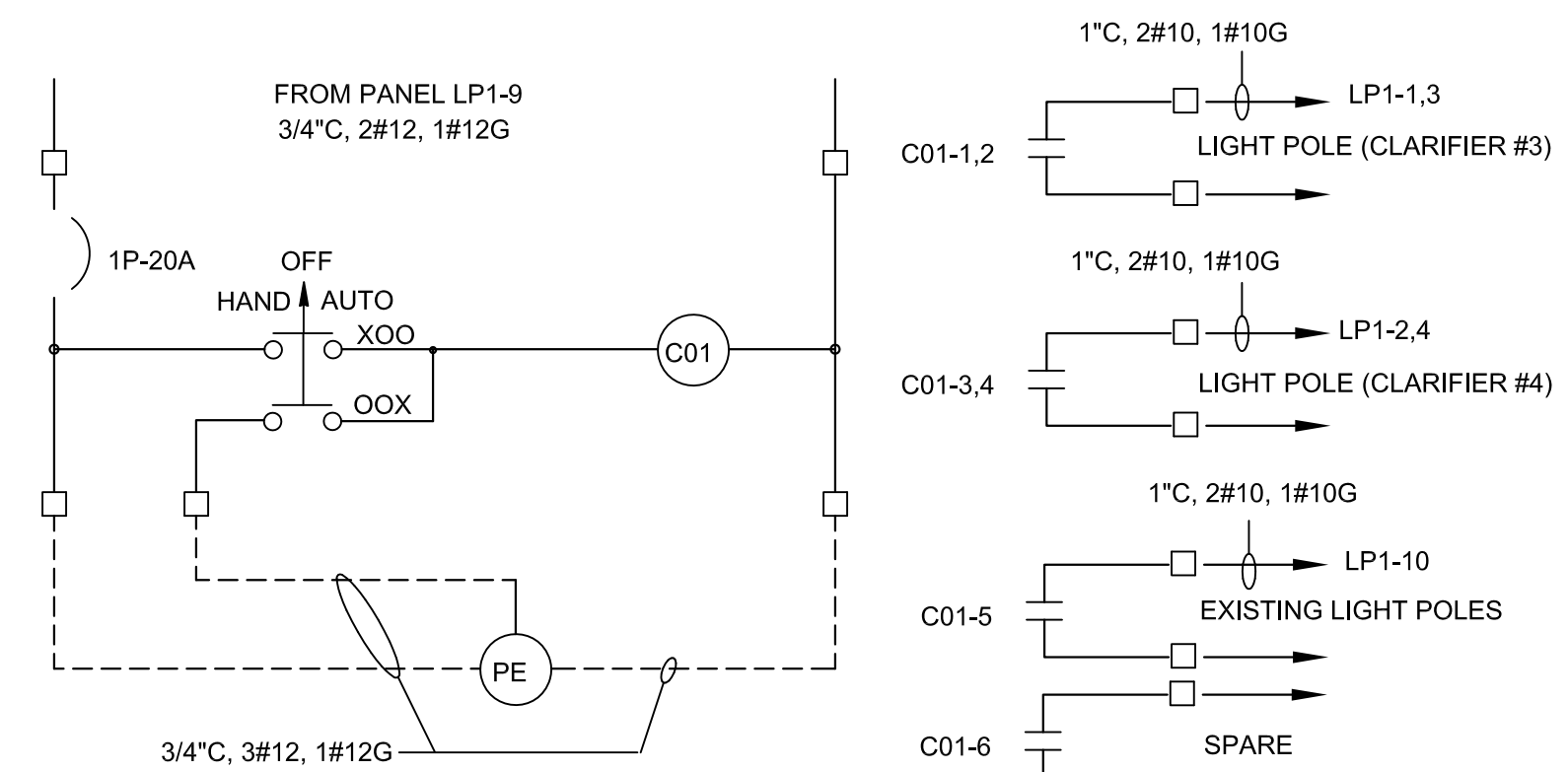
CLARIFIER NO. Y CONTROL PANEL LAYOUT

NOT TO SCALE
Y=3,4



CLARIFIER NO. Y CONTROL PANEL RISER

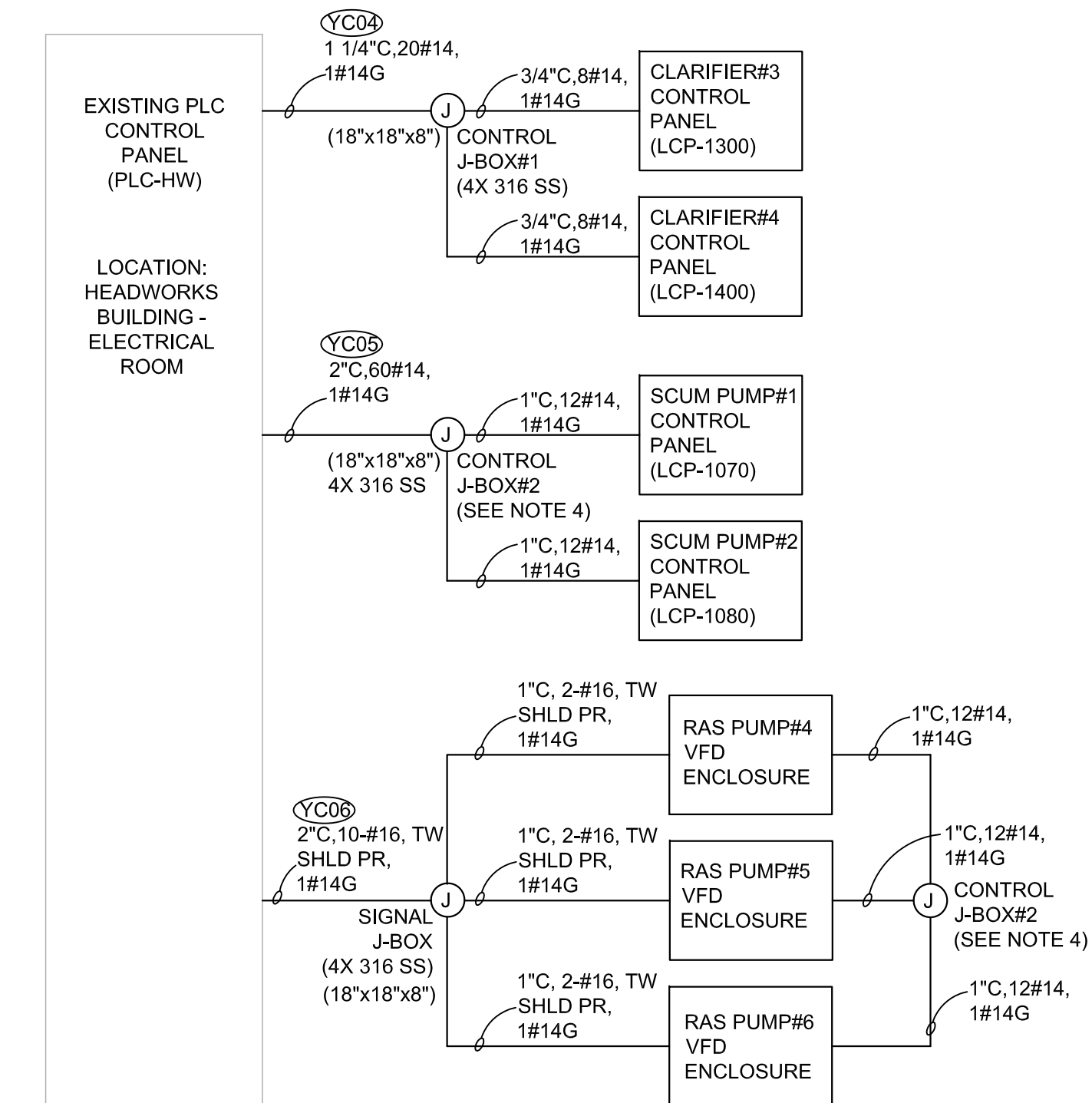
NOT TO SCALE
Y=3,4



CONTRACTOR SHALL PROVIDE AND INSTALL ELECTRICALLY HELD LIGHTING CONTACTOR, 120/208V, 1P COIL, 30A 277V RATED CONTACTS IN NEMA 4X ENCLOSURE. MAKE ALL NECESSARY CONNECTIONS FOR A COMPLETE WORKING SYSTEM IN PLACE.

LIGHTING CONTROL (CO1) SCHEMATIC

SCALE: NONE



PLC-HW CONTROL PANEL RISER

NOT TO SCALE

NOTES:

- NOT ALL CONDUITS AND CABLES SHOWN. SEE OTHER PLAN DRAWINGS FOR ADDITIONAL CONDUITS AND CABLES.
- CONTRACTOR IS ALLOWED TO COMBINE CONTROL AND INSTRUMENTATION WIRE AS LONG AS WORK IS ACCOMPLISHED IN ACCORDANCE WITH THE NEC.
- FOR CLARIFICATION, X-#16 TW SHLD PR = X SETS OF #16 TWISTED SHIELDED PAIR. TW SHLD PR IS TYPE B - INSTRUMENTATION CABLE AS PER SPECIFICATION 16120.
- J-BOX#2 IS THE SAME JUNCTION BOX FOR CONNECTING SCUM PUMP CONTROL PANELS AND RAS PUMPS VFD ENCLOSURES.
- ALL J-BOX SIZE SHOWN IS FOR MINIMUM SIZE ONLY. CONTRACTOR SHALL ADJUST THE SIZE AS NEEDED BASED ON THE ACTUAL CONDUIT CONFIGURATION AND QUANTITY.

LAST SAVED BY: iwin

REV	DATE	BY	DESCRIPTION

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DATE	MARCH 2013

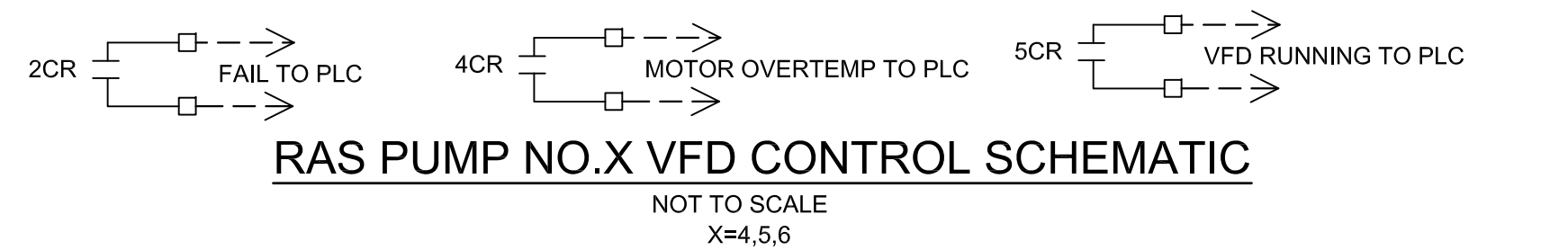
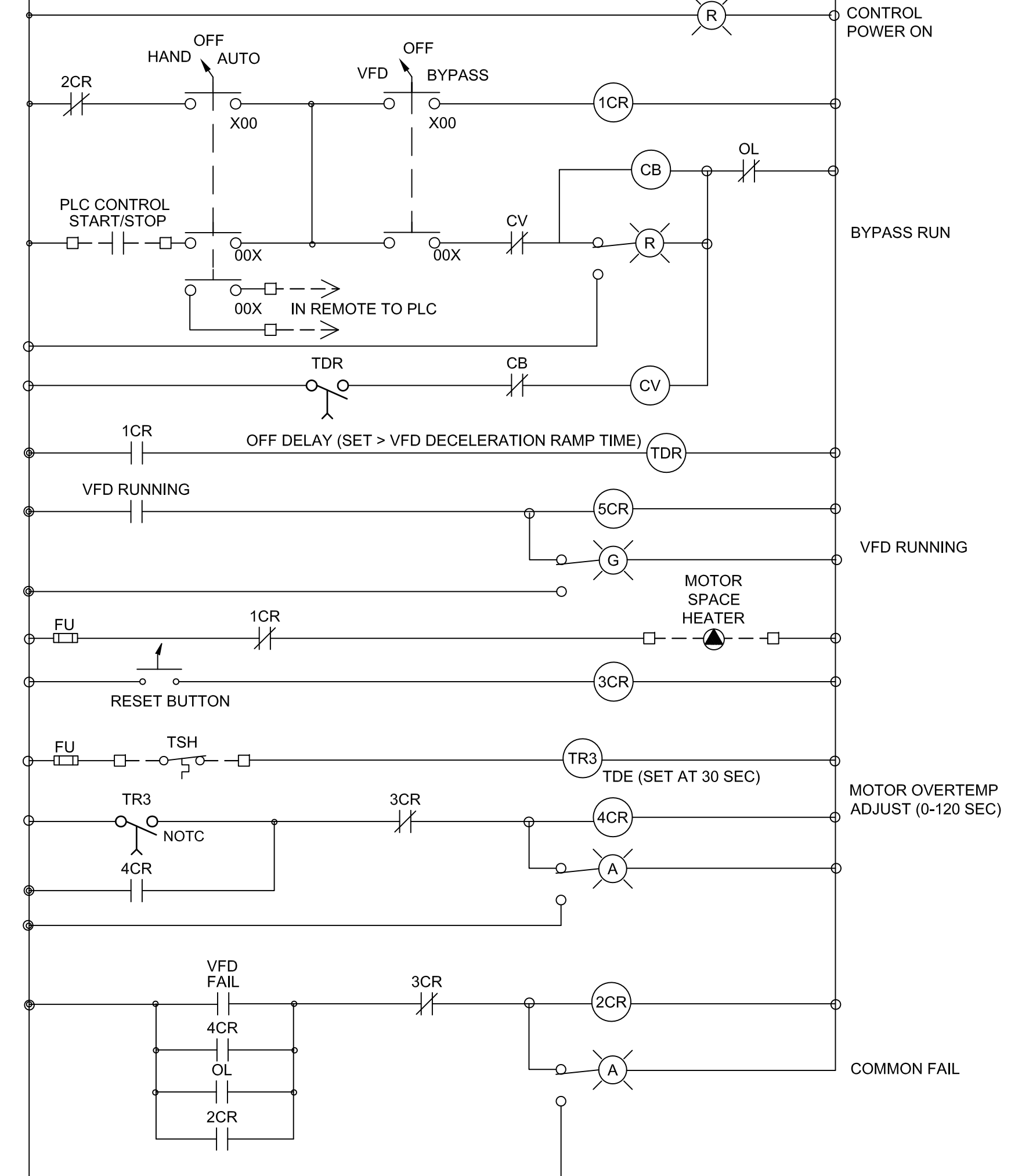
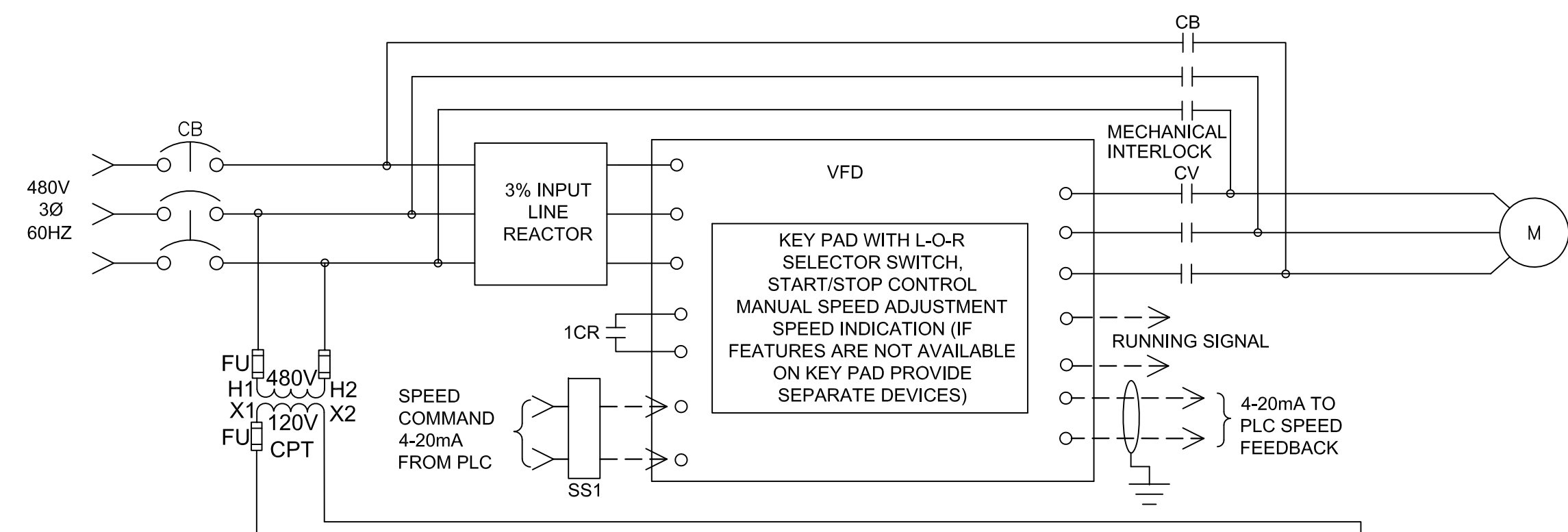
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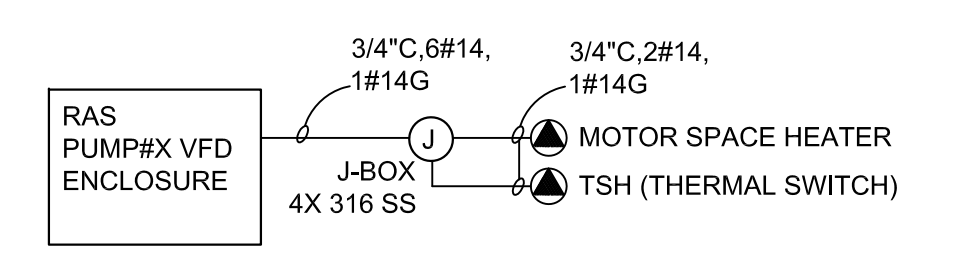
MANATEE COUNTY
SWWRF CLARIFIER 3&4 REHABILITATION
ELECTRICAL
CLARIFIER CONTROL PANEL SCHEMATIC DIAGRAM

VERIFY SCALES	JOB NO. 7880J10
BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO. E-6
0 1"	
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	



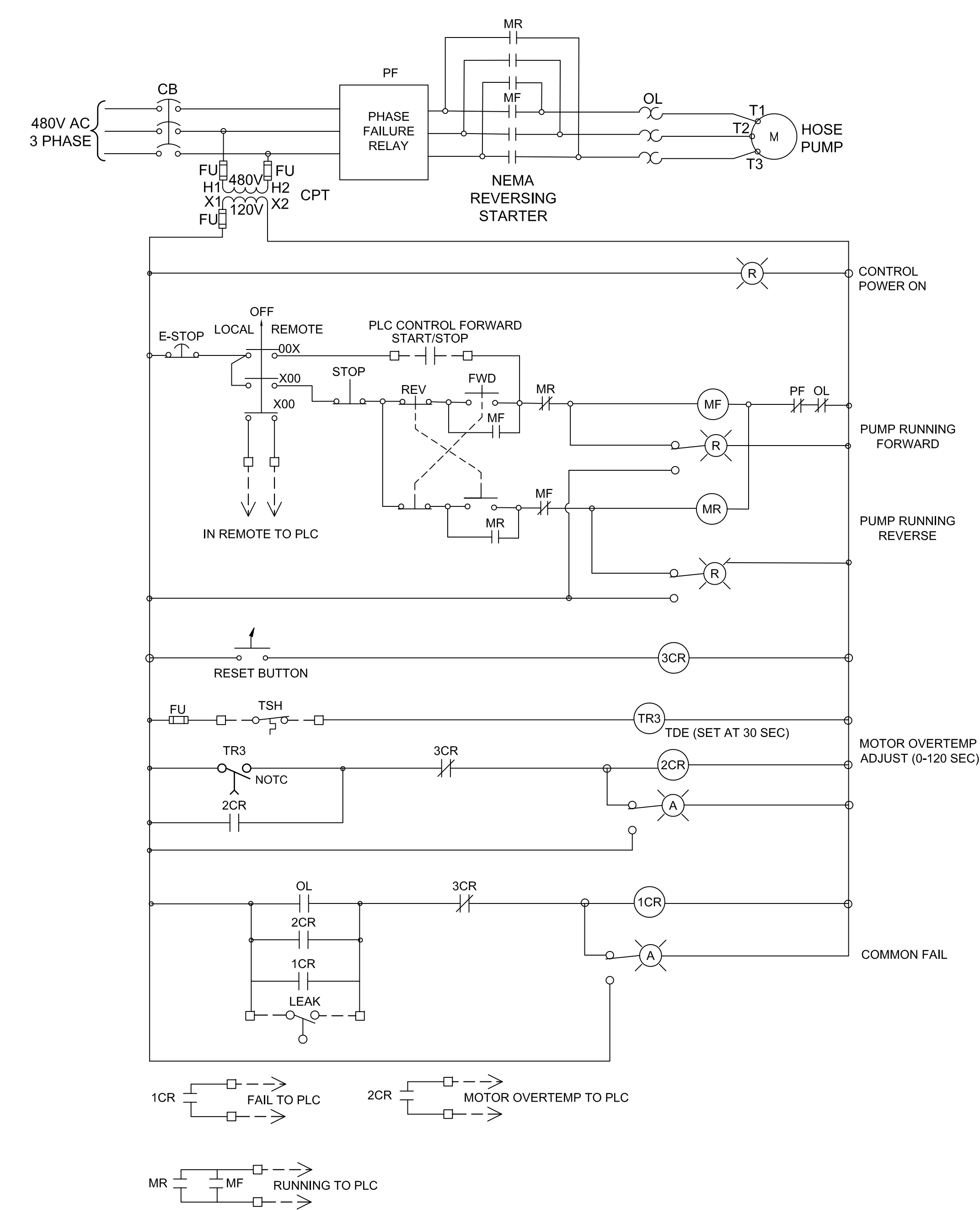
RAS PUMP NO.X VFD CONTROL SCHEMATIC

NOT TO SCALE
X=4,5,6



RAS PUMP NO.X VFD RISER

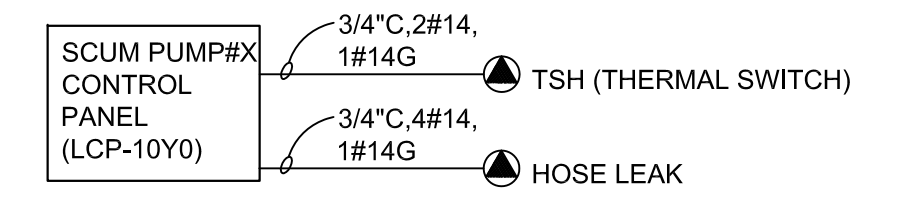
NOT TO SCALE
X=4, 5, 6



SCUM PUMP CONTROL PANEL NO.X CONTROL SCHEMATIC

NOT TO SCALE
X=1,2

NOTE: SCUM PUMP CONTROL PANELS ARE PROVIDED AS PER SPECIFICATION 11301.



SCUM PUMP NO.X VFD RISER

NOT TO SCALE
X,Y = 1,7
2,8

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PFH	
DATE	
MARCH 2013	

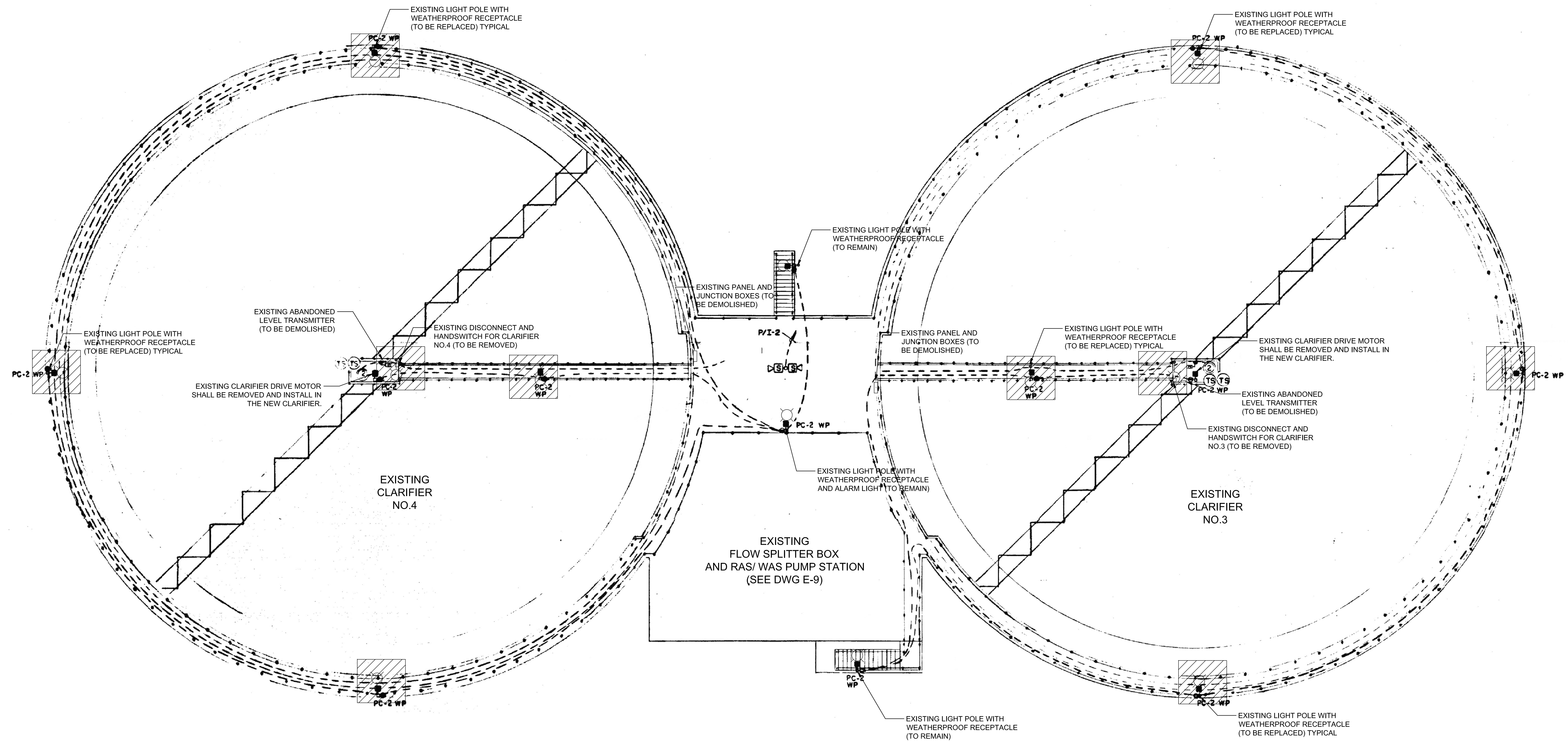
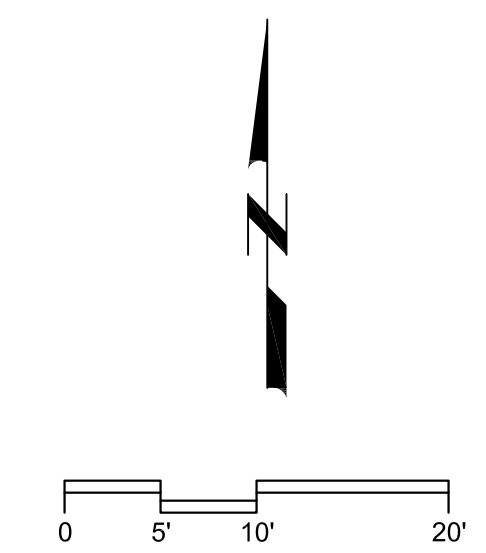
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MANATEE COUNTY
SWWRF CLARIFIER 3&4 REHABILITATION
ELECTRICAL
RAS AND SCUM PUMP SCHEMATIC DIAGRAMS

VERIFY SCALES	JOB NO. 7880J10
BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO. E-7
0 1"	
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	



EXISTING CLARIFIER 3 & 4 - ELECTRICAL DEMOLITION PLAN

SCALE: 1"=10'-0"

DEMOLITION NOTES:

1. CONTRACTOR SHALL COORDINATE WITH OTHER DISCIPLINES FOR DEMOLITION OF EXISTING CLARIFIER NO.3 AND NO.4. REMOVE ALL ELECTRICAL EQUIPMENT, PANELS, LIGHT POLES, ETC. AS SHOWN ON DRAWINGS. REMOVE ALL ASSOCIATED WIRES AND EXPOSED CONDUITS BACK TO SOURCE. FOR UNDERGROUND CONDUITS THAT WILL NOT BE REUSED, CUT FLUSH WITH FINISHED FLOOR OR WALL AND CAP.
2. TURN OVER TO THE OWNER FOR ALL REMOVED ITEMS OR DISPOSE AS NEEDED, IF INSTRUCTED BY THE OWNER.

LAST SAVED BY: WTW

REV	DATE	BY	DESCRIPTION

DESIGNED	TW
DRAWN	DGU
CHECKED	PFH
DATE	MARCH 2013

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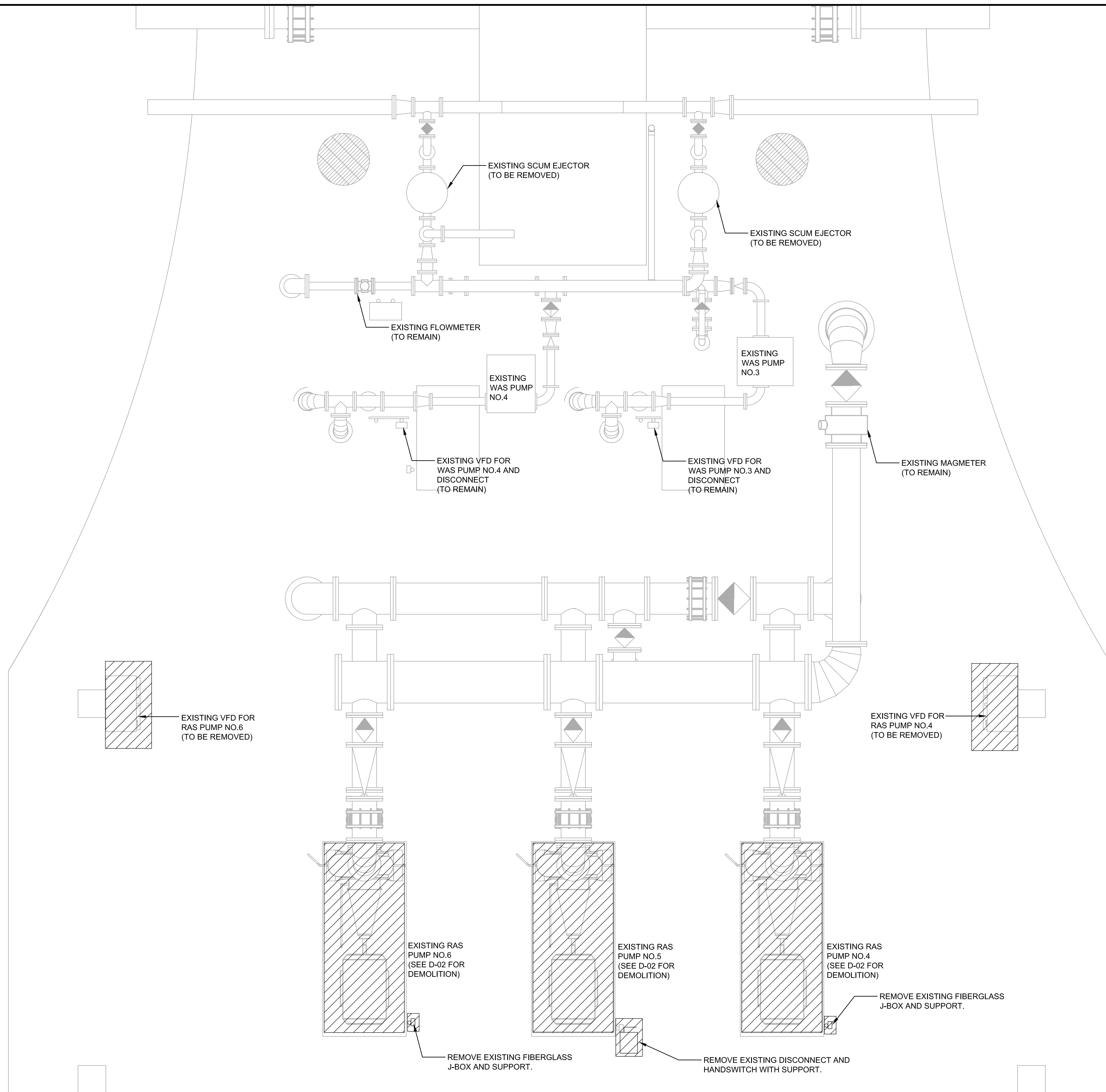
THEIN WIN, P.E.
 No. 65722



MANATEE COUNTY
SWWRF CLARIFIER 3&4 REHABILITATION
ELECTRICAL
EXISTING CLARIFIER 3 & 4 DEMOLITION PLAN

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

JOB NO. 7880J10
 DRAWING NO. E-8



DEMOLITION NOTES:

1. CONTRACTOR SHALL REMOVE EXISTING VFD NO.4 AND NO.6 AND OTHER ELECTRICAL ITEMS AS SHOWN ON DRAWINGS AND TURN OVER TO THE OWNER OR DISPOSE AS NEEDED, IF DIRECTED BY THE OWNER. REMOVE ALL CABLES AND EXPOSED CONDUITS BACK TO SOURCE. FOR UNDERGROUND CONDUITS THAT WILL NOT BE REUSED, CUT FLUSH WITH FINISHED FLOOR OR WALL AND CAP.
2. REMOVE ALL EXISTING LIGHT FIXTURE MOUNTED ON THE CEILING OF RAS/WAS PUMP STATION, LIGHT SWITCHES, AND ASSOCIATED CONDUITS/CABLES COMPLETELY. PROVIDE AND INSTALL NEW LIGHTING SYSTEM AS SHOWN ON DRAWING E-12.
3. DISCONNECT AND REMOVE CABLES BACK TO SOURCE FOR EXISTING VFD FOR WAS PUMPS (NO.3 & NO.4). CUT AND CAP EXISTING CONDUITS THAT WILL NOT BE REUSED FLUSH WITH FLOOR. PROVIDE AND INSTALL NEW CONDUITS AND CABLES AS SHOWN ON DRAWING E-5 TO EXISTING VFD'S. MAKE ALL NECESSARY CONNECTIONS, TERMINATIONS, MODIFICATIONS, ETC. FOR A COMPLETE AND WORKING SYSTEM IN PLACE.

EXISTING RAS/WAS PUMP STATION - ELECTRICAL DEMOLITION PLAN
SCALE: 3/8"=1'-0"

LAST SAVED BY: nwn

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DATE	MARCH 2013

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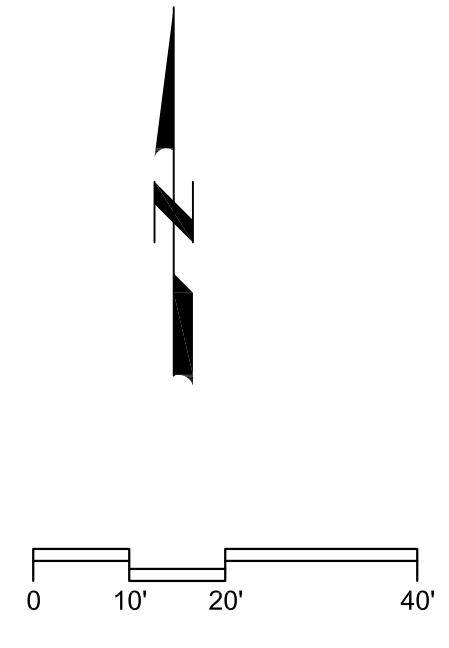
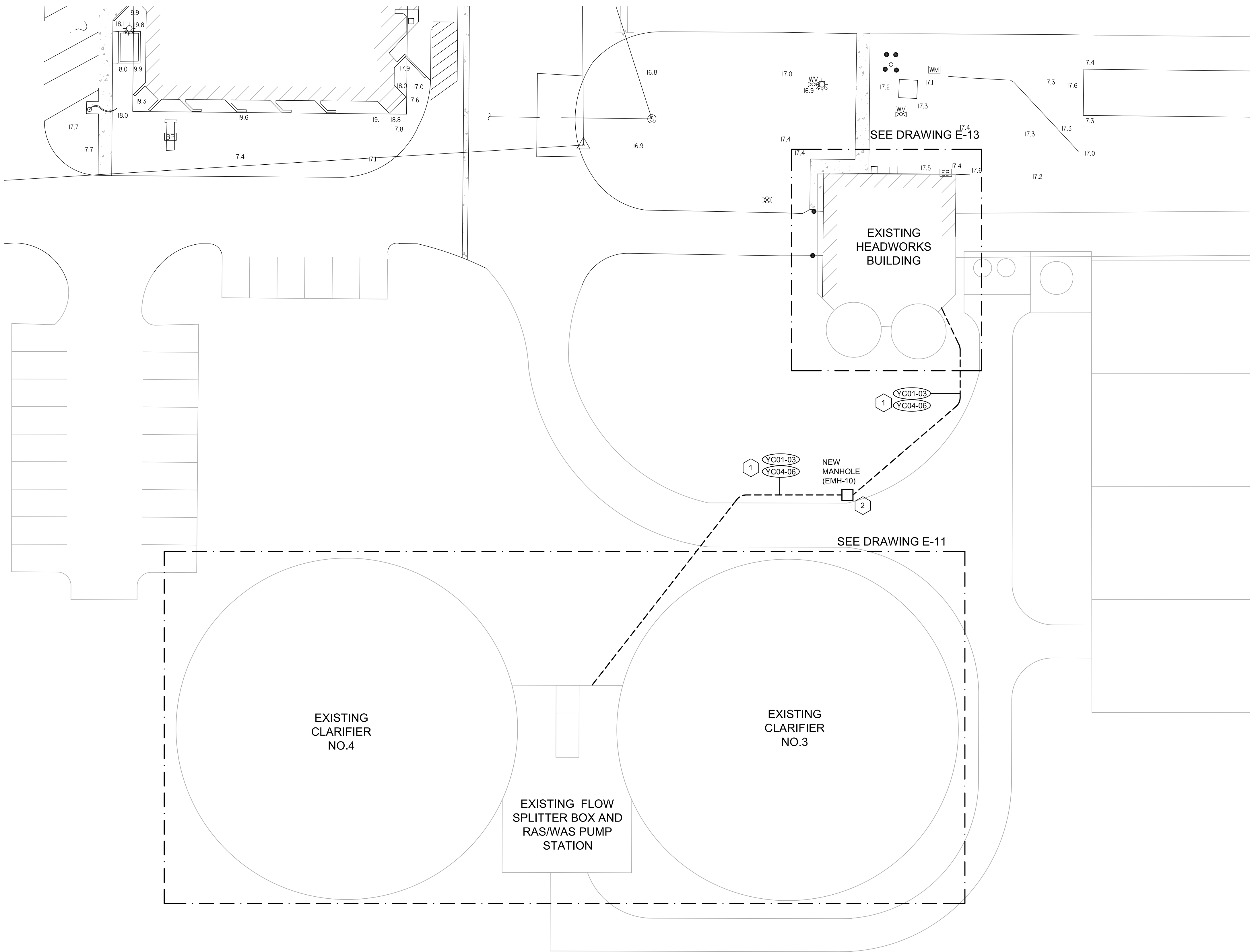
THEIN WIN, P.E.
No. 65722



MANATEE COUNTY
SWWRF CLARIFIER 3&4 REHABILITATION
ELECTRICAL
RAS PUMP STATION DEMOLITION PLAN

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

JOB NO. 7880J10
DRAWING NO. E-9



NOTES

1. ELECTRICAL CONDUIT ROUTING IS SHOWN FOR ILLUSTRATION PURPOSES ONLY. CONTRACTOR SHALL FIELD VERIFY THE CONDUIT ROUTING WITH EXISTING CONDITIONS AND PROPOSED PIPING, DRAINAGE, ETC. TO AVOID CONFLICTS AND ADJUST ACCORDINGLY. CONTRACTOR SHALL VISIT THE SITE AND DETERMINE CONDITIONS AT THE EXISTING SITE BEFORE SUBMITTING HIS/HER BID. SOME CONDUIT ROUTINGS REQUIRE FIELD DETERMINATION OF THE ROUTINGS TO AVOID CONFLICTS WITH EXISTING CONDITIONS.
2. CONTRACTOR SHALL SAW CUT EXISTING SIDEWALK FOR CONDUIT CROSSING AND RESTORE TO MATCH EXISTING CONDITION.
3. NO CONDUIT SHALL PENETRATE AN OUTDOOR ELECTRICAL PANEL FROM THE TOP. FOR OUTDOOR ELECTRICAL PANELS, ALL CONDUIT PENETRATIONS SHALL BE FROM THE BOTTOM OR SIDE. PROVIDE NEMA 4X 316 STAINLESS STEEL J-BOX AS NECESSARY TO ASSIST CONDUITS ENTERING OUTDOOR ELECTRICAL PANEL.

KEYED NOTES

1. CONTRACTOR SHALL KEEP THE MINIMUM SEPARATION BETWEEN POWER AND INSTRUMENTATION YARD CONDUITS AS PER DRAWING E-2, NOTE 22.
2. CONTRACTOR SHALL KEEP THE SEPARATION OF POWER AND INSTRUMENTATION CABLES IN THE NEW MANHOLE AS MUCH AS POSSIBLE BY ROUTING POWER TO ONE SIDE OF THE MANHOLE AND INSTRUMENTATION CABLES ON THE OPPOSITE WALL. ALL CABLES PASSING THRU THE NEW MANHOLE SHALL BE 600V RATED AS PER SPECIFICATION 16120. SEE DETAIL NO.21 FOR NEW MANHOLE SIZE AND ADDITIONAL INFORMATION.

ELECTRICAL SITE PLAN
SCALE: 1"=20'-0"

LAST SAVED BY: win

REV	DATE	BY	DESCRIPTION

DESIGNED	TW
DRAWN	DGU
CHECKED	PFH
DATE	MARCH 2013

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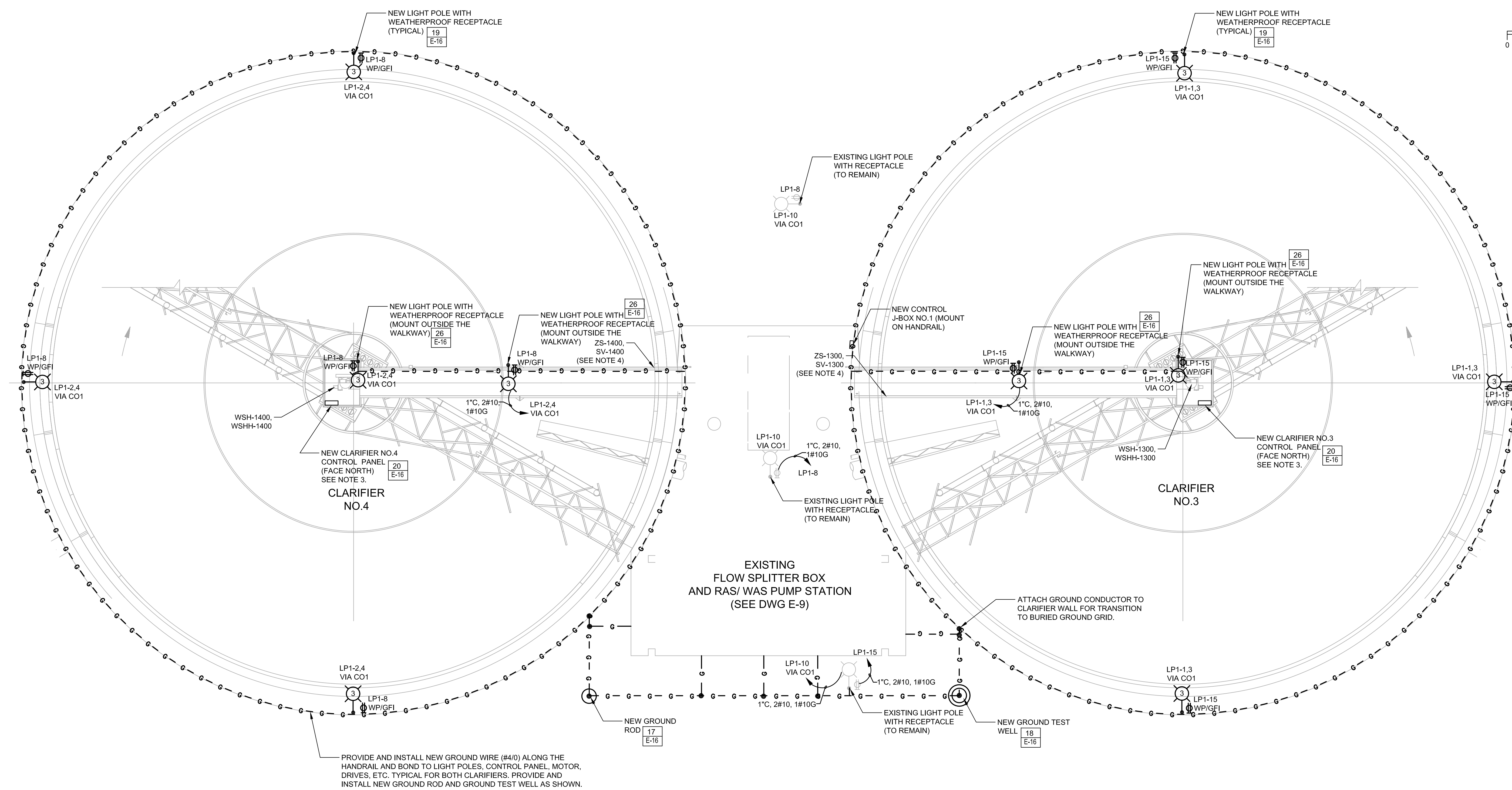
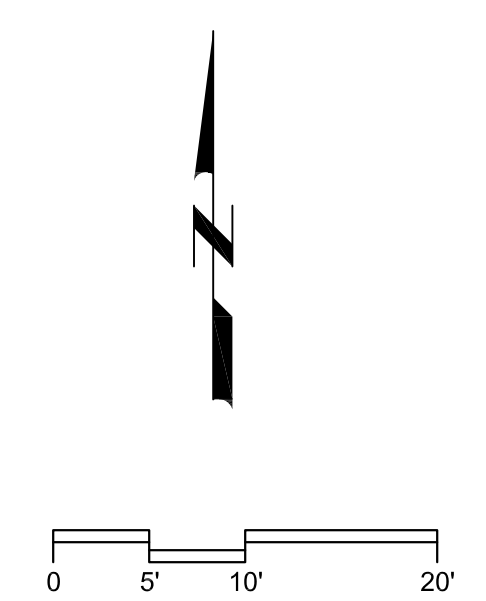
THEIN WIN, P.E.
No. 65722



MANATEE COUNTY
SWWRF CLARIFIER 3&4 REHABILITATION
ELECTRICAL
ELECTRICAL SITE PLAN

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

JOB NO. 7880J10
DRAWING NO. E-10



- NOTES:**
- BEFORE INSTALLATION, COORDINATE LOCATION OF FIXTURES WITH ALL OTHER DISCIPLINES AND EXISTING CONDITION TO AVOID CONFLICTS AND MOVE FIXTURES IF NECESSARY AFTER APPROVAL FROM ENGINEER.
 - ROUTING OF CONDUIT/CABLES NOT SHOWN ON PLAN VIEW FOR CLARITY. FIELD VERIFY AND ADJUST ROUTING AS NEEDED TO AVOID CONFLICTS. PROVIDE ALUMINUM STEP COVER FOR ALL EXPOSED CONDUITS TO AVOID BEING TRIPPING HAZARD. PROVIDE COMPLETE WORKING LIGHTING AND RECEPTACLE SYSTEM.
 - IN FRONT OF CLARIFIER CONTROL PANEL SHALL HAVE 42" CLEARANCE AS PER NEC REQUIREMENTS. PROVIDE 316 STAINLESS STEEL MOUNTING BRACKETS AND UNISTRUT FOR MOUNTING OF CLARIFIER CONTROL PANEL AND INSTALL ACCORDINGLY. OUTDOOR CONTROL PANEL SHALL FACED NORTH WHERE POSSIBLE.
 - COORDINATE WITH CLARIFIER SUPPLIER FOR ACTUAL LOCATION OF LIMIT SWITCH AND SPRAY WATER SOLENOID VALVE AND ADJUST CONDUIT ROUTING ACCORDINGLY.
 - ONLY HOMERUN CIRCUIT OF THE FIRST LIGHT IS SHOWN ON DRAWING. CONTRACTOR SHALL PROVIDE AND INSTALL THE SAME CIRCUIT TO NEXT LIGHT AS SHOWN ON DRAWINGS. REWIRE EXISTING LIGHT POLES AND RECEPTACLES TO NEW CIRCUITS AS SHOWN.
 - TOTAL VOLTAGE DROP FOR CIRCUIT (LP1-1.3) OF CLARIFIER NO.3 TO THE LAST LIGHT POLE IS 1.7%.
 - TOTAL VOLTAGE DROP FOR CIRCUIT (LP1-2.4) OF CLARIFIER NO.4 TO THE LAST LIGHT POLE IS 2.1%.
 - TOTAL VOLTAGE DROP FOR CIRCUIT (LP1-10) OF CLARIFIER'S EXISTING LIGHT POLES IS LESS THAN 1%..

PARTIAL CLARIFIER 3 AND 4 - ELECTRICAL PLAN
SCALE: 1"=10'-0"

LAST SAVED BY: mhw

REV	DATE	BY	DESCRIPTION

DESIGNED TW
DRAWN DEU
CHECKED PFH
DATE MARCH 2013

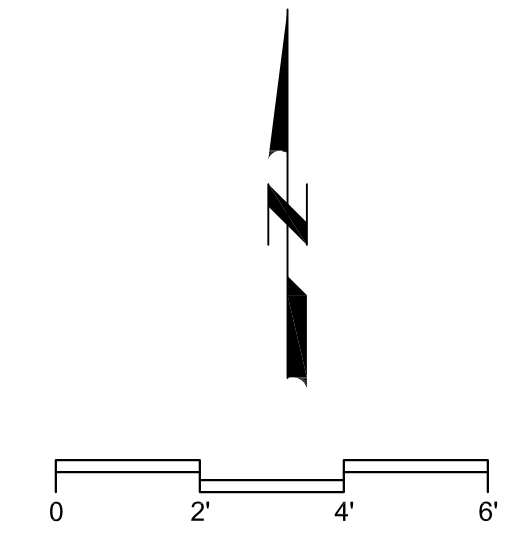
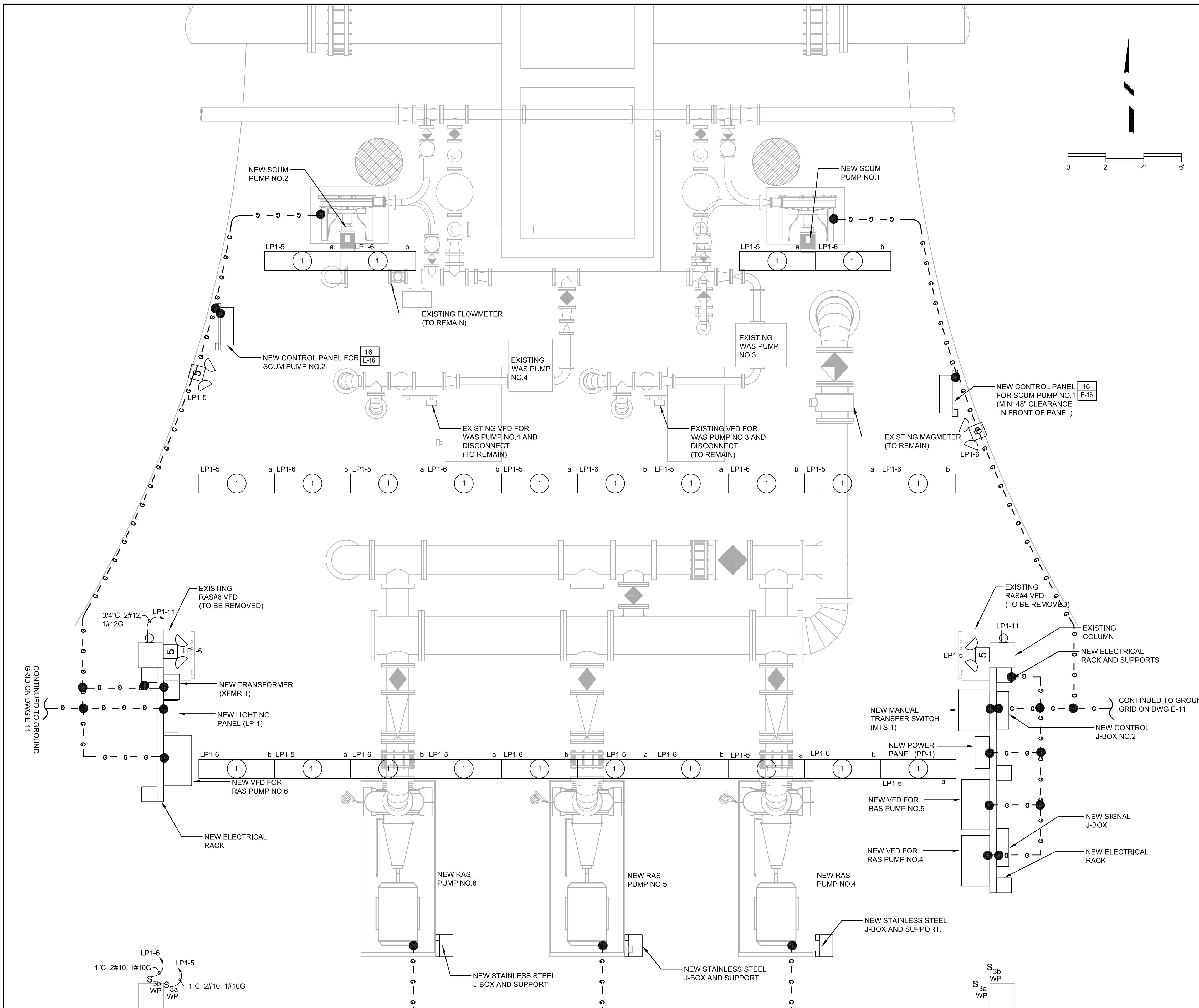
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MANATEE COUNTY
SWWRF CLARIFIER 3&4 REHABILITATION
ELECTRICAL
CLARIFIER ELECTRICAL PLAN

VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	JOB NO. 7880J10 DRAWING NO. E-11
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- NOTES:**
- BEFORE INSTALLATION, COORDINATE LOCATION OF FIXTURES WITH EXISTING STRUCTURAL BEAMS, PIPES, ETC. TO AVOID CONFLICTS AND MOVE FIXTURES IF NECESSARY AFTER APPROVAL FROM ENGINEER.
 - ROUTING OF CONDUIT/CABLES NOT SHOWN ON PLAN VIEW FOR CLARITY. FIELD VERIFY AND ADJUST ROUTING AS NEEDED TO AVOID CONFLICTS. PROVIDE ALUMINUM STEP COVER FOR ALL EXPOSED CONDUITS TO AVOID BEING TRIPPING HAZARD. PROVIDE COMPLETE WORKING LIGHTING AND RECEPTACLE SYSTEM.
 - MOUNT EMERGENCY LIGHT FIXTURES 8 FEET ABOVE FINISHED FLOOR.
 - CONTRACTOR SHALL PROVIDE AND INSTALL GROUNDING CONDUCTOR FROM THE GROUNDING GRID TO ALL NEW PANELS, PUMPS, DISCONNECTS, EXISTING STAIRWAYS, EXISTING LIGHT POLES, ETC. FOR A COMPLETE GROUNDING SYSTEM.

MODIFIED RAS/WAS PUMP STATION - ELECTRICAL PLAN
SCALE: 3/8"=1'-0"

DESIGNED	TW
DRAWN	DGU
CHECKED	PFH
DATE	MARCH 2013

REV	DATE	BY	DESCRIPTION

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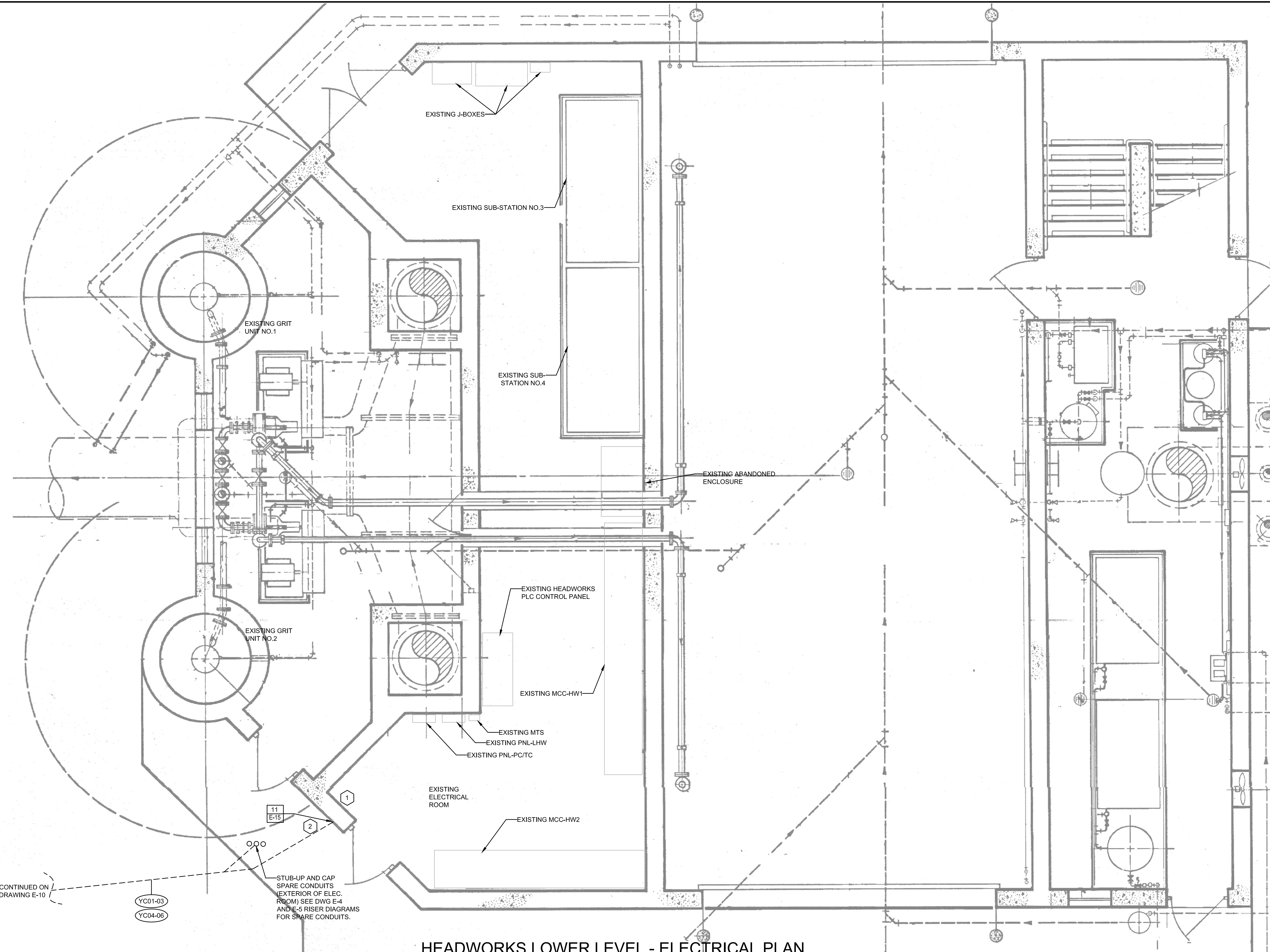
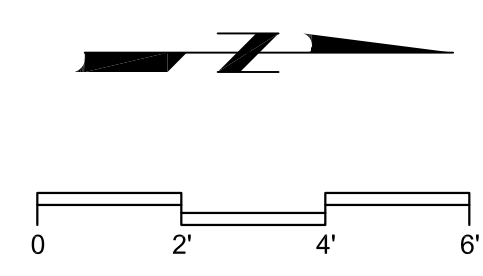
THEIN WIN, P.E.
No. 65722



MANATEE COUNTY
SWWRF CLARIFIER 3&4 REHABILITATION
ELECTRICAL
MODIFIED RAS/WAS PUMP STATION - ELECTRICAL PLAN

VERIFY SCALES	JOB NO. 7880J10
BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO. E-12
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	

LAST SAVED BY: nwn



- KEYED NOTES**
- 1 CONDUIT ROUTING IN THE ELECTRICAL ROOM IS NOT SHOWN FOR CLARITY. FIELD VERIFY AND ROUTE CONDUITS TO AVOID CONFLICTS WITH EXISTING LIGHT FIXTURES AND EXISTING EQUIPMENTS.
 - 2 FIELD LOCATE EXISTING GROUNDING SYSTEM AT THE HEADWORKS BUILDING. IF EXISTING GROUND GRID CANNOT BE LOCATED, PROVIDE AND INSTALL A NEW GROUND ROD AND BOND #4/0 WIRE FROM THE DUCTBANK TO THE GROUND ROD.

HEADWORKS LOWER LEVEL - ELECTRICAL PLAN
SCALE: 3/8"=1'-0"

DESIGNED	TW
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CHECKED	PFH
DATE	MARCH 2013
REV	DATE BY DESCRIPTION
PROJECT NO:	7880J10
FILENAME:	7880J10-E-13.dwg

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MANATEE COUNTY
SWWRF CLARIFIER 3&4 REHABILITATION
ELECTRICAL
HEADWORKS LOWER LEVEL - ELECTRICAL PLAN

VERIFY SCALES
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JOB NO. 7880J10
DRAWING NO. E-13

LAST SAVED BY: WTW

EXISTING PNL. PC/TC SCHEDULE

BUS AMPS			LOAD	POLES	AMPS	BUS			AMPS	POLES	LOAD	BUS AMPS		
A	B	C				A	B	C				A	B	C
			TC	3	100	1	2	60	1	PC				
			CONTROL	1	20	7	8	20	1	EME. SHOWER & RECP. POLES AER. TANK				
			RECP. FINAL CLARIFIER #3	1	20	9	10	20	1	STR. POLES & CENTER POLES AER. TANK				
			RECP. PRIMARY CLARIFIER WEST	1	20	11	12	20	1	RECEP. POLES WEST AERATION TANK				
			10' POLES HEADWORKS SAMPLER RECP.	1	20	13	14	20	1	RECEP. PRIMARY CLARIFIER EAST				
			10' POLES HEADWORKS WEST	1	20	15	16	20	1	RECEP. LIGHT POLES				
			STAIRWELL LIGHTS HEADWORKS	1	20	17	18	20	1	RECEP. LIGHT POLES				
			SPACE	-	-	19	20	-	-	SPACE				
			SPACE	-	-	21	22	-	-	SPACE				
			SPACE	-	-	23	24	-	-	SPACE				
			STREET POLES PRIMARY CLARIFIER WEST	1	20	1	2	20	1	STREET POLES PRIMARY CLARIFIER EAST				
			10' POLES CENTER AERATION TANK	1	20	3	4	20	1	20' POLES AERATION TANK				
			10' POLES FINAL CLARIFIER #3	1	20	5	6	20	1	10' POLES FINAL CLARIFIER SOUTH				
			10' PO. AER. TANK EAST. 10' PO. PRIM. CLAR. WEST	1	20	7	8	20	1	10' POLES PRIMARY CLARIFIER WEST				
			10' PO. & OUTSIDE LIGHTS ON HEADWORKS EAST	1	20	9	10	20	1	10' POLES PRIMARY CLARIFIER NORTH				
			10' PO. & OUTSIDE LIGHTS ON HEADWORKS WEST	1	20	11	12	20	1	10' POLES AERATION WEST AERATION WEST				
			SPACE	-	-	13	14	-	-	SPACE				
			SPACE	-	-	15	16	-	-	SPACE				
			SPACE	-	-	17	18	-	-	SPACE				
			USED	1	20	1	2	20	1	USED				
			USED	1	20	3	4	20	1	USED				
			USED	1	20	5	6	20	1	USED				
			USED	1	20	7	8	20	1	USED				
			USED	1	20	9	10	20	1	USED				
			USED	1	20	11	12	20	1	USED				

RATED VOLTAGE: 120/208 277/480 3 PHASE, 4 WIRE BRANCH POLES 12 20 24 42

RATED AMPS: 100 225 400 _____ CABINET: SURFACE FLUSH

NEUTRAL BUS 100% 150% 200% _____ GROUND BUS HINGED DOOR KEYED DOOR LATCH LOCATION: RAS/WAS PUMP STATION

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

MAIN LUGS ONLY MAIN _____ AMPS BREAKER _____ TO BE GFI BREAKERS

PANELBOARD MUST BE RATED TO INTERRUPT A SHORT CIRCUIT ISC OF _____ 18,000 AMPS SYMMETRICAL.

MFRS. SQUARE D COPPER BUSSES MAIN LUGS _____ SETS SIZE: _____

NO LOAD IS ADDED TO EXISTING PC/TC PANEL.

NEW PANELBOARD SCHEDULE 16LP-1

BUS AMPS			LOAD	POLES	AMPS	BUS			AMPS	POLES	LOAD	BUS AMPS		
A	B	C				A	B	C				A	B	C
2.4			LIGHTING - CLARIFIER NO.3	2	20	1	2	20	2	LIGHTING - CLARIFIER NO.4	2.4			
2.4			LIGHTING - RAS/WAS AREA	1	20	3	4	20	1	LIGHTING - RAS/WAS AREA	2.4			
-	6.4		SPARE	1	20	5	6	20	1	RECEPTACLE - CLARIFIER NO.4	10.5		6.4	
-	0.5		LIGHTING CONTACTOR (CO1)	1	20	7	8	20	1	LIGHTING - EXISTING LIGHT POLES	2.5			
-	3.0		RECEPTACLE - RAW/WAS AREA	1	20	9	10	20	1	SPARE	-		-	
-			SPARE	1	20	11	12	20	1	SPARE	-		-	
-	9.0		RECEPTACLE - CLARIFIER NO.3	1	20	13	14	20	1	SPARE	-		-	
-			SPARE	1	20	15	16	20	3	SPD	-		-	
-			SPARE	1	20	17	18	20			-		-	
-			SPARE	1	20	19	20				-		-	

TOTAL AMPS: BUS A 15.3 BUS B 16.8 BUS C 15.8 CONNECTED Kva 5.8

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

RATED AMPS: 100 225 400 _____ CABINET: SURFACE FLUSH

NEUTRAL BUS 100% 150% 200% _____ GROUND BUS HINGED DOOR KEYED DOOR LATCH LOCATION: RAS/WAS PUMP STATION

CIRCUIT BREAKER (BOLT-IN) BRANCH DEVICES SPD ENCLOSURE TYPE NEMA 1 NEMA 3R NEMA 4X 316 STAINLESS STEEL ENCLOSURE

MAIN LUGS ONLY MAIN _____ AMPS BREAKER _____ TO BE GFI BREAKERS

PANELBOARD MUST BE RATED TO INTERRUPT A SHORT CIRCUIT ISC OF _____ 18,000 AMPS SYMMETRICAL.

APPROVED MFRS. SEE SPECIFICATION. COPPER BUSSES MAIN LUGS _____ SETS SIZE: _____

LUMINAIRE SCHEDULE

TYPE	VOLTS	DESCRIPTION	MANUFACTURER	CATALOG NO	LAMPS	MOUNTING	REMARKS
1	120	ENCLOSED POLYCARBONATE REFRACTOR U.L. LISTED, SUITABLE FOR DAMP LOCATION DIE CAST ALUM. HOUSING	COLUMBIA	WCW4-232-3EU-GLR	2-32T8/35K-FLUOR 2850 LUMENS	SURFACE	MOUNT ON THE CEILING BETWEEN EXISTING STRUCTURAL BEAMS.
2	120	COMPACT EMERGENCY LIGHTING UNIT	MCPHILBEN	NC6N-50-PNC-SDA-PS1-DCS	2-50W HALOGEN	SURFACE	MOUNT 8' A.F.F.
3	208	RAVEN SMALL RCS SERIES, TYPE III, SITE LIGHT POLE	SPAULDING	RCS-A4-P10-H3-F-PS-RPA	100 PSMH (ED-17)	POLE MOUNT	FURNISH WITH ALUMINUM POLE. SEE DETAIL.

LAST SAVED BY: win

REV	DATE	BY	DESCRIPTION

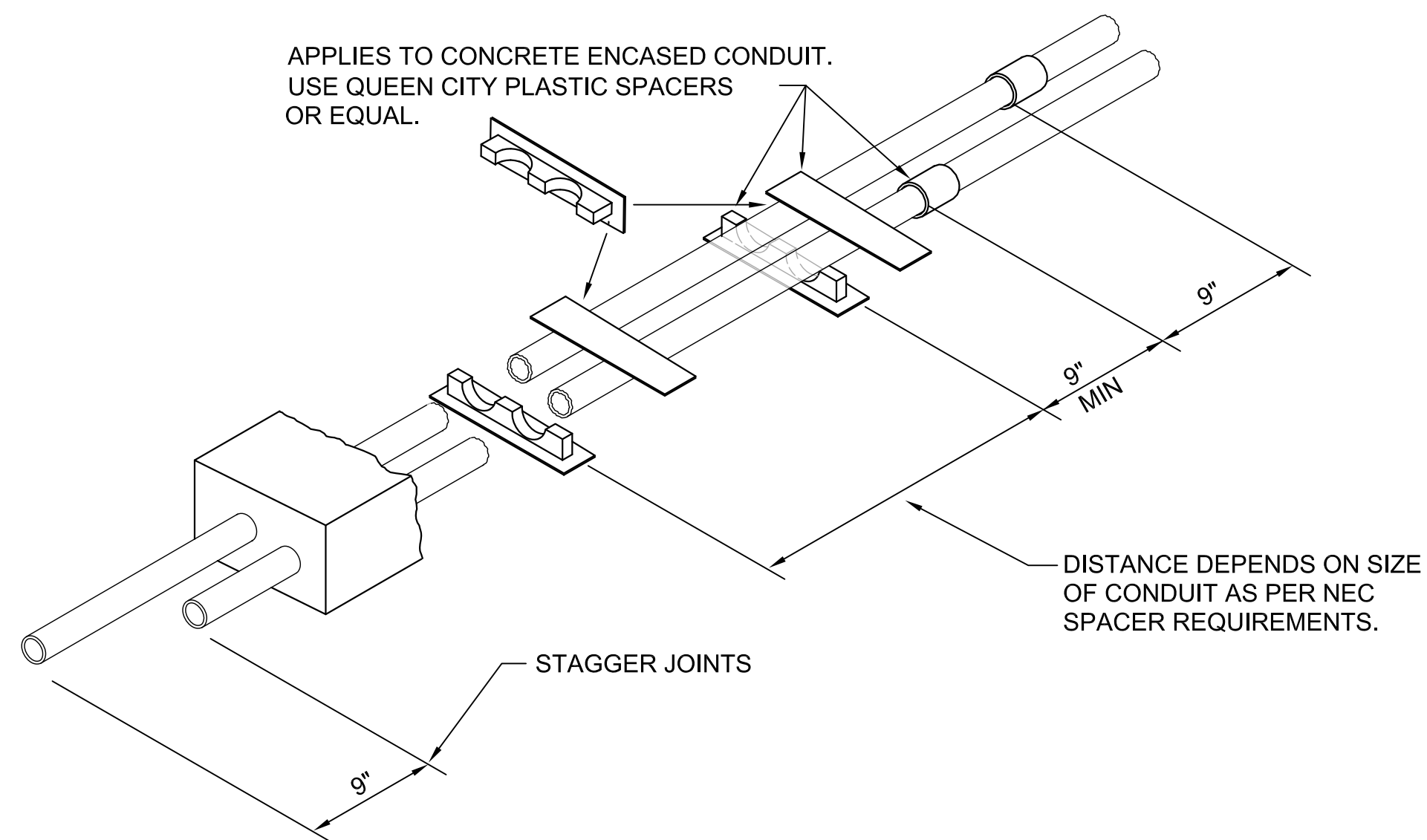
DESIGNED TW	HILLERS ELECTRICAL ENGINEERING, INC. 23257 STATE ROAD 7, SUITE 100 BOCA RATON, FLORIDA 33428 (561) 451-1915 (561) 451-4886 FAX LICENSE NO: EB 0006877
DRAWN DGU	
CHECKED PFH	
DATE	
MARCH 2013	

THEIN WIN, P.E.
No. 65722



MANATEE COUNTY	
SWWRF CLARIFIER 3&4 REHABILITATION	
ELECTRICAL SCHEDULES	

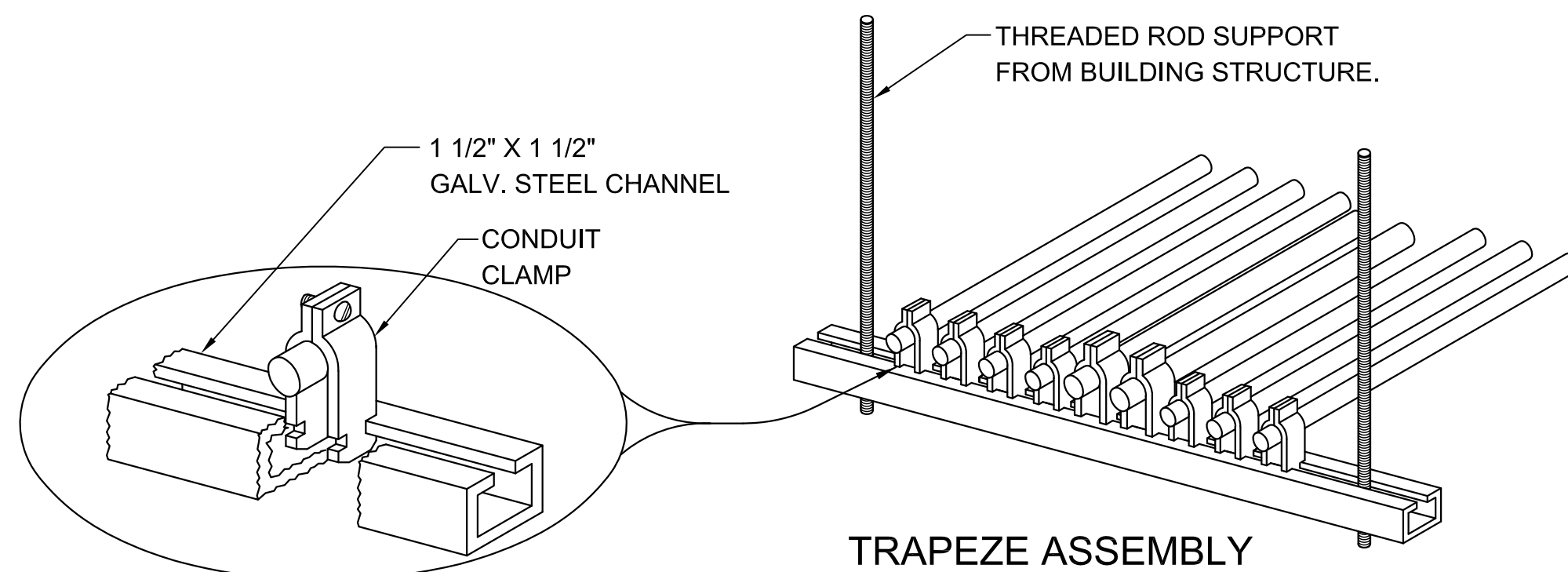
VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	JOB NO. 7880J10 DRAWING NO. E-14
--	---



1 HORIZONTAL STAGGERING OF SPACERS AND JOINTS
VAR. NOT TO SCALE

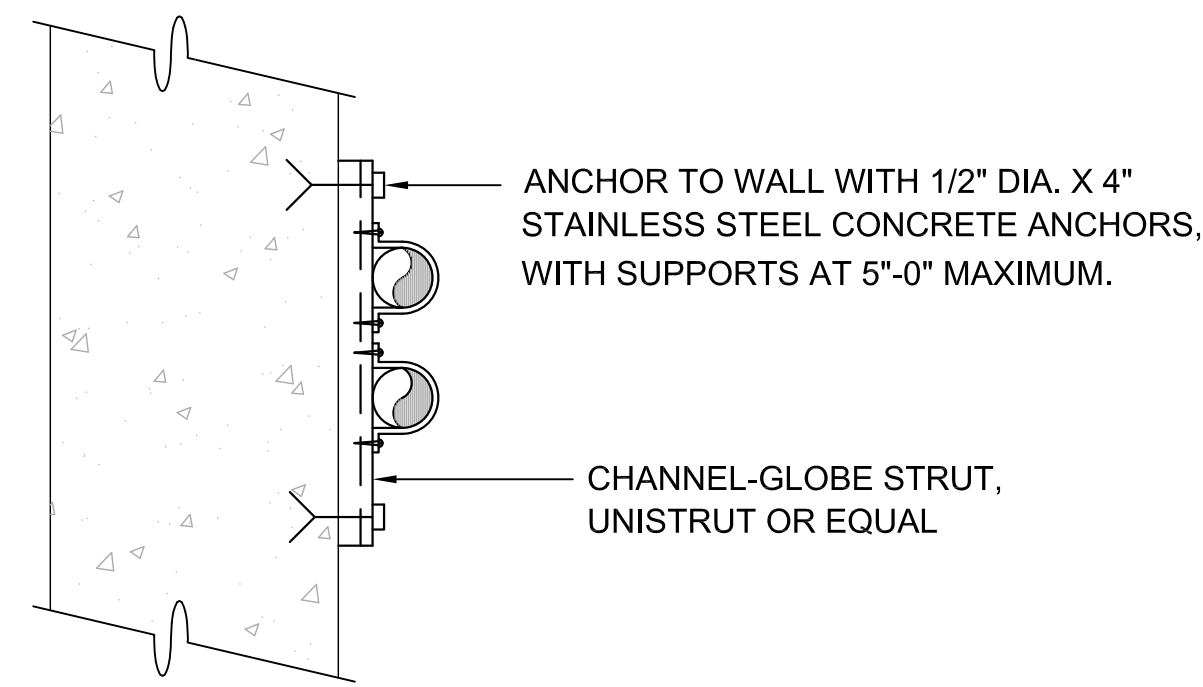
NOTES:

1. THIS DETAIL TYPICAL FOR BOTH VERTICAL AND HORIZONTAL MOUNTING
2. CHANNEL AND ALL SUPPORT DEVICES TO BE HOT DIP GALVANIZED STEEL. FIELD COAT ALL CUTS, ETC. TO MATCH.
3. CHANNELS TO BE SPACED 5" MAXIMUM.

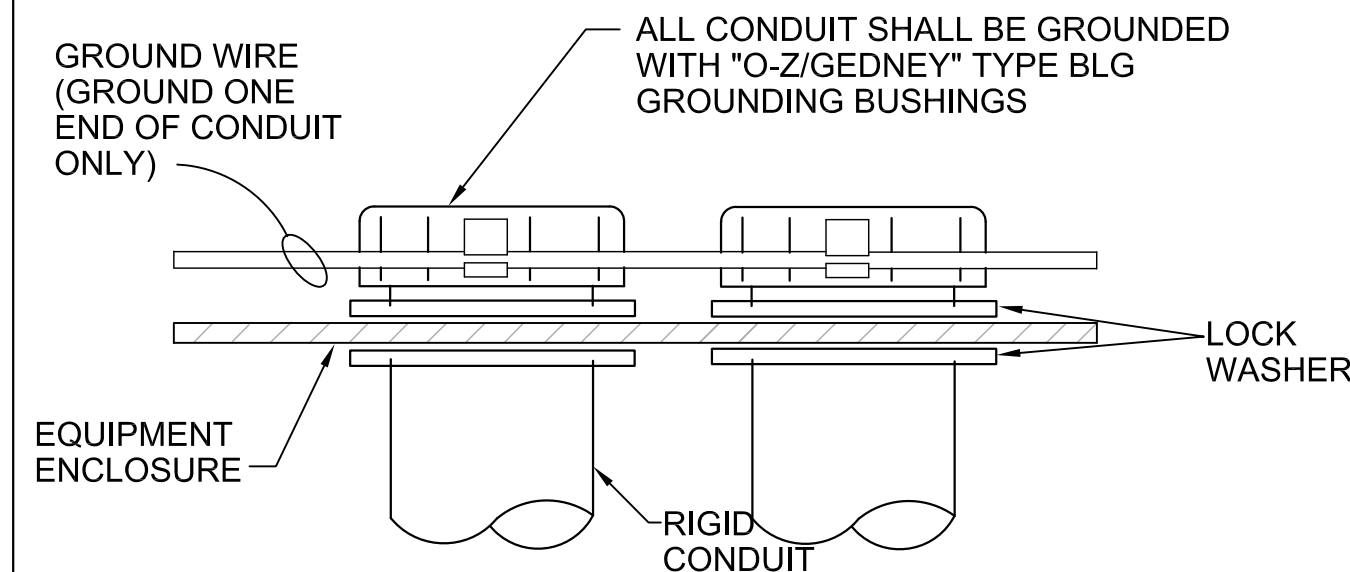


CONDUIT PIPE STRAP MOUNTING DETAILS

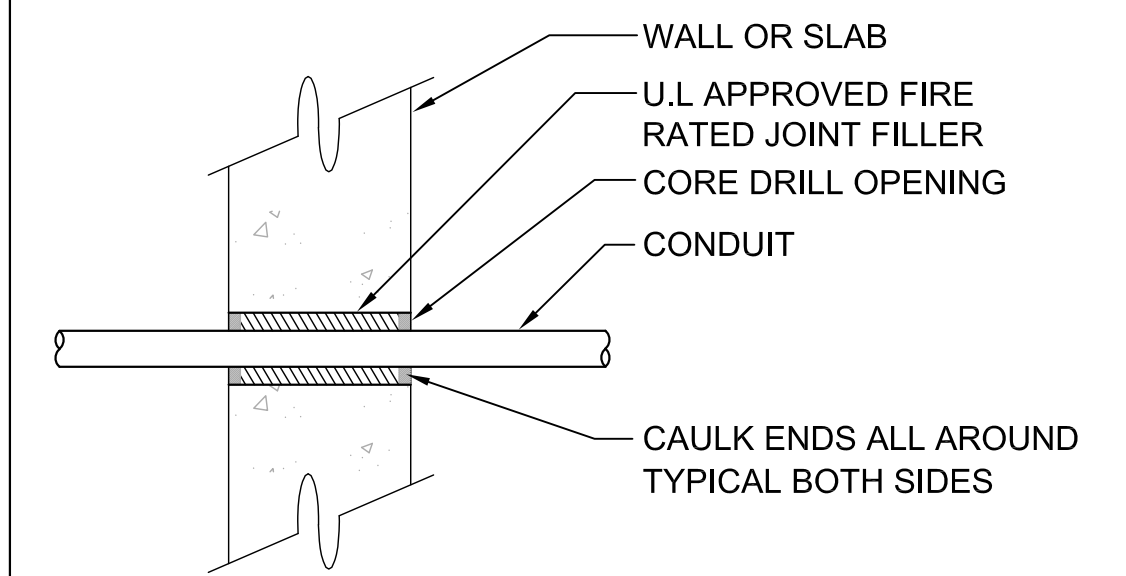
5 CONDUIT SUPPORT
VAR. NOT TO SCALE



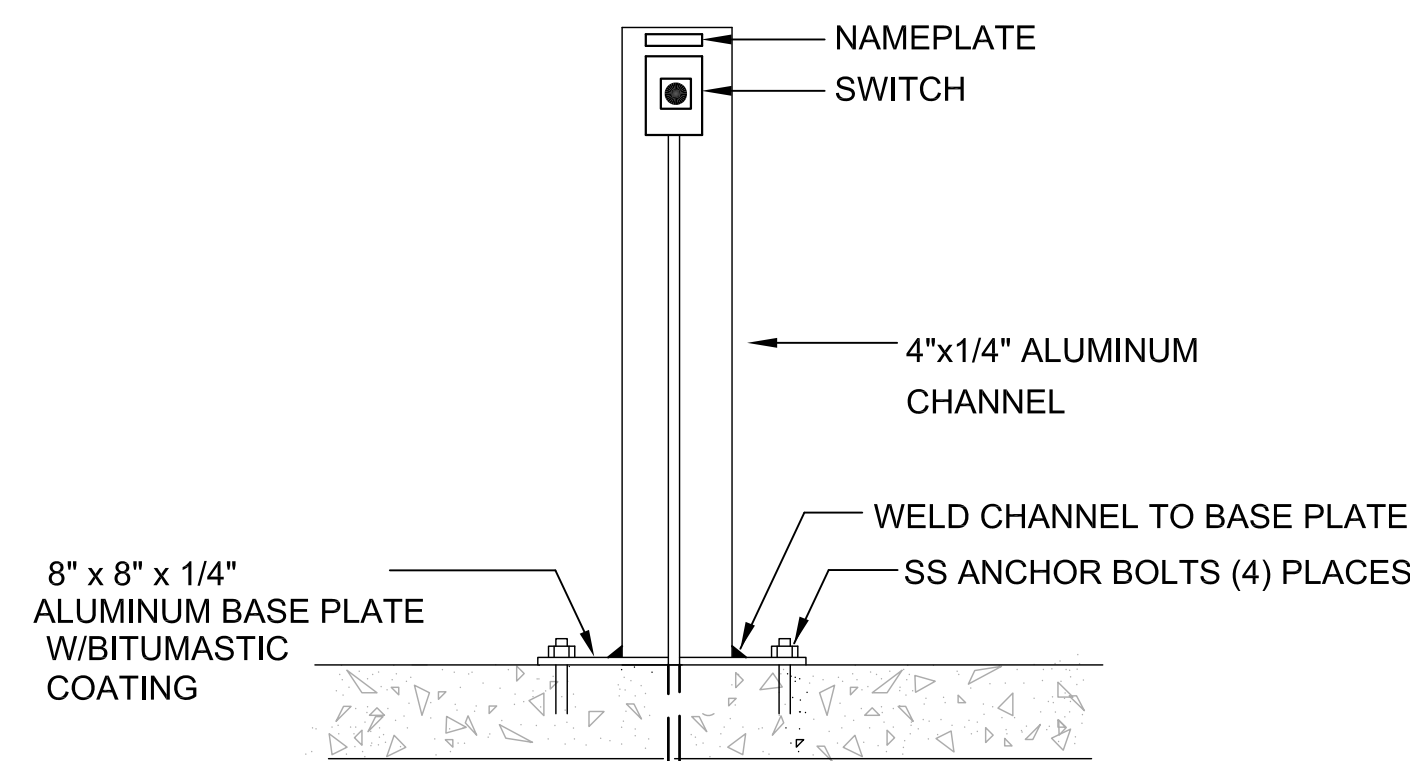
2 CONDUIT SUPPORT
VAR. NOT TO SCALE



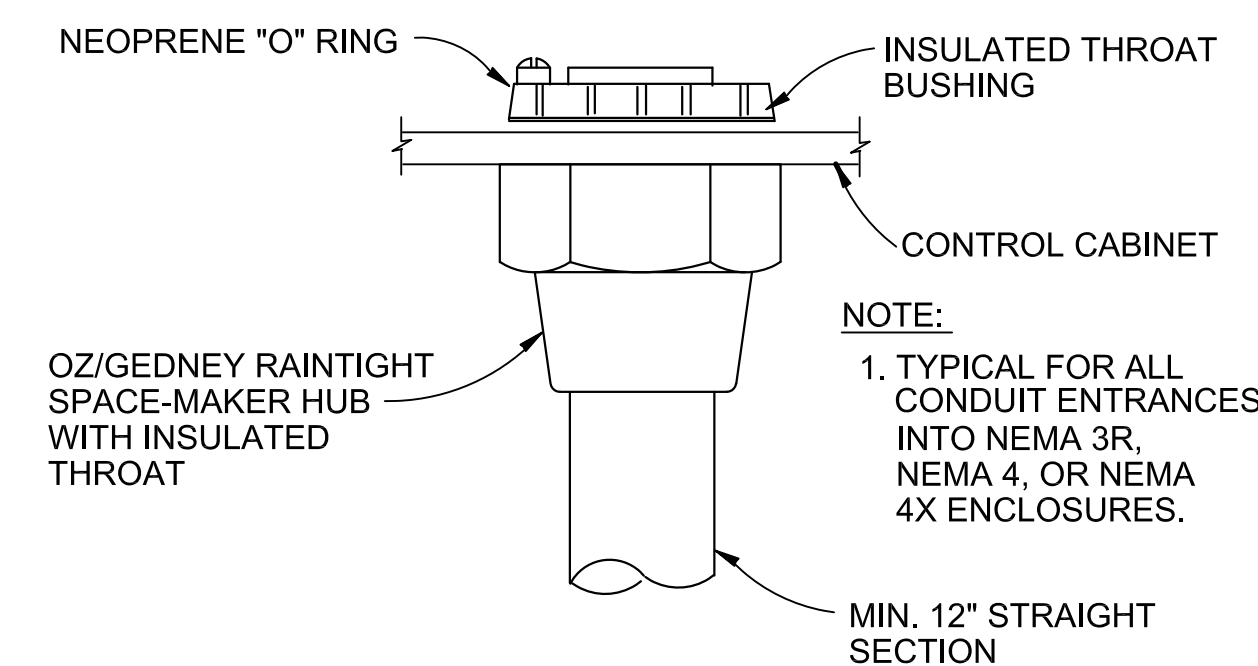
3 CONDUIT GROUNDED
VAR. NOT TO SCALE



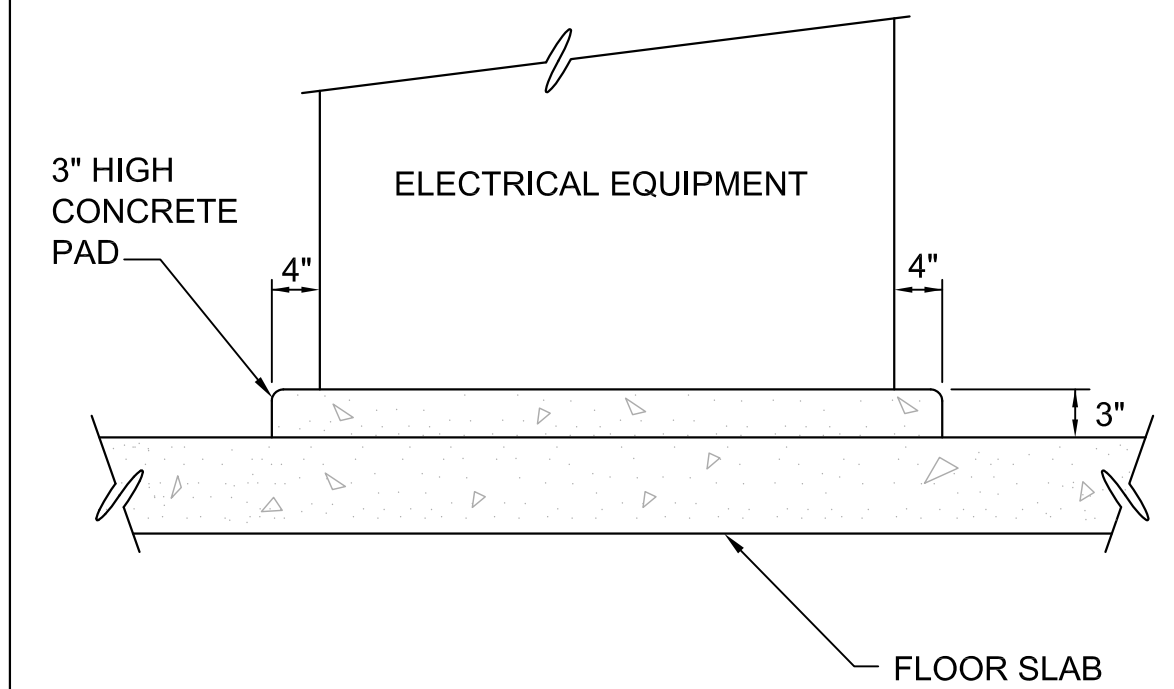
4 CONDUIT PENETRATION AT WALL OR SLAB
VAR. NOT TO SCALE



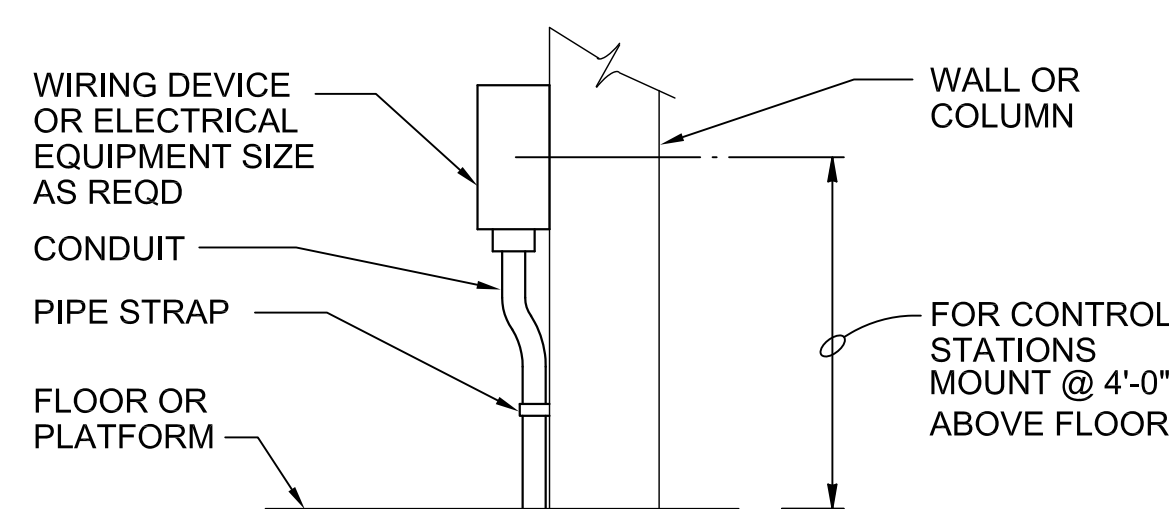
6 SWITCH PEDESTAL
VAR. NOT TO SCALE



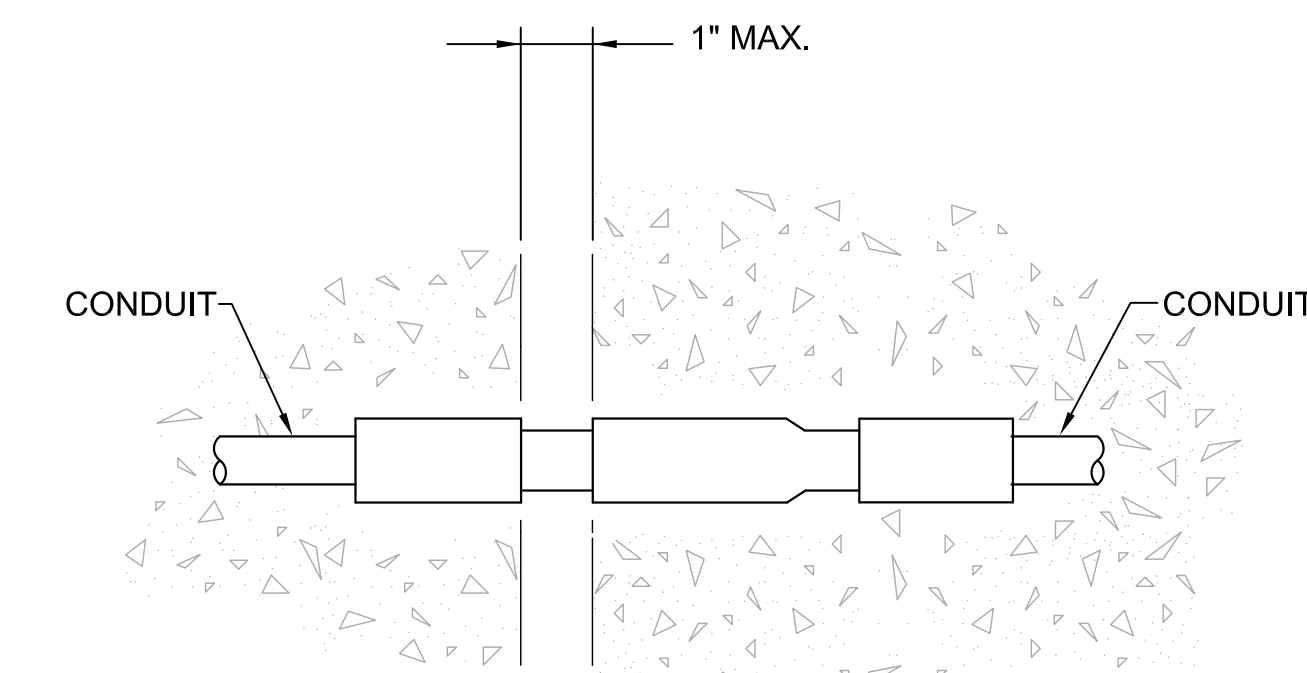
7 CONDUIT HUB
VAR. NOT TO SCALE



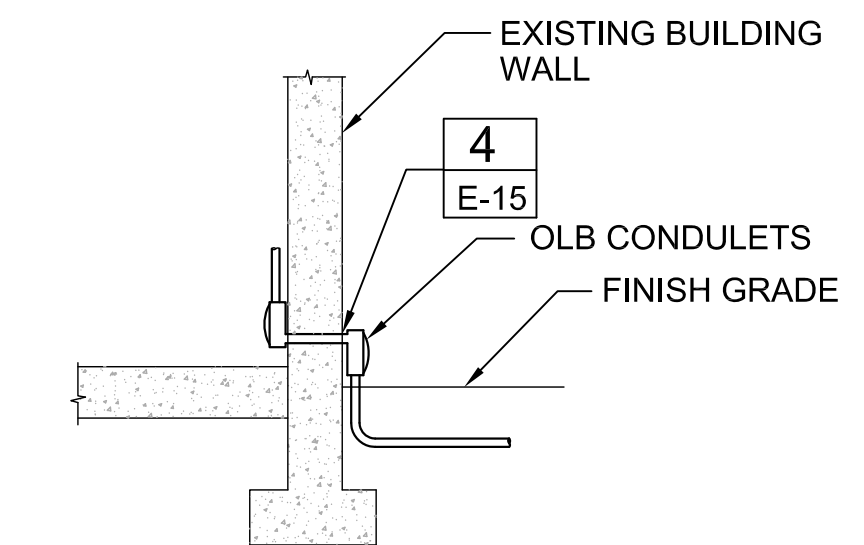
8 EQUIPMENT HOUSE KEEPING PAD
VAR. NOT TO SCALE



9 WALL OR COLUMN MOUNTED DEVICE
VAR. NOT TO SCALE



10 EXPANSION COUPLING
VAR. NOT TO SCALE



11 CONDUIT ENTRANCE
VAR. NOT TO SCALE

DESIGNED	TW		
DRAWN	DGU		
CHECKED	PFH		
DATE	MARCH 2013		
REV	DATE	BY	DESCRIPTION

PROJECT NO:	7880J10
FILENAME:	7880J10-E-15.dwg

HILLERS ELECTRICAL ENGINEERING, INC.
23257 STATE ROAD 7, SUITE 100
BOCA RATON, FLORIDA 33428
(561) 451-9165
(561) 451-4886 FAX
LICENSE NO: EB 0006877

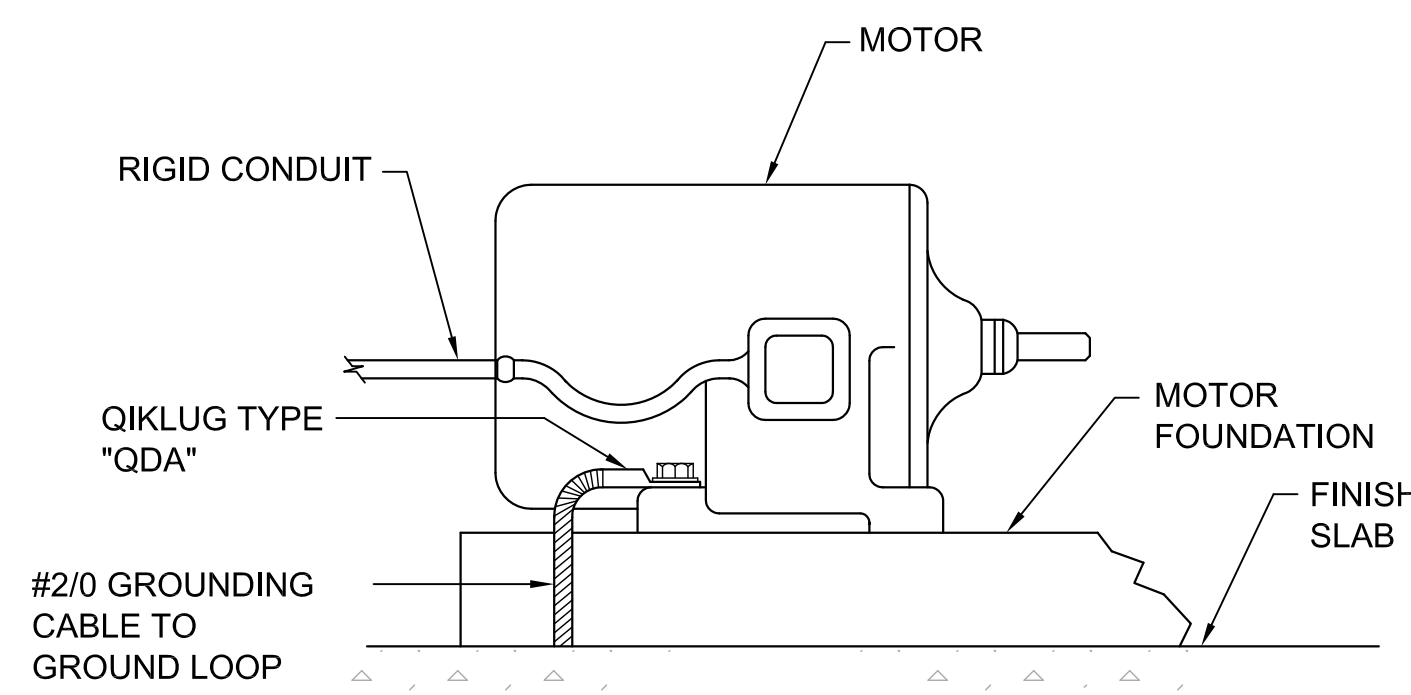
THEIN WIN, P.E.
No. 65722



MANATEE COUNTY
SWWRF CLARIFIER 3&4 REHABILITATION
ELECTRICAL
ELECTRICAL DETAILS - SHEET 1

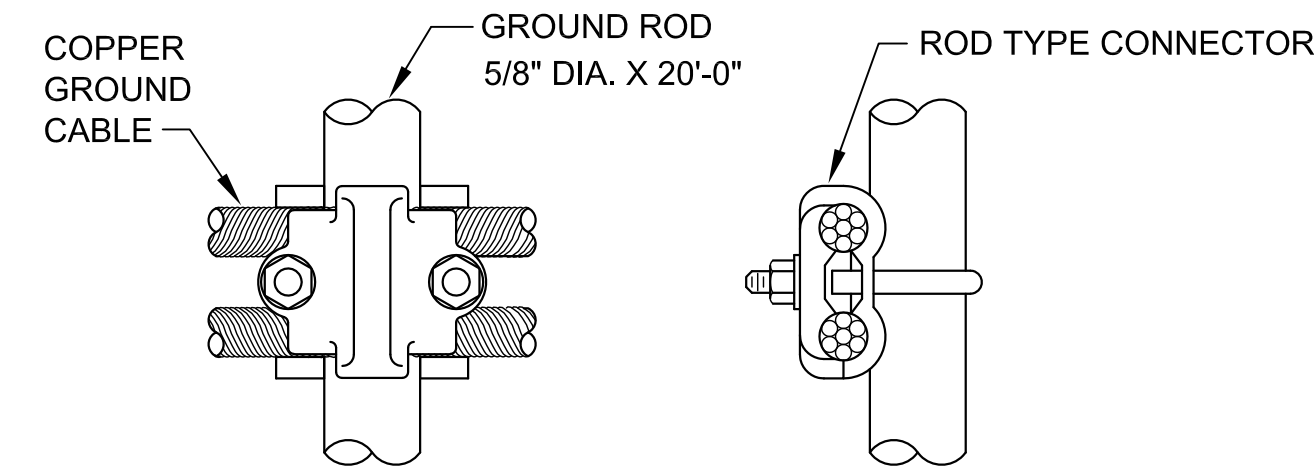
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IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	

LAST SAVED BY: WIN

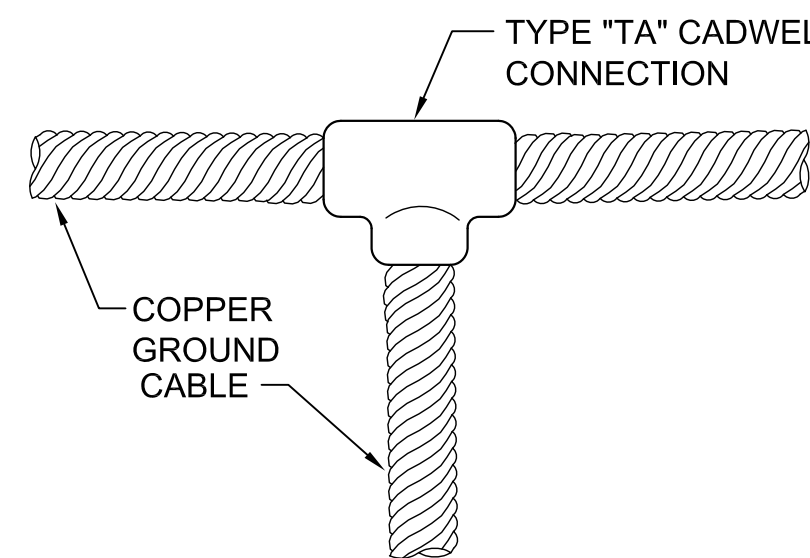


NOTE:
THIS GROUND IS IN ADDITION TO THE GROUND FROM THE MAIN ELECTRICAL SERVICE.

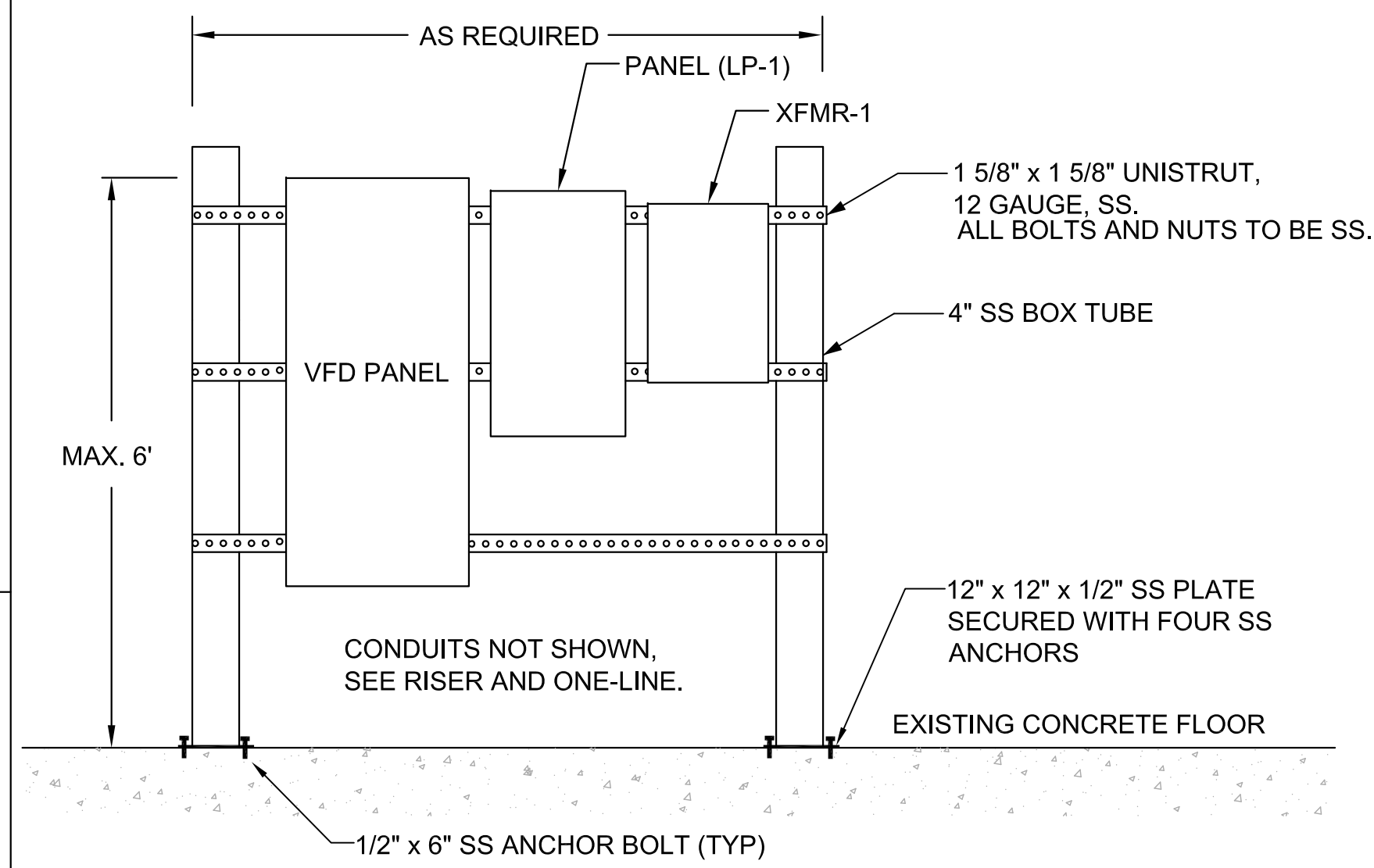
12 EQUIPMENT GROUNDING DETAIL
VAR. (TYPICAL)
NOT TO SCALE



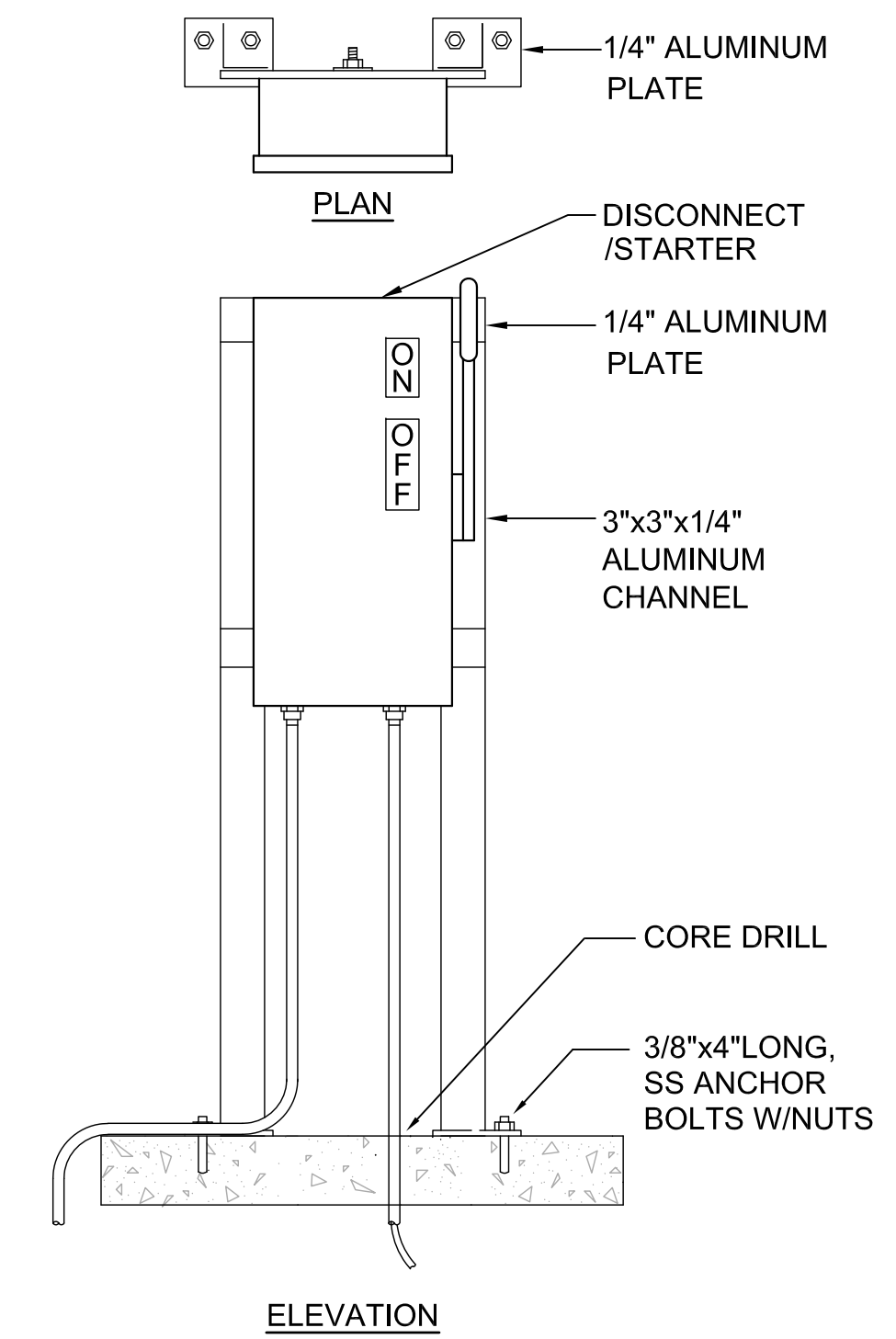
13 CABLE TO ROD CONNECTION
VAR. NOT TO SCALE



14 GROUND CABLE CONNECTION
VAR. NOT TO SCALE

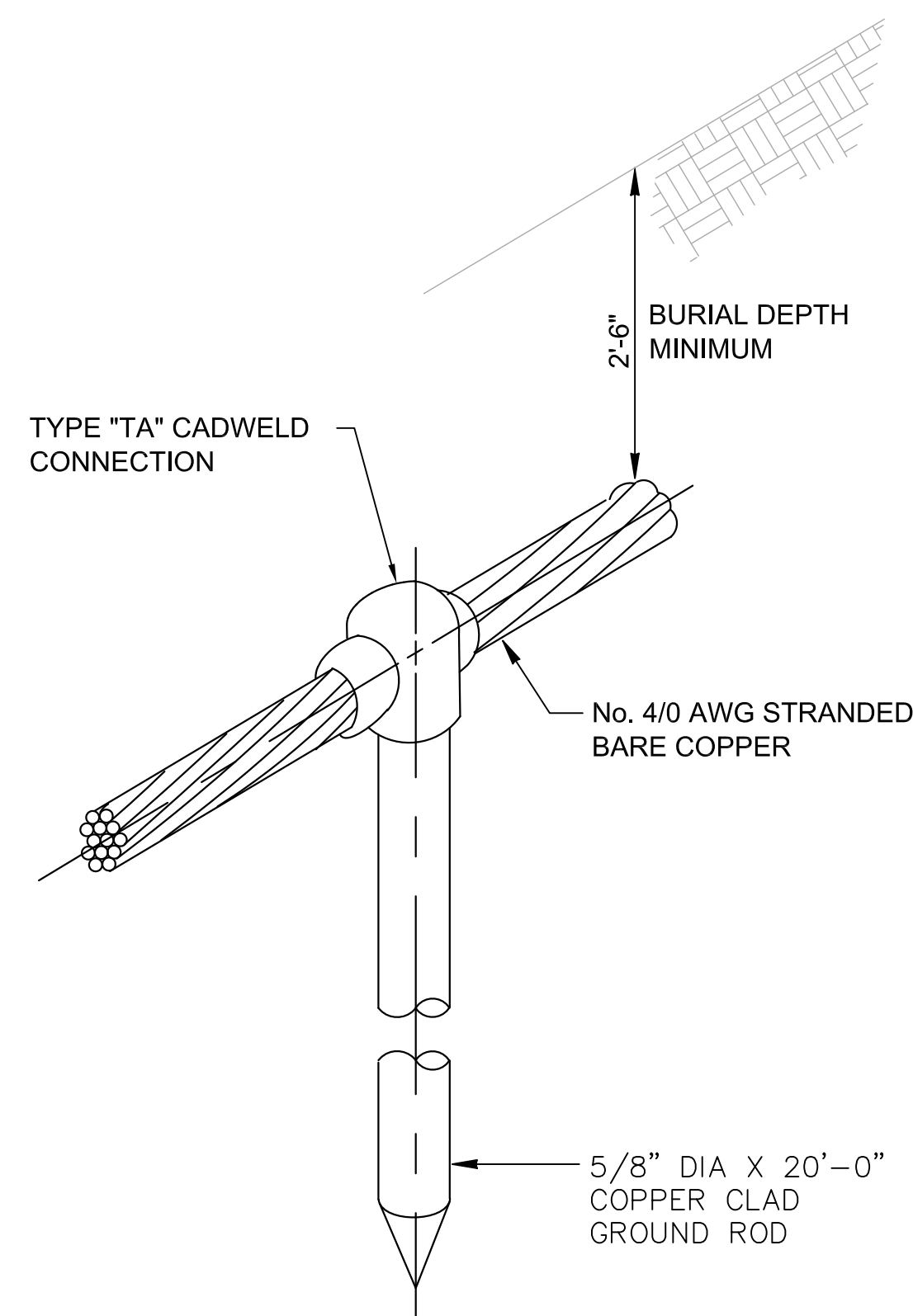


15 ELECTRICAL RACK NO.1 DETAIL
VAR. NOT TO SCALE

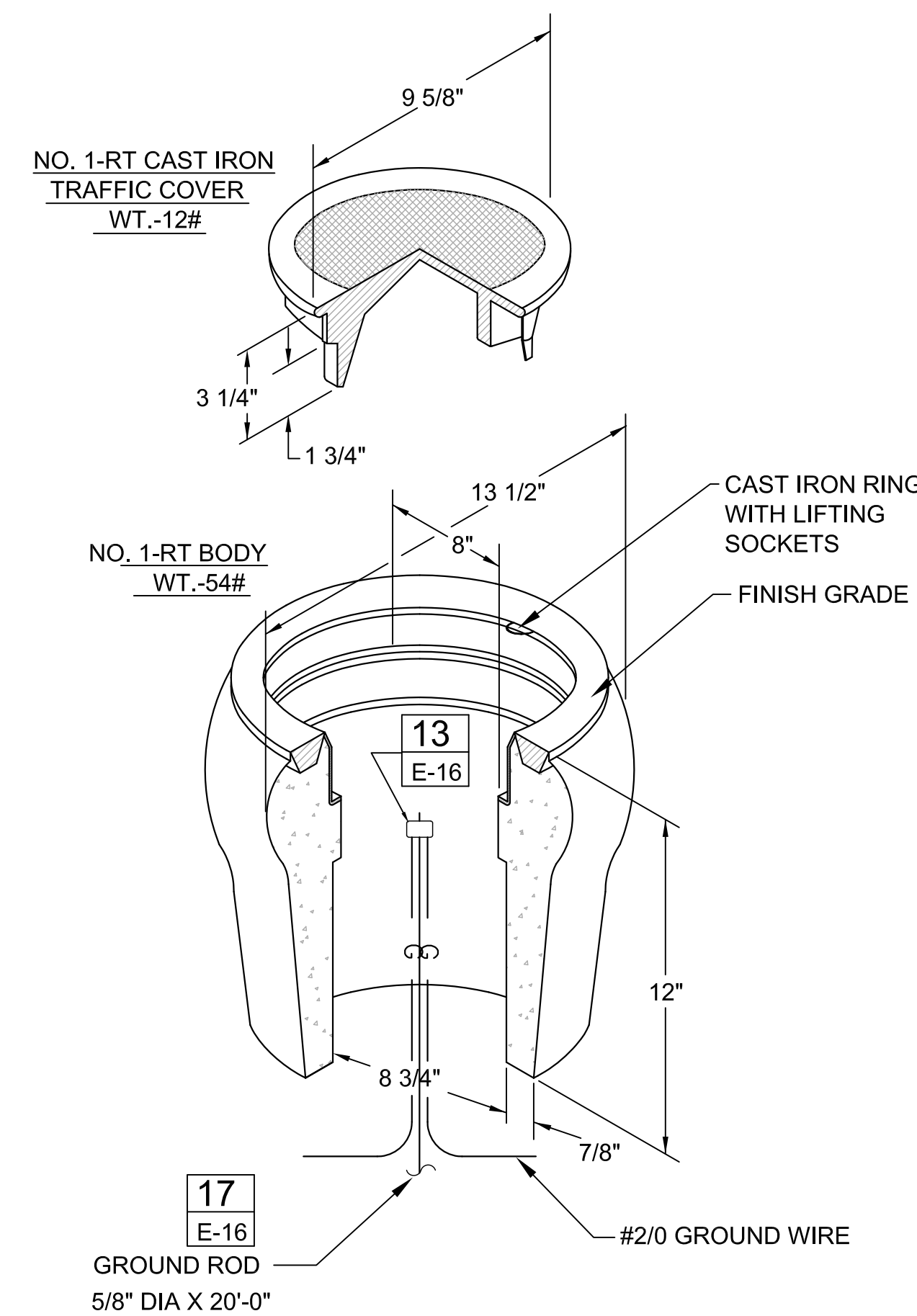


16 DISCONNECT, COMBINATION STARTER, OR SMALL PANEL PEDESTAL
VAR. NOT TO SCALE

NOTE: FOR SMALL CONTROL PANEL, MINI POWER ZONE, ETC. USE THIS DETAIL FOR MOUNTING. ADJUST THE ALUMINUM CHANNEL SIZE AS REQUIRED.

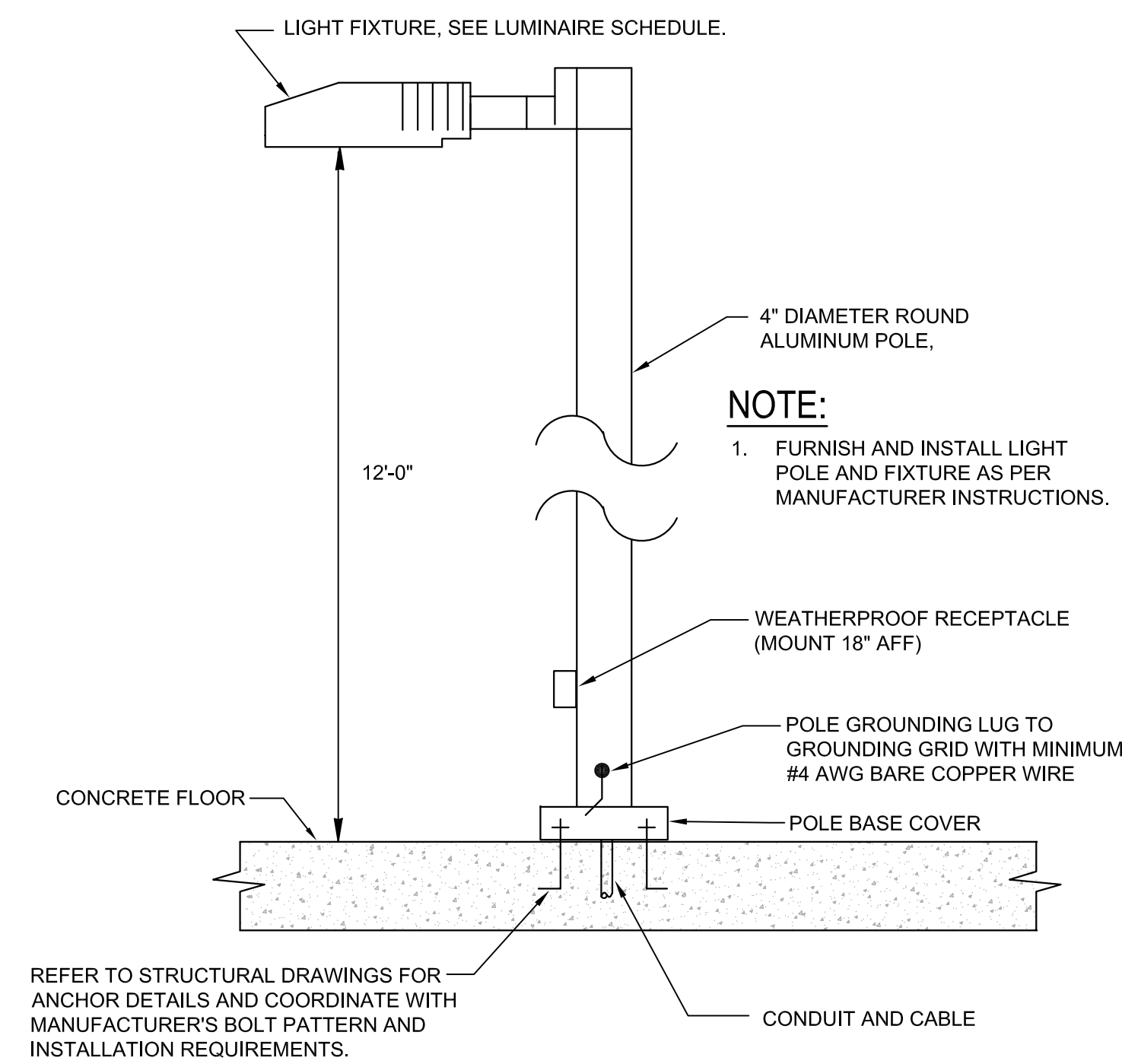


17 GROUND ROD DETAIL
VAR. NOT TO SCALE



17 E-16
GROUND ROD
5/8" DIA X 20'-0"

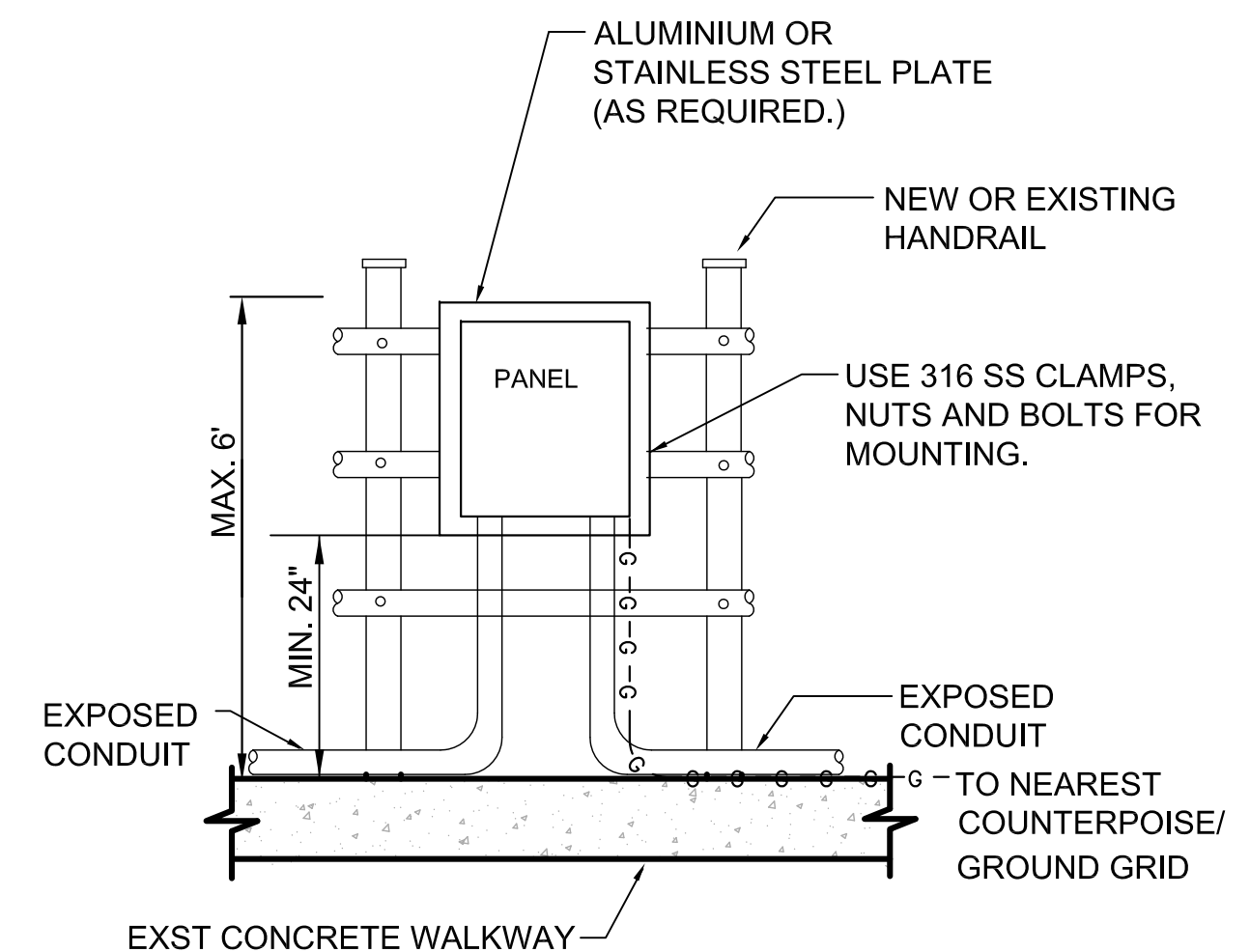
18 GROUND TEST WELL DETAIL
VAR. NOT TO SCALE



NOTE:
1. FURNISH AND INSTALL LIGHT POLE AND FIXTURE AS PER MANUFACTURER INSTRUCTIONS.

19 LIGHT POLE ON CONCRETE FLOOR DETAIL
VAR. NOT TO SCALE

WINDLOADING NOTE:
1. ALL POLE INSTALLATIONS MUST MEET FLORIDA BUILDING CODE WIND LOADING REQUIREMENT WITH APPROPRIATE WIND GUST FACTOR FOR THE LOCATION OF INSTALLATION. THE CONTRACTOR SHALL INCLUDE WITH THE SHOP DRAWING SUBMITTAL, A POLE WIND LOADING CALCULATION SIGNED & SEALED BY A STRUCTURAL ENGINEER REGISTERED IN THE STATE OF FLORIDA SHOWING THAT THE PROPOSED POLE AND INSTALLATIONS WILL MEET THE GIVEN WIND LOADING REQUIREMENT.



20 PANEL HANDRAIL MOUNTING DETAIL
VAR. NOT TO SCALE

LAST SAVED BY: mwh

REV	DATE	BY	DESCRIPTION

DESIGNED	TW
DRAWN	
DGU	
CHECKED	
PFH	
DATE	
MARCH 2013	

HILLERS ELECTRICAL ENGINEERING, INC.
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BOCA RATON, FLORIDA 33428
(561) 451-9165
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THEIN WIN, P.E.
No. 65722



MANATEE COUNTY
SWWRF CLARIFIER 3&4 REHABILITATION
ELECTRICAL
ELECTRICAL DETAILS - SHEET 2

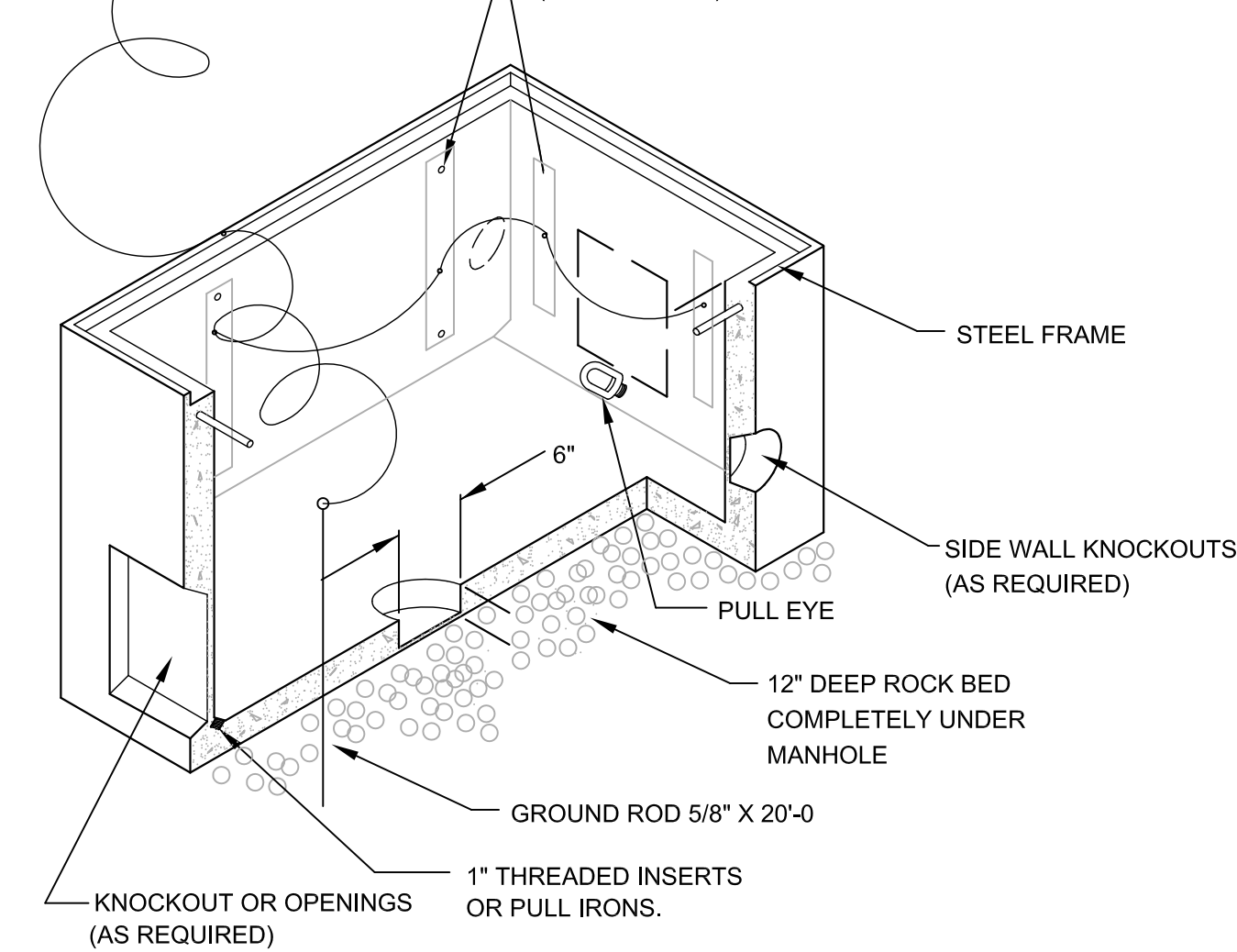
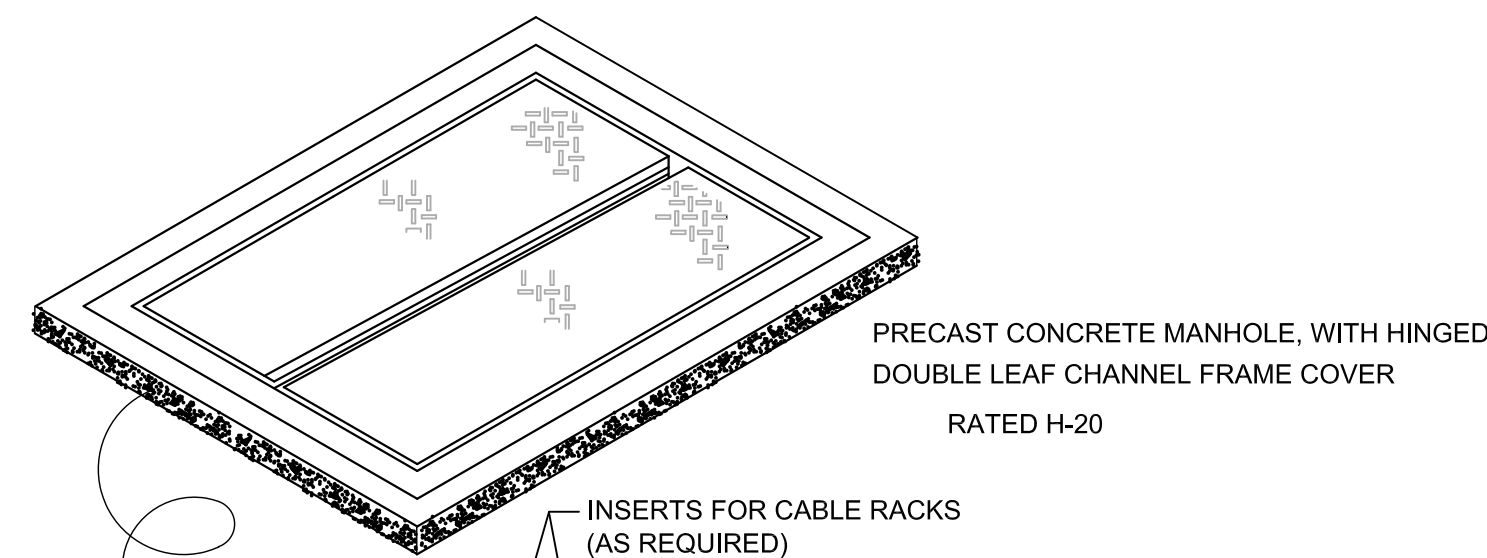
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BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO. E-16
0 1"	
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	

NOTES FOR ALL MANHOLES:

1. CONTRACTOR SHALL PROVIDE REQUIRED END BELL LOCATIONS TO MANHOLE MANUFACTURER BEFORE MANUFACTURING.
2. ALL MANHOLES SHALL BE H-20-44 TRAFFIC RATED.
3. THE HEIGHT OF CONDUIT ENTRANCES SHALL BE COORDINATED BY THE CONTRACTOR TO ACCOMMODATE OTHER UTILITIES IN THE AREA. SEE CIVIL AND ELECTRICAL SITE PLANS FOR ELEVATIONS REQUIREMENTS.
4. CONTRACTOR SHALL COORDINATE CONDUIT ENTRY REQUIREMENTS WITH SITE PLAN, PRIOR TO ORDERING MANHOLES.

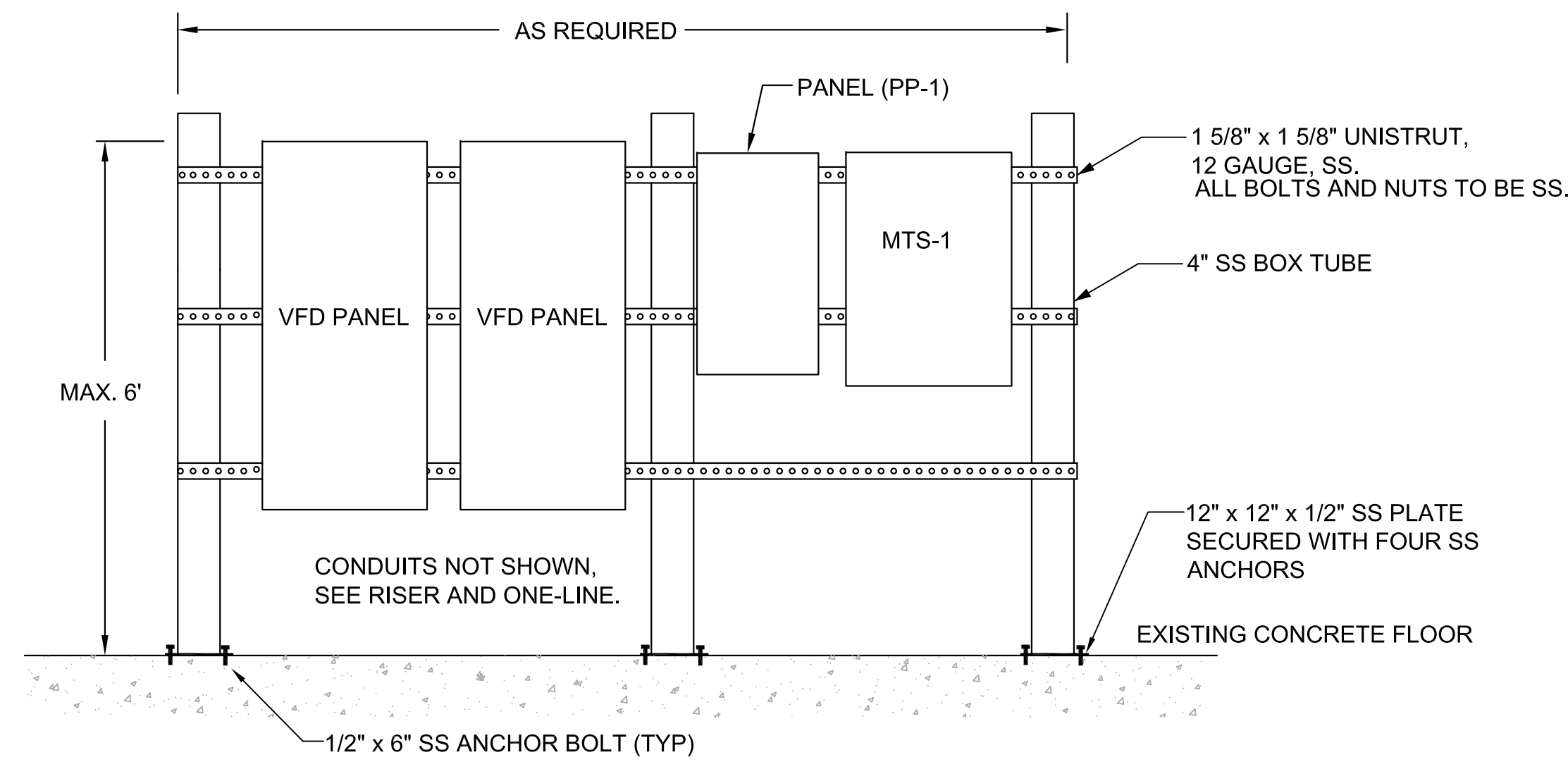
MANHOLE NOTES:

1. CABLE RACK, JOSLYN J-5126 OR EQUAL
CABLE HOOKS, JOSLYN J-5131A OR EQUAL
CABLE RACK INSULATORS, JOSLYN J-5120
2. PULLING-IN-IRONS INSTALL OPPOSITE CONDUIT ENTRANCE. POSITION BELOW LEVEL OF CONDUIT ENTRANCE. HUBBART & CO. CATALOG 9119 OR EQUAL.
3. TERMINATE ALL DUCTS IN MANHOLE WITH END BELLS.
4. MANHOLE COVERS SHALL BE MARKED "ELECTRICAL POWER" OR "ELECTRICAL INSTRUMENTATION" BY THE MANUFACTURER, WITH RAISED LETTERS. THE CONTRACTOR SHALL STAMP IN THE MANHOLE COVERS THE IDENTIFICATION NUMBER OF THE MANHOLE. LETTERS AND NUMBERS SHALL BE 2" HIGH. AS AN ALTERNATE THE CONTRACTOR MAY INSTALL SST NAMEPLATES ATTACHED WITH FOUR SST BOLTS TO THE MANHOLE. COVERS INDICATING THE MANHOLE NUMBER. LETTERS AND NUMBERS TO BE RAISED AND 2" HIGH. SUBMIT ONE SAMPLE NAMEPLATE FOR ENGINEER'S APPROVAL PRIOR TO INSTALLATION.
5. GROUND ROD, 5/8"X20'-0, COPPER CLAD.
6. BOND ALL METALLIC PARTS TO GROUNDING SYSTEM.
7. PRECAST CONCRETE MANHOLE WITH COVER, U.S. PRECAST CORP. OR EQUAL.
8. TOP OF MANHOLE SHALL BE PLACED 1" AFG AND SLOPE DOWN.

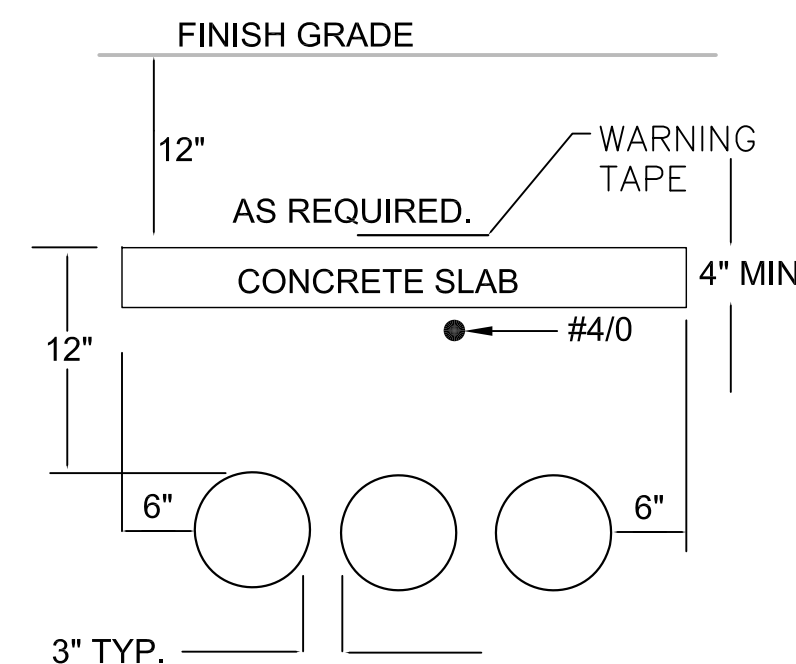


NOTE: COVER AND STEEL FRAME SHALL BE GROUNDED. MANHOLE INTERNAL DIMENSIONS: 48"x48"x48"

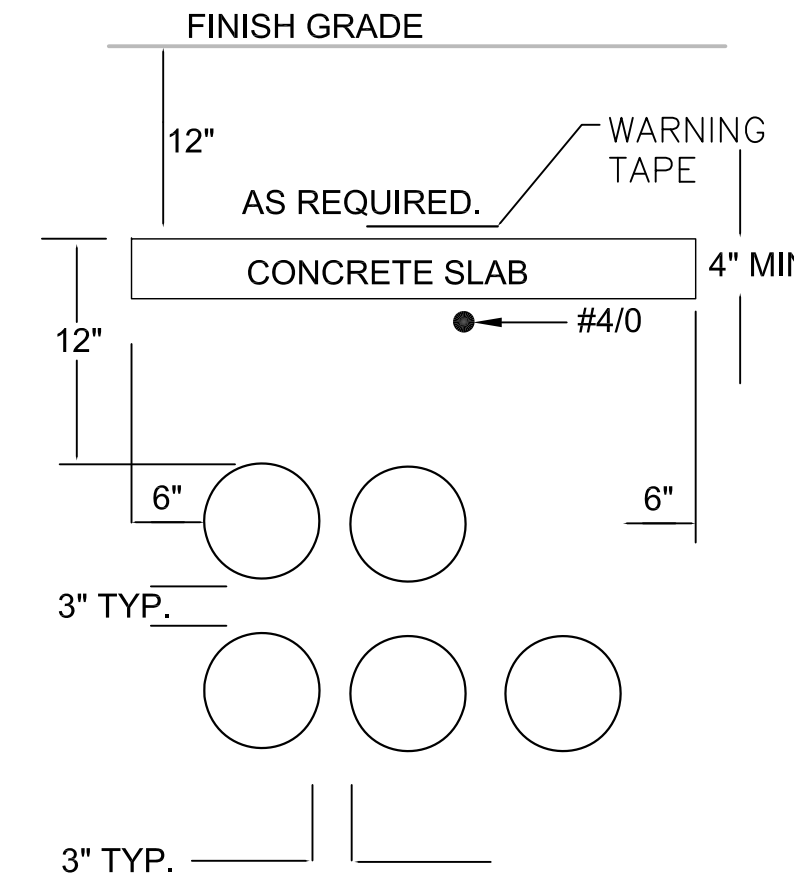
21 MANHOLE DETAIL
VAR. NOT TO SCALE



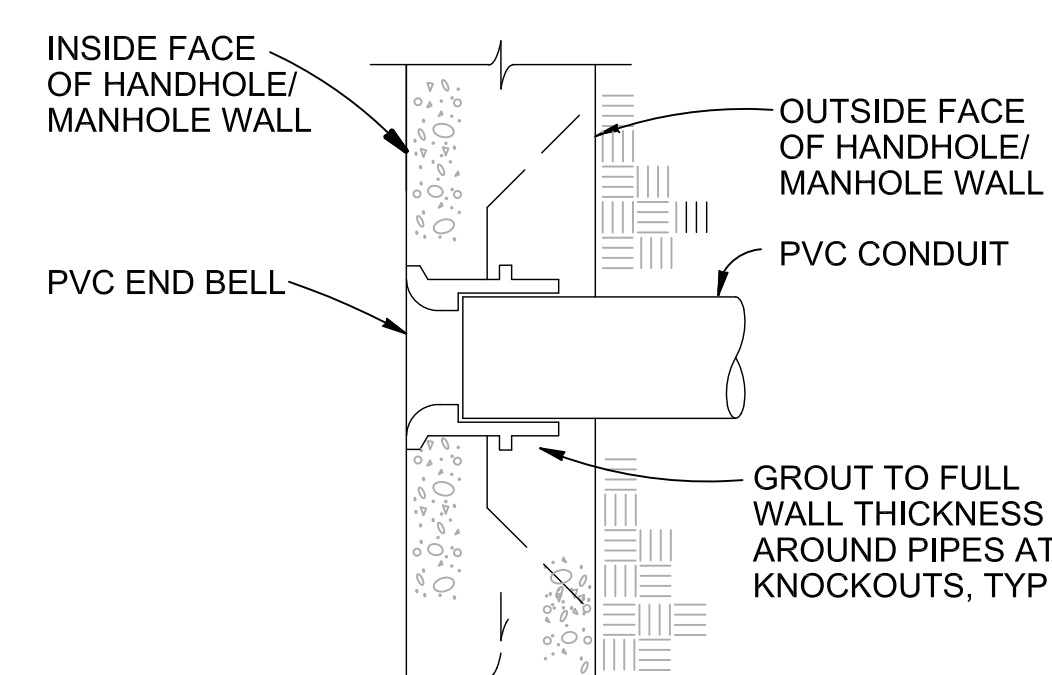
22 ELECTRICAL RACK NO.2 DETAIL
VAR. NOT TO SCALE



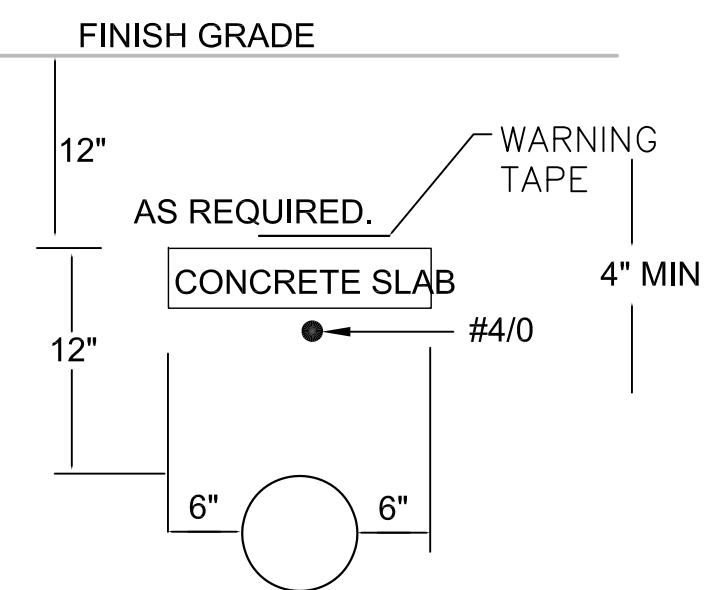
23 DIRECT BURIED 3-WAY DUCTBANK DETAIL
VAR. NOT TO SCALE



25 DIRECT BURIED 5-WAY DUCTBANK DETAIL
VAR. NOT TO SCALE

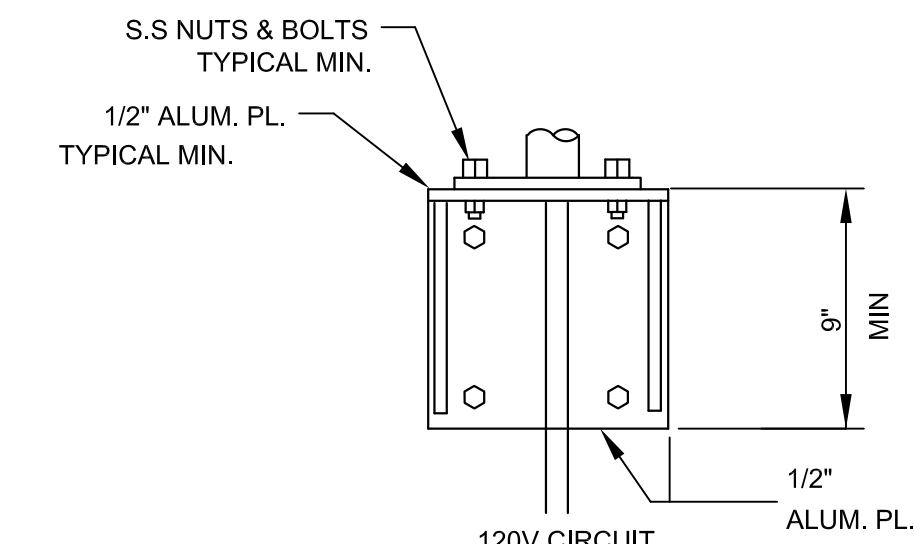
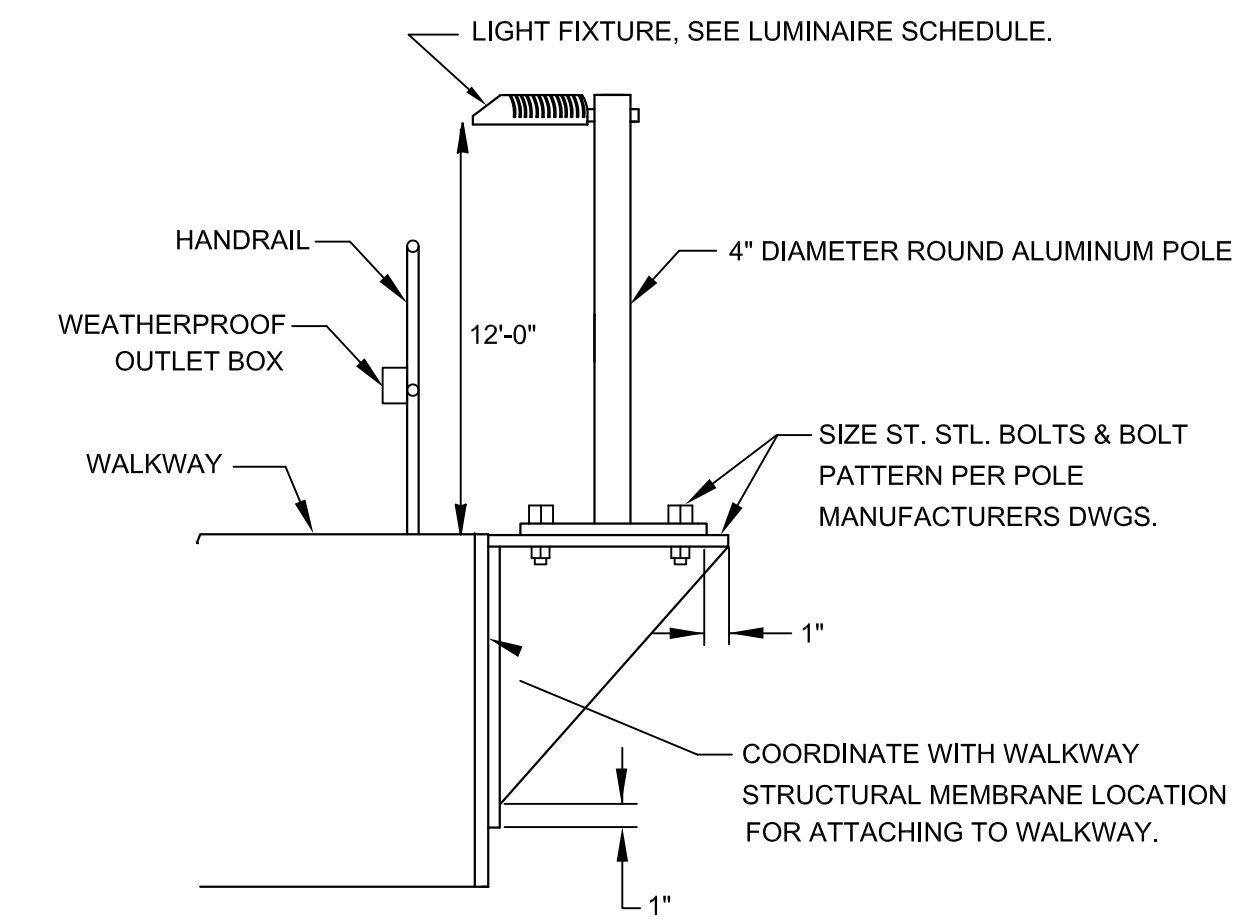


24 CONDUIT HANDHOLE/MANHOLE ENTRANCE
VAR. NOT TO SCALE



27 DIRECT BURIED 1-WAY DUCTBANK DETAIL
VAR. NOT TO SCALE

IF DUCTBANK IS DIFFERENT QUANTITY OF CONDUITS THAN SHOWN HERE, ADJUST THE CONDUIT LAYOUT USING A COMBINATION OF DETAIL 23, 25, AND 27 AS NEEDED.



DETAIL

26 LIGHT FIXTURE MOUNTING OUTSIDE WALKWAY
VAR. NOT TO SCALE

WINDLOADING NOTE:

1. ALL POLE INSTALLATIONS MUST MEET FLORIDA BUILDING CODE WIND LOADING REQUIREMENT WITH APPROPRIATE WIND GUST FACTOR FOR THE LOCATION OF INSTALLATION. THE CONTRACTOR SHALL INCLUDE WITH THE SHOP DRAWING SUBMITTAL, A POLE WIND LOADING CALCULATION SIGNED & SEALED BY A STRUCTURAL ENGINEER REGISTERED IN THE STATE OF FLORIDA SHOWING THAT THE PROPOSED POLE AND INSTALLATIONS WILL MEET THE GIVEN WIND LOADING REQUIREMENT. FIELD VERIFY THE REQUIRED STRUCTURAL INFORMATION RELATING TO EXISTING WALKWAY.

LAST SAVED BY: win

REV	DATE	BY	DESCRIPTION

DESIGNED	TW
DRAWN	DGU
CHECKED	PFH
DATE	MARCH 2013

HILLERS ELECTRICAL ENGINEERING, INC.
23257 STATE ROAD 7, SUITE 100
BOCA RATON, FLORIDA 33428
(561) 451-9165
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THEIN WIN, P.E.
No. 65722



MANATEE COUNTY	
SWWRF CLARIFIER 3&4 REHABILITATION	
ELECTRICAL	
ELECTRICAL DETAILS - SHEET 3	

VERIFY SCALES	JOB NO. 7880J10
BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO. E-17
0 1"	
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	

INSTRUMENT SOCIETY OF AMERICA TABLE

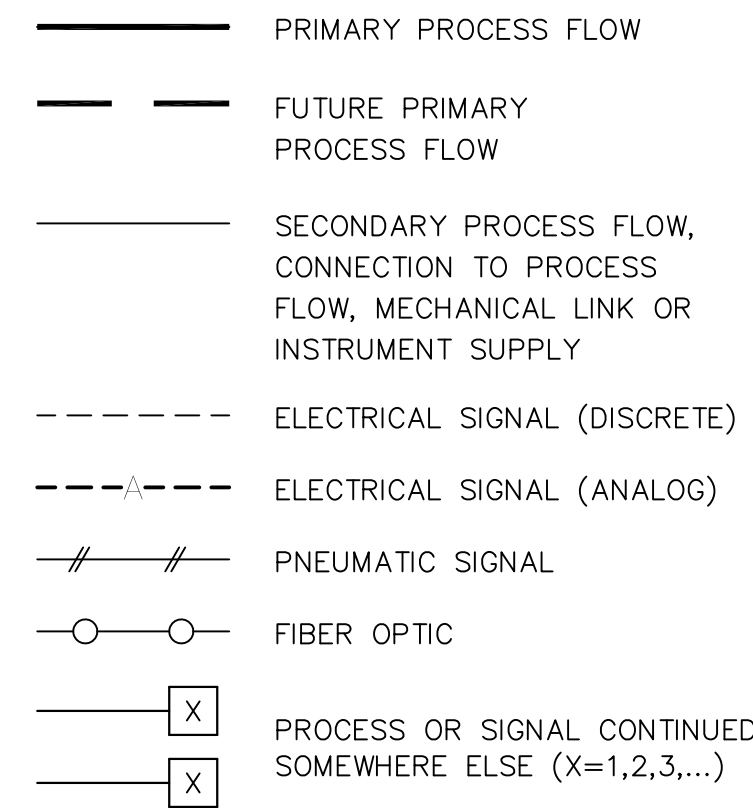
LETTER	FIRST LETTER		SUCCEEDING LETTERS		
	PROCESS OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS (*)		ALARM		USERS CHOICE (*)
B	BURNER FLAME		USERS CHOICE (*)	USERS CHOICE (*)	
C	CONDUCTIVITY			CONTROL	CLOSE
D	DENSITY (S.G.)	DIFFERENTIAL			
E	VOLTAGE		PRIMARY ELEMENT		
F	FLOW RATE	RATIO			
G	GAUGE		GLASS	GATE	
H	HAND (MANUAL)				HIGH
I	CURRENT		INDICATE		
J	POWER	SCAN			
K	TIME OR SCHEDULE			CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW
M	MOTION				MIDDLE
N	STROKE		USERS CHOICE (*)	USERS CHOICE (*)	NORMAL
O	LOOP VEH. DETECTOR		OFFICE		OPEN
P	PRESSURE OR VACUUM		POINT (TEST CONNECTION)		
Q	QUANTITY OR EVENT		INTEGRATE		
R	RATIO		RECORD OR PRINT		
S	SPEED OR FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE (*)		MULTIFUNCTION (*)		
V	VIBRATION			VALVE	
W	WEIGHT OR FORCE		WELL		
X	UNCLASSIFIED (*)		UNCLASSIFIED (*)	UNCLASSIFIED (*)	UNCLASSIFIED (*)
Y	PHOTO CELL		LIGHT SOURCE	RELAY OR COMPUTE (*)	
Z	POSITION			DRIVE, ACTUATE OR UNCLASSIFIED FINAL CONTROL ELEMENT	

(*) WHEN USED, EXPLANATION IS SHOWN ADJACENT TO INSTRUMENT SYMBOL

NOTES:

- COMPONENTS AND PANELS SHOWN WITH A DIAMOND (◆) ARE TO BE PROVIDED BY THE ELECTRICAL CONTRACTOR PER SPECIFICATION 16010.
- COMPONENTS AND PANELS SHOWN WITH A DOUBLE ASTERISK (**) ARE TO BE PROVIDED AS PART OF A PACKAGED OR MECHANICAL SYSTEM.
- COMPONENTS AND PANELS SHOWN WITH A TRIANGLE (▲) ARE EXISTING. COMPONENTS AND PANELS WHICH HAVE NO SYMBOL ATTACHED TO IT ARE EXISTING.
- COMPONENTS AND PANELS SHOWN WITH A HEXAGON (⬡) ARE EXISTING TO BE MODIFIED AND/OR RELOCATED.
- COMPONENTS AND PANELS SHOWN WITH A SQUARE (■) ARE FUTURE. DURING SHOP DRAWING PREPARATION, THE CONTRACTOR SHALL FIELD VERIFY.
- ALL THE EXISTING ANALOG AND DISCRETE POINTS FOR DETAILED INTERFACE AND INCLUDE IT AS PART OF SUBMITTAL.
- THE SINGLE INSTRUMENT & CONTROL SUPPLIER SHALL HAVE A U.L. APPROVED SHOP.
- ALL PROCESS TUBING AND ISOLATION VALVES SHALL BE 1/4"- 316 S.S., UNLESS OTHERWISE NOTED.
- ALL CONTROL PANELS SHALL BE FURNISHED AND INSTALLED WITH A 1P-15A CIRCUIT BREAKER, UNLESS OTHERWISE NOTED.
- SEE MECHANICAL PLANS AND SPECIFICATIONS FOR EQUIPMENT NUMBERS.

INSTRUMENT LINE SYMBOLS

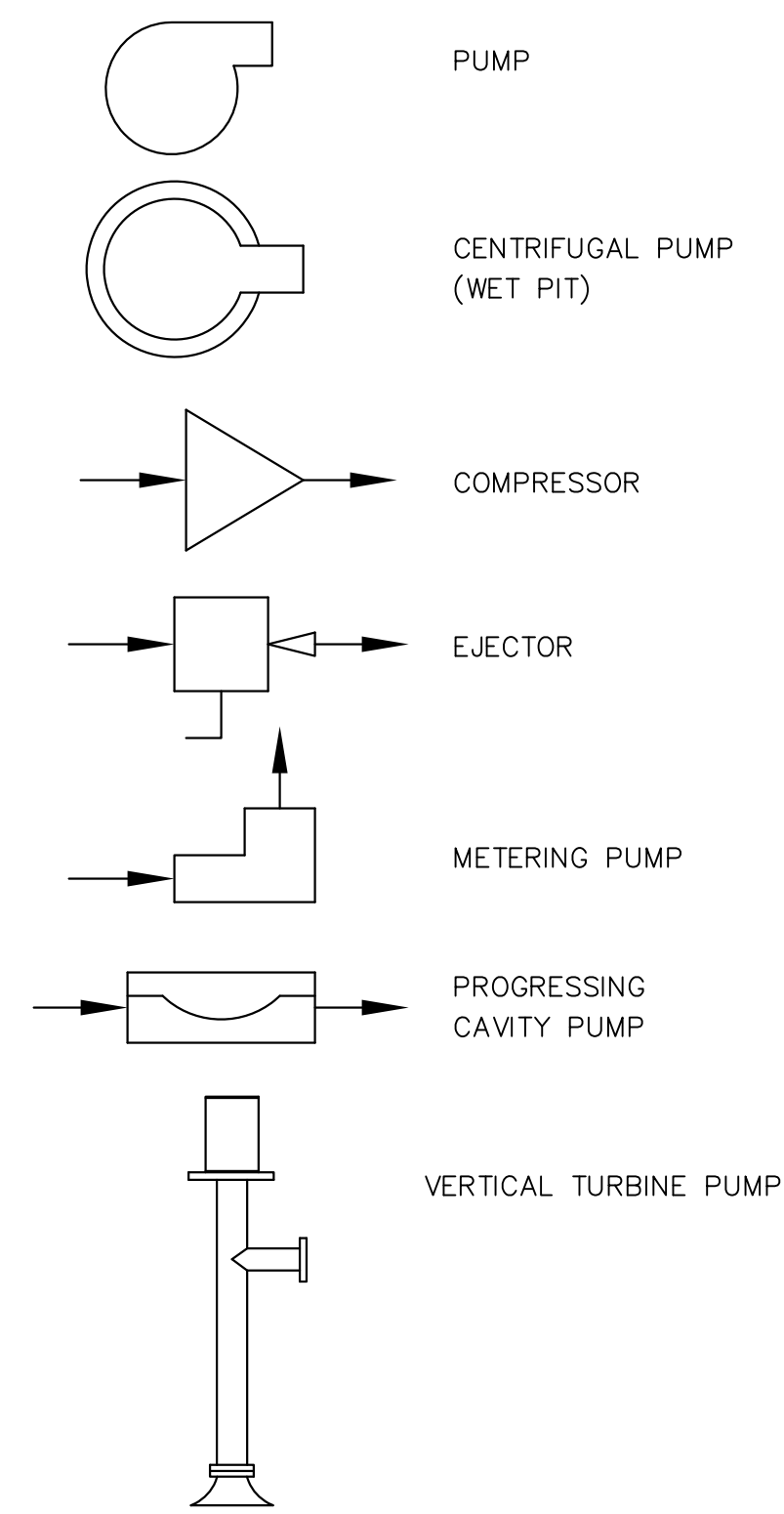


INSTRUMENT ABBREVIATION

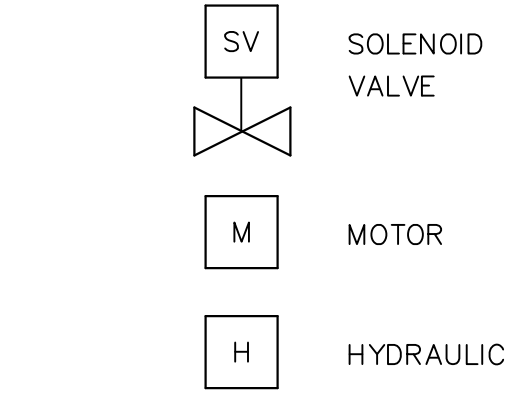
ACC	ACCELERATOR
BFP	BELT FILTER PRESS
CL2	CHLORINE
CLW	CLEARWELL
COM	COMMON
COND	CONDUCTIVITY
CP	CONTROL PANEL
DI, AI	DISCRETE INPUT, ANALOG INPUT
DO, AO	DISCRETE OUTPUT, ANALOG OUTPUT
D.O.	DISSOLVED OXYGEN
DR	DISTANCE RELAY
EFFL	EFFLUENT
EP	ELECTRICAL PANEL
ES	EMERGENCY STOP
ETM	ELAPSED TIME METER
FD	CHEMICAL FEEDER
FIL	FILTER
GEN	GENERATOR
HLO	HIGH-LOW-OFF
HLOR	HIGH-LOW-OFF-REMOTE
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
HOTC	HAND-OFF-TIMER-COMPUTER
H/L	HIGH/LOW
HSP	HIGH SERVICE PUMP
INFL	INFLUENT
JP	JOCKEY PUMP
LOS	LOCK-OUT-STOP
LPU	LINE PROTECTION UNIT
MCC	MOTOR CONTROL CENTER
MCP	MAIN CONTROL PANEL
ME	MISCELLANEOUS EQUIPMENT
M.G.	MILLION GALLON
MOV	MOTOR OPERATED VALVE
OCA	OPEN-CLOSE-AUTO
OC	OPEN-CLOSE
OO	ON-OFF
ORP	OXIDATION REDUCTION POTENTIAL
OSC	OPEN-STOP-CLOSE
OSCR	OPEN-STOP-CLOSE-REMOTE
PH	HYDROGEN ION CONCENTRATION
PRES	PRESSURE
RES	RESTORE
RF	RF (ADMITTANCE) LEVEL MONITOR
RIP, RIO	REMOTE I/O PANEL
R/L	REMOTE/LOCAL
RSP	REMOTE SETPOINT
SA	SURGE ARRESTER
SEC	SECONDARY
SL	SLAKER
SF	SONIC FLOWMETER
SP	SETPOINT
SS	START/STOP
ST	STEP
STOR	STORAGE
SUS	SUSPENDED SOLIDS
SSRVS	SOLID STATE REDUCED VOLTAGE STARTER
TD	THERMAL DISPERSION
TP	TRANSFER PUMP
TURB	TURBIDITY
VFD	VARIABLE FREQUENCY DRIVE

INSTRUMENTATION LEGEND

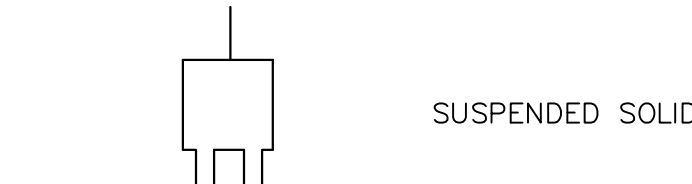
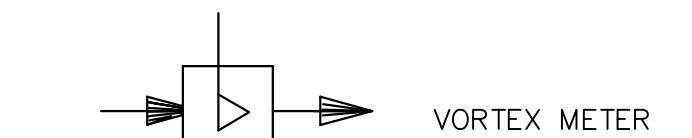
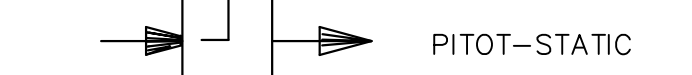
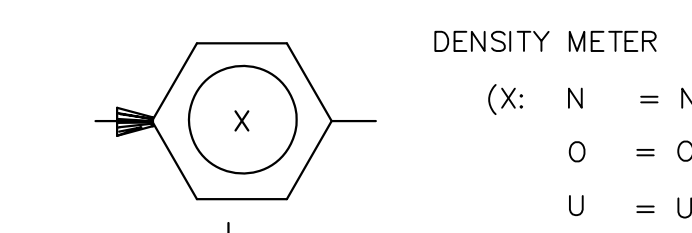
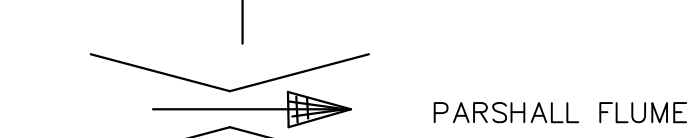
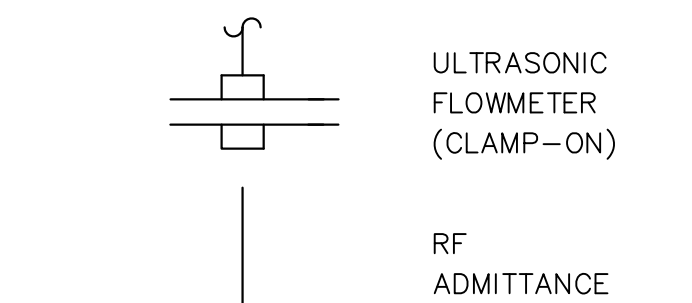
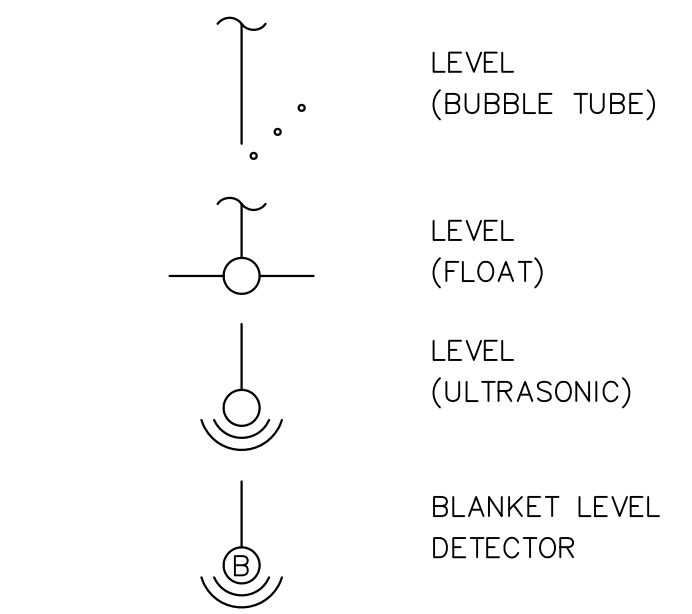
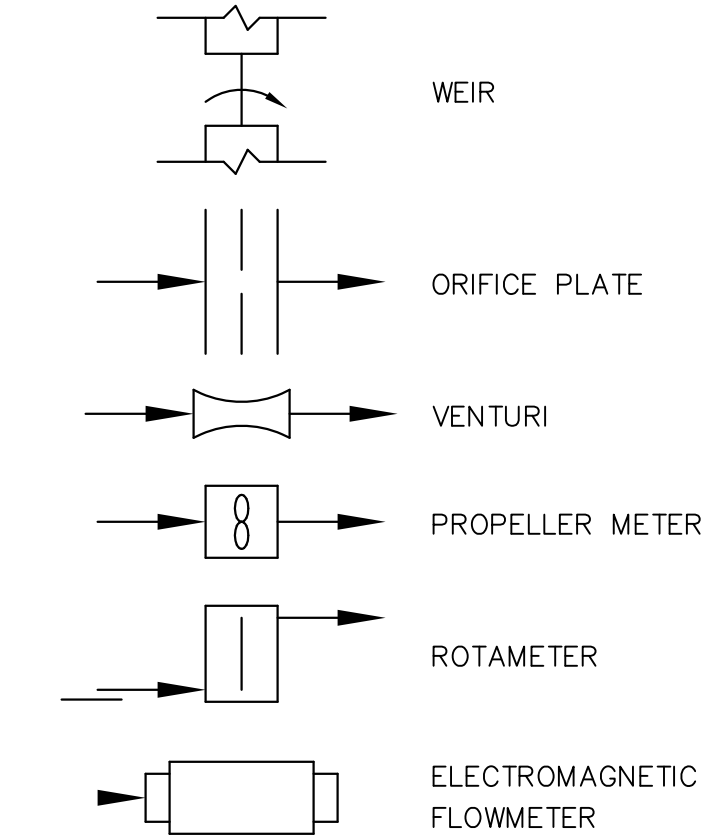
PUMPS & COMPRESSORS



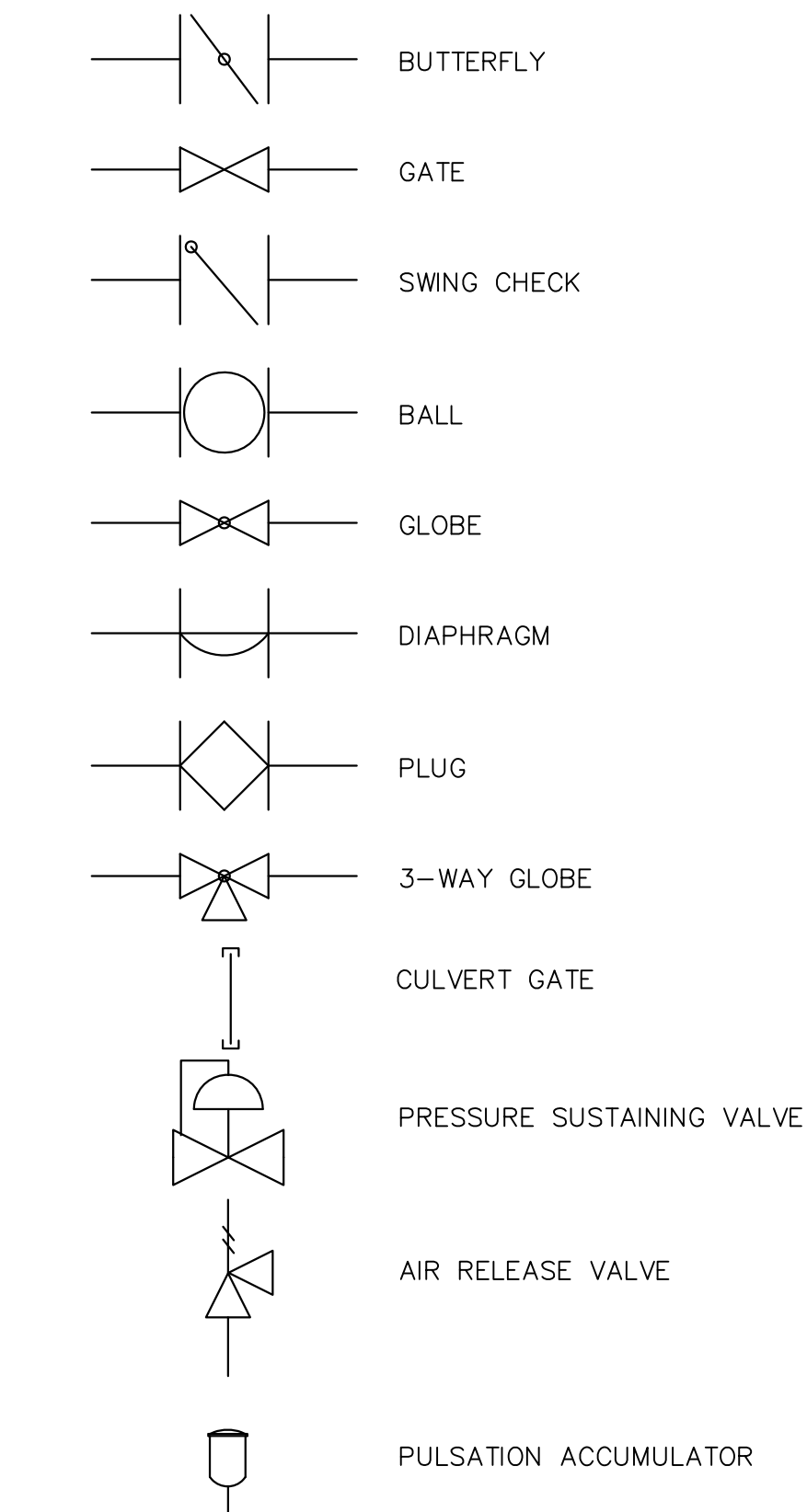
ACTUATOR OR OPERATORS



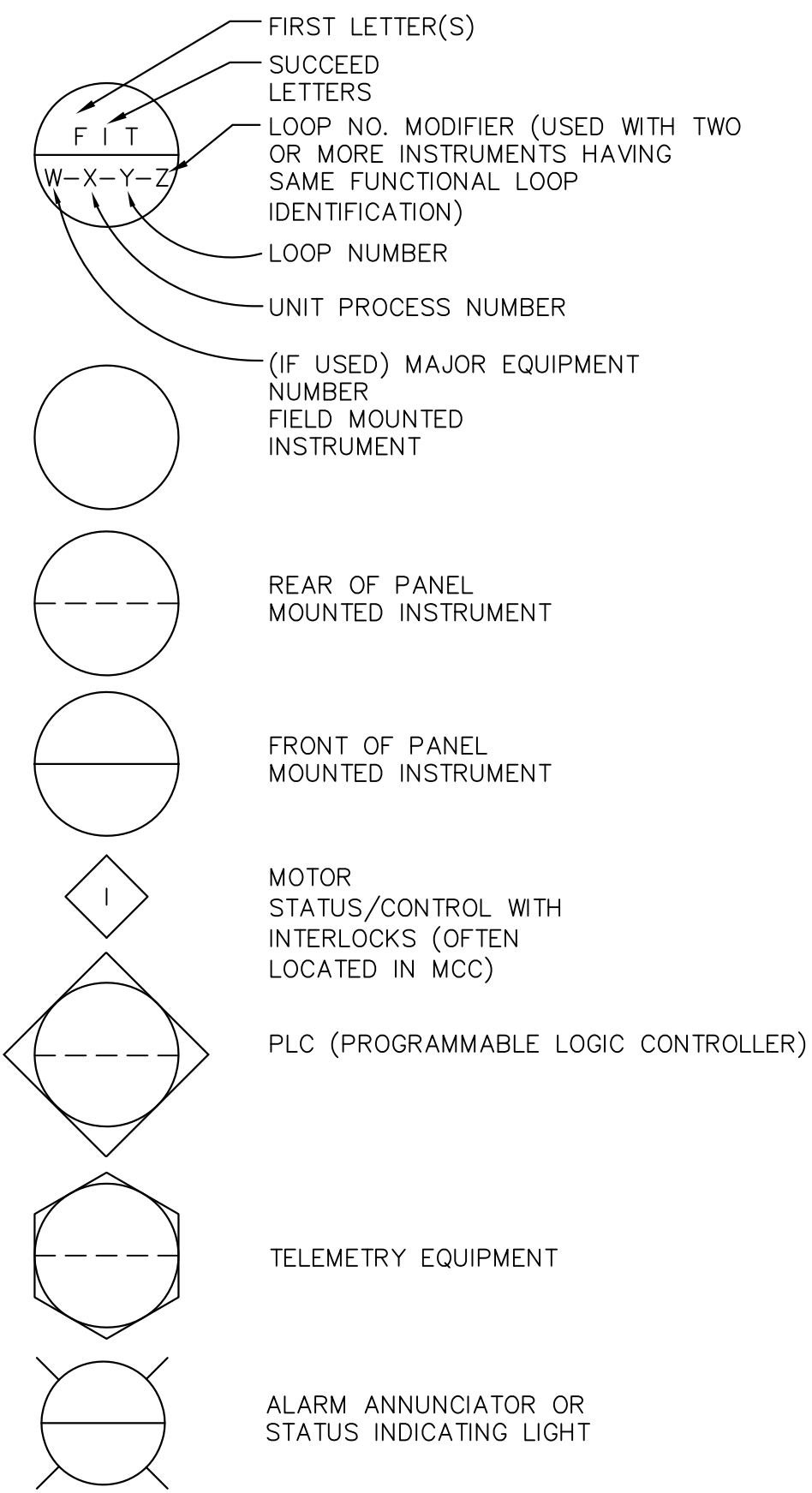
PRIMARY ELEMENTS



VALVES & GATES



INSTRUMENT IDENTIFICATION



LAST SAVED BY: win

REV	DATE	BY	DESCRIPTION

DESIGNED	TW
DRAWN	DGU
CHECKED	PFH
DATE	MARCH 2013

HILLERS ELECTRICAL ENGINEERING, INC.
 23257 STATE ROAD 7, SUITE 100
 BOCA RATON, FLORIDA 33428
 (561) 451-9165
 (561) 451-4886 FAX
 LICENSE NO: EB 0006877

THEIN WIN, P.E.
 No. 65722



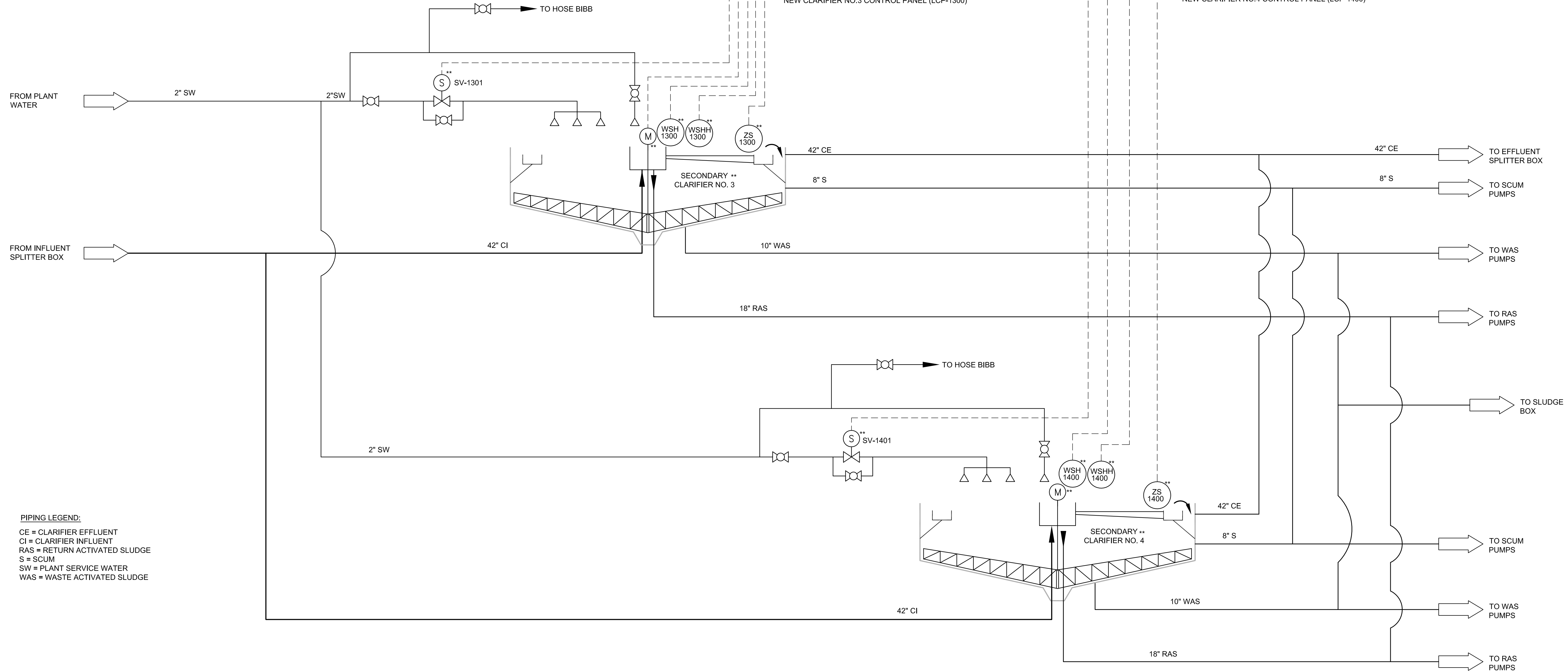
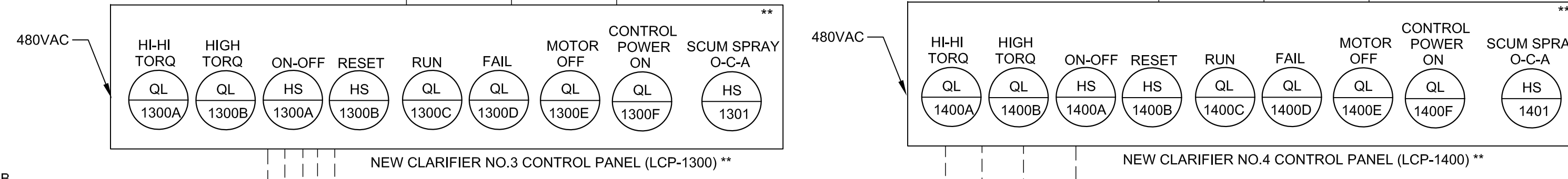
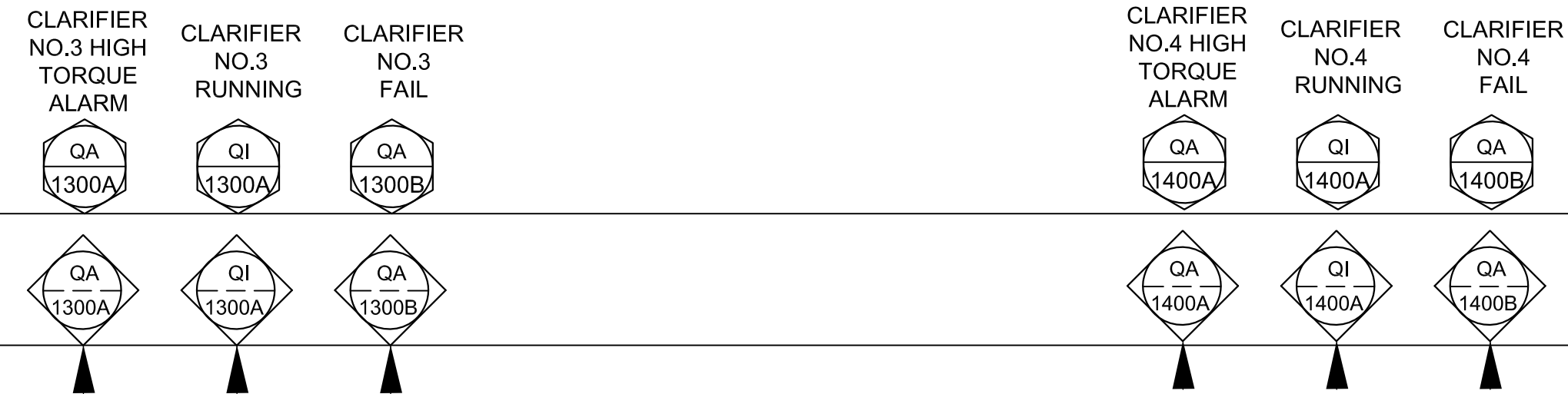
MANATEE COUNTY
 SWWRF CLARIFIER 3&4 REHABILITATION
 INSTRUMENTATION
 INSTRUMENTATION LEGEND AND SYMBOLS

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

JOB NO. 7880J10
 DRAWING NO. N-1

EXISTING HEADWORKS HMI AND PLANT HMI/SCADA

EXISTING PLANT PLC
LOCATION: HEADWORKS BUILDING - ELECTRICAL ROOM



PIPING LEGEND:
 CE = CLARIFIER EFFLUENT
 CI = CLARIFIER INFLUENT
 RAS = RETURN ACTIVATED SLUDGE
 S = SCUM
 SW = PLANT SERVICE WATER
 WAS = WASTE ACTIVATED SLUDGE

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CHECKED PFH
DATE MARCH 2013

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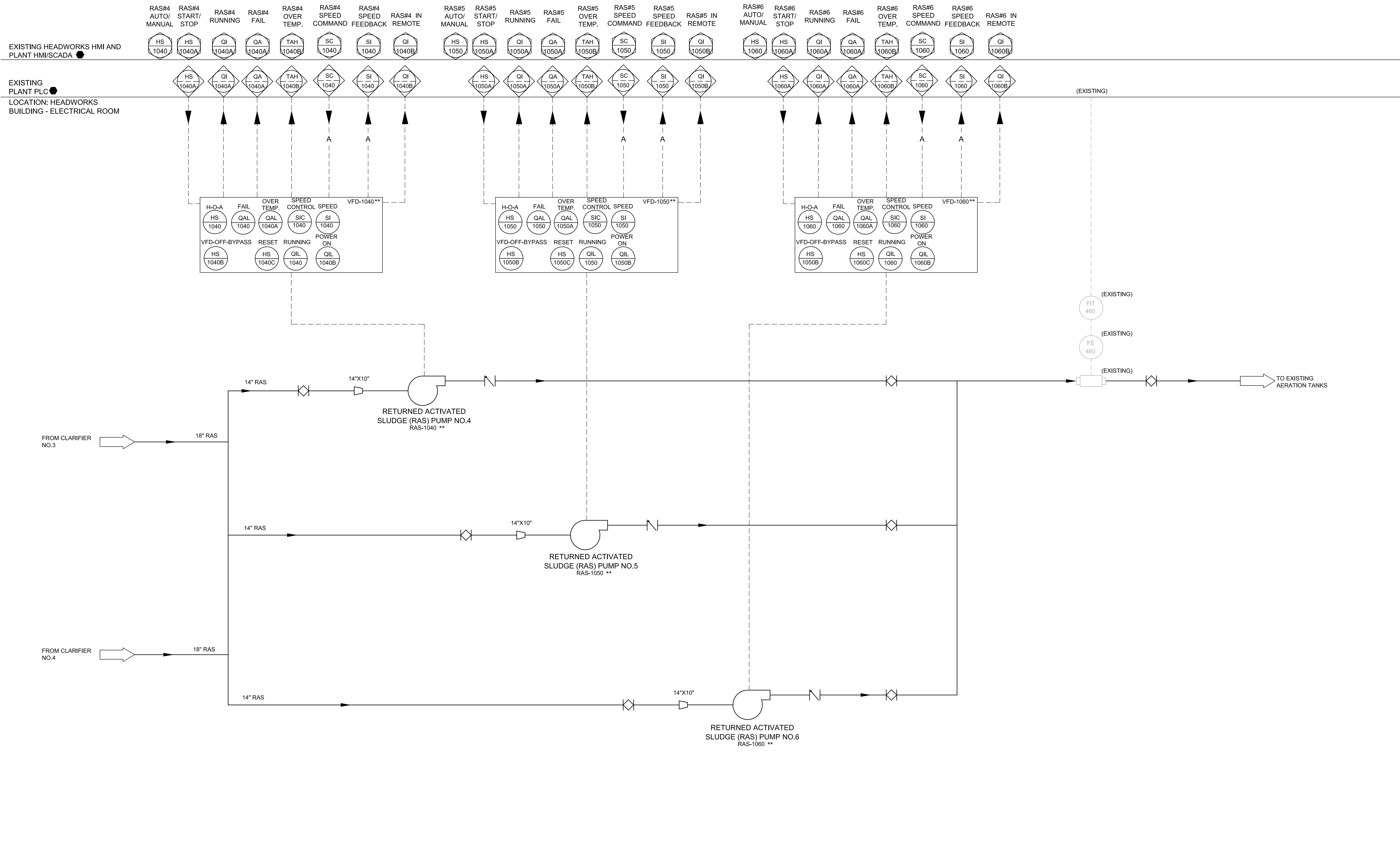
THEIN WIN, P.E.
 No. 65722



MANATEE COUNTY
SWWRF CLARIFIER 3&4 REHABILITATION
 INSTRUMENTATION
P&ID - CLARIFIER 3 AND 4

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

JOB NO.
7880J10
 DRAWING NO.
N-2



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THEIN WIN, P.E.
 No. 65722



MANATEE COUNTY
 SWWRF CLARIFIER 3&4 REHABILITATION
 INSTRUMENTATION
 P&ID - RAS PUMP STATION

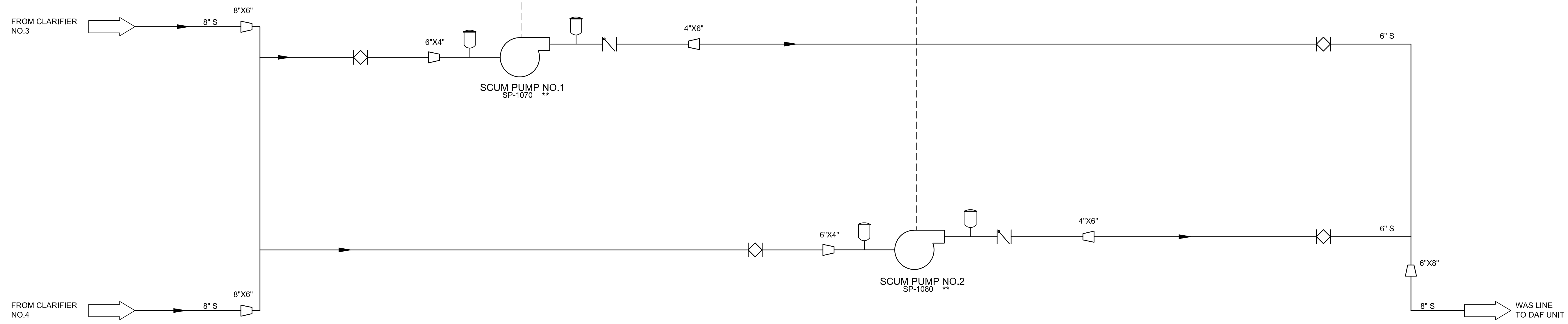
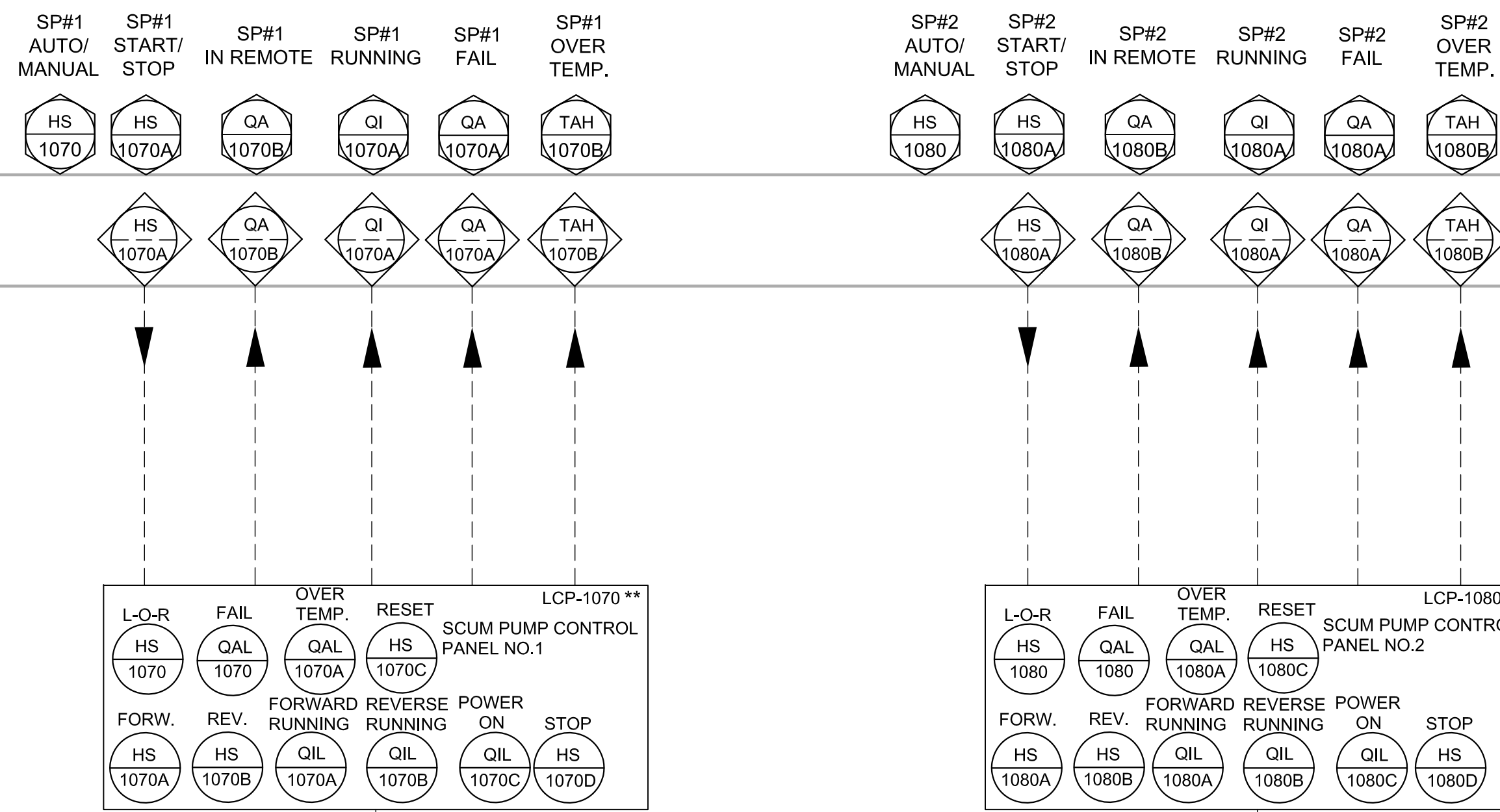
VERIFY SCALES
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JOB NO. 7880J10
 DRAWING NO. N-3

EXISTING HEADWORKS HMI AND PLANT HMI/SCADA ●

EXISTING PLANT PLC ●

LOCATION: HEADWORKS BUILDING - ELECTRICAL ROOM



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REV	DATE	BY	DESCRIPTION

DESIGNED	TW
DRAWN	DGU
CHECKED	PFH
DATE	MARCH 2013

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MANATEE COUNTY
 SWWRF CLARIFIER 3&4 REHABILITATION
 INSTRUMENTATION
 P&ID - SCUM PUMPS

VERIFY SCALES
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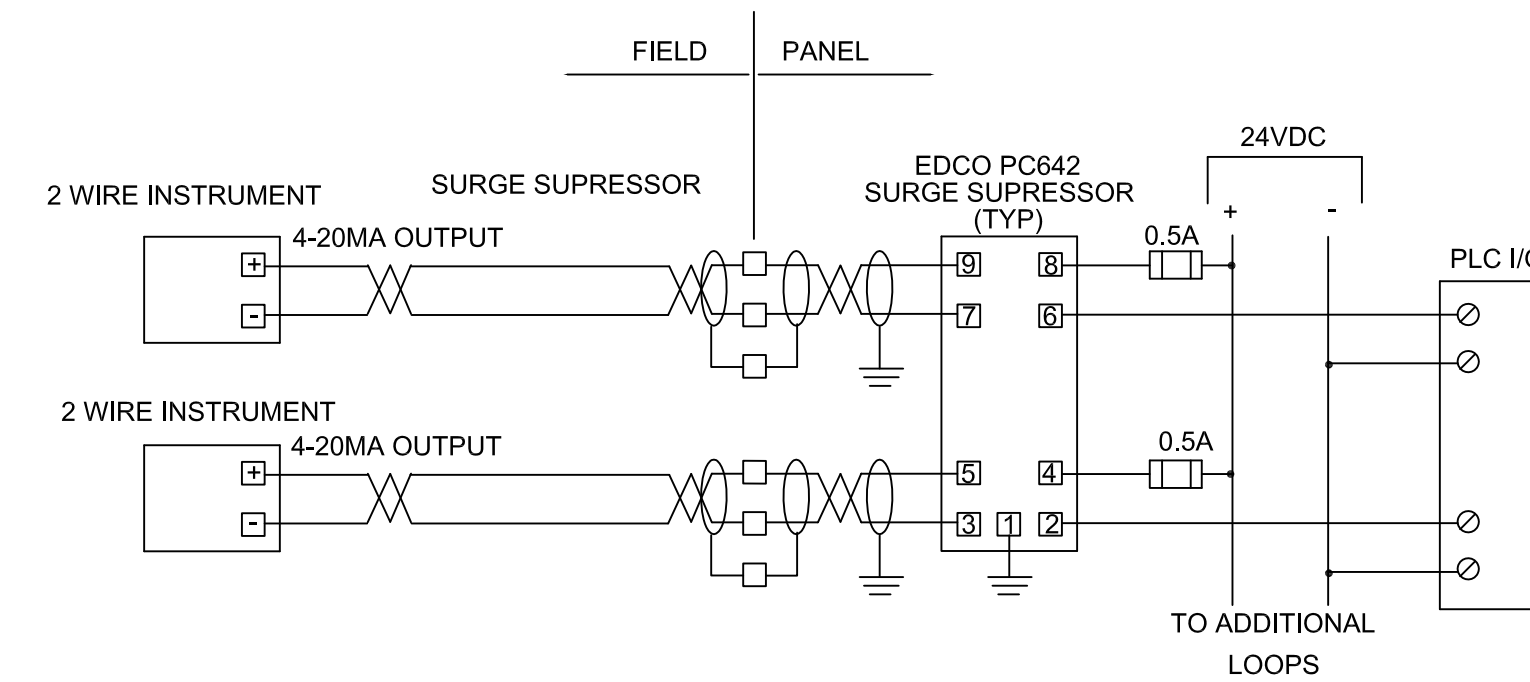
JOB NO. 7880J10
 DRAWING NO. N-4



EXISTING HEADWORKS PLC PANEL
NOT TO SCALE



EXISTING HEADWORKS PLC PANEL - INTERIOR
NOT TO SCALE



TYPICAL 2 WIRE INSTRUMENT ISOLATOR
NOT TO SCALE

I/O POINTS TO BE CONNECTED IN PLC-HW PANEL

- CLARIFIER NO.3 HI TORQUE (DI) = 1/5/0
- CLARIFIER NO.3 RUNNING (DI) = 1/5/1
- CLARIFIER NO.3 FAIL (DI) = 1/5/2
- CLARIFIER NO.4 HI TORQUE (DI) = 1/5/3
- CLARIFIER NO.4 RUNNING (DI) = 1/5/4
- CLARIFIER NO.4 FAIL (DI) = 1/5/5
- RAS PUMP NO.4 VFD RUNNING (DI) = 1/5/6
- RAS PUMP NO.4 FAIL (DI) = 1/5/7
- RAS PUMP NO.4 IN REMOTE (DI) = 1/5/8
- RAS PUMP NO.4 MOTOR OVERTEMP. (DI) = 1/5/9
- RAS PUMP NO.5 VFD RUNNING (DI) = 1/5/10
- RAS PUMP NO.5 FAIL (DI) = 1/5/11
- RAS PUMP NO.5 IN REMOTE (DI) = 1/5/12
- RAS PUMP NO.5 MOTOR OVERTEMP. (DI) = 1/5/13
- RAS PUMP NO.6 VFD RUNNING (DI) = 1/5/14
- RAS PUMP NO.6 FAIL (DI) = 1/5/15
- RAS PUMP NO.6 IN REMOTE (DI) = 1/6/0
- RAS PUMP NO.6 MOTOR OVERTEMP. (DI) = 1/6/1
- SCUM PUMP NO.1 RUNNING (DI) = 1/6/2
- SCUM PUMP NO.1 FAIL (DI) = 1/6/3
- SCUM PUMP NO.1 IN REMOTE (DI) = 1/6/4
- SCUM PUMP NO.1 MOTOR OVERTEMP. (DI) = 1/6/5
- SCUM PUMP NO.2 RUNNING (DI) = 1/6/6
- SCUM PUMP NO.2 FAIL (DI) = 1/6/7
- SCUM PUMP NO.2 IN REMOTE (DI) = 1/6/8
- SCUM PUMP NO.2 MOTOR OVERTEMP. (DI) = 1/6/9

- RAS PUMP NO.4 START/STOP (DO) = 1/10/9
- RAS PUMP NO.5 START/STOP (DO) = 1/10/8
- RAS PUMP NO.6 START/STOP (DO) = 1/10/10
- SCUM PUMP NO.1 START/STOP (DO) = 1/10/14
- SCUM PUMP NO.2 START/STOP (DO) = 1/10/15
- RAS PUMP NO.4 SPEED INDICATION (AI) = 2/2/5
- RAS PUMP NO.5 SPEED INDICATION (AI) = 2/2/6
- RAS PUMP NO.6 SPEED INDICATION (AI) = 2/2/7
- RAS PUMP NO.4 SPEED COMMAND (AO) = 2/9/1
- RAS PUMP NO.5 SPEED COMMAND (AO) = 2/9/2
- RAS PUMP NO.6 SPEED COMMAND (AO) = 2/9/3

KEYED NOTE

- 1 CONTRACTOR SHALL PROVIDE AND INSTALL ONE NEW DIGITAL INPUT CARD (1746-IB16), ONE NEW DIGITAL OUTPUT CARD (1746-OB16), ONE NEW ANALOG INPUT CARD (1746-NI8), AND ONE NEW ANALOG OUTPUT CARD (1746-NO4) IN THE EXISTING PLC-HW CONTROL PANEL LOCATED IN THE HEADWORKS BUILDING - ELECTRICAL ROOM. NEW INPUT/OUTPUT CARDS (I/O CARD) SHALL MATCH THE I/O POINT QUANTITY AND TYPE WITH EXISTING. EXISTING PLC IS ALLEN-BRADLEY SLC 5/05 PLC SYSTEM. INSTALL NEW DIGITAL INPUT CARD AT RACK 1 / SLOT 6, NEW DIGITAL OUTPUT CARD AT RACK 1 / SLOT 11, NEW ANALOG INPUT CARD AT RACK 2 / SLOT 3, AND NEW ANALOG OUTPUT CARD AT RACK 2 / SLOT 10. PROVIDE WIRES FROM NEW CARDS TO EXISTING SPARE TERMINAL BLOCK SIMILAR TO EXISTING WIRING CONFIGURATION. EXISTING SPARE RELAYS CAN BE USED FOR DIGITAL OUTPUTS. SEE EXISTING LOOP DIAGRAMS FOR TERMINATIONS OF NEW WIRES AND UPDATE THE LOOP DRAWINGS ACCORDINGLY. CONNECT POWER FOR THE ANALOG INSTRUMENT FROM THE EXISTING POWER SUPPLY IN THE PLC PANEL IF NECESSARY. MAKE ALL NECESSARY CONNECTIONS, TERMINATIONS, MODIFICATIONS, ETC. FOR A COMPLETE AND WORKING PLC SYSTEM IN PLACE.
- 2 NEW I/O POINT LOCATIONS ARE BASED ON THE EXISTING AS-BUILT DRAWINGS (REVERE CONTROL SYSTEMS, DATED 04-27-2006). CONTRACTOR SHALL FIELD VERIFY THE AVAILABLE I/O POINTS AND ADJUST ACCORDINGLY. CONTRACTOR SHALL UPDATE AS-BUILT DRAWINGS FOR EXISTING SIGNALS THAT ARE NOT RECONNECTED AS SPARE.
- 3 FIELD VERIFY AND CONNECT THE RAS PUMP NO.4, 5, 6 START/STOP SIGNAL (DIGITAL OUTPUT) AT THE EXISTING I/O POINT LOCATIONS.
- 4 PROVIDE AND INSTALL SURGE PROTECTION IN THE PLC CONTROL PANEL FOR ALL ANALOG SIGNALS AS PER DETAILS ON THIS DRAWING. MAKE ALL NECESSARY CONNECTIONS, TERMINATIONS, MODIFICATIONS, ETC. FOR A COMPLETE AND WORKING SYSTEM IN PLACE.

LAST SAVED BY: nwn

REV	DATE	BY	DESCRIPTION

DESIGNED	TW
DRAWN	DGU
CHECKED	PFH
DATE	MARCH 2013

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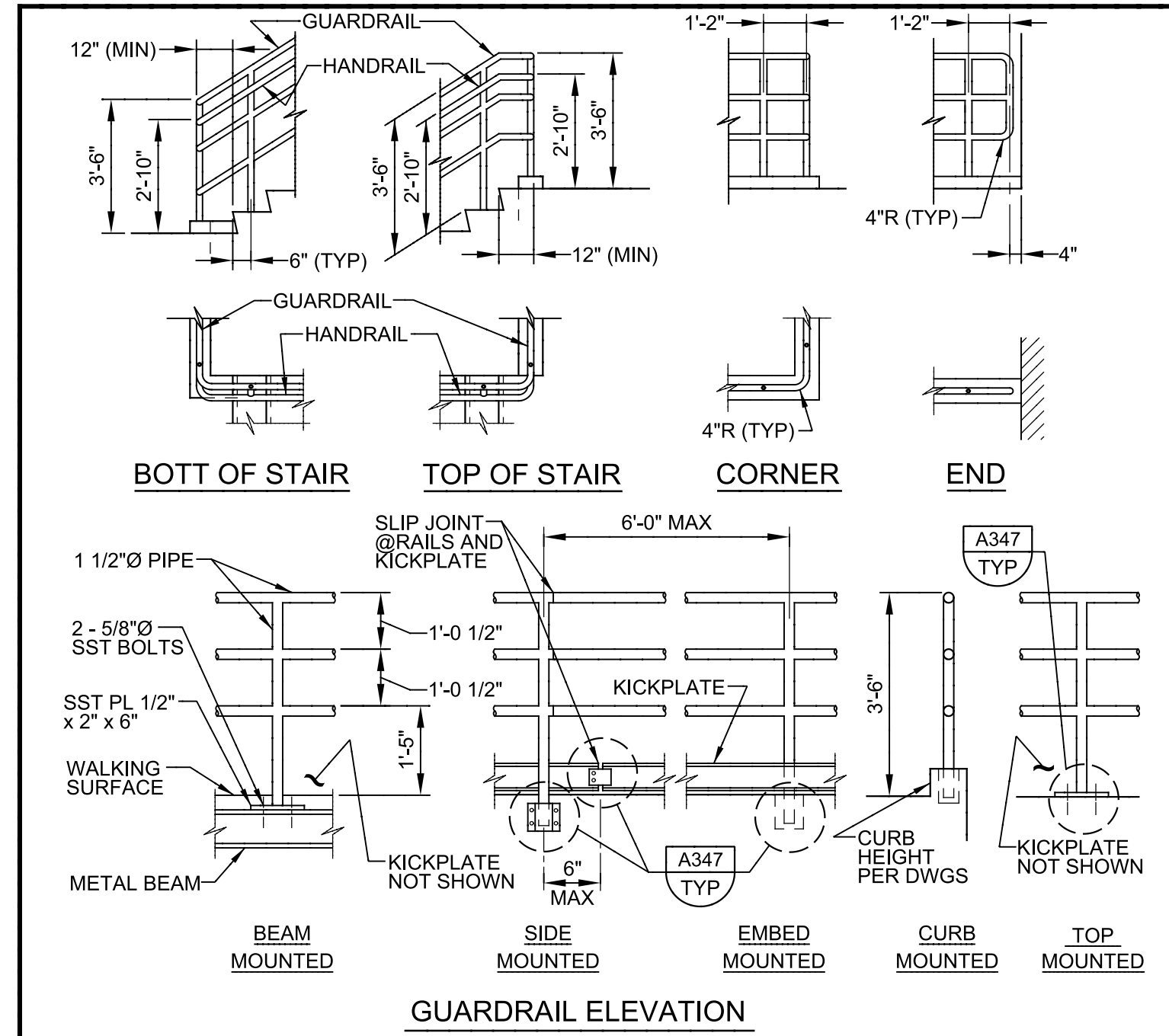
THEIN WIN, P.E.
No. 65722



MANATEE COUNTY
SWWRF CLARIFIER 3&4 REHABILITATION
INSTRUMENTATION
PLC PANEL AND INSTRUMENTATION DETAILS

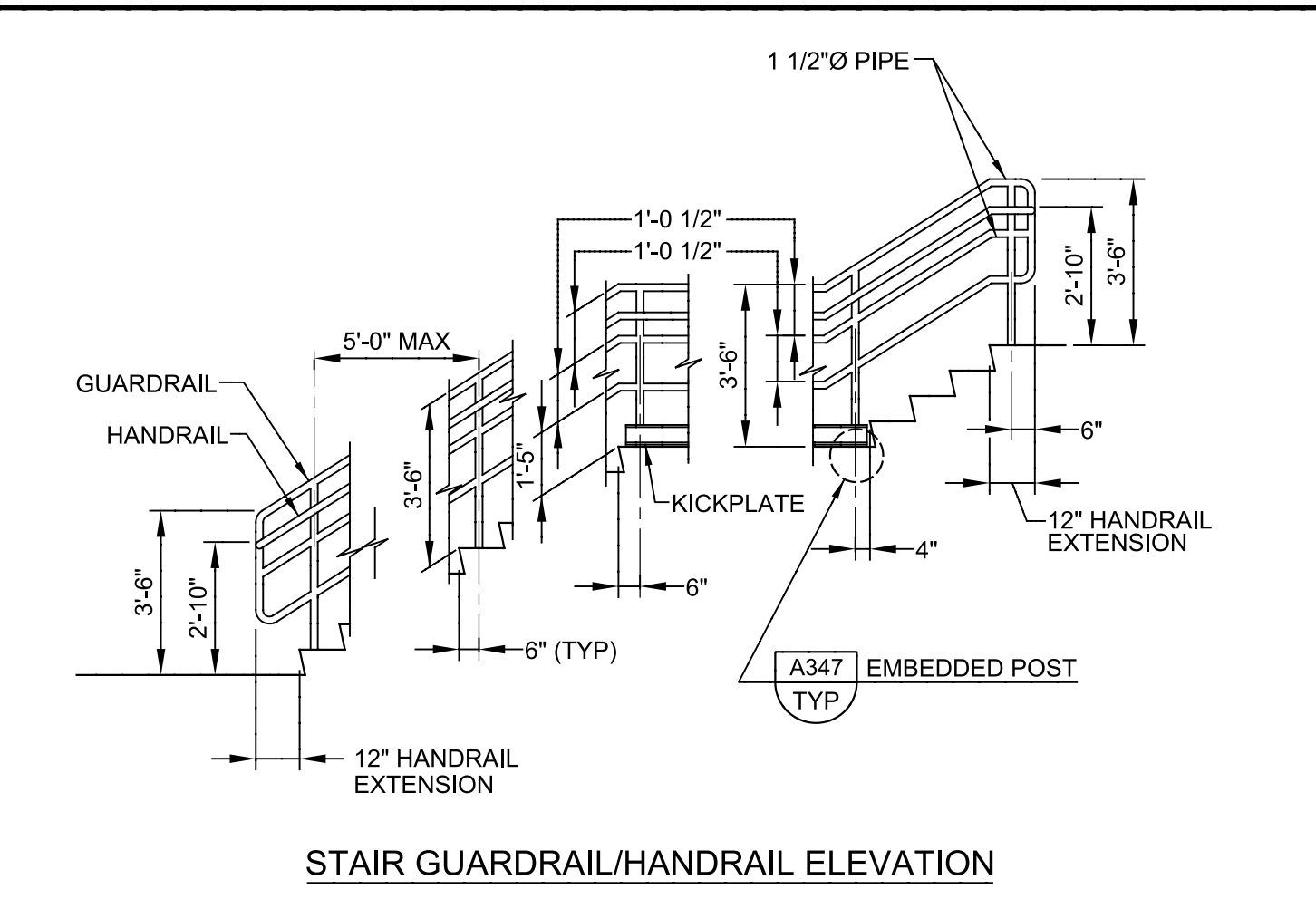
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JOB NO. 7880J10
DRAWING NO. N-5



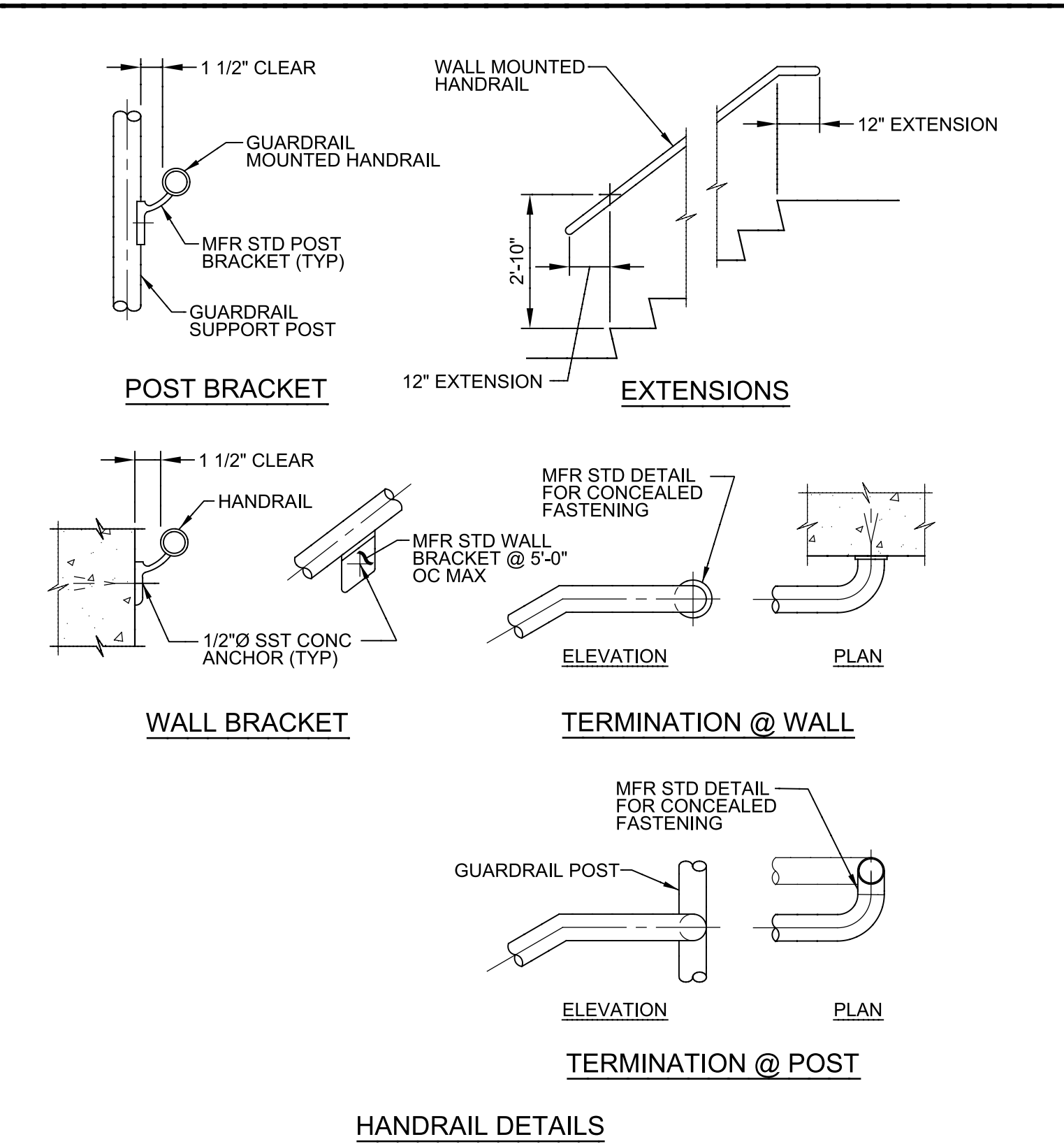
NOTES:
 1. THIS DETAIL IS APPLICABLE AT PRIVATE STAIRS IN F, H, AND S OCCUPANCIES WHERE OPERATOR ONLY ACCESSIBILITY IS REQUIRED. DETAILS AND INSTALLATION SHALL COMPLY WITH THE BUILDING CODE.
 2. FOR ADDITIONAL REQUIREMENTS, SEE SPECIFICATIONS AND **A340** TYP.
 3. VARIOUS POST MOUNTING DETAILS ARE ILLUSTRATED. SEE DRAWINGS FOR SPECIFIC MOUNTING REQUIREMENTS.

A343 THREE RAIL GUARDRAIL (PRIVATE USE)
 TYP NS SHEET 1 OF 3 03/01/06



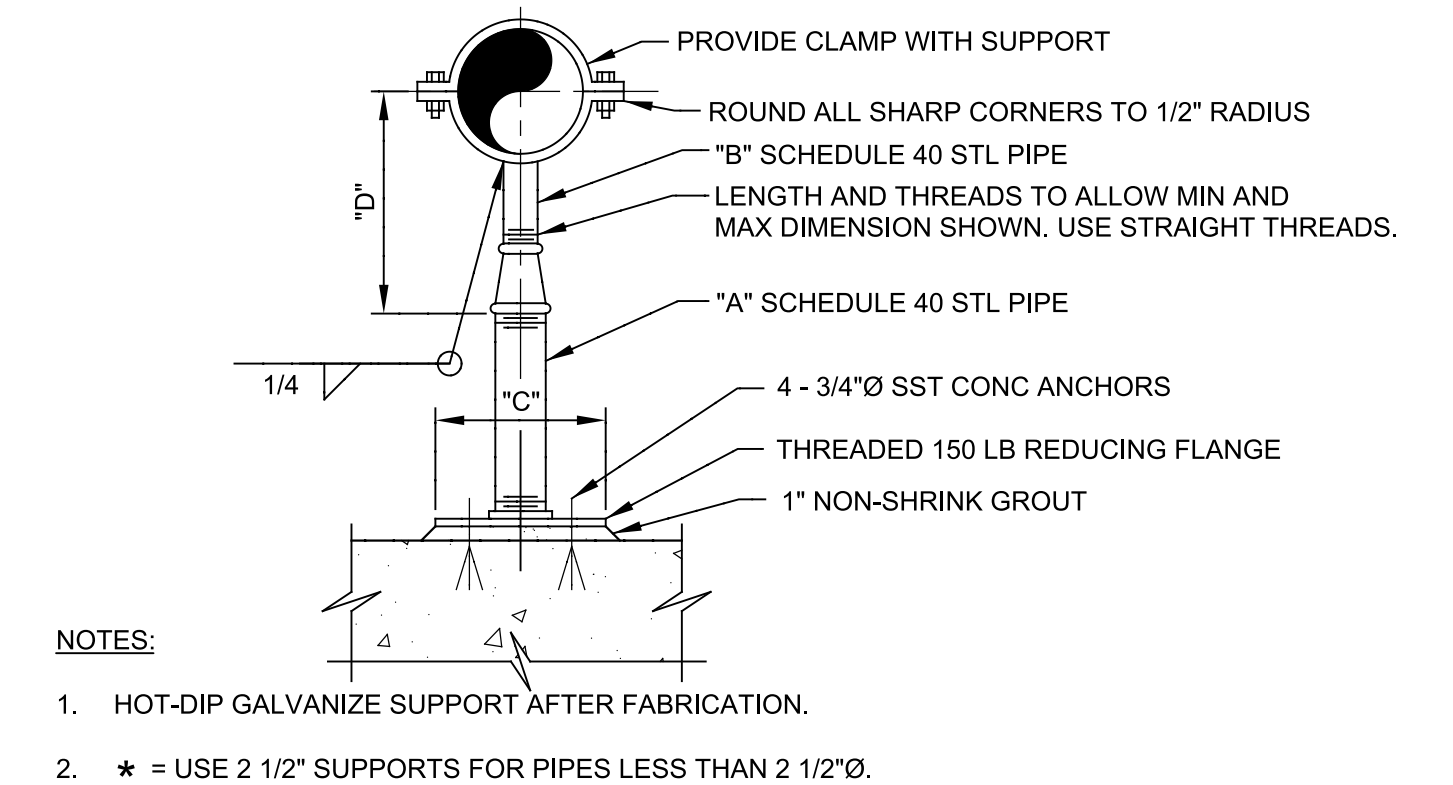
NOTES:
 1. SEE SPECIFICATIONS AND **A340** TYP FOR ADDITIONAL REQUIREMENTS.
 2. HANDRAIL EXTENSIONS ARE REQUIRED ON BOTH SIDES OF STAIR. THEY ARE NOT REQUIRED WHERE HANDRAIL IS CONTINUOUS.

A343 THREE RAIL GUARDRAIL (PRIVATE USE)
 TYP NS SHEET 2 OF 3 03/01/06



A343 THREE RAIL GUARDRAIL (PRIVATE USE)
 TYP NS SHEET 3 OF 3 03/01/06

ADJUSTABLE PIPE SADDLE SUPPORT SCHEDULE (INCHES)					
SIZE OF SUPPORTED PIPE	PIPE SIZE "A"	PIPE SIZE "B"	"C"	"D"	
				MINIMUM	MAXIMUM
2 1/2 *	2 1/2	1 1/2	9	8	13
3	2 1/2	1 1/2	9	8 1/2	13 1/2
3 1/2	2 1/2	1 1/2	9	8 1/2	13 1/2
4	3	2 1/2	9	9 1/2	14
6	3	2 1/2	9	10 1/2	15 1/2
8	3	2 1/2	9	11 1/2	16 1/2
10	3	2 1/2	9	13 1/2	18 1/2
12	3	2 1/2	9	15	19 1/2
14	4	3	11	16 1/2	20 1/2
16	4	3	11	17 1/2	22 1/2
18	6	3 1/2	13 1/2	19 1/2	24
20	6	3 1/2	13 1/2	21	25 1/2
24	6	4	13 1/2	23 1/2	28 1/2
30	6	4	13 1/2	27	31 1/2
32	6	4	13 1/2	28 1/2	32 1/2
36	6	4	13 1/2	30 1/2	34 1/2



P624 ADJUSTABLE PIPE SUPPORT
 TYP NS 05/16/09

REV	DATE	BY	DESCRIPTION

DESIGNED MV	
DRAWN DVP	
CHECKED EP	
DATE MARCH 2013	



MANATEE COUNTY
 SWWRF CLARIFIER 3&4 REHABILITATION
 DETAILS
 TYPICAL DETAILS

VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	JOB NO. 7880J10 DRAWING NO. T-01
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