

NEW RIVER REGIONAL WATER AUTHORITY WATER TREATMENT PLANT EXPANSION

AUSTINVILLE, VIRGINIA

EDA PROJECT NO. 01-01-15370

PREPARED FOR:
New River Regional Water Authority
289 Kohler Avenue
Austinville, VA 24312

NEW RIVER REGIONAL WATER AUTHORITY BOARD MEMBERS

CANDICE N. JOHNSON

ROLLAND COOK

T. BRIAN FREEMAN

STEPHEN D. BEAR

MICHAEL WATSON

CATHY D. PATTISON

REX HILL

SUPERINTENDENT ZACHARY SLATE

PROJECT DESCRIPTION:

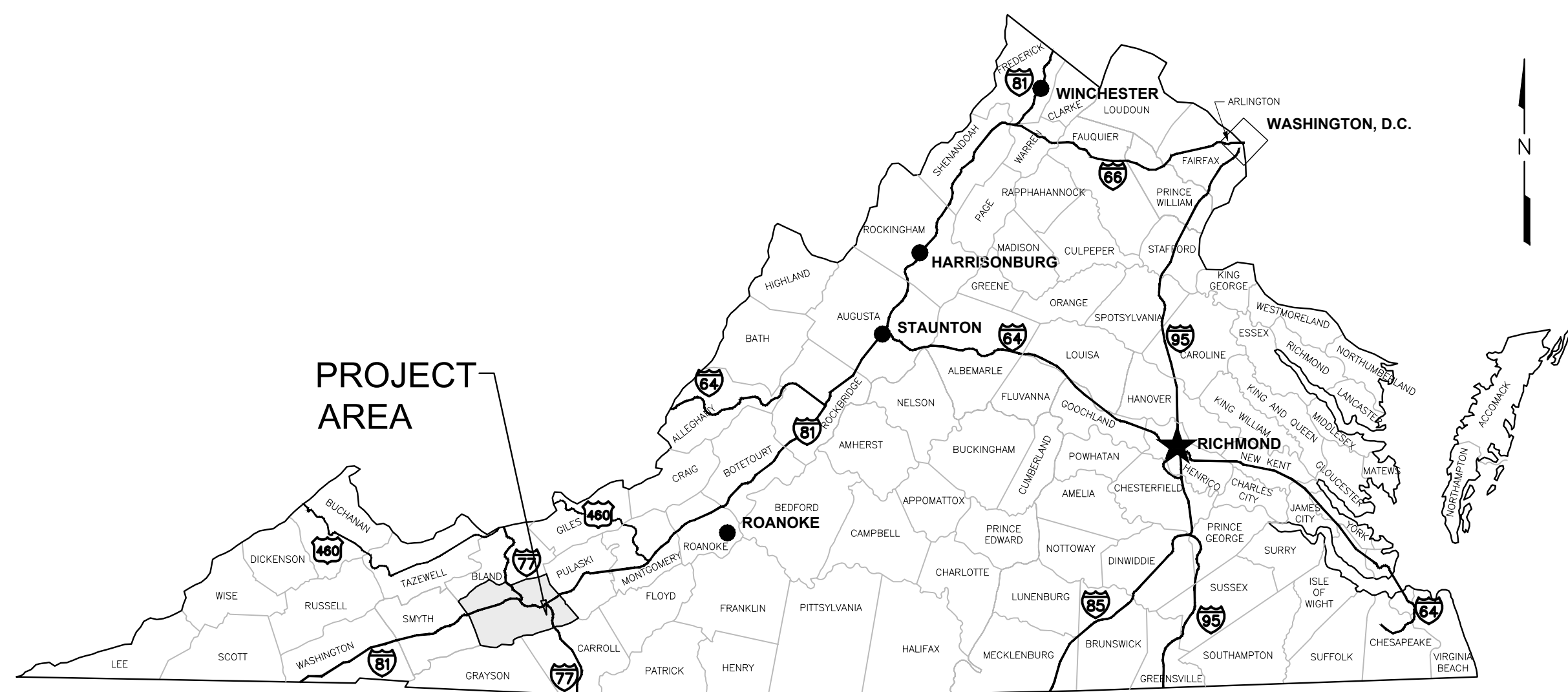
Project will expand the existing 4.0 MGD water treatment facility capacity to 6.33 MGD and provide additional plant improvements in accordance with approved PER titled "Preliminary Engineering Report Austinville Water Treatment Plant 6 MGD Expansion Evaluation" dated May 17, 2022. Improvements include replacing existing submersible raw water intake pumps with vertical turbine pumps, developing a fourth gravity sand filter, installing a third finished water pump, replacing liquid chemical feed pumps, installing mechanical sludge collectors and tube settlers in existing sedimentation basins, and constructing waste sludge thickener and dewatering facilities.

NOTES:

1. BY CONVENTION "Title Case" LABELS INDICATE EXISTING FEATURES AND "ALL UPPER CASE" LABELS INDICATE PROPOSED FEATURES.
2. EXPECTED DISTURBED AREA: 0.95 ACRES (41,170 SQFT)
3. OWNER/APPLICANT:
NEW RIVER REGIONAL WATER AUTHORITY
PO BOX 966
WYTHEVILLE, VA 24382
PWSID: 1197435
PROJECT LOCATION: 289 KOHLER AVE, AUSTINVILLE, VA 24312
PROPERTIES IMPACTED: WYTHE COUNTY PARCEL 75-5-35C (WTP)
WYTHE COUNTY PARCEL 75-254E (INTAKE)



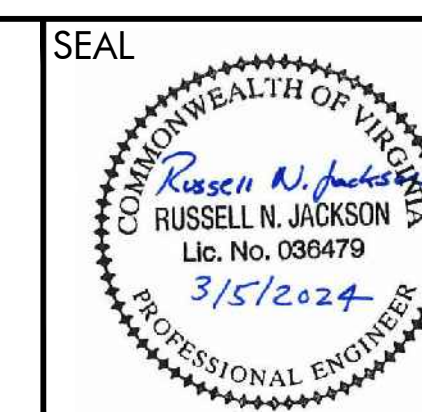
VICINITY MAP
SCALE: 1"=2000'



LOCATION MAP
N.T.S.

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3214 FAX: (540) 394 - 3215

NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



DRAWN BY:
RNJ
REVIEW BY:
RNJ
DATE:
5 MARCH 2024
REVISION:

SHEET DESCRIPTION:
TITLE SHEET

G01

SHEET INDEX

SHEET DESCRIPTION

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GENERAL NOTES:

1. BY CONVENTION "Title Case" LABELS INDICATE EXISTING FEATURES AND "ALL UPPER CASE" LABELS INDICATE PROPOSED FEATURES.
2. THE EXISTING TREATMENT PLANT OPERATES EVERY DAY, TYPICALLY BETWEEN 12 AND 16 HOURS PER DAY. TREATMENT PLANT WILL REMAIN IN OPERATION DURING CONSTRUCTION.
3. CONTRACTOR SHALL MAKE EVERY EFFORT TO AVOID INTERRUPTIONS TO TOTAL TREATMENT PRODUCTION RATE. CONTRACTOR WILL TYPICALLY BE PERMITTED TO SCHEDULE INTERRUPTIONS WITH THE OWNER FOR UP TO 4 HOURS AT A TIME, WITH MINIMUM 72 HOURS REQUEST NOTICE, CONTINGENT ON OWNER'S APPROVAL. LONGER INTERRUPTIONS MAY BE PERMITTED IN SPECIAL CIRCUMSTANCES.
4. THE TREATMENT FACILITY INCLUDES TWO SEPARATE TREATMENT TRAINS FROM THE RAW WATER FEED PIPE INTO THE MAIN BUILDING THROUGH THE SEDIMENTATION BASINS, ALLOWING PORTIONS OF THE TREATMENT FACILITY TO BE ISOLATED DURING CONSTRUCTION WHILE FLOW CONTINUES THROUGH THE OPPOSITE TREATMENT TRAIN. THE SEQUENCE OF CONSTRUCTION NOTES ALLOWABLE INTERRUPTION TIMES AND STEPS INTENDED TO MAINTAIN MAXIMUM TREATMENT CAPACITY DURING CONSTRUCTION.

SEQUENCE OF CONSTRUCTION:

THE CONTRACT INCLUDES A PARTIAL SUBSTANTIAL COMPLETION DEADLINE FOR CAPACITY RELATED IMPROVEMENTS (WORK OTHER THAN THE SOLIDS HANDLING AND DEWATERING RELATED IMPROVEMENTS); THEREFORE, THE INDICATED SEQUENCE OF CONSTRUCTION LISTS THE SOLIDS HANDLING AND DEWATERING ITEMS SEPARATE FROM THE OTHER WORK. CONTRACTOR SHOULD PRIORITIZE CAPACITY RELATED IMPROVEMENTS (WHICH HAVE AN EARLIER COMPLETION DEADLINE), BUT MAY PROMOTE OR WORK ON OTHER TASKS CONCURRENTLY AS DEEMED MOST EFFECTIVE AND IN CONSIDERATION OF ANTICIPATED EQUIPMENT DELIVERY TIMES. ADJUSTMENTS TO SEQUENCE OF CONSTRUCTION SHALL BE DISCUSSED WITH AND APPROVED BY OWNER AND ENGINEER.

CAPACITY IMPROVEMENTS:

1. REFER TO SHEET C05 FOR RAW WATER INTAKE IMPROVEMENTS SEQUENCE OF CONSTRUCTION.
2. PERFORM CHEMICAL FEED IMPROVEMENTS. REFER TO SHEETS C12-C14 FOR NOTES REGARDING CHEMICAL FEED PUMP SEQUENCE OF CONSTRUCTION AND TEMPORARY MEASURES TO MAINTAIN OPERATIONS.
3. INSTALL INTERCONNECT PIPE AND VALVES BETWEEN TREATMENT TRAIN #1 AND #2 RAW WATER PIPES IN MAIN BUILDING TO ALLOW FULL PLANT FLOW TO BE ROUTED THROUGH A SINGLE FLOCCULATION AND SEDIMENTATION TREATMENT TRAIN. REPLACE RAW WATER PIPE STATIC MIXERS.
4. INSTALL SLUDGE COLLECTOR AND TUBE SETTLERS IN ONE SEDIMENTATION BASIN AT A TIME. ONLY ONE BASIN MAY BE OFFLINE AT A TIME. ANTICIPATED DOWNTIME FOR EACH SEDIMENTATION BASIN IS UP TO THREE WEEKS. CONTRACTOR SHALL DETERMINE EXPECTED BASIN DOWNTIME AND REVIEW SCHEDULE WITH OWNER AND ENGINEER FOR APPROVAL.
5. DEVELOP FILTER #4 INCLUDING PIPING, VALVES, INSTRUMENTATION, AND CONTROLS. PLACE FILTER #4 IN SERVICE PRIOR TO PERFORMING UPGRADES TO EXISTING FILTERS #2 OR #3. REBUILD OF EITHER FILTER #2 OR #3 SHALL BE COMPLETED AND THE FILTER RETURNED TO SERVICE PRIOR TO BEGINNING WORK ON THE OTHER, SO THREE FILTERS ARE IN SERVICE AT ALL TIMES.
6. CONSTRUCT FINISHED WATER PUMPING IMPROVEMENTS.
7. COMPLETE CONTROLS IMPROVEMENTS FOR OPERATION OF ALL CAPACITY RELATED IMPROVEMENTS.

SOLIDS HANDLING & DEWATERING IMPROVEMENTS:

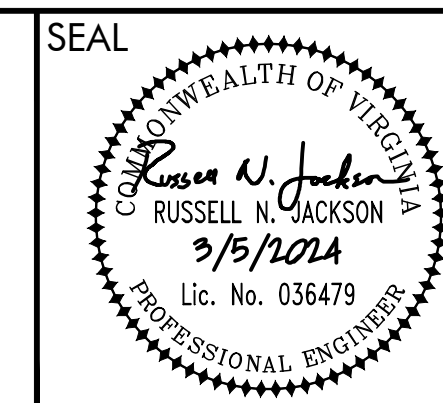
1. CONSTRUCT SLUDGE PUMPING STATION, THICKENER TANKS, AND SITE PIPING IMPROVEMENTS.
2. CONSTRUCT DEWATERING BUILDING AND DRY SOLIDS SHELTER AFTER APPROVAL OF CENTRIFUGE AND CONVEYOR SYSTEM SUBMITTALS TO COORDINATE LAYOUT, BUILDING WALL OPENINGS, AND IMPACTED STRUCTURAL LOADS.
3. COMPLETE EQUIPMENT INSTALLATION.
4. CONSTRUCT IMPROVEMENTS TO EXISTING SOLIDS HOLDING BASINS.
5. COMPLETE ALL OTHER WORK.

SITE LEGEND

	Existing Fence		PROPOSED FENCE
	Existing Water		PROPOSED WATER
	Existing Asphalt		PROPOSED ASPHALT
	Existing Gravel		PROPOSED GRAVEL
	Existing Contours		PROPOSED CONTOURS
	Existing Underground Electric		PROPOSED UNDERGROUND ELECTRIC
	Existing Overhead Electric		PROPOSED FIBER OPTIC
	Existing Storm Sewer		PROPOSED DUCTBANK
	Existing Sanitary Sewer		PROPOSED SANITARY SEWER WITH PROFILE
	Existing Ditch		PROPOSED DITCH
	Objects For Demolition		PROPOSED SANITARY SEWER WITHOUT PROFILE
			PROPOSED FORCE MAIN

Peed & Bortz, L.L.C.
 CIVIL & ENVIRONMENTAL ENGINEERS
 20 MIDWAY PLAZA DRIVE - SUITE 100
 CHRISTIANSBURG, VIRGINIA 24073
 PHONE: (540) 394 - 3214 FAX : (540) 394 - 3215

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 AUSTINVILLE VIRGINIA



DRAWN BY: RNJ
REVIEW BY: RNJ
DATE: 5 MARCH 2024
REVISION:

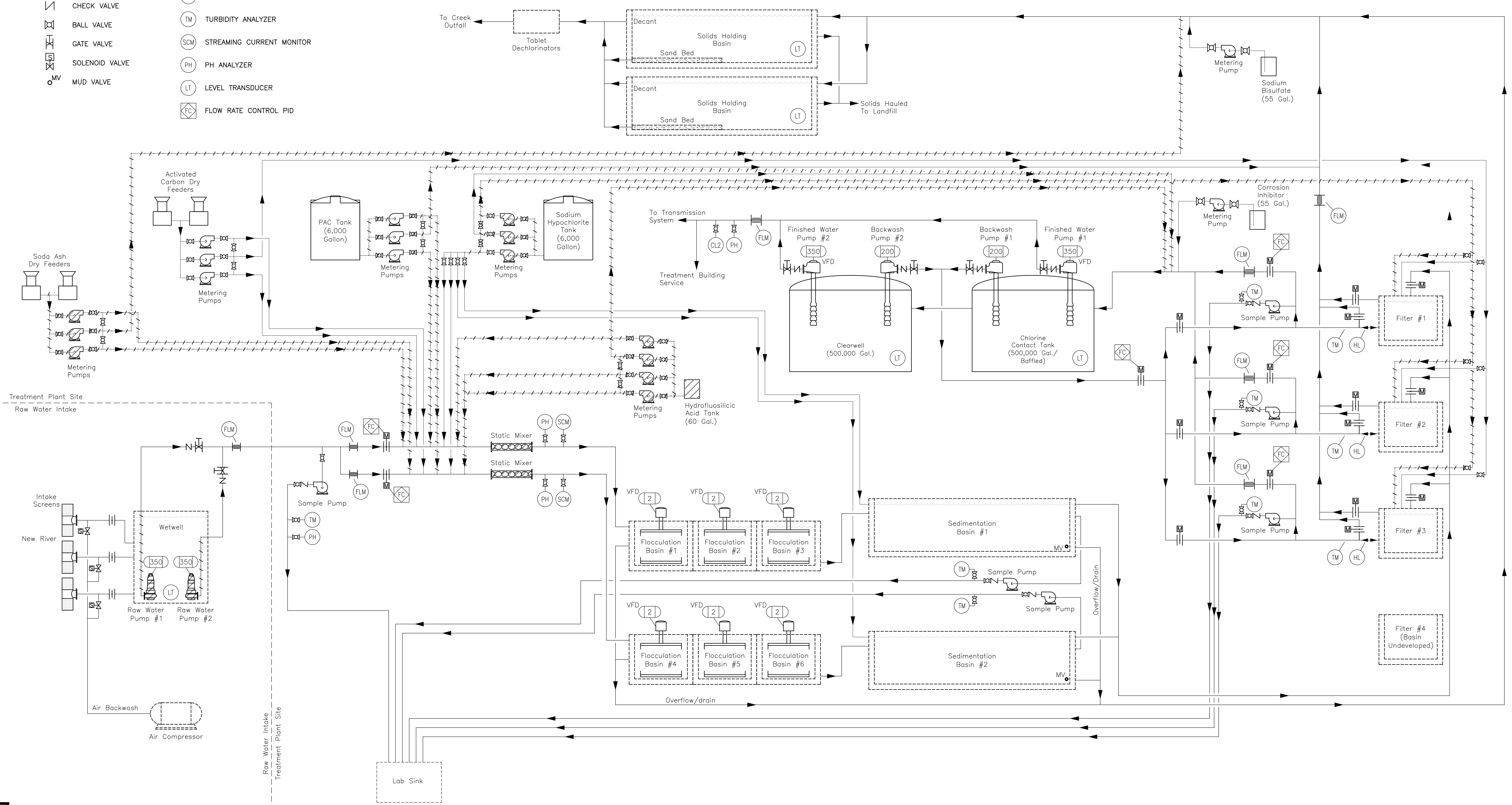
SHEET DESCRIPTION:
SHEET INDEX & NOTES

G02

- EQUIPMENT LEGEND**
- BUTTERFLY VALVE
 - FLOW METER
 - CHECK VALVE
 - BALL VALVE
 - GATE VALVE
 - SOLENOID VALVE
 - MUD VALVE

- CONTROL / INSTRUMENTATION LEGEND**
- FREE CHLORINE RESIDUAL ANALYZER
 - FLOW METER
 - TURBIDITY ANALYZER
 - STREAMING CURRENT MONITOR
 - PH ANALYZER
 - LEVEL TRANSDUCER
 - FLOW RATE CONTROL PID

EQUIPMENT/PIPING TO BE REMOVED



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WATER TREATMENT PLANT
WATER TREATMENT PLANT EXPANSION
 AUSTINVILLE VIRGINIA

SEAL
 COMMONWEALTH OF VIRGINIA
 Russell N. Jackson
 3/5/2024
 Lic. No. 036479
 PROFESSIONAL ENGINEER

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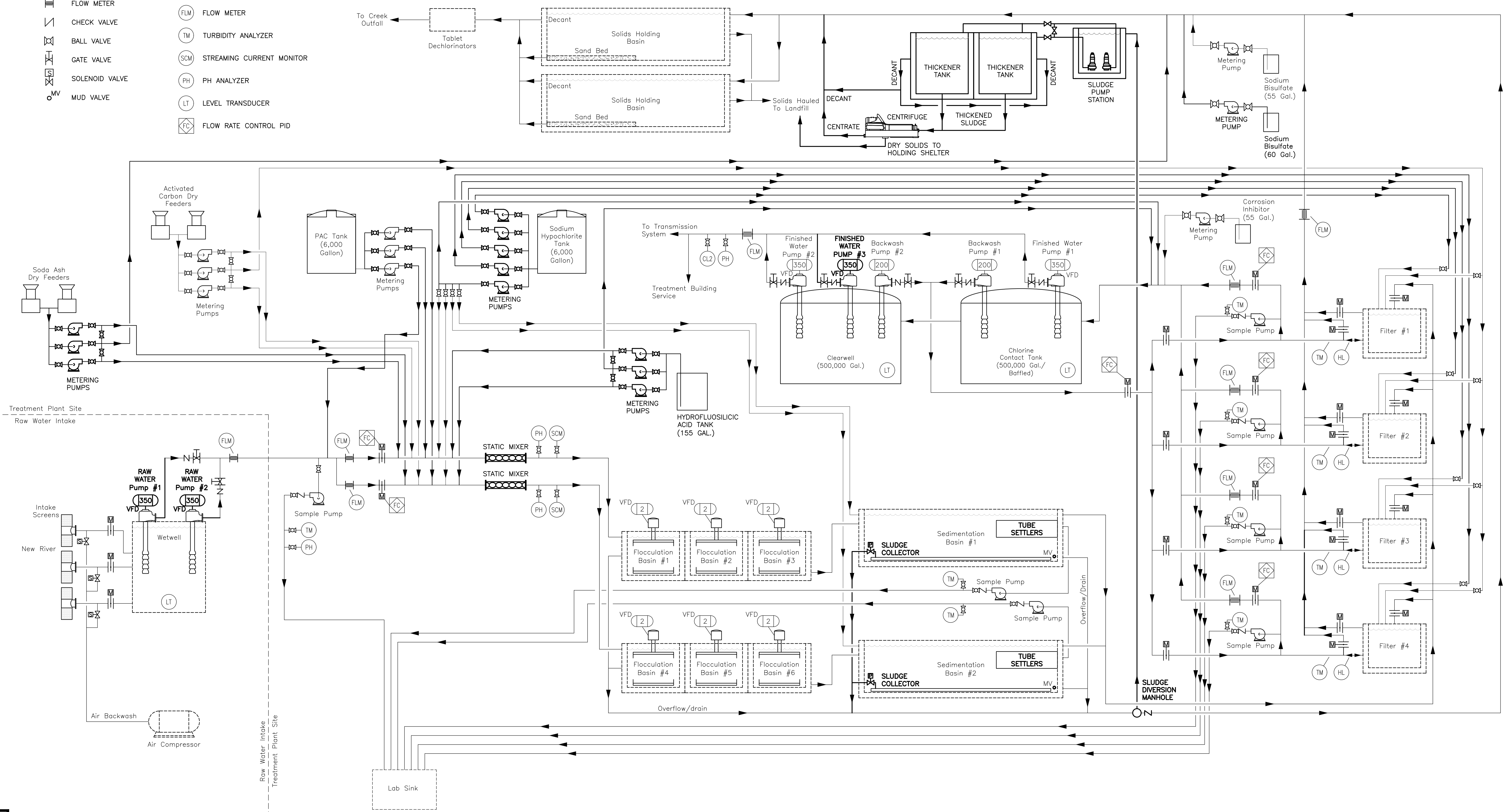
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 EXISTING PROCESS
 DIAGRAM

C01

- EQUIPMENT LEGEND**
- BUTTERFLY VALVE
 - FLOW METER
 - CHECK VALVE
 - BALL VALVE
 - GATE VALVE
 - SOLENOID VALVE
 - MUD VALVE

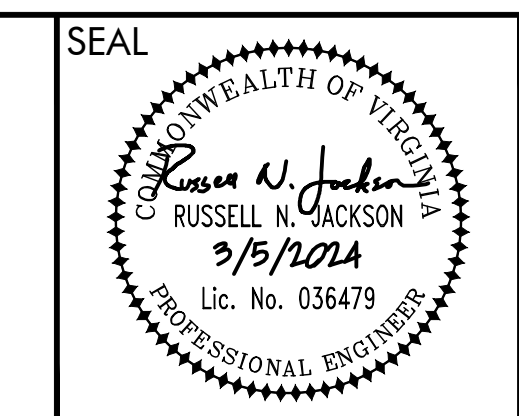
- CONTROL / INSTRUMENTATION LEGEND**
- FREE CHLORINE RESIDUAL ANALYZER
 - FLOW METER
 - TURBIDITY ANALYZER
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 - PH ANALYZER
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 - FLOW RATE CONTROL PID

EQUIPMENT/PIPING TO BE REMOVED



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 CHRISTIANSBURG, VIRGINIA 24073
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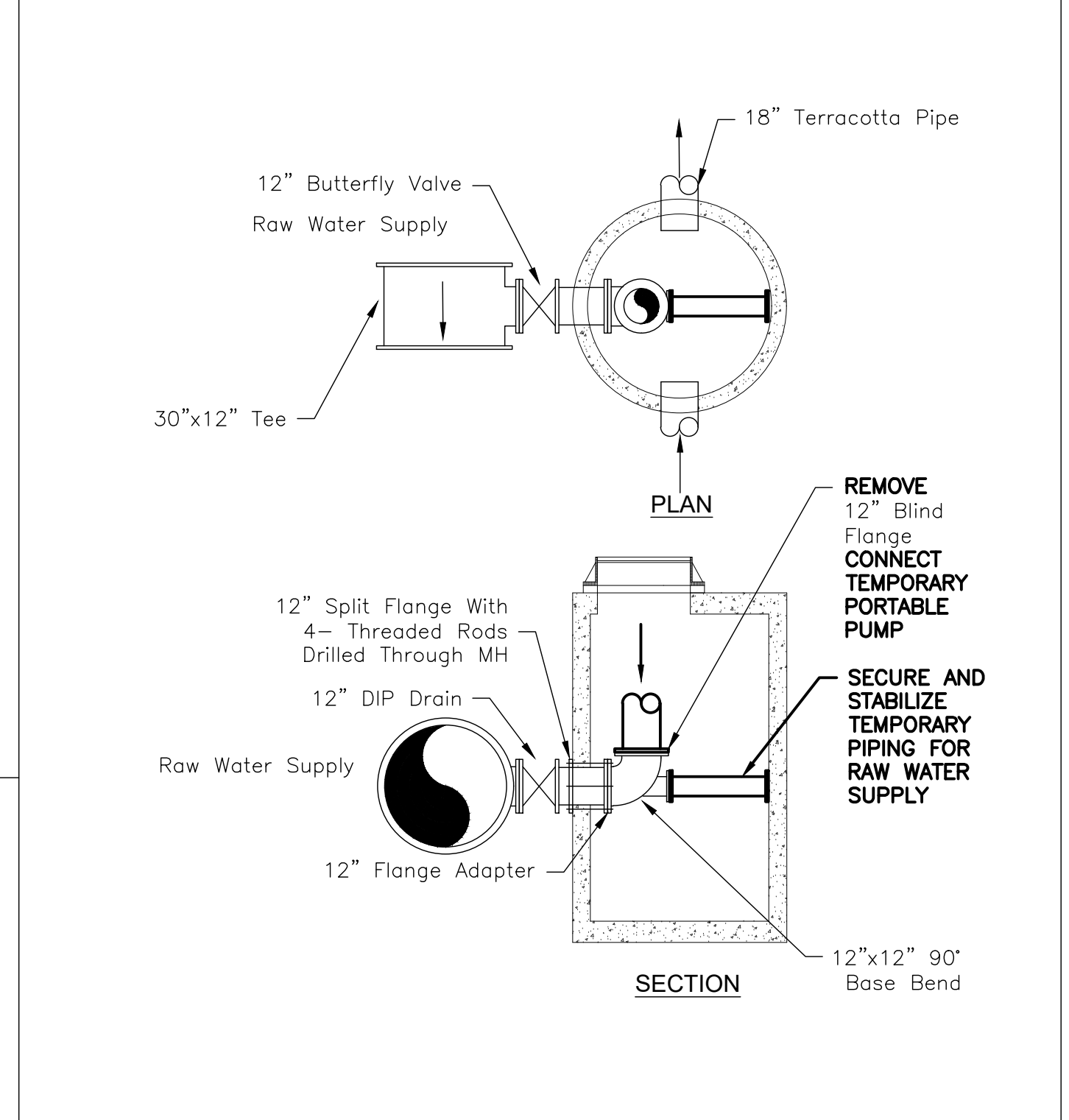
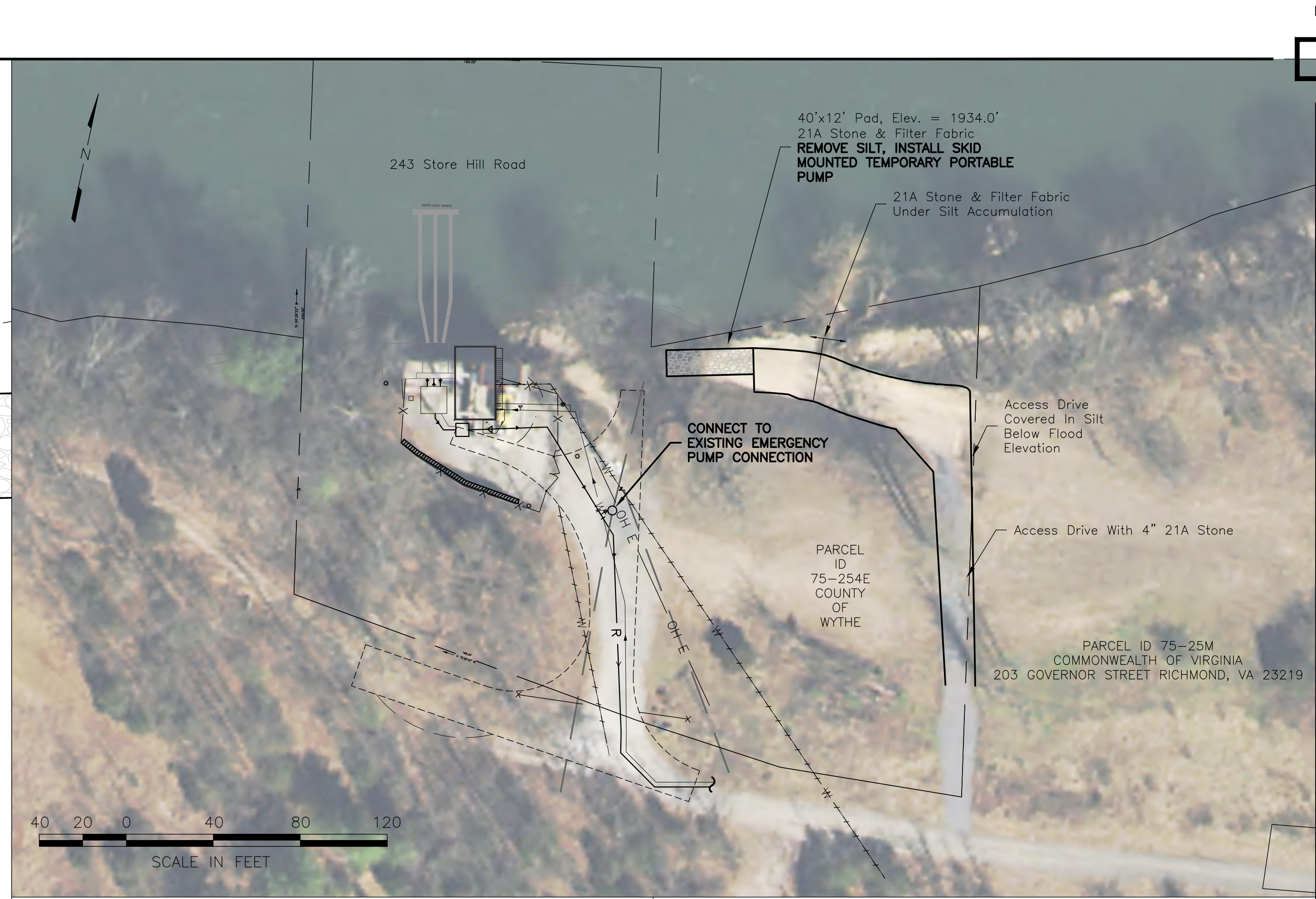
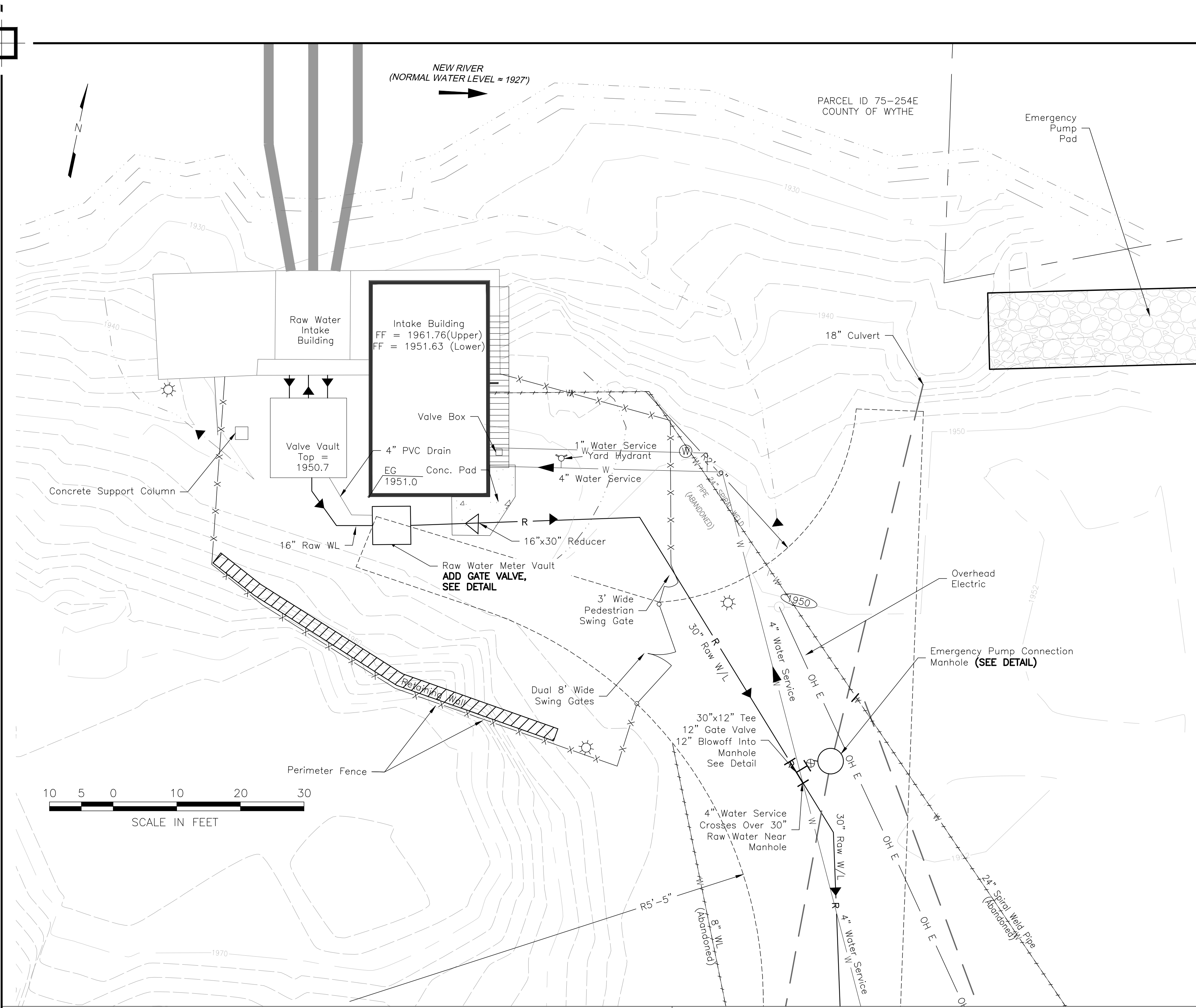
WATER TREATMENT PLANT
WATER TREATMENT PLANT EXPANSION
 AUSTINVILLE VIRGINIA



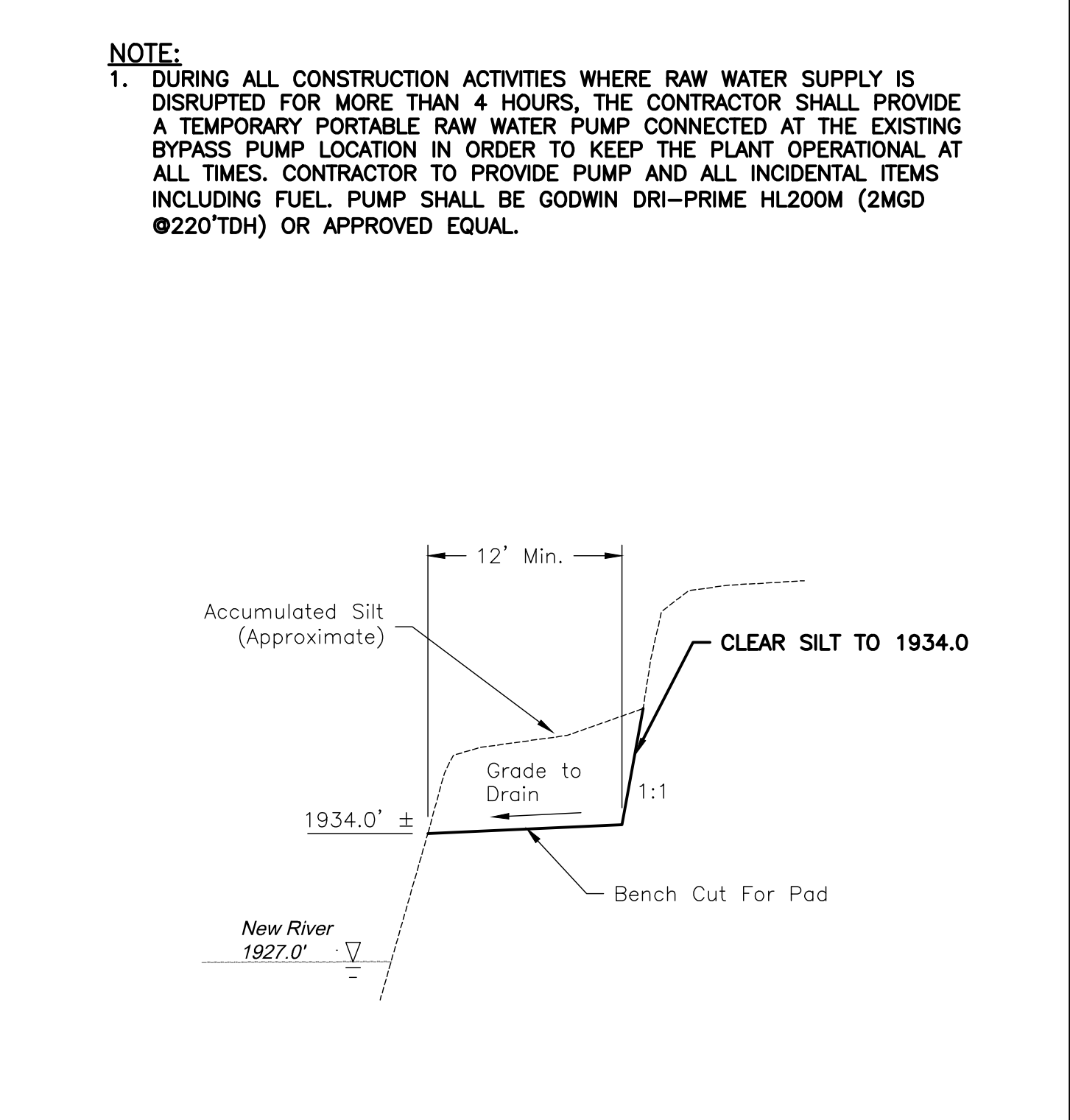
DRAWN BY: RNJ
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SHEET DESCRIPTION:
 MODIFIED PROCESS
 DIAGRAM

C02

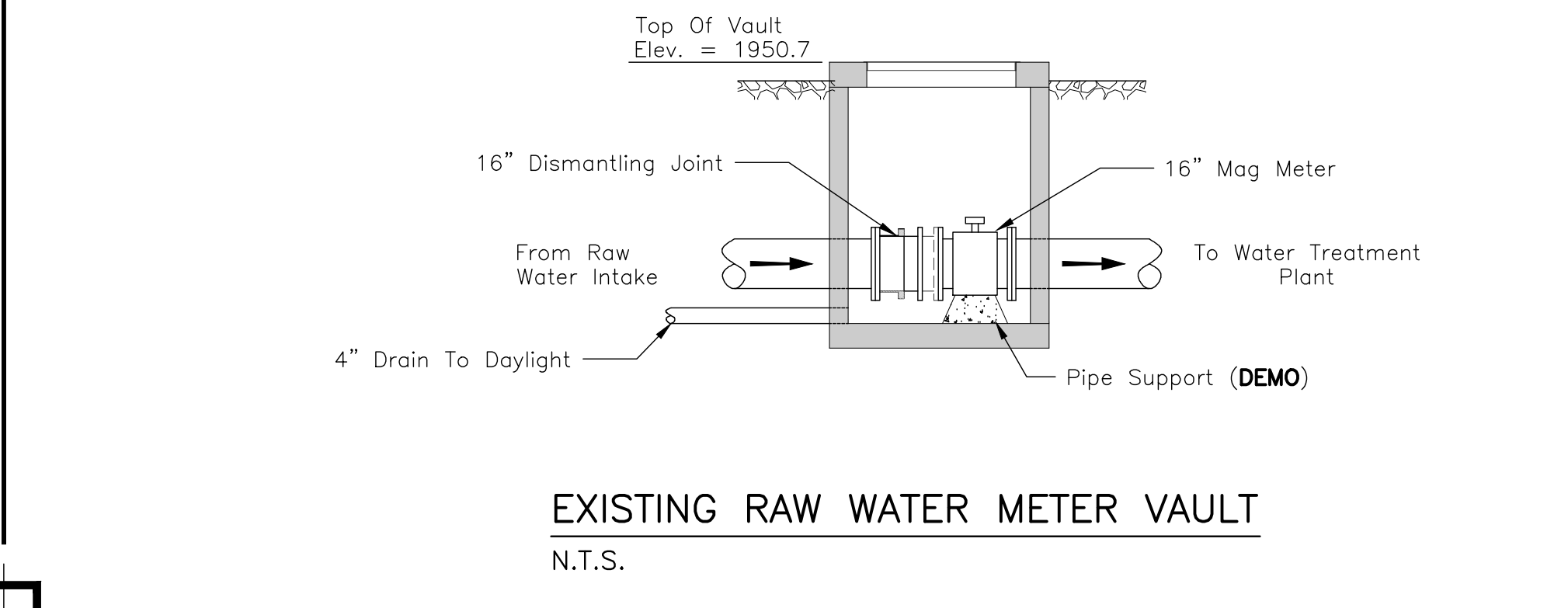


EMERGENCY CONNECTION MANHOLE
N.T.S.

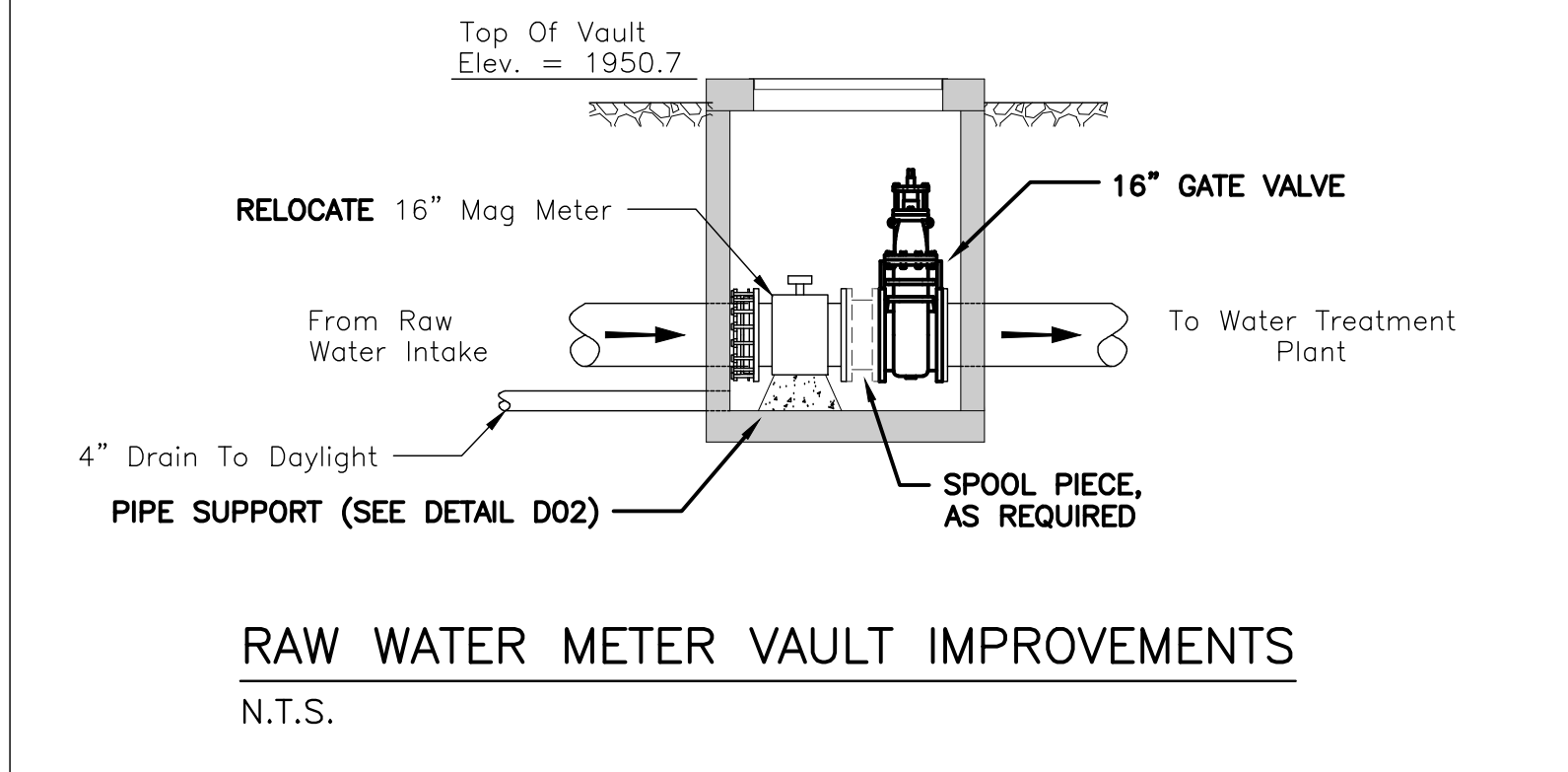


EMERGENCY PUMP PAD SECTION
N.T.S.

NOTE:
1. DURING ALL CONSTRUCTION ACTIVITIES WHERE RAW WATER SUPPLY IS DISRUPTED FOR MORE THAN 4 HOURS, THE CONTRACTOR SHALL PROVIDE A TEMPORARY PORTABLE RAW WATER PUMP CONNECTED AT THE EXISTING BYPASS PUMP LOCATION IN ORDER TO KEEP THE PLANT OPERATIONAL AT ALL TIMES. CONTRACTOR TO PROVIDE PUMP AND ALL INCIDENTAL ITEMS INCLUDING FUEL. PUMP SHALL BE GODWIN DRI-PRIME HL200M (2MGD @220'TDH) OR APPROVED EQUAL.



EXISTING RAW WATER METER VAULT
N.T.S.



RAW WATER METER VAULT IMPROVEMENTS
N.T.S.

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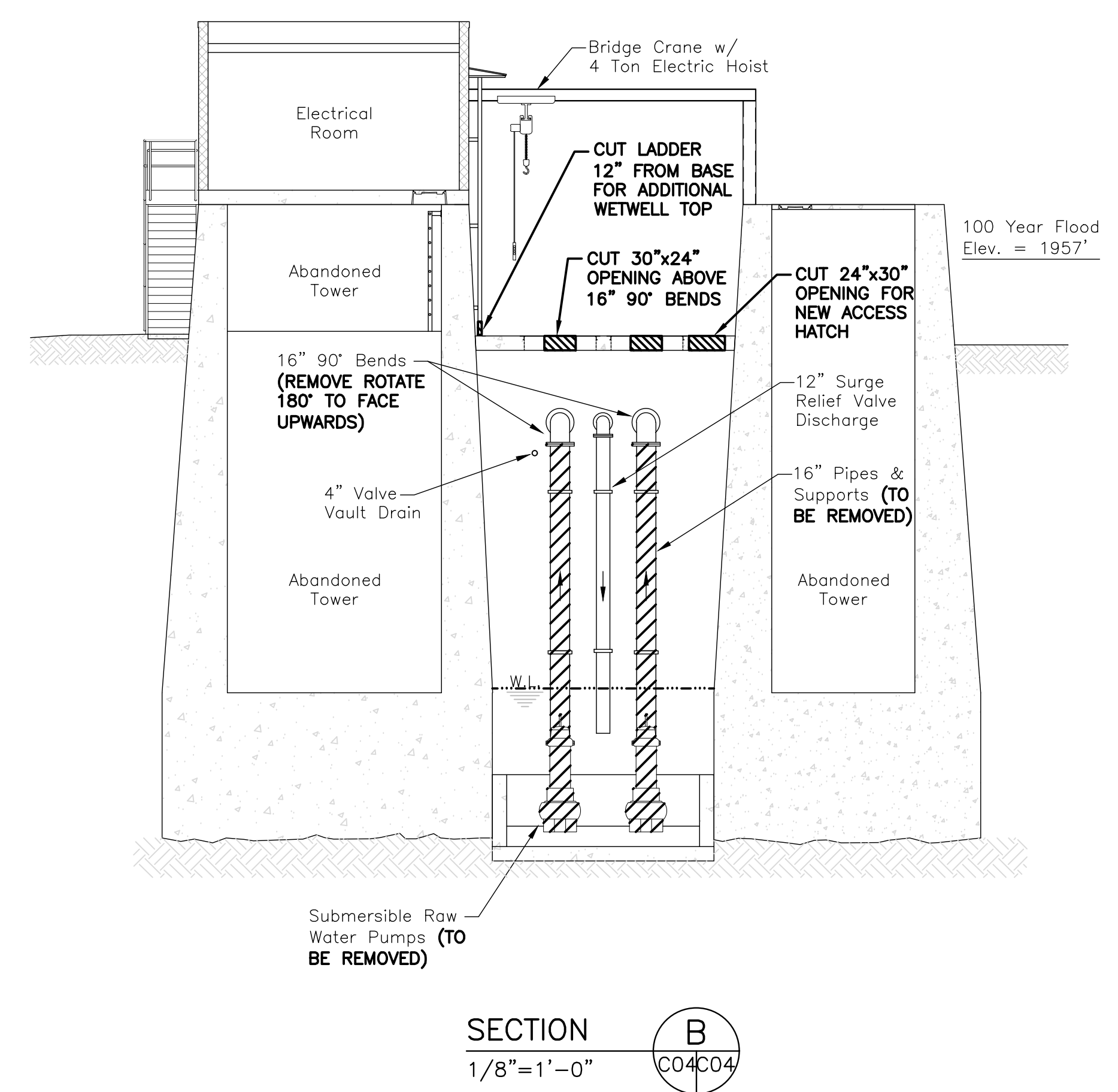
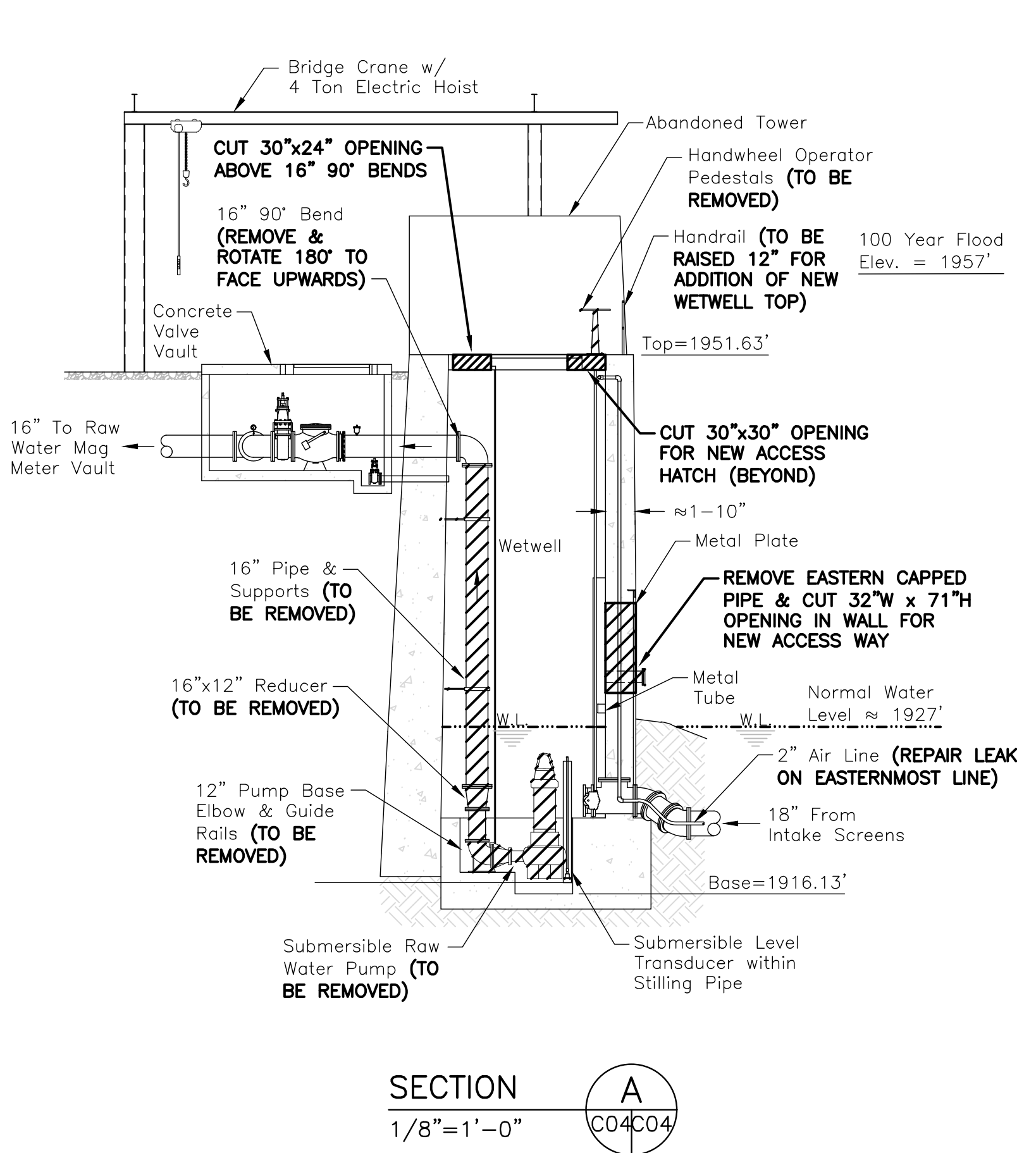
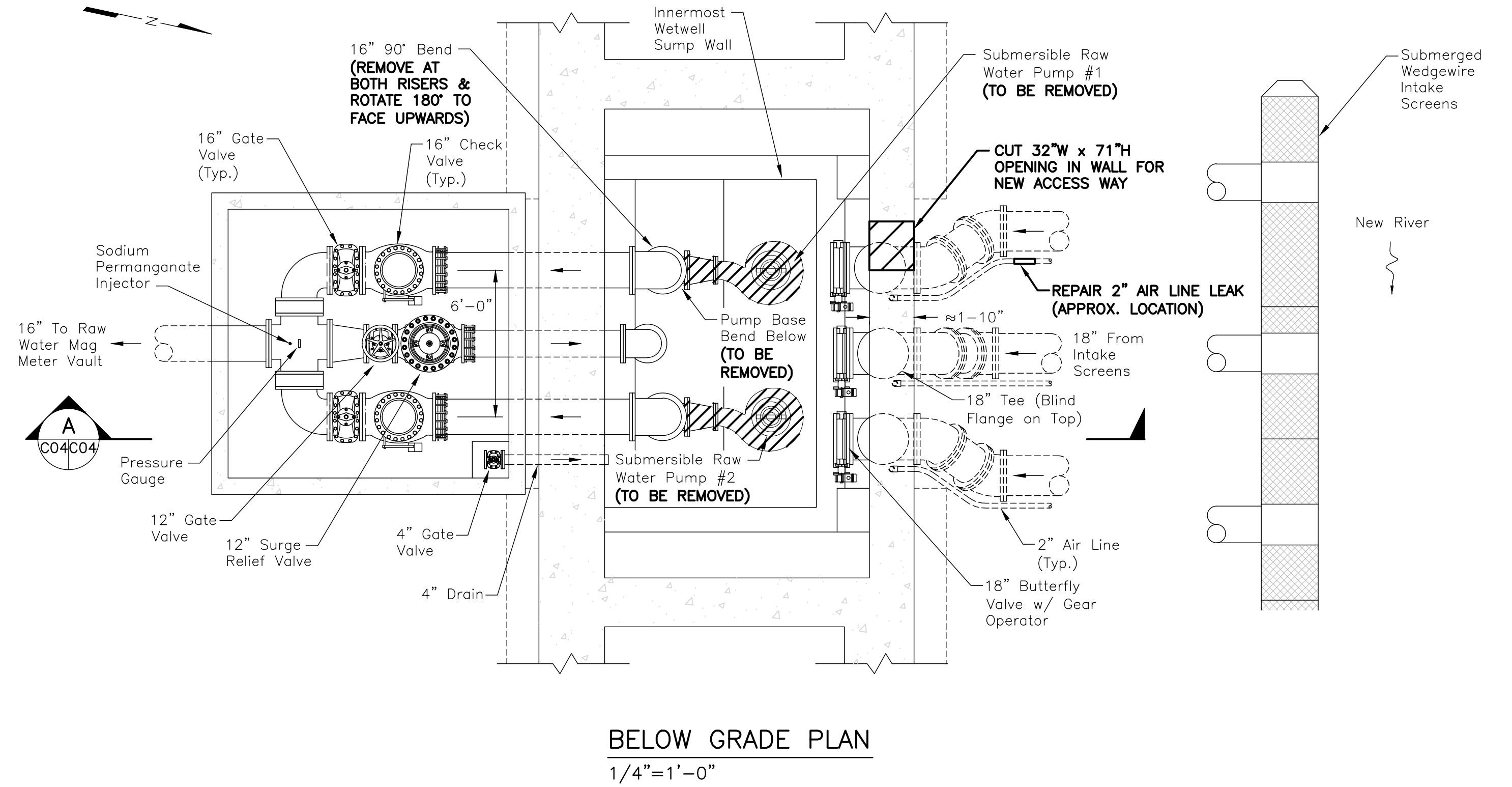
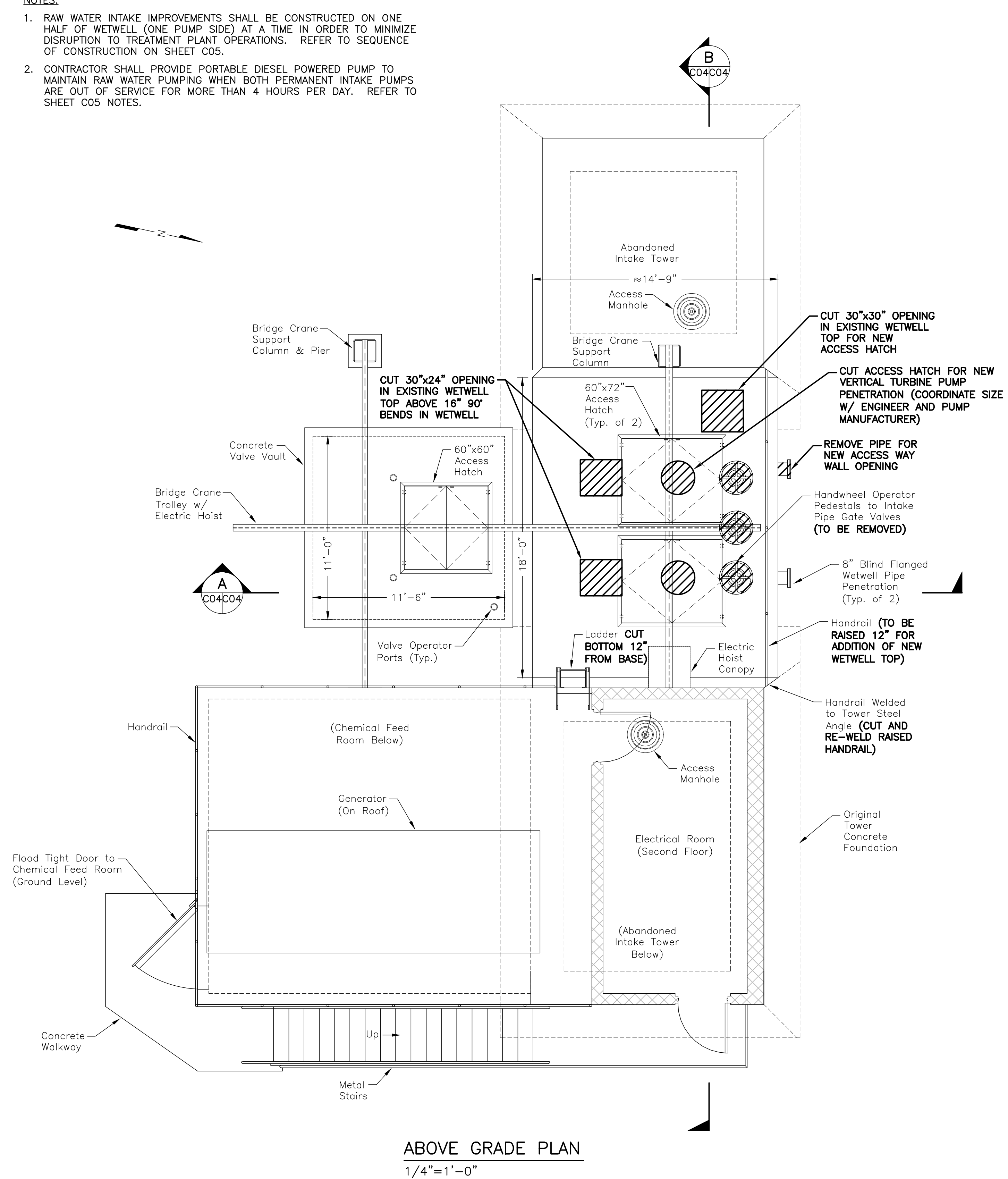
DRAWN BY:
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SHEET DESCRIPTION:
RAW WATER INTAKE SITE
PLAN

C03

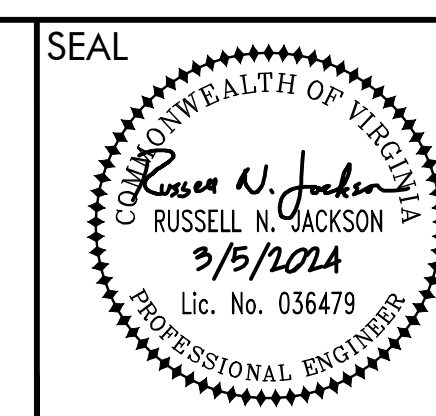
NOTES:

1. RAW WATER INTAKE IMPROVEMENTS SHALL BE CONSTRUCTED ON ONE HALF OF WETWELL (ONE PUMP SIDE) AT A TIME IN ORDER TO MINIMIZE DISRUPTION TO TREATMENT PLANT OPERATIONS. REFER TO SEQUENCE OF CONSTRUCTION ON SHEET C05.
2. CONTRACTOR SHALL PROVIDE PORTABLE DIESEL POWERED PUMP TO MAINTAIN RAW WATER PUMPING WHEN BOTH PERMANENT INTAKE PUMPS ARE OUT OF SERVICE FOR MORE THAN 4 HOURS PER DAY. REFER TO SHEET C05 NOTES.



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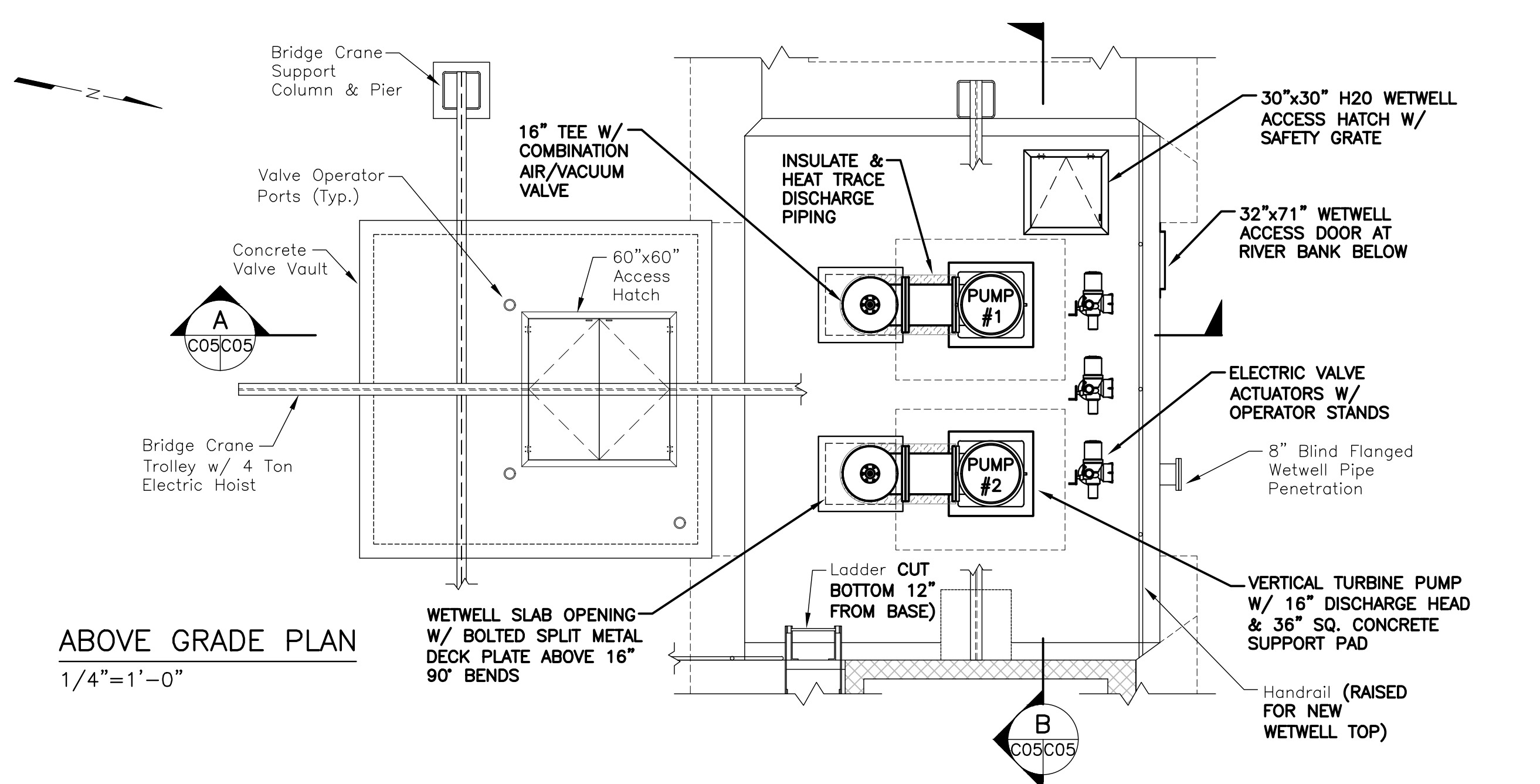
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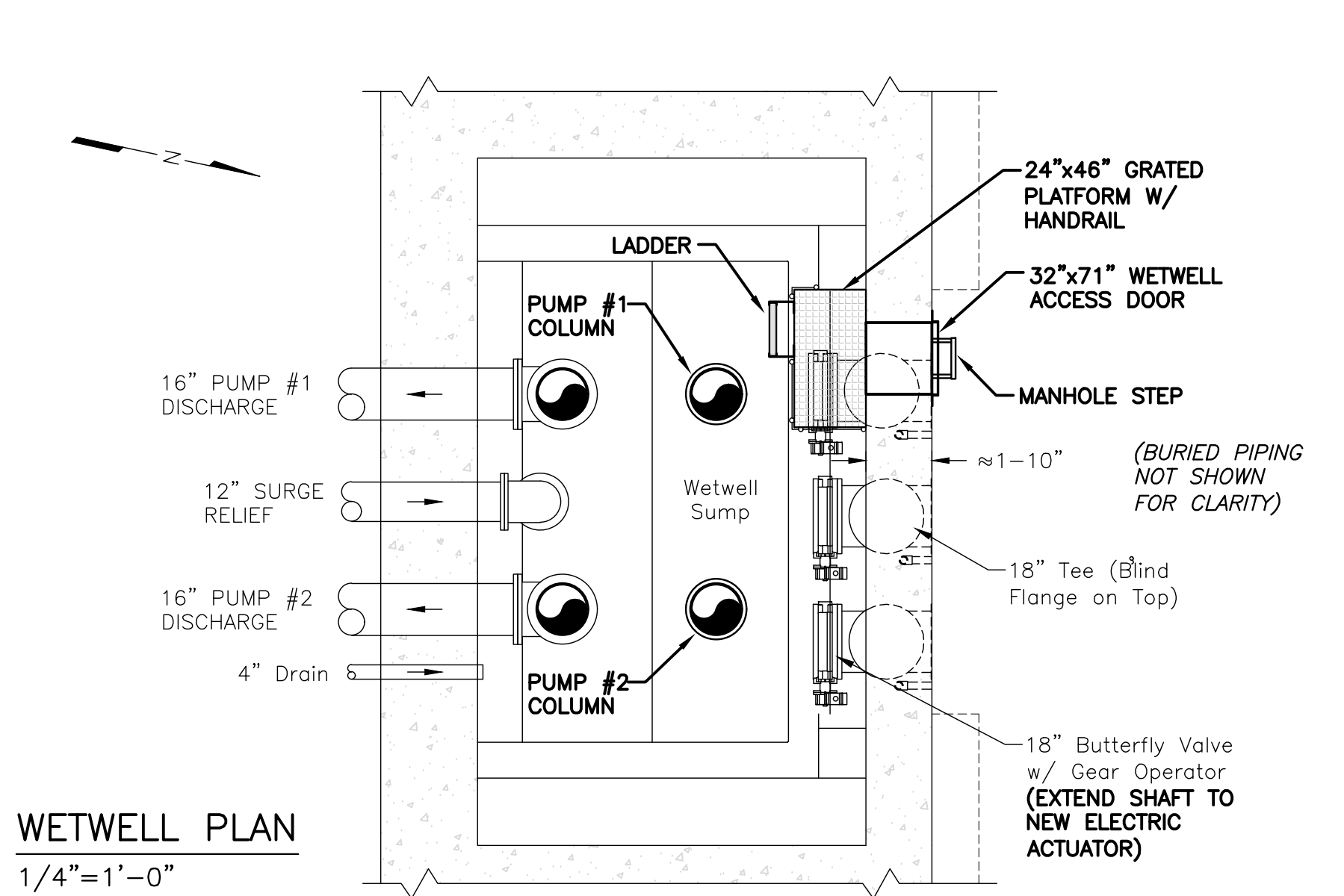
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SHEET DESCRIPTION:
 EXISTING RAW WATER INTAKE STRUCTURE

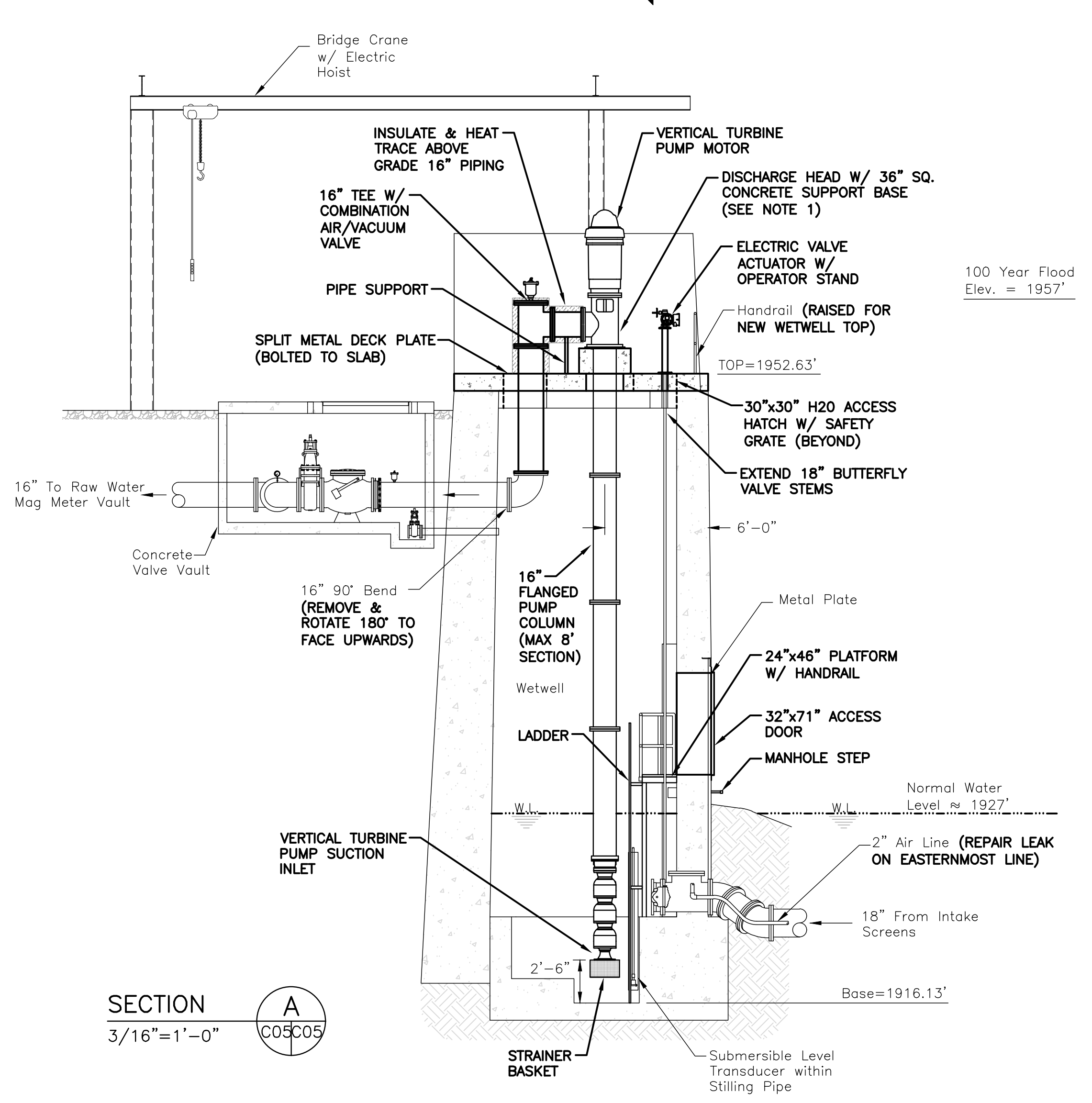
C04



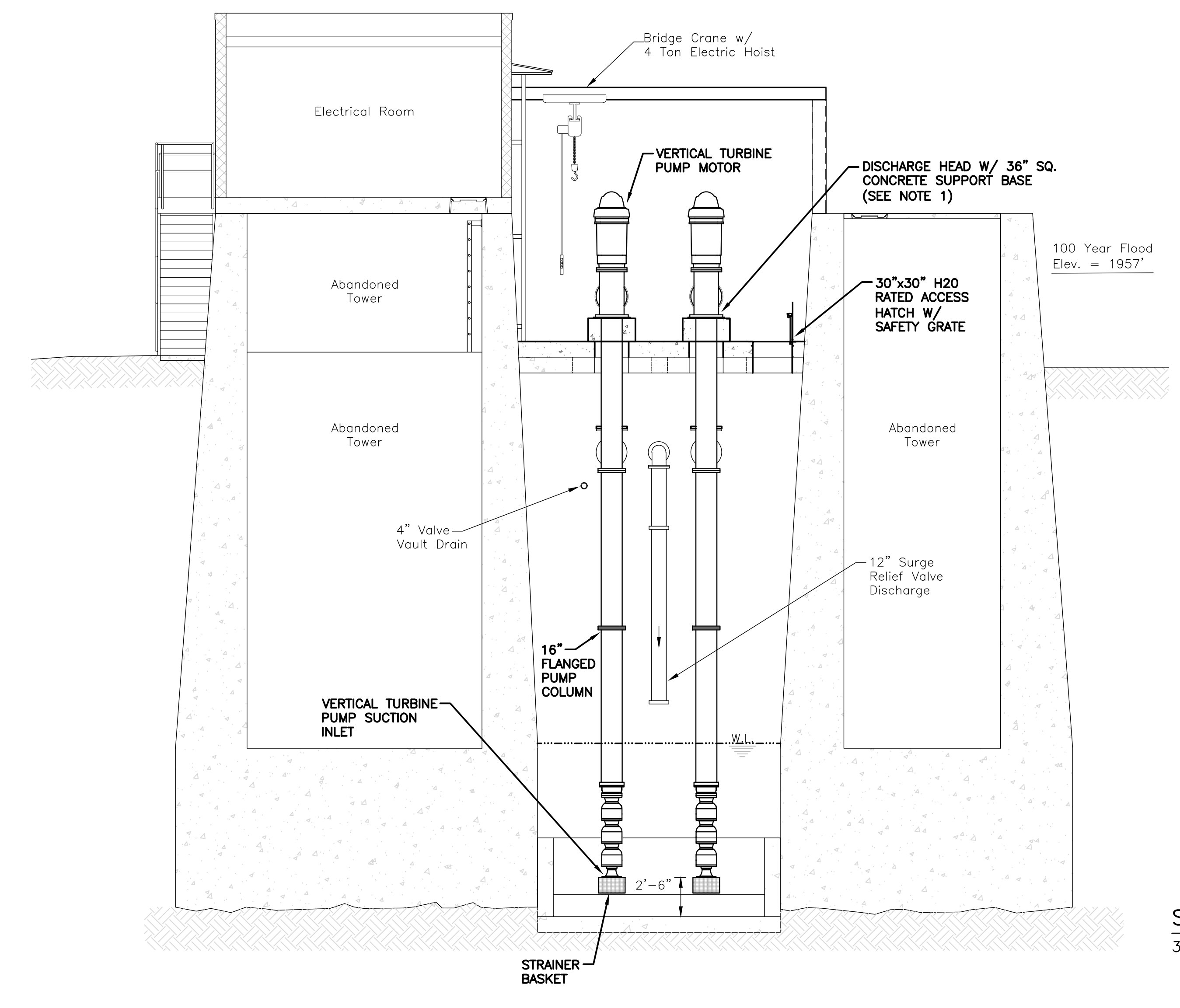
ABOVE GRADE PLAN
1/4"=1'-0"



WETWELL PLAN
1/4"=1'-0"



SECTION A
3/16"=1'-0"



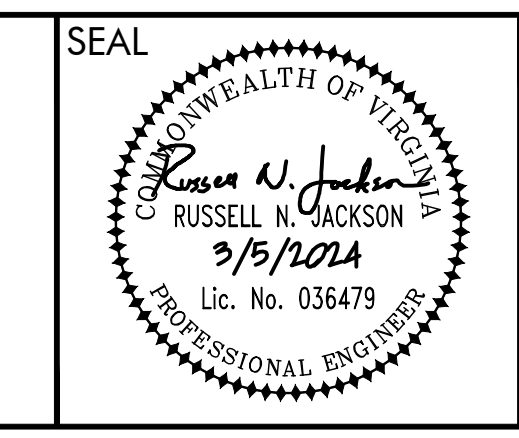
SECTION B
3/16"=1'-0"

NOTES:

1. COMBINED HEIGHT OF VERTICAL TURBINE PUMP DISCHARGE HEAD AND CONCRETE SUPPORT PAD SHALL RAISE BASE OF MOTOR TO BE AT OR ABOVE THE 100 YEAR FLOOD PLAIN, 4'-3" ABOVE NEW WETWELL TOP.
 2. REFER TO STRUCTURAL SHEETS FOR WETWELL PLATFORM DETAILS. CONTRACTOR SHALL CUT WETWELL WALL PENETRATION, INSTALL ACCESS DOOR, AND FIELD VERIFY PROPOSED PLATFORM AND SUPPORT LEG DIMENSIONS PRIOR TO FABRICATION.
 3. CONTRACTOR SHALL COORDINATE WITH OPERATORS A MINIMUM OF 72 HOURS IN ADVANCE OF ANY WORK WITHIN THE WETWELL WHICH WILL REQUIRE DRAINING THE WETWELL OR INTERRUPTING PUMP OPERATION.
 4. CONTRACTOR SHALL PROVIDE DIESEL POWERED PORTABLE PUMP TO CONTINUE RAW WATER PUMPING AND TREATMENT PLANT OPERATION ON ANY DAYS IN WHICH EXISTING INTAKE PUMPS WILL BE OUT OF SERVICE FOR 6 HOURS OR MORE. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING PUMP FUEL. PUMP SHALL BE RATED FOR RAW WATER FOR POTABLE TREATMENT WITH MINIMUM DESIGN POINT OF 2,400 GPM AT 230' TDH.
- SEQUENCE OF CONSTRUCTION:**
1. CUT ACCESS WAY IN WETWELL WALL AND INSTALL DOOR.
 2. REMOVE SUBMERSIBLE PUMP #2 AND DISCHARGE PIPING IN WETWELL.
 3. REMOVE EXISTING PUMP #3 SOFT START DRIVE AND INSTALL NEW VFD.
 4. CONSTRUCT NEW WETWELL TOP OVER PUMP #2 (EASTERN) HALF OF WETWELL.
 5. INSTALL NEW VERTICAL TURBINE PUMP #2 WITH ALL ASSOCIATED PIPING, ELECTRICAL, & CONTROL WORK. STARTUP NEW PUMP #2 AND PLACE PUMP IN OPERATION. CONTROLS SHALL ALLOW REMOTE START AND STOP OPERATION FROM MAIN TREATMENT PLANT SCADA. VFD SPEED MAY BE MANUALLY ADJUSTED UNTIL CONTROL WORK IS COMPLETE.
 6. REPEAT STEPS #2-#6 FOR PUMP #1 AND WESTERN HALF OF WETWELL.
 7. COMPLETE REMAINING WORK.

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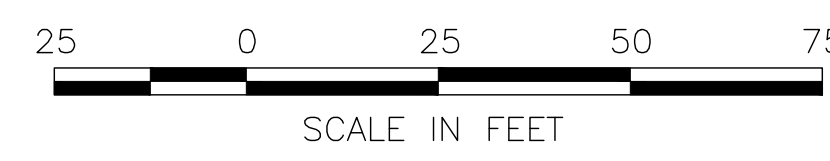
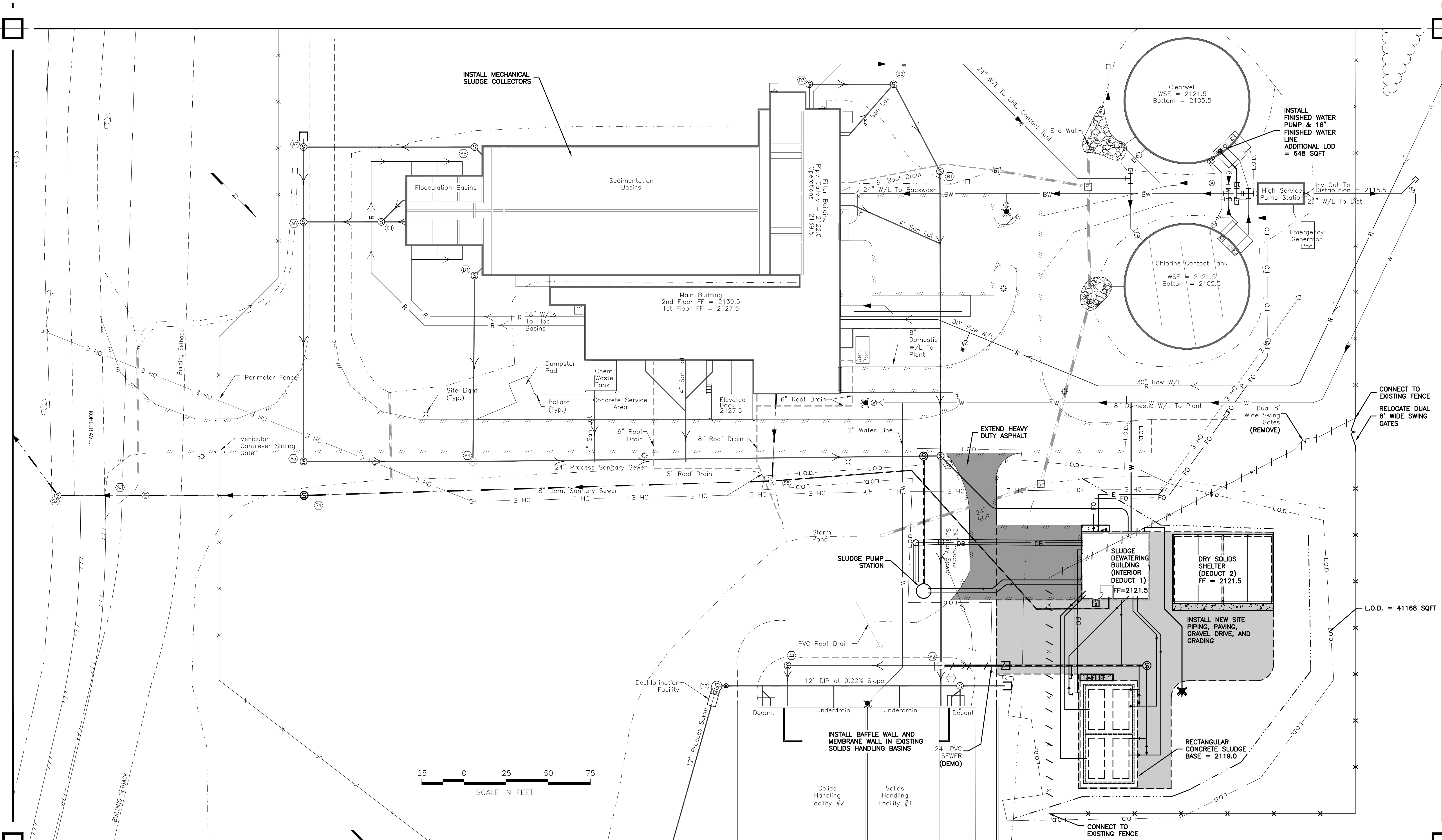
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WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



DRAWN BY: RNJ
REVIEW BY: RNJ
DATE: 5 MARCH 2024
REVISION:

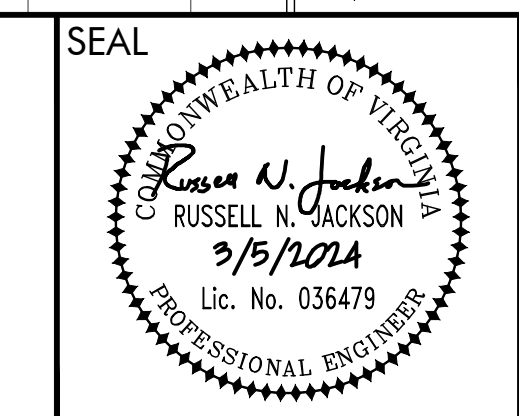
SHEET DESCRIPTION:
INTAKE STRUCTURE IMPROVEMENTS

C05



Peed & Bortz, L.L.C.
 CIVIL & ENVIRONMENTAL ENGINEERS
 20 MIDWAY PLAZA DRIVE - SUITE 100
 CHRISTIANBURG, VIRGINIA 24073
 PHONE: (540) 394 - 3214 FAX: (540) 394 - 3215

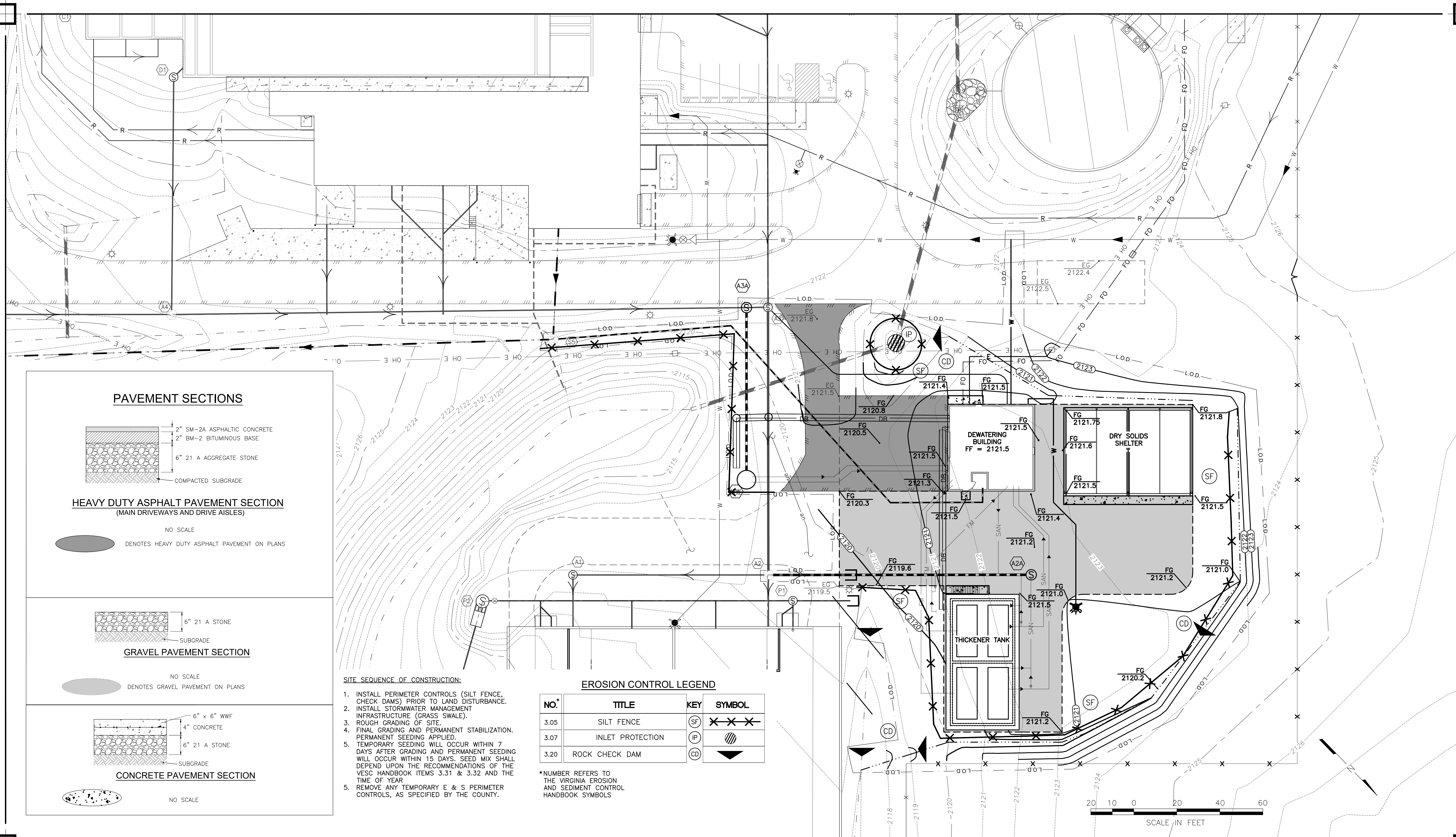
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
 AUSTINVILLE VIRGINIA



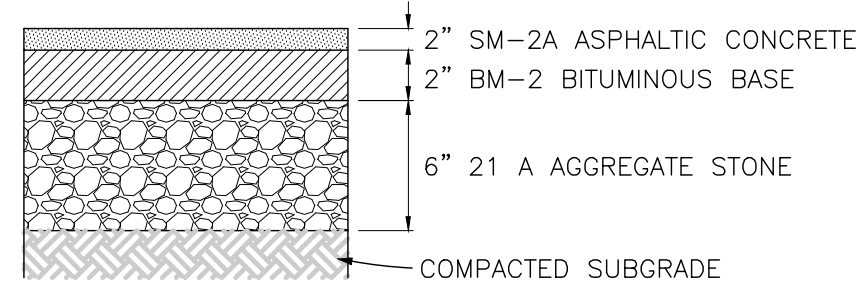
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SHEET DESCRIPTION:
 WATER TREATMENT PLANT
 SITE PLAN

C06

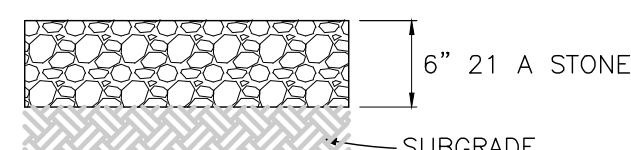


PAVEMENT SECTIONS



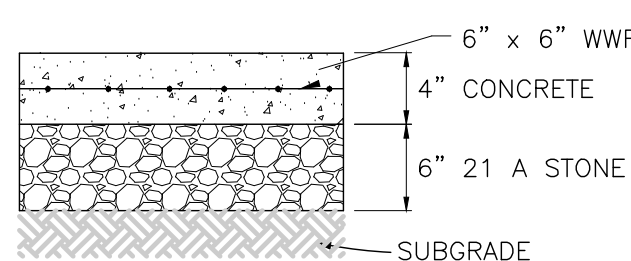
HEAVY DUTY ASPHALT PAVEMENT SECTION
(MAIN DRIVEWAYS AND DRIVE AISLES)

NO SCALE
 ○ DENOTES HEAVY DUTY ASPHALT PAVEMENT ON PLANS



GRAVEL PAVEMENT SECTION

NO SCALE
 ○ DENOTES GRAVEL PAVEMENT ON PLANS



CONCRETE PAVEMENT SECTION

NO SCALE

SITE SEQUENCE OF CONSTRUCTION:

1. INSTALL PERIMETER CONTROLS (SILT FENCE, CHECK DAMS) PRIOR TO LAND DISTURBANCE.
2. INSTALL STORMWATER MANAGEMENT INFRASTRUCTURE (GRASS SWALE).
3. ROUGH GRADING OF SITE.
4. FINAL GRADING AND PERMANENT STABILIZATION. PERMANENT SEEDING APPLIED.
5. TEMPORARY SEEDING WILL OCCUR WITHIN 7 DAYS AFTER GRADING AND PERMANENT SEEDING WILL OCCUR WITHIN 15 DAYS. SEED MIX SHALL DEPEND UPON THE RECOMMENDATIONS OF THE VESC HANDBOOK ITEMS 3.31 & 3.32 AND THE TIME OF YEAR.
5. REMOVE ANY TEMPORARY E & S PERIMETER CONTROLS, AS SPECIFIED BY THE COUNTY.

EROSION CONTROL LEGEND

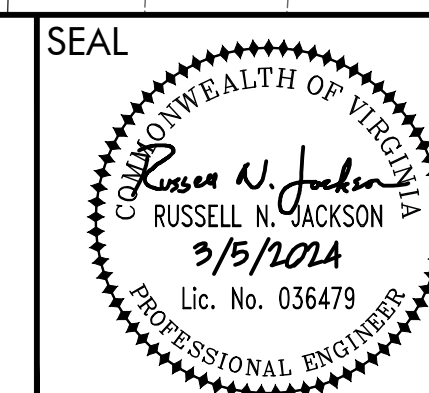
NO.*	TITLE	KEY	SYMBOL
3.05	SILT FENCE	(SF)	XXX
3.07	INLET PROTECTION	(IP)	⊘
3.20	ROCK CHECK DAM	(CD)	▲

*NUMBER REFERS TO THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK SYMBOLS



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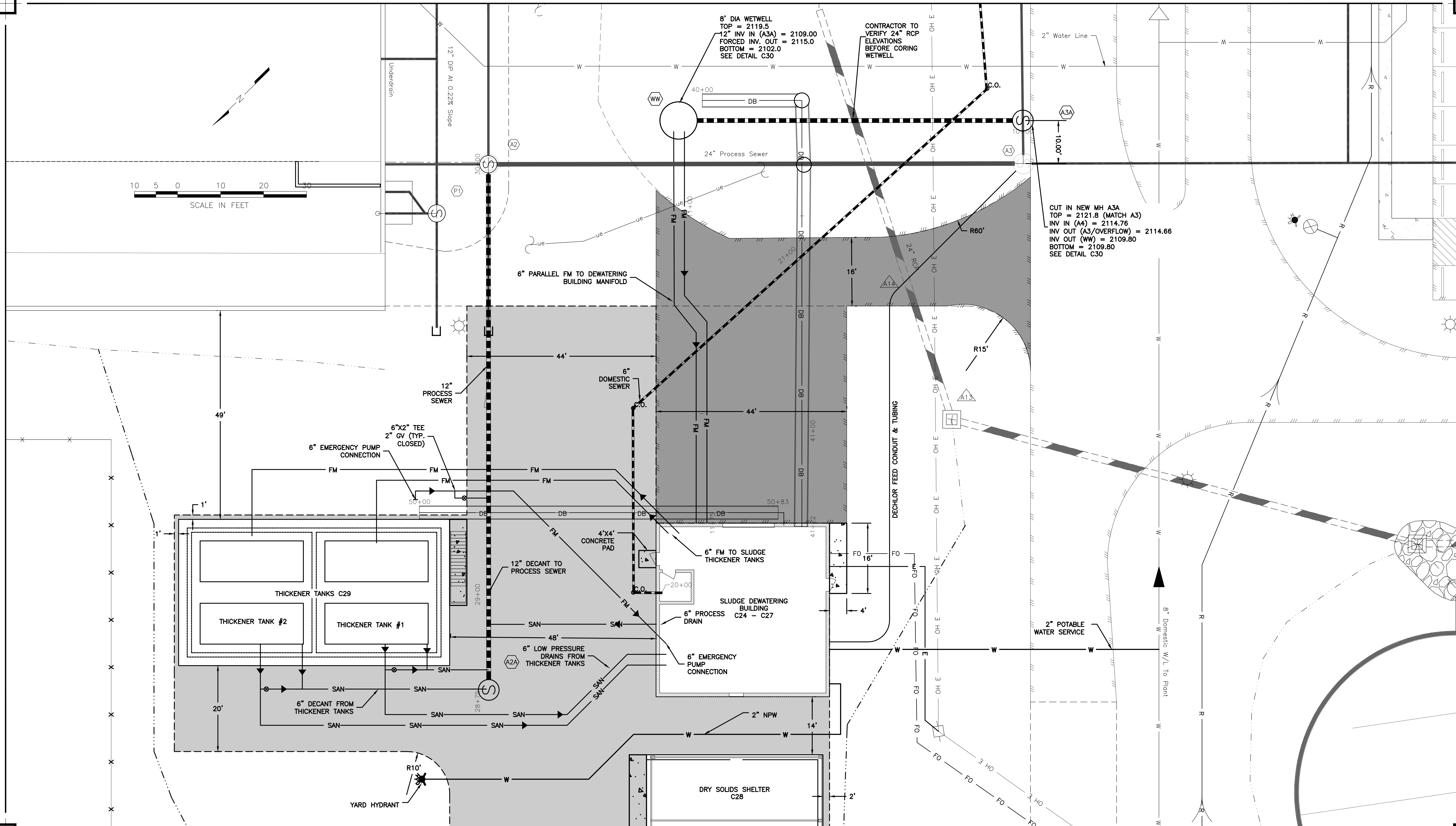
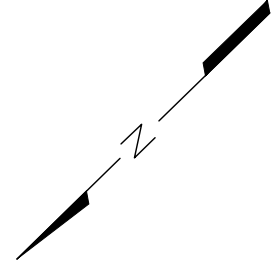
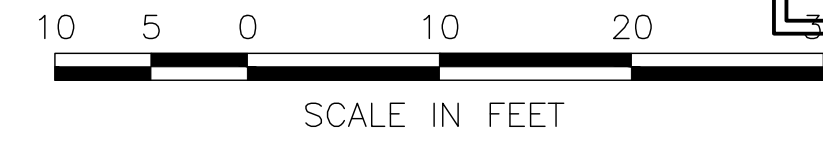
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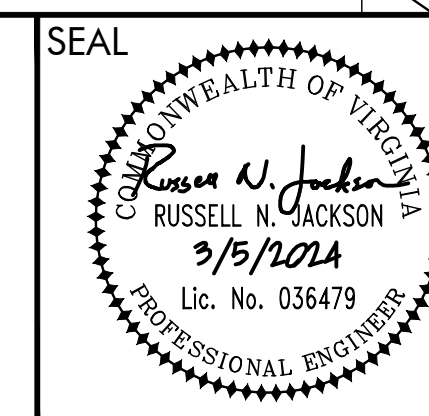
SHEET DESCRIPTION:
 SLUDGE HANDLING FACILITIES SITE & GRADING PLAN

C07



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 CIVIL & ENVIRONMENTAL ENGINEERS
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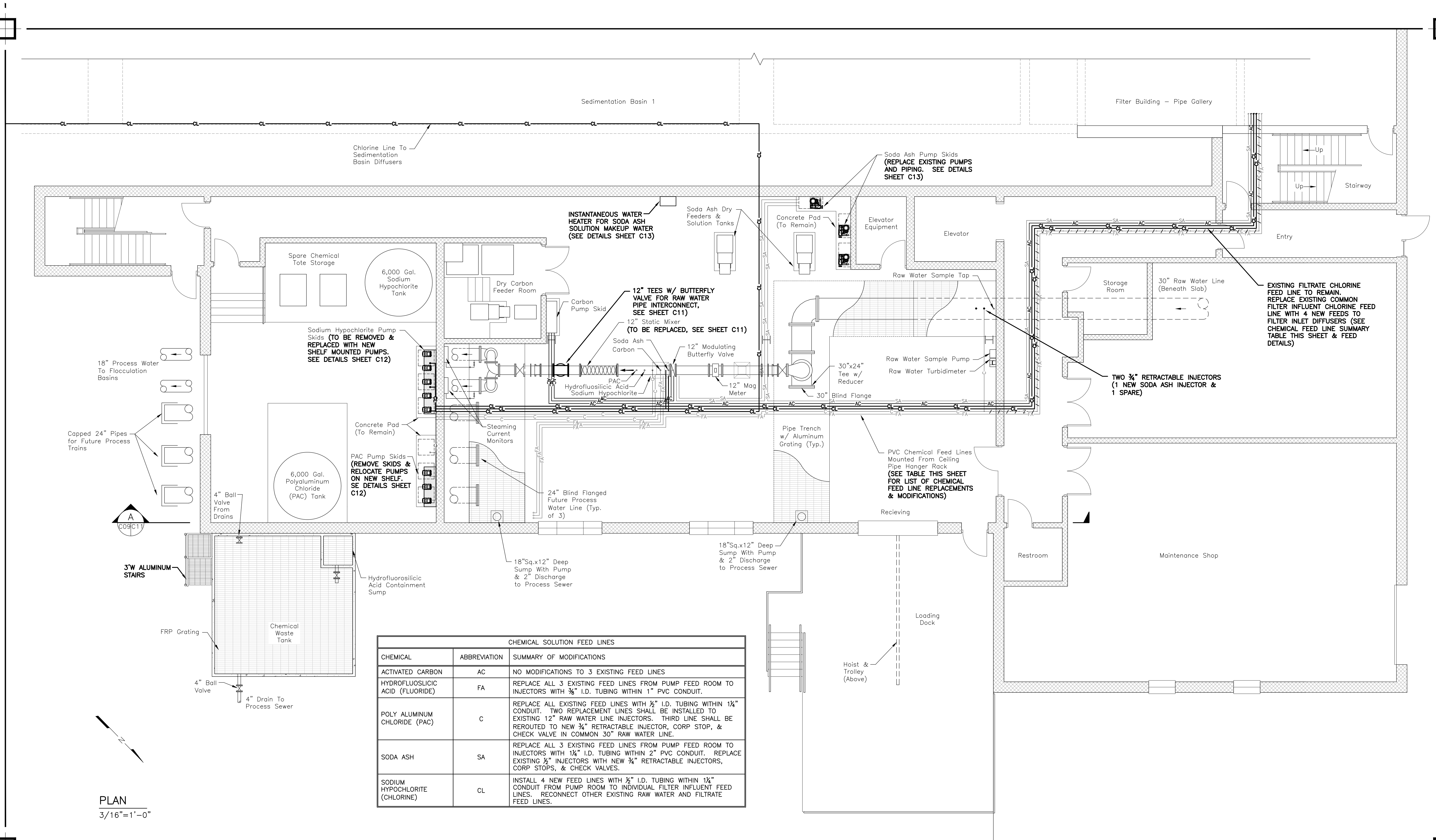
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
 AUSTINVILLE VIRGINIA



SEAL
 DRAWN BY: RNJ
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 DATE: 5 MARCH 2024
 REVISION:

SHEET DESCRIPTION:
SLUDGE HANDLING FACILITIES PIPING PLAN

C08

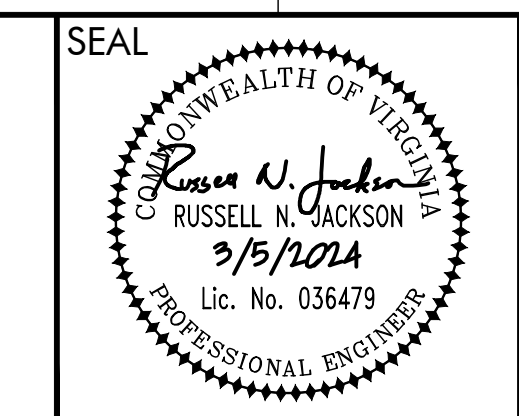


CHEMICAL SOLUTION FEED LINES		
CHEMICAL	ABBREVIATION	SUMMARY OF MODIFICATIONS
ACTIVATED CARBON	AC	NO MODIFICATIONS TO 3 EXISTING FEED LINES
HYDROFLUOSLICIC ACID (FLUORIDE)	FA	REPLACE ALL 3 EXISTING FEED LINES FROM PUMP FEED ROOM TO INJECTORS WITH 3/8" I.D. TUBING WITHIN 1" PVC CONDUIT.
POLY ALUMINUM CHLORIDE (PAC)	C	REPLACE ALL EXISTING FEED LINES WITH 1/2" I.D. TUBING WITHIN 1 1/4" CONDUIT. TWO REPLACEMENT LINES SHALL BE INSTALLED TO EXISTING 12" RAW WATER LINE INJECTORS. THIRD LINE SHALL BE REROUTED TO NEW 3/4" RETRACTABLE INJECTOR, CORP STOP, & CHECK VALVE IN COMMON 30" RAW WATER LINE.
SODA ASH	SA	REPLACE ALL 3 EXISTING FEED LINES FROM PUMP FEED ROOM TO INJECTORS WITH 1/4" I.D. TUBING WITHIN 2" PVC CONDUIT. REPLACE EXISTING 1/2" INJECTORS WITH NEW 3/4" RETRACTABLE INJECTORS, CORP STOPS, & CHECK VALVES.
SODIUM HYPOCHLORITE (CHLORINE)	CL	INSTALL 4 NEW FEED LINES WITH 1/2" I.D. TUBING WITHIN 1 1/4" CONDUIT FROM PUMP ROOM TO INDIVIDUAL FILTER INFLUENT FEED LINES. RECONNECT OTHER EXISTING RAW WATER AND FILTRATE FEED LINES.

PLAN
3/16"=1'-0"

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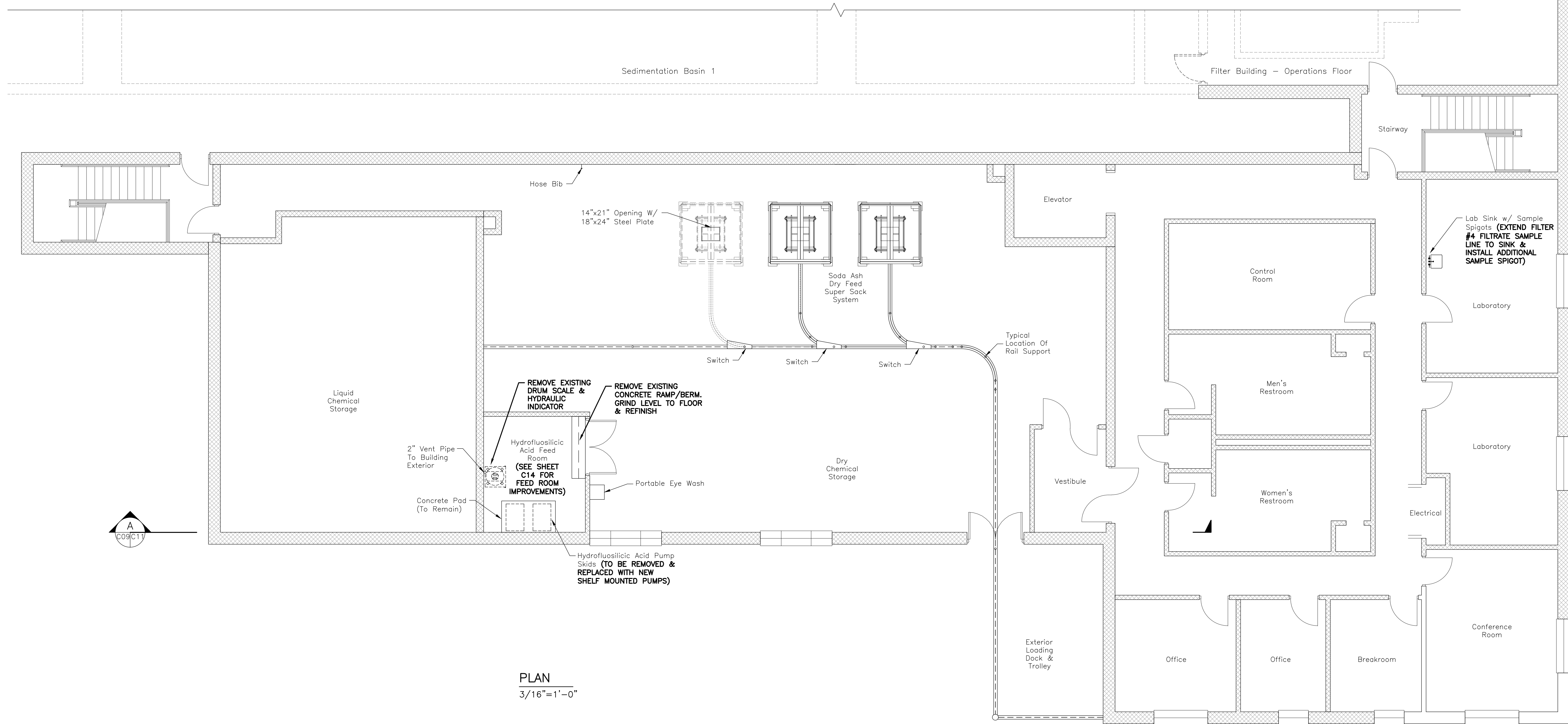
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



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SHEET DESCRIPTION:
MAIN BUILDING - GROUND FLOOR PLAN

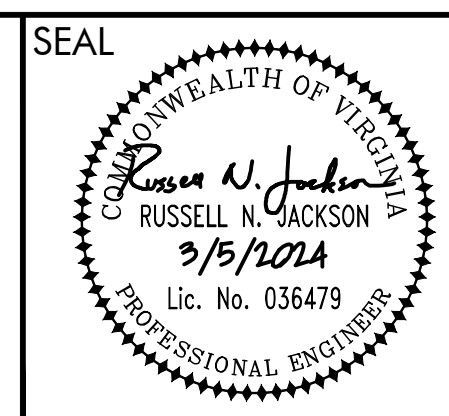
C09



PLAN
3/16"=1'-0"

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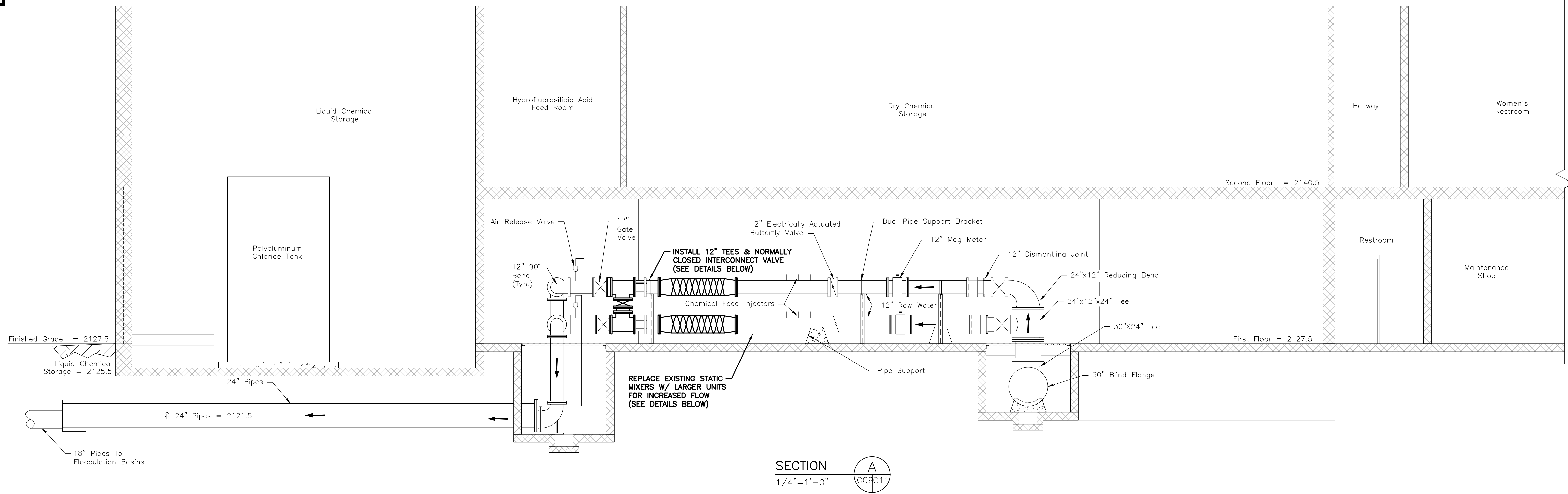
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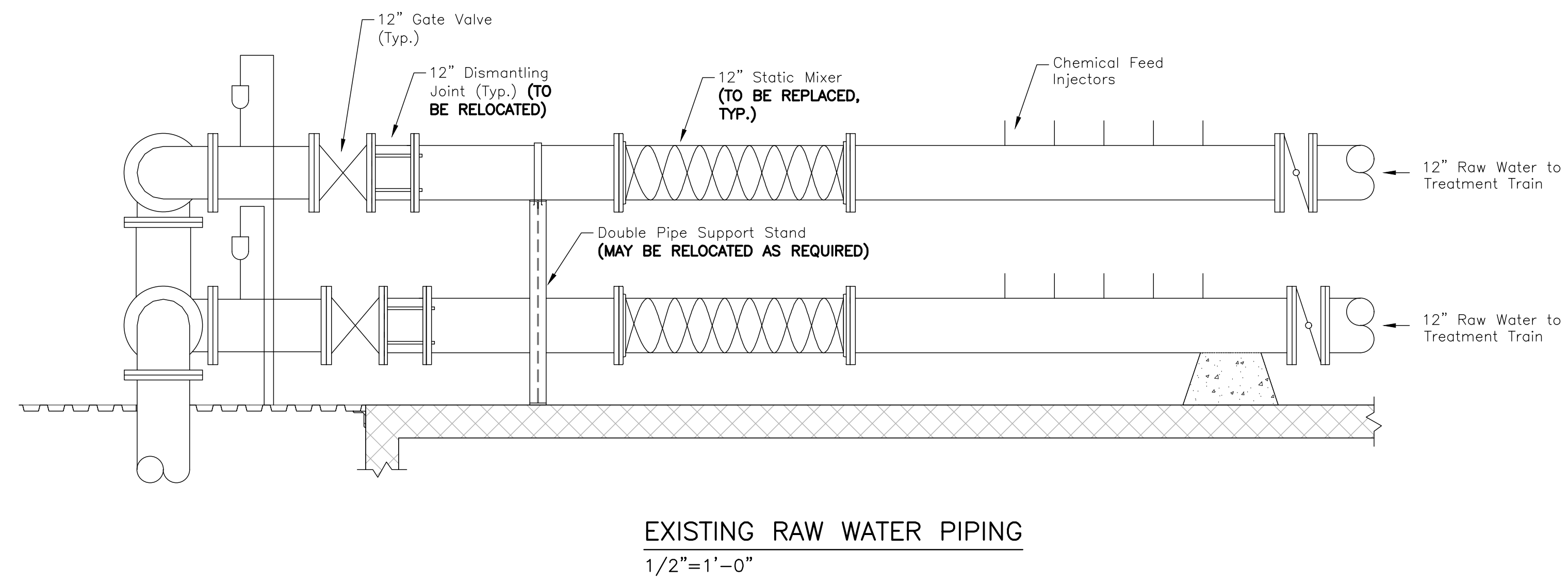
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5 MARCH 2024
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SHEET DESCRIPTION:
MAIN BUILDING - SECOND
FLOOR PLAN

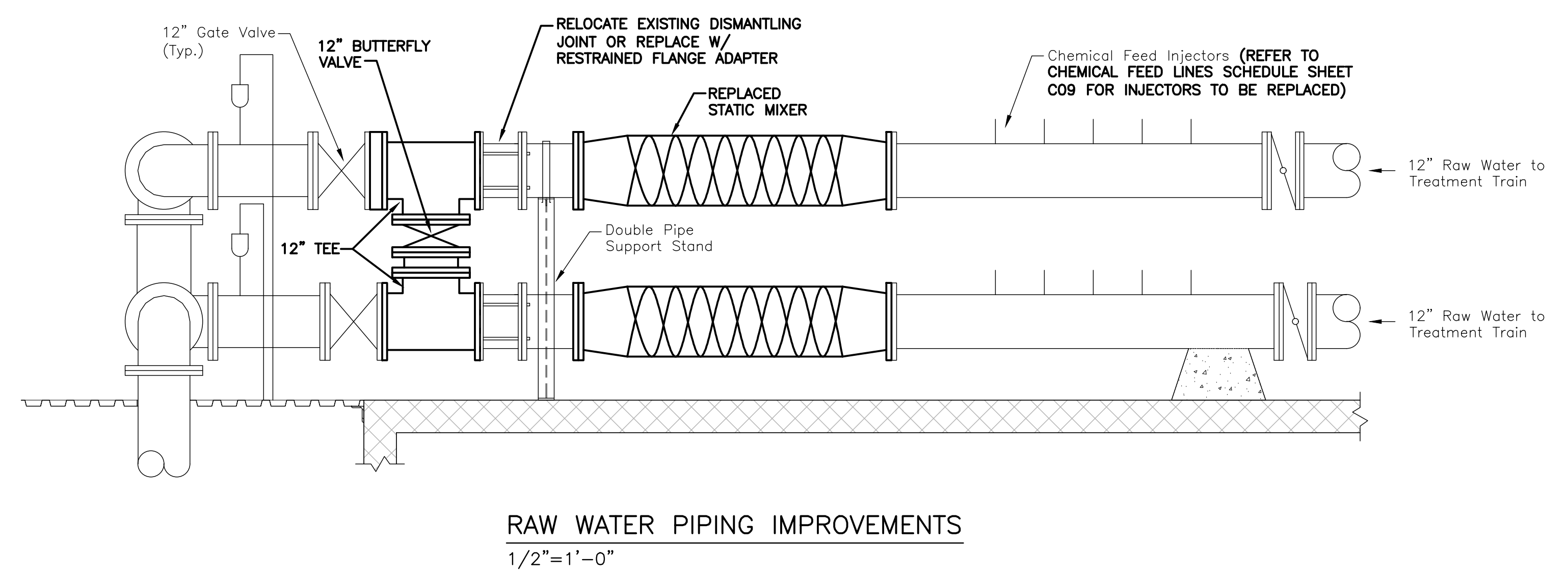
C10



SECTION A
1/4"=1'-0"



EXISTING RAW WATER PIPING
1/2"=1'-0"



RAW WATER PIPING IMPROVEMENTS
1/2"=1'-0"

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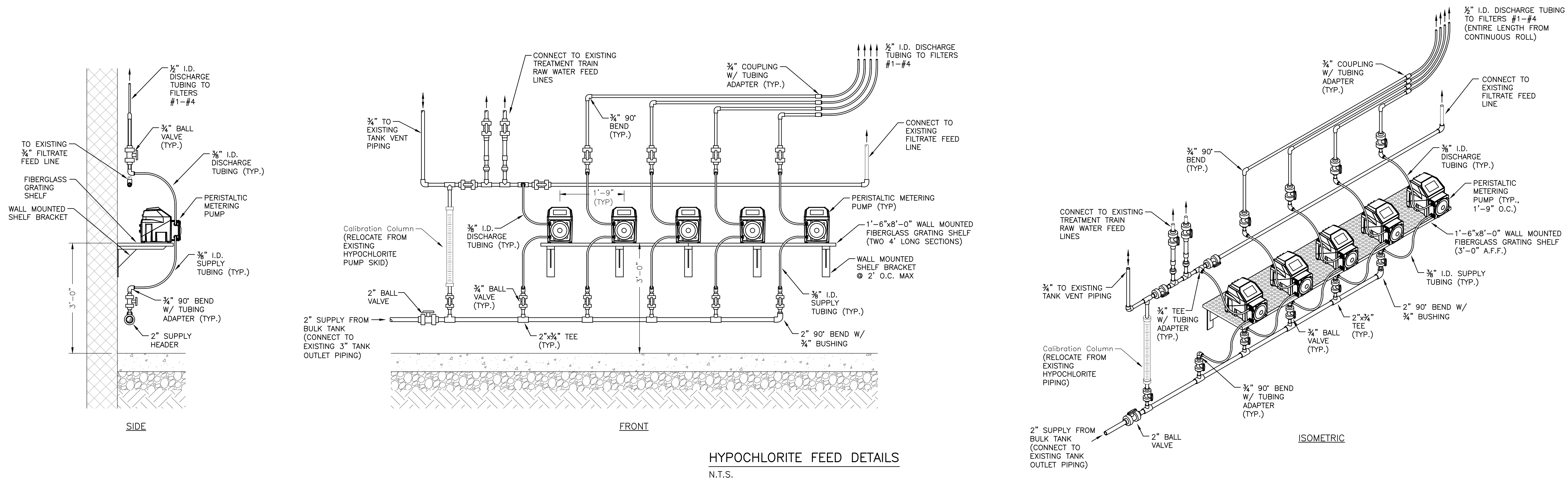
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA

SEAL
COMMONWEALTH OF VIRGINIA
Russell N. Jackson
3/5/2024
Lic. No. 036479
PROFESSIONAL ENGINEER

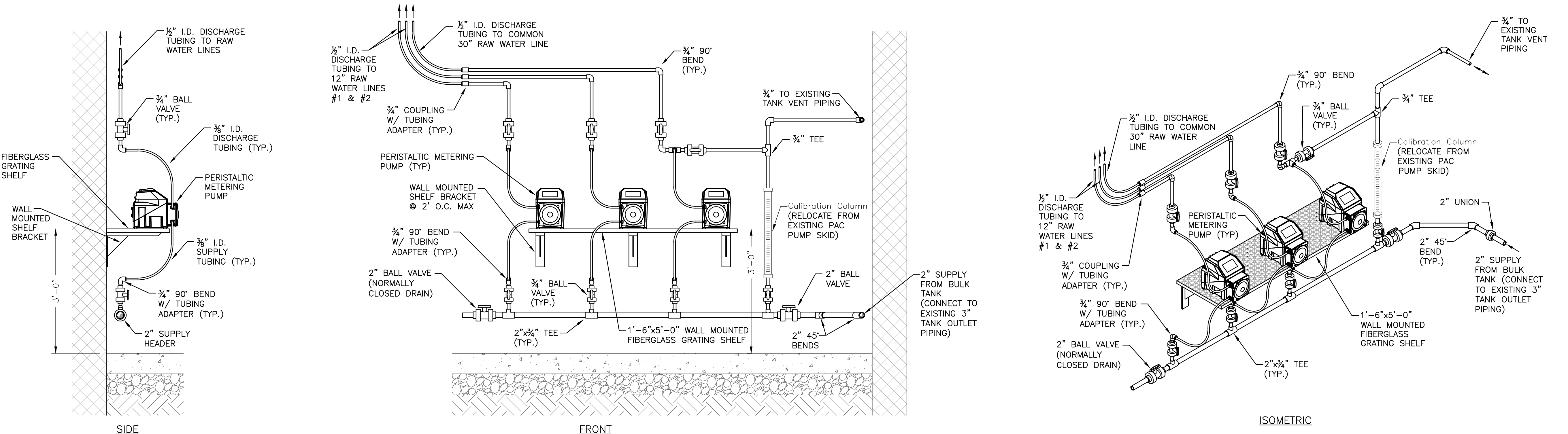
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SHEET DESCRIPTION:
MAIN BUILDING - SECTION
AND DETAILS

C11



HYPOCHLORITE FEED DETAILS
N.T.S.

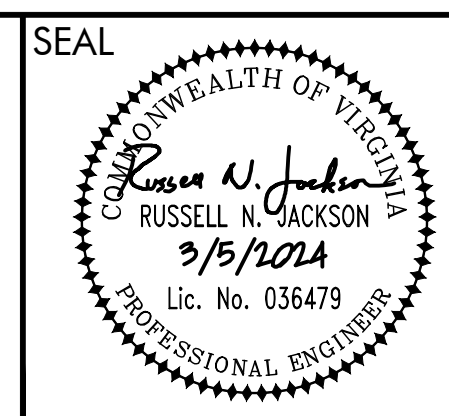


PAC FEED DETAILS
N.T.S.

- NOTES:**
1. PUMP MANUFACTURER ACCESSORY WALL MOUNT BRACKETS MAY BE PROVIDED FOR EACH PUMP, IN LIEU OF FIBERGLASS GRATED SHELF.
 2. EACH EXISTING HYPOCHLORITE AND PAC PUMP SKID INCLUDES AN INDIVIDUAL CALIBRATION COLUMN. ONE HYPOCHLORITE AND ONE PAC CALIBRATION COLUMN SHALL BE RELOCATED FROM EXISTING PUMP SKIDS TO NEW CHEMICAL FEED PIPING. REMAINING EXISTING CALIBRATION COLUMNS SHALL BE REMOVED AND PROVIDED TO OWNER TO BE KEPT AS SPARES.
 3. ALL TUBING FITTING CONNECTORS SHALL BE COMPRESSION STYLE W/ THREADED PIPE JOINT CONNECTIONS.
 4. HYPOCHLORITE AND PAC CHEMICAL DISCHARGE TUBING SHALL BE FROM CONTINUOUS ROLL ENTIRE LENGTH FROM TUBING ADAPTERS IN CHEMICAL FEED ROOM TO CONNECTION TO EXISTING INJECTION PIPING. TUBING COUPLINGS SHALL NOT BE USED.
 5. HYPOCHLORITE AND PAC CHEMICAL DISCHARGE TUBING SHALL BE INSTALLED WITHIN 1 1/4" PVC CONDUIT FROM CHEMICAL FEED ROOM TO CONNECTION TO EXISTING INJECTION PIPING.
 6. ALL PIPING SHALL BE WALL SUPPORTED WITH SCH. 80 PVC WALL PIPE STRAPS AT 4' O.C. MAXIMUM.
 7. ALL BALL VALVES SHALL BE TRUE UNION STYLE.
 8. CONTRACTOR SHALL RELOCATE TWO EXISTING HYPOCHLORITE PUMPS AND PAC PUMPS OR INSTALL NEW PUMPS FOR TEMPORARY SERVICE, IN ORDER TO MAINTAIN TREATMENT OPERATIONS DURING CONSTRUCTION. TREATMENT PLANT OPERATION MAY BE DISRUPTED FOR A MAXIMUM OF 4 HOURS DURING SWITCH OVERS TO TEMPORARY AND PERMANENT PUMP INSTALLATION.
 9. EXISTING HYPOCHLORITE & PAC PUMP SKIDS ARE SIMILAR STYLE TO TYPICAL EXISTING SODA ASH PUMP SKID SHOWN ON SHEET C13, EXCEPT THAT OVERALL DIMENSIONS ARE APPROXIMATELY 2' WIDE x 2' DEEP x 6' HIGH.

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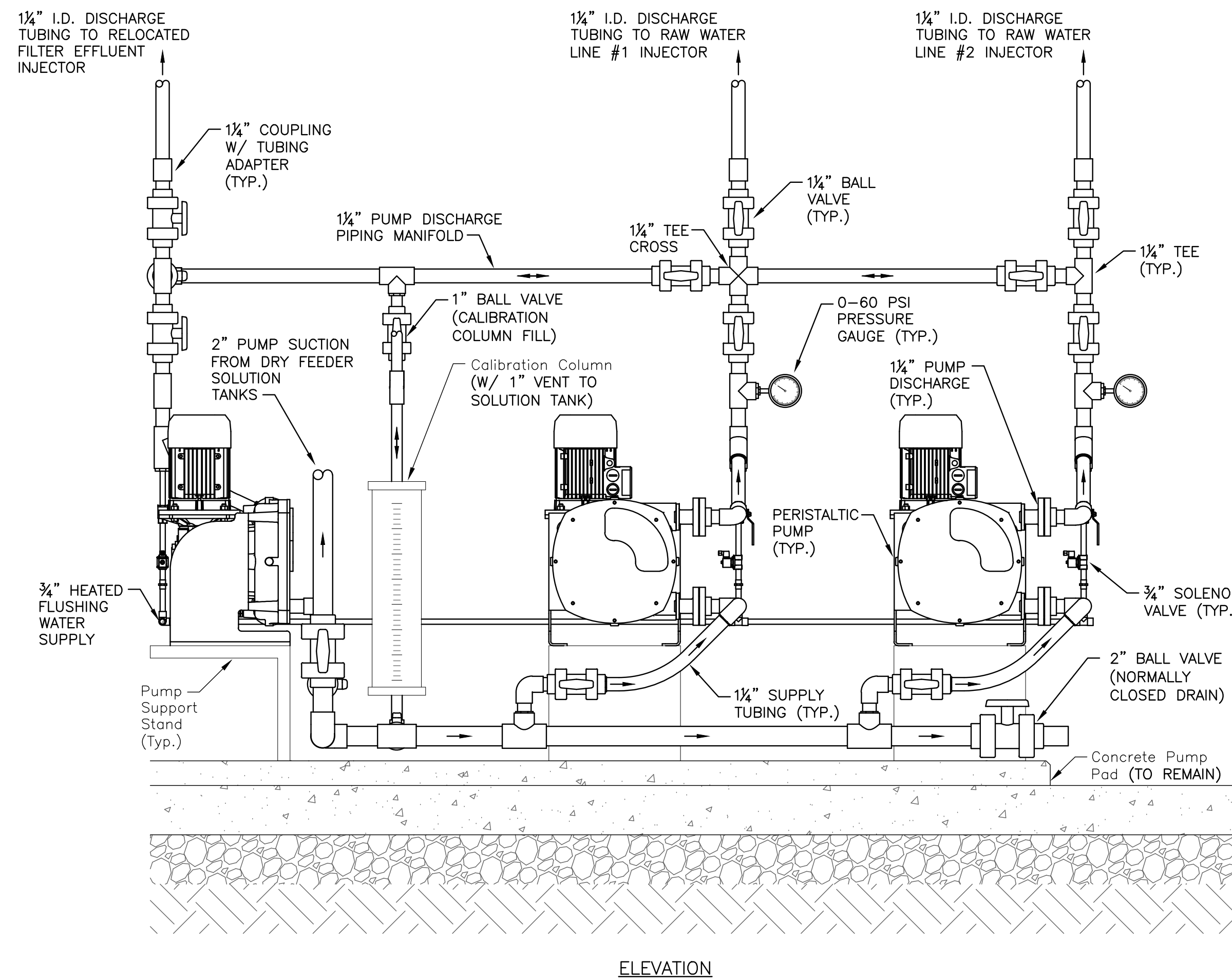
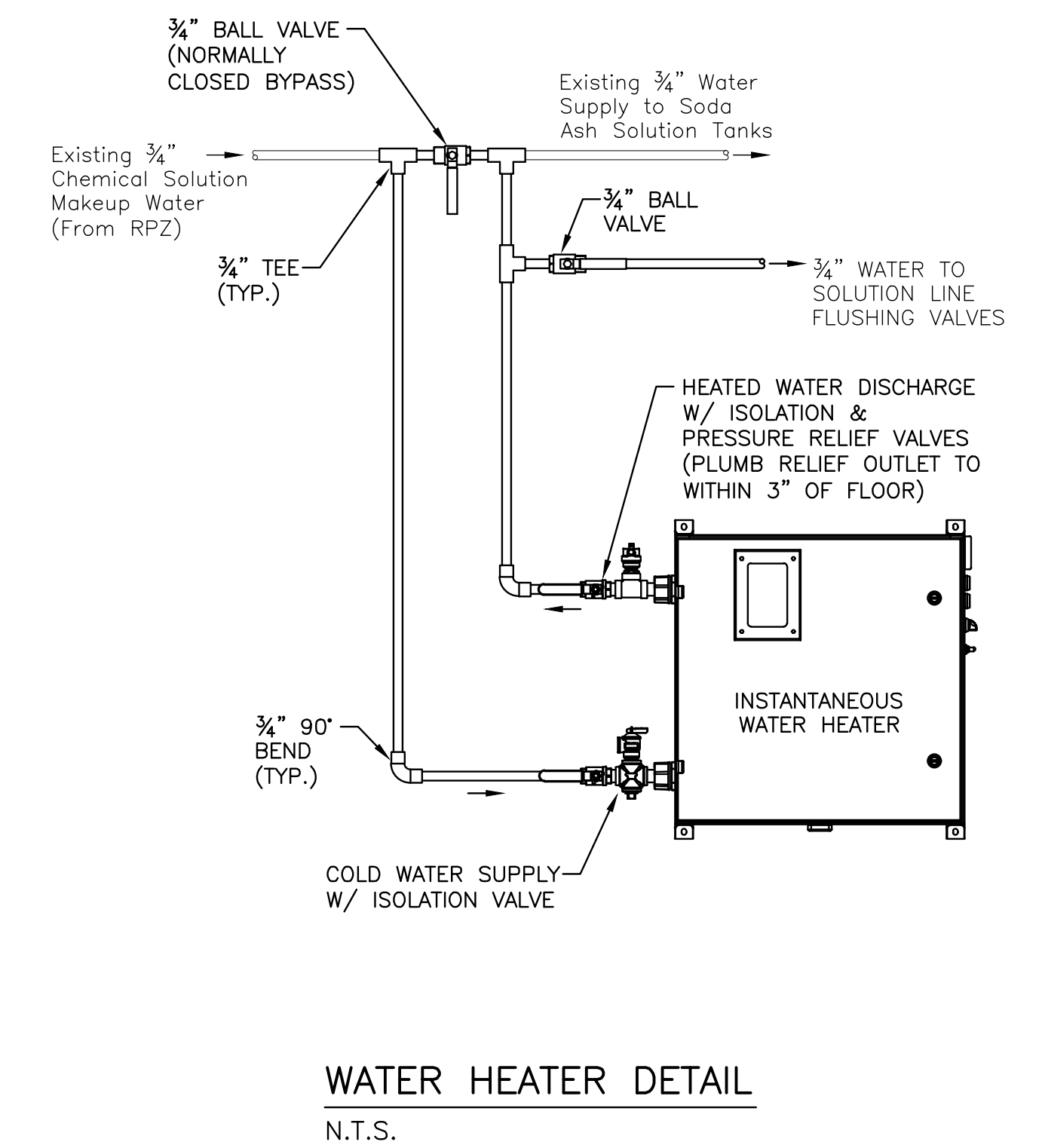
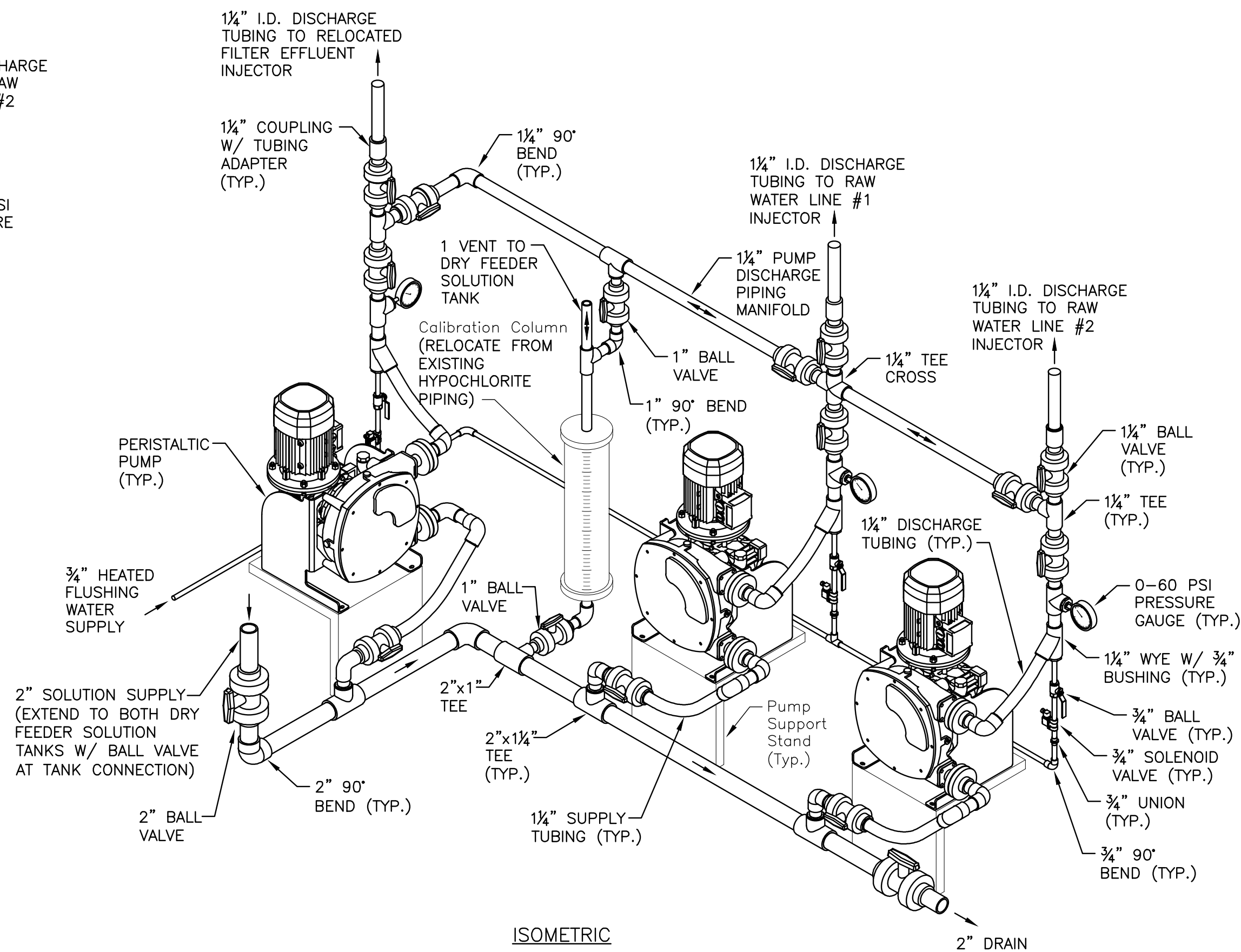
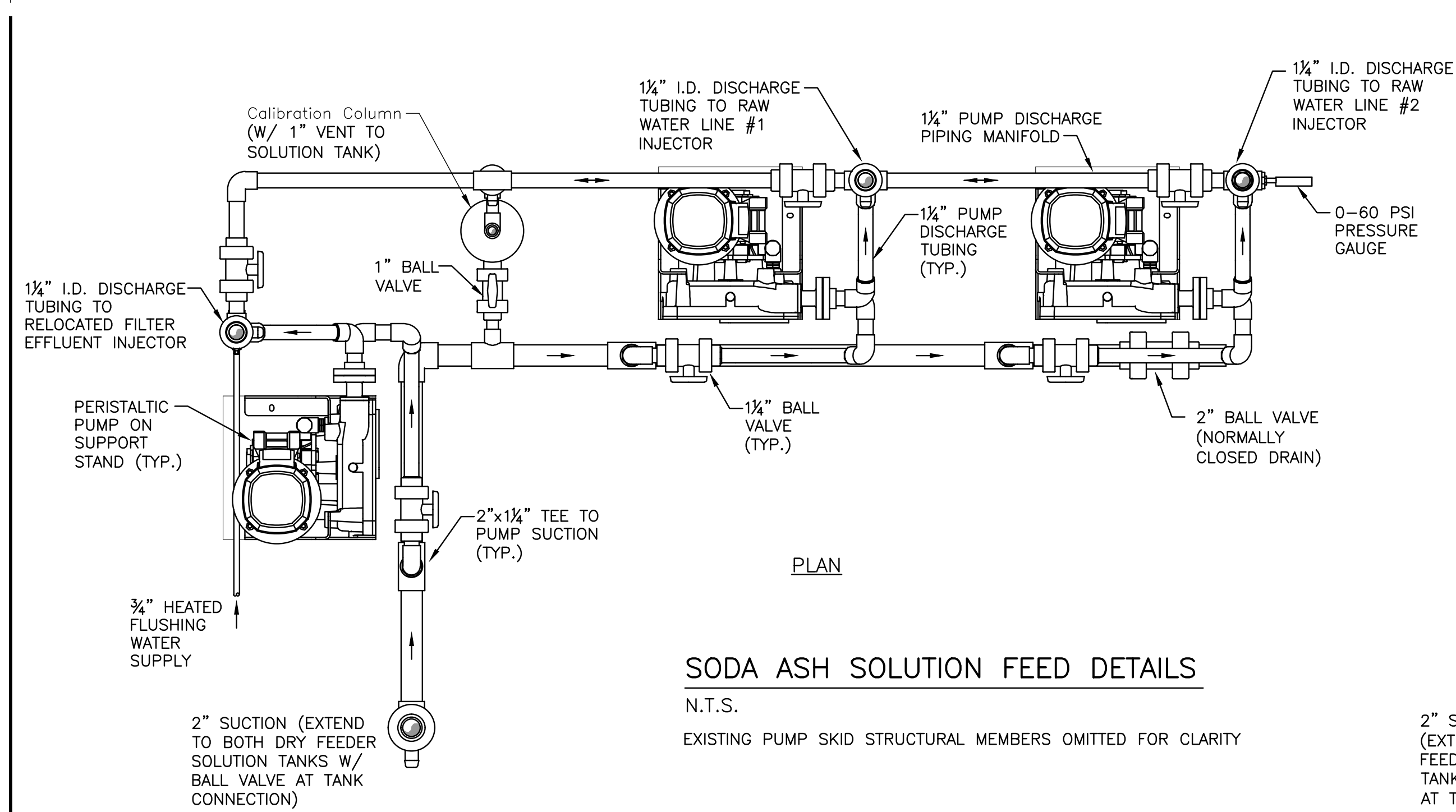
NEW RIVER REGIONAL WATER AUTHORITY
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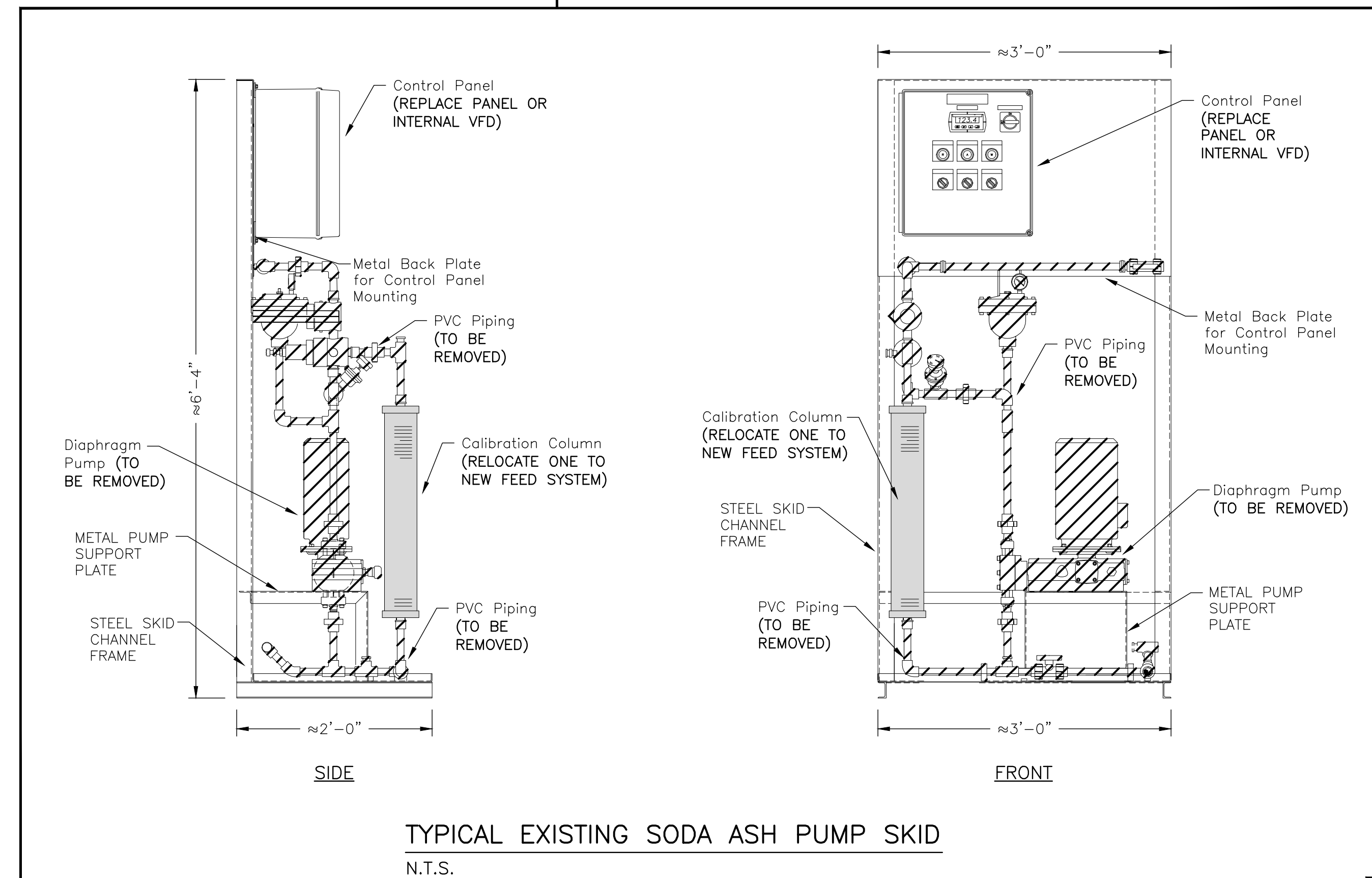
SHEET DESCRIPTION:
HYPOCHLORITE & PAC FEED DETAILS

C12



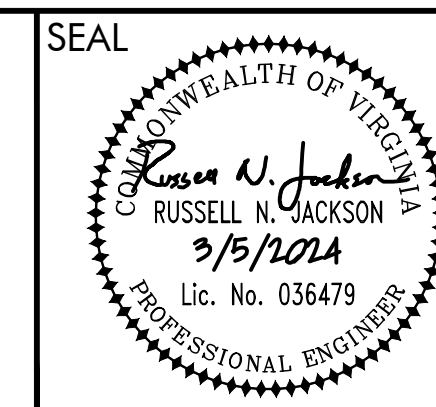
NOTES:

1. PLANS SHOW NEW SODA ASH PERISTALTIC PUMPS TO BE INSTALLED ON EXISTING PUMP SKIDS. IN LIEU OF THIS, CONTRACTOR MAY INSTALL NEW PUMP & PIPING SKIDS TO REPLACE EXISTING OR INSTALL PUMPS ON NEW FLOOR STANDS WITH WALL MOUNTED PIPING. CONTRACTOR SHALL COORDINATE DETAILS OF ALTERNATE INSTALLATION METHODS WITH ENGINEER FOR APPROVAL.
2. IF EXISTING PUMP SKIDS ARE TO BE REUSED, ALL CHEMICAL FEED SKID PIPING AND PUMPS SHALL BE REMOVED. NEW PUMPS SHALL BE INSTALLED ON SKID EXISTING PUMP SUPPORT STANDS WITH STAINLESS STEEL ADAPTER MOUNTING PLATES PROVIDED AS APPROPRIATE.
3. IF EXISTING PUMP SKIDS ARE NOT TO BE USED FOR THE FINAL INSTALLATION, THE SKIDS SHALL BE REMOVED IN THEIR ENTIRETY.
4. CONTRACTOR SHALL RELOCATE TWO EXISTING SODA ASH PUMPS OR INSTALL ONE NEW PUMP FOR TEMPORARY SERVICE. IN ORDER TO MAINTAIN TREATMENT OPERATIONS DURING CONSTRUCTION, TREATMENT PLANT OPERATION MAY BE DISRUPTED FOR A MAXIMUM OF 4 HOURS DURING SWITCH OVERTS TO TEMPORARY AND PERMANENT PUMP INSTALLATION.
5. EACH EXISTING SODA ASH PUMP SKID INCLUDES AN INDIVIDUAL CALIBRATION COLUMN. ONE COLUMN SHALL BE RELOCATED FROM EXISTING PUMP SKID TO NEW CHEMICAL FEED PIPING. REMAINING EXISTING CALIBRATION COLUMNS SHALL BE REMOVED AND PROVIDED TO OWNER TO BE KEPT AS SPARES.
6. ALL TUBING FITTING CONNECTORS SHALL BE BARBED STYLE W/ STAINLESS STEEL SCREW CLAMP AND THREADED PIPE JOINT CONNECTIONS.
7. DISCHARGE TUBING SHALL BE FROM CONTINUOUS ROLL ENTIRE LENGTH FROM SKID DISCHARGE PIPING TO FEED INJECTORS TUBING COUPLINGS SHALL NOT BE USED.
8. DISCHARGE TUBING TO FEED INJECTORS SHALL BE INSTALLED WITHIN 2" PVC CONDUIT.
9. ALL PIPING SHALL BE SUPPORTED WITH SCH. 80 PVC WALL PIPE STRAPS OR FLOOR STANDS AT 4' O.C. MAXIMUM.
10. ALL BALL VALVES SHALL BE TRUE UNION STYLE.
11. ALL SOLUTION TANK MAKEUP WATER AND FLUSHING LINE PIPING TO BE COPPER PIPE W/ SOLDERED OR COMPRESSION FITTINGS AND PIPE INSULATION.



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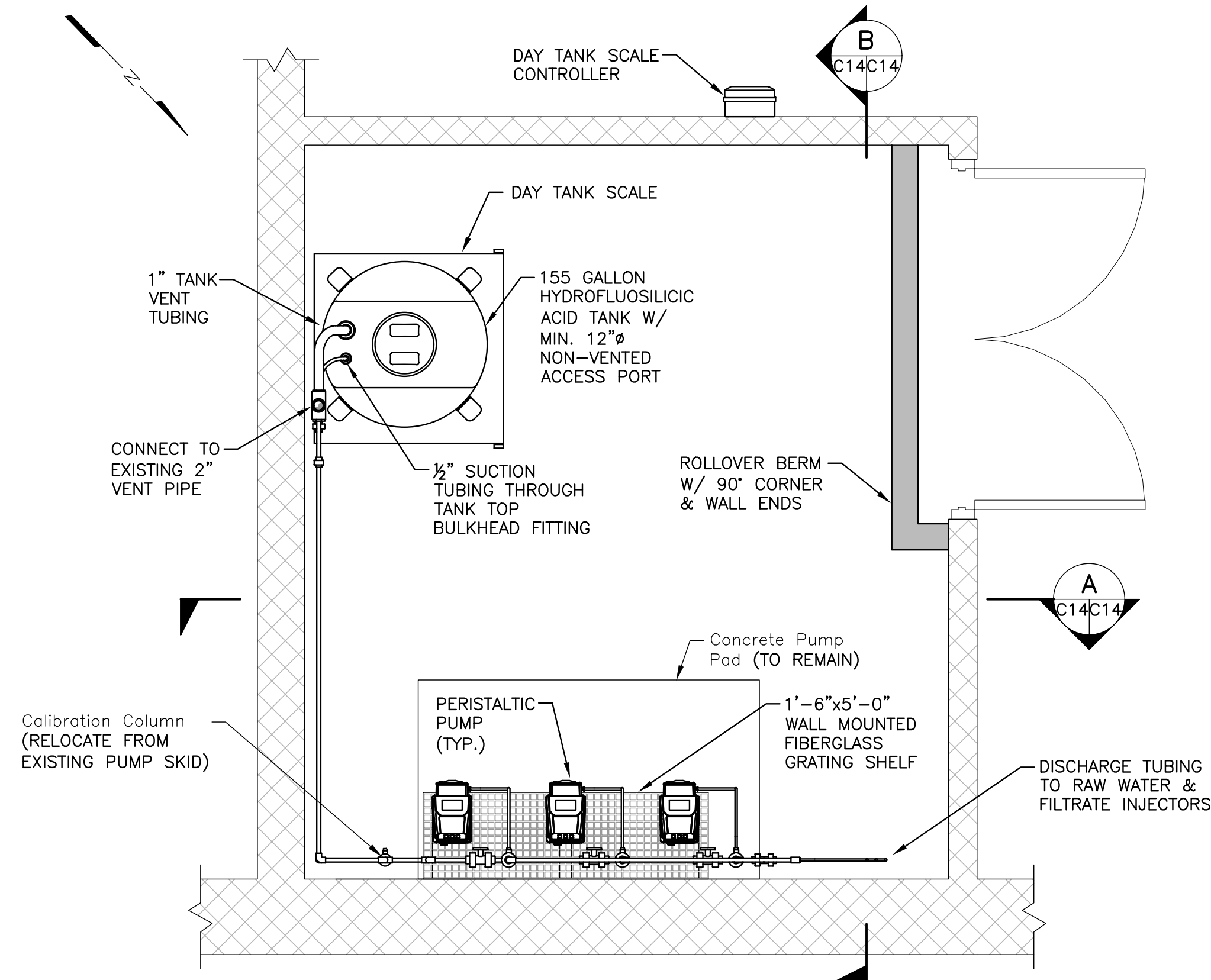
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



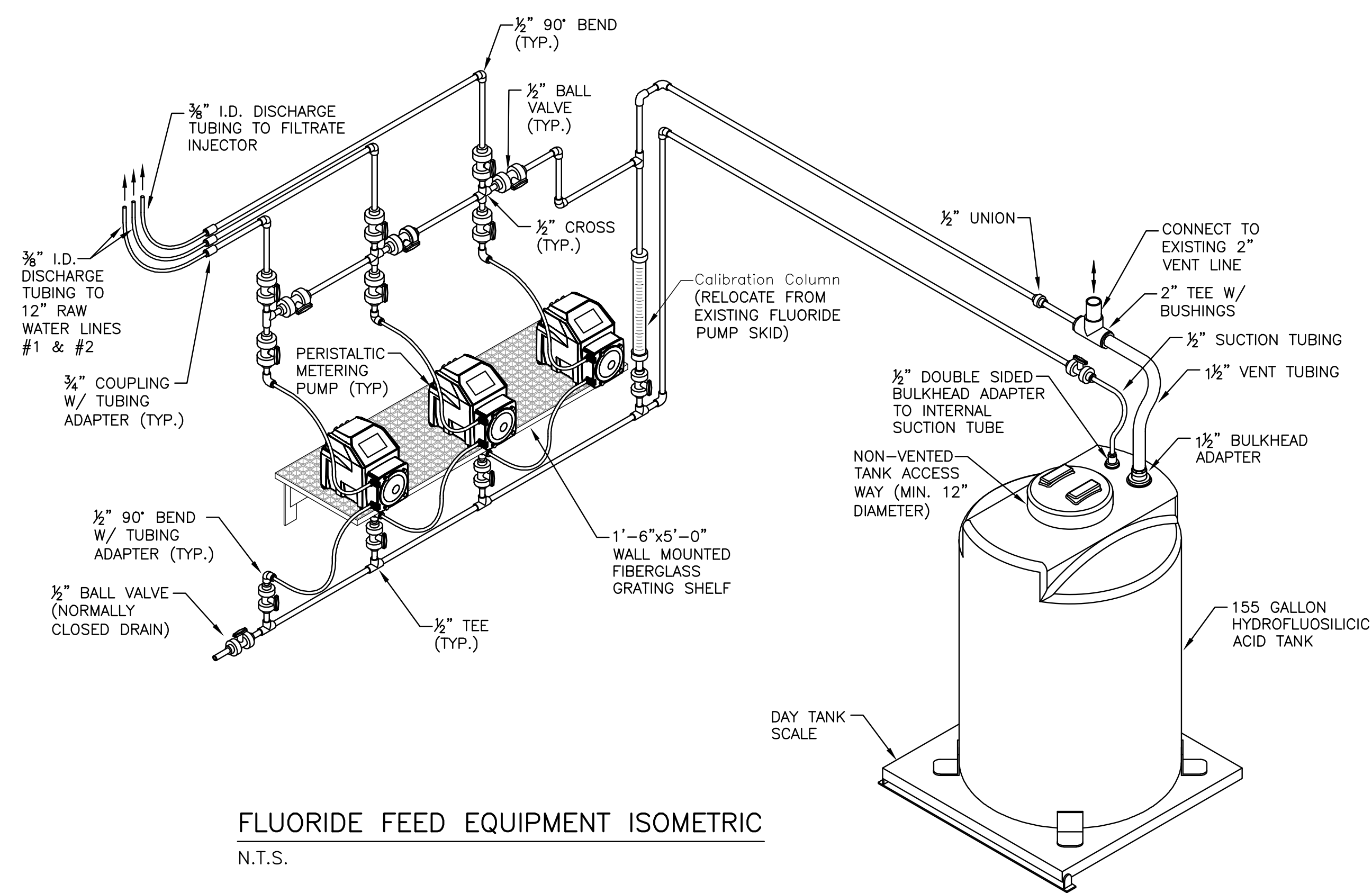
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5 MARCH 2024
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SHEET DESCRIPTION:
SODA ASH FEED DETAILS

C13



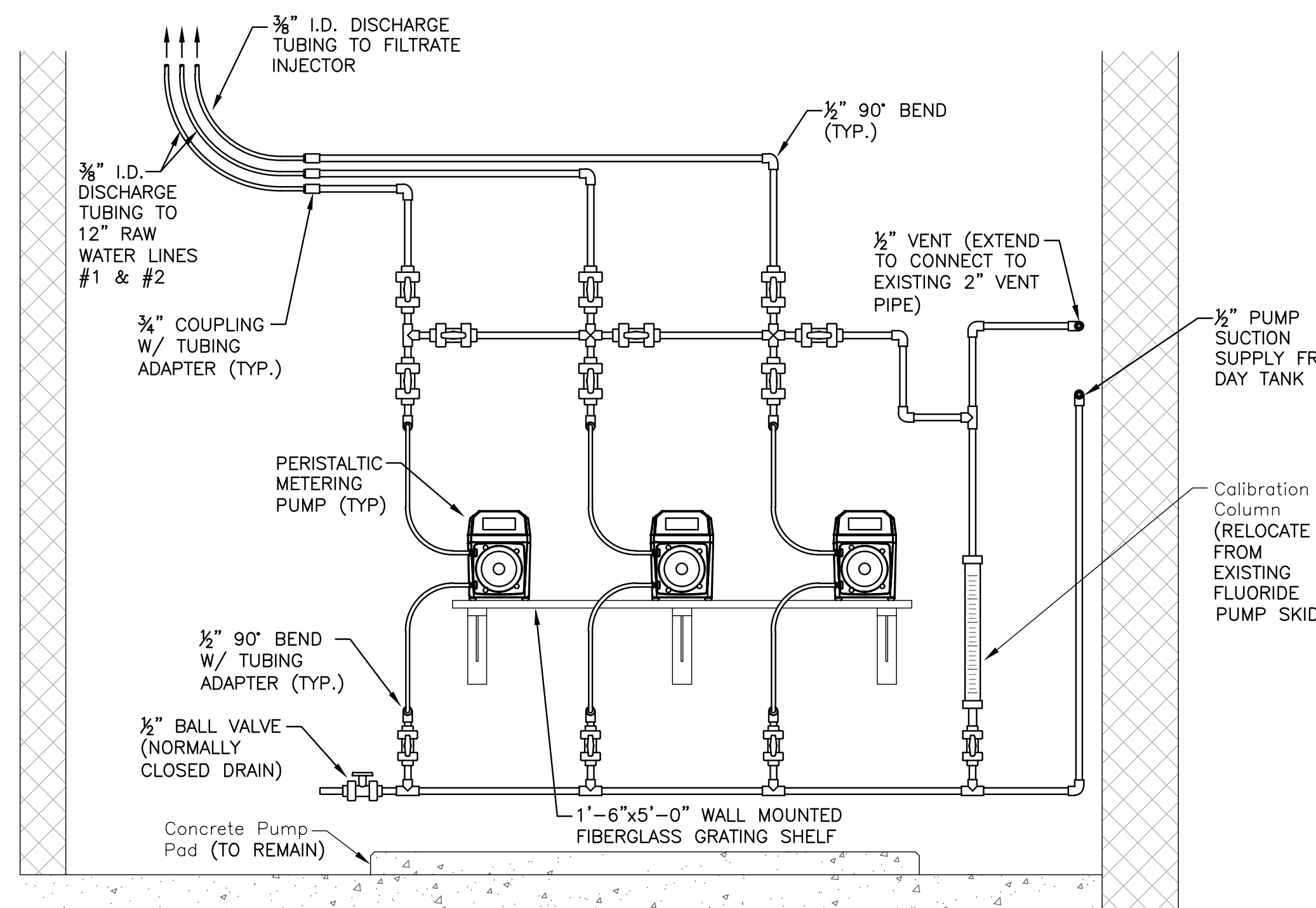
FLUORIDE FEED ROOM PLAN
1/2"=1'-0"



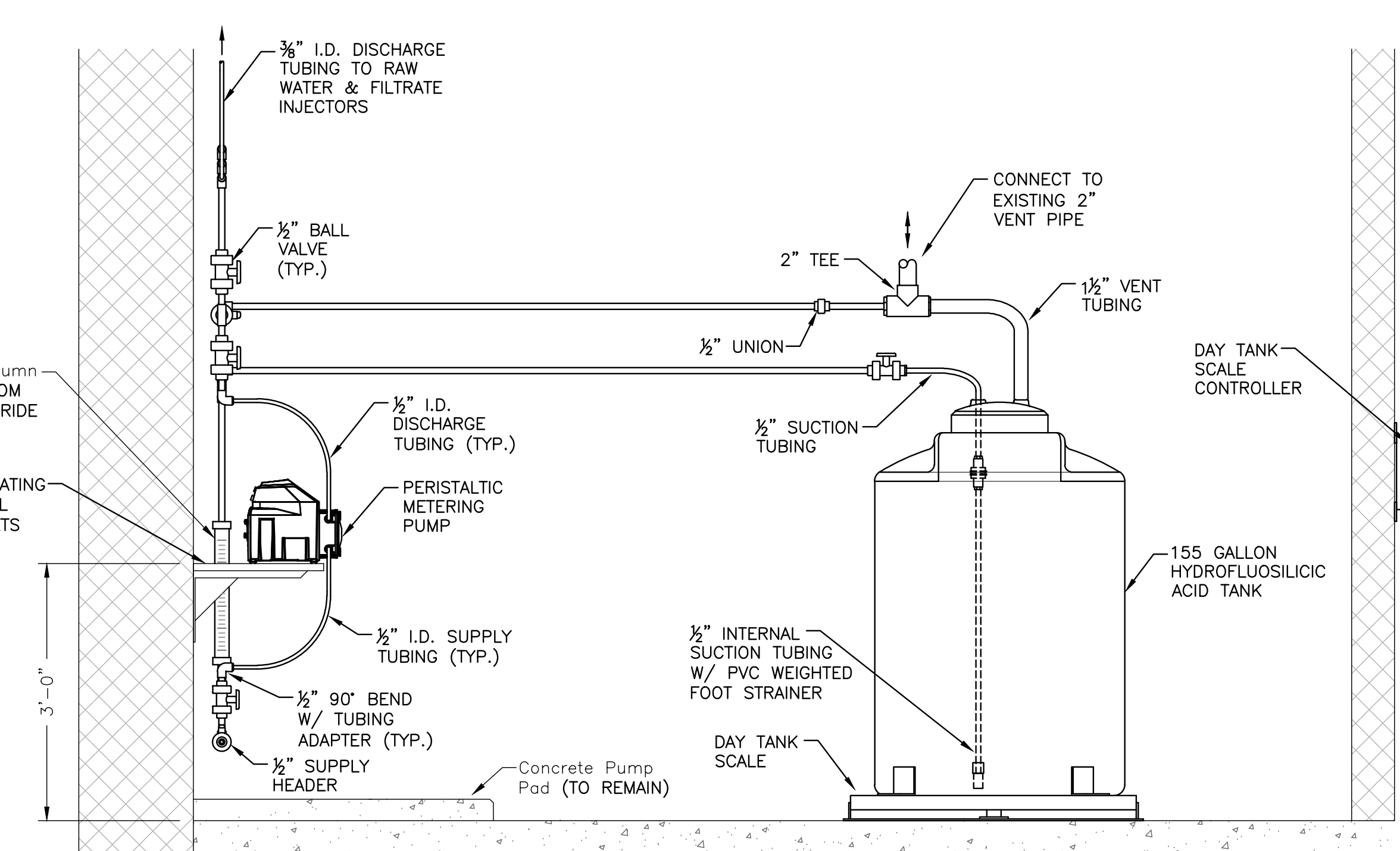
FLUORIDE FEED EQUIPMENT ISOMETRIC
N.T.S.

NOTES:

1. FLUORIDE DAY TANK SHALL HAVE A NOMINAL 155 GALLON CAPACITY. OTHER TANK CAPACITIES BETWEEN 150 AND 160 GALLONS SHALL BE CONSIDERED ACCEPTABLE. TANK SHALL HAVE A MAXIMUM OVERALL HEIGHT OF 4'-6" AND A DIAMETER BETWEEN 30" AND 40". TANK SHALL BE GAS TIGHT WITH NON VENTED TOP ACCESS WAY OF MINIMUM 12" DIAMETER.
2. FLUORIDE DAY TANK SUCTION AND VENT PIPE CONNECTIONS SHALL BE MADE WITH GAS TIGHT BULKHEAD FITTING ADAPTERS. SUCTION BULKHEAD ADAPTER SHALL BE DOUBLE SIDED TYPE PROVIDING THREADED PIPE CONNECTIONS ON THE OUTSIDE AND INSIDE OF THE TANK. A SUCTION TUBE SHALL BE PROVIDED ON THE INSIDE OF THE TANK TO A SUCTION STRAINER WITH PVC WEIGHT SUSPENDED NEAR THE BOTTOM OF THE TANK.
3. PUMP MANUFACTURER ACCESSORY WALL MOUNT BRACKETS MAY BE PROVIDED FOR EACH PUMP, IN LIEU OF FIBERGLASS GRATED SHELF.
4. EACH OF THE TWO EXISTING FLUORIDE FEED PUMP SKIDS INCLUDES AN INDIVIDUAL CALIBRATION COLUMN. ONE CALIBRATION COLUMN SHALL BE RELOCATED FROM EXISTING PUMP SKID TO NEW CHEMICAL FEED PIPING, WITH THE OTHER REMOVED AND PROVIDED TO OWNER TO BE KEPT AS A SPARE.
5. DAY TANK TUBING FITTING CONNECTORS SHALL BE BARBED STYLE W/ STAINLESS STEEL SCREW CLAMP AND THREADED PIPE JOINT CONNECTIONS. ALL OTHER TUBING FITTING CONNECTORS SHALL BE COMPRESSION STYLE W/ THREADED PIPE JOINT CONNECTIONS.
6. DISCHARGE TUBING SHALL BE FROM CONTINUOUS ROLL ENTIRE LENGTH FROM TUBING ADAPTERS IN FLUORIDE FEED ROOM TO CONNECTION TO EXISTING RAW WATER AND FILTRATE INJECTORS. TUBING COUPLINGS SHALL NOT BE USED.
7. DISCHARGE TUBING SHALL BE INSTALLED WITHIN 1" PVC CONDUIT FROM FLUORIDE FEED ROOM TO CONNECTION TO EXISTING INJECTORS.
8. ALL PIPING SHALL BE WALL SUPPORTED WITH SCH. 80 PVC WALL PIPE STRAPS AT 4' O.C. MAXIMUM.
9. ALL BALL VALVES SHALL BE TRUE UNION STYLE.
10. FLUORIDE FEED SYSTEM MAY BE OFFLINE FOR UP TO 10 CALENDAR DAYS WHILE EXISTING EQUIPMENT IS REMOVED AND NEW FEED PUMP SYSTEM INSTALLED.
11. ROLLOVER BERM SYSTEM SHALL BE VINYL CLAD FOAM CORE TYPE WITH APPROXIMATE 2" OVERALL HEIGHT, PROVIDING A NOMINAL CONTAINMENT VOLUME OF 170 GALLONS WITHIN THE FLUORIDE FEED ROOM.
12. CONTRACTOR SHALL COORDINATE ANY DRAINING AND FLUSHING OF EXISTING FLUORIDE CHEMICAL LINES TO CONTAIN CHEMICAL AND PREVENT ANY LEAKS OR SPILLS.



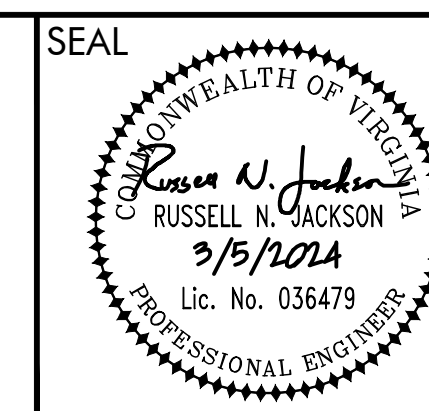
SECTION A
1/2"=1'-0" C14C14



SECTION B
1/2"=1'-0" C14C14

Peed & Bortz, L.L.C.
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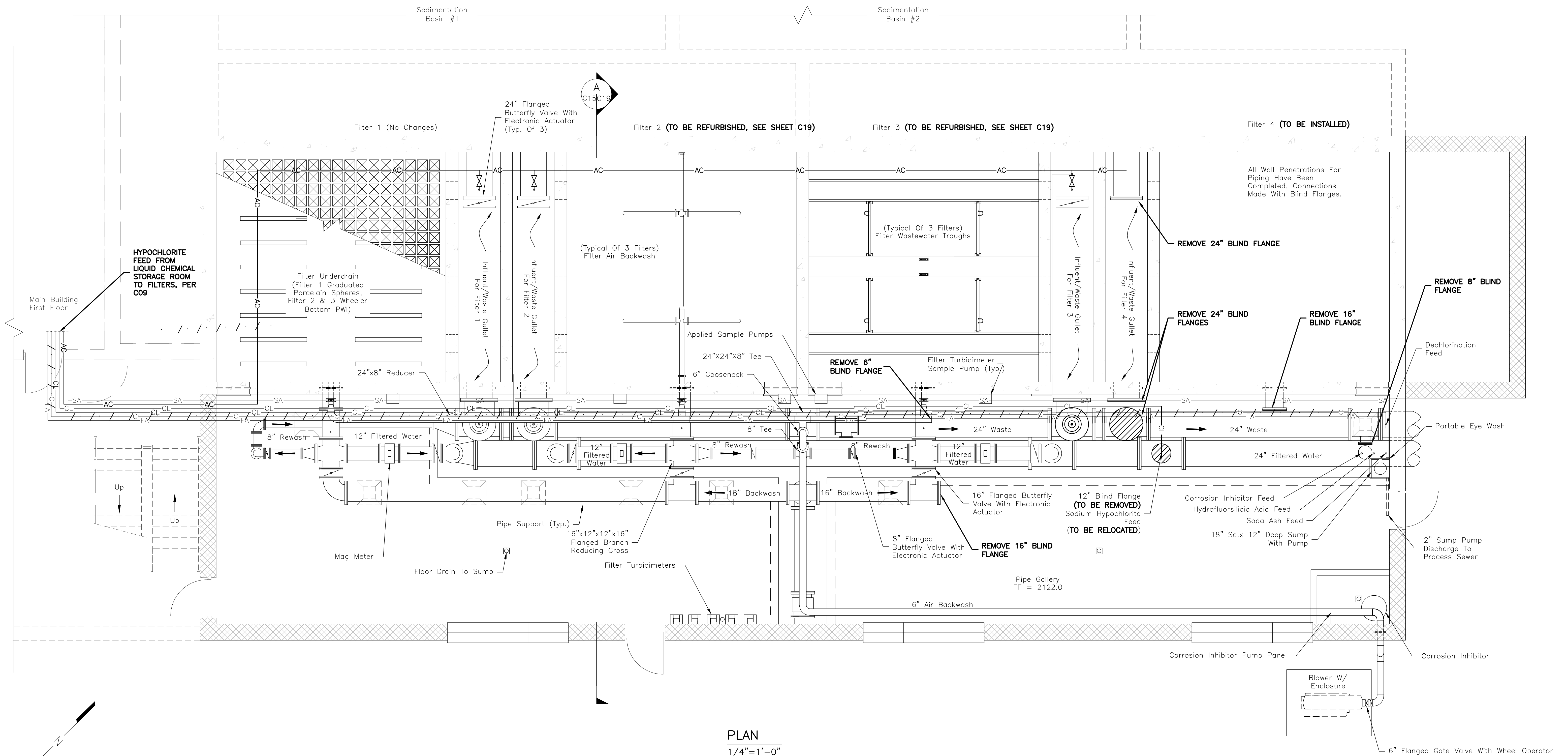
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SHEET DESCRIPTION:
FLUORIDE FEED DETAILS

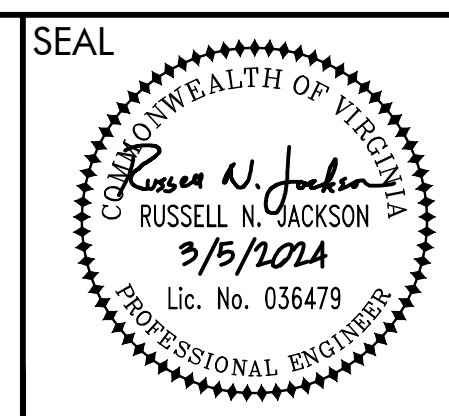
C14



PLAN
1/4"=1'-0"

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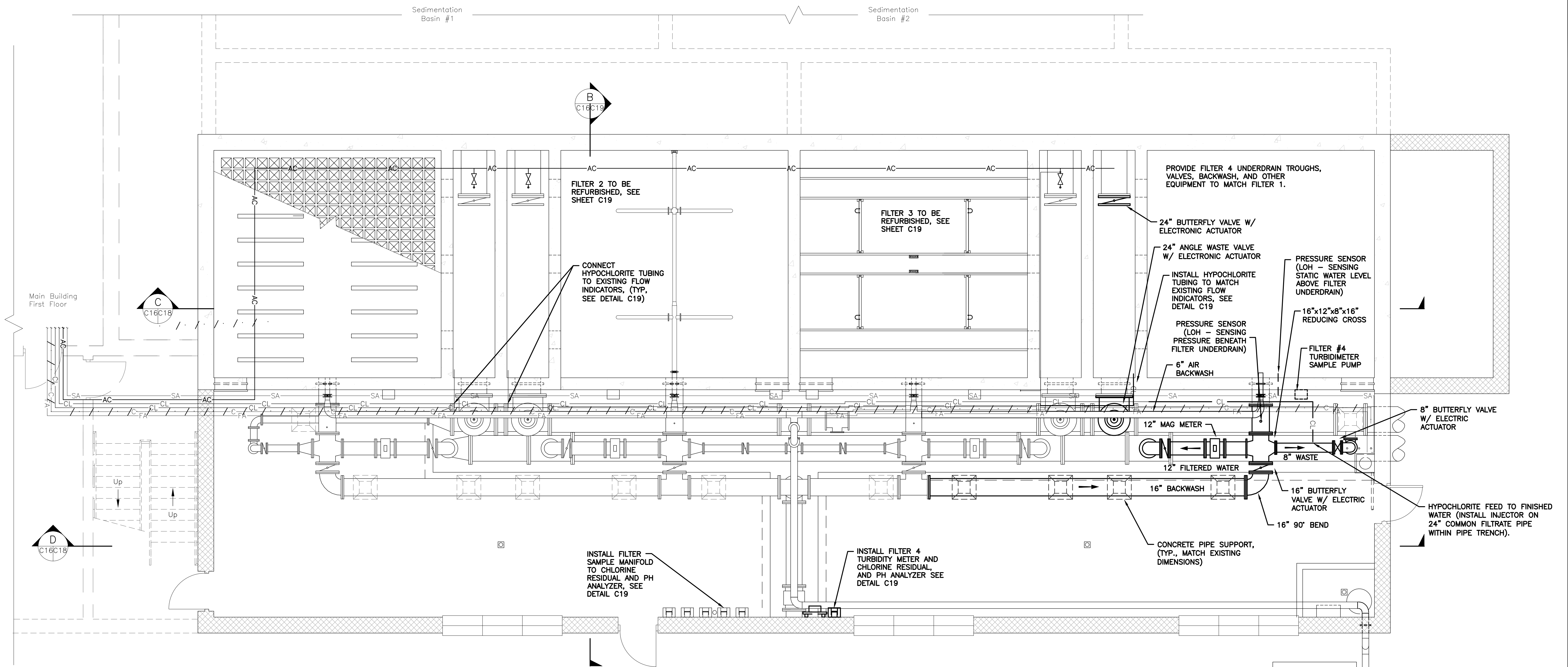
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SEAL
DRAWN BY: RNJ
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SHEET DESCRIPTION:
FILTER BUILDING - EXISTING
GROUND FLOOR PLAN

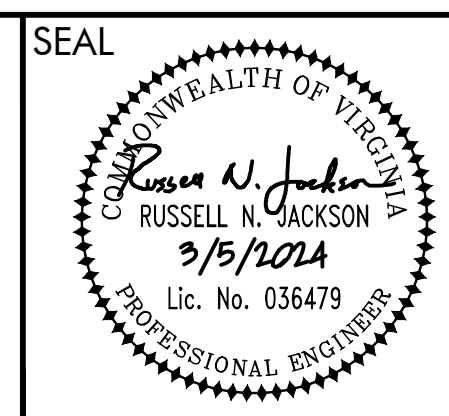
C15



PLAN
1/4"=1'-0"

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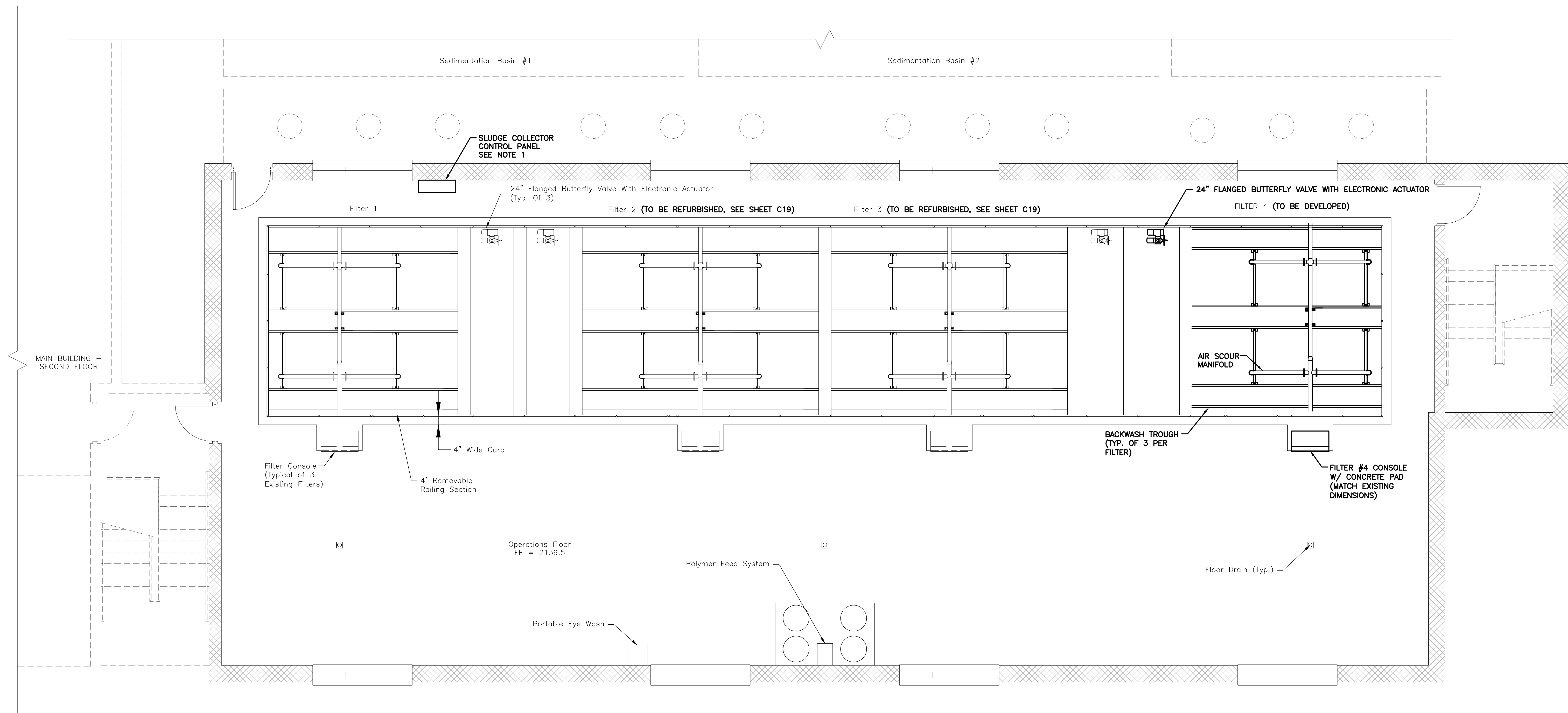
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



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RNJ
REVIEW BY:
RNJ
DATE:
5 MARCH 2024
REVISION:

SHEET DESCRIPTION:
FILTER BUILDING -
GROUND FLOOR
IMPROVEMENTS PLAN

C16



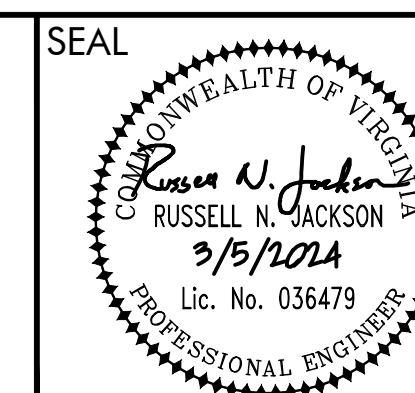
NOTES:

1. INSTALL SIGNAL AND POWER WIRES AND CONDUIT FROM CONTROL PANEL TO SLUDGE COLLECTOR EQUIPMENT. COORDINATE NUMBER AND SIZE OF WIRES AND CONDUIT WITH SLUDGE COLLECTOR MANUFACTURER. INSTALL ALL EXTERIOR CONDUIT ALONG BASIN WALLS WITHIN 8" OF TOP OF WALL (EXCEPT AS NECESSARY TO CROSS UNDER WALKWAY BRIDGES). USE WATERTIGHT SEALS AT ALL CONDUIT CONNECTIONS. PROVIDE LOCKABLE DISCONNECT SWITCHES MOUNTED TO HANDRAIL WITHIN 5 FEET OF EACH SLUDGE COLLECTOR DRIVE MOTOR ASSEMBLY

PLAN
1/4"=1'-0"

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3214 FAX: (540) 394 - 3215

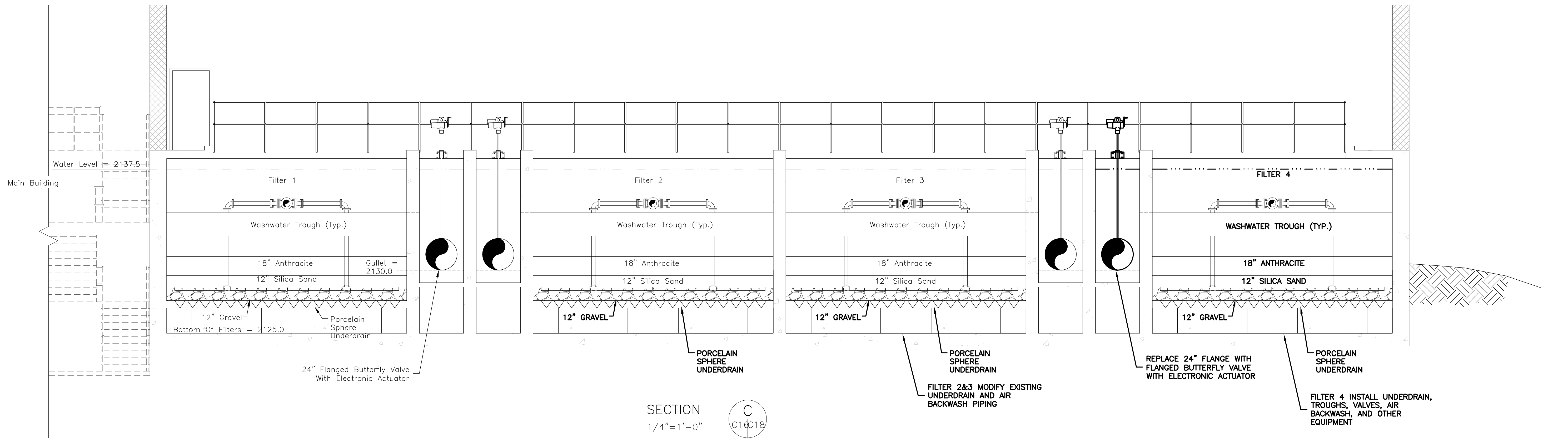
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



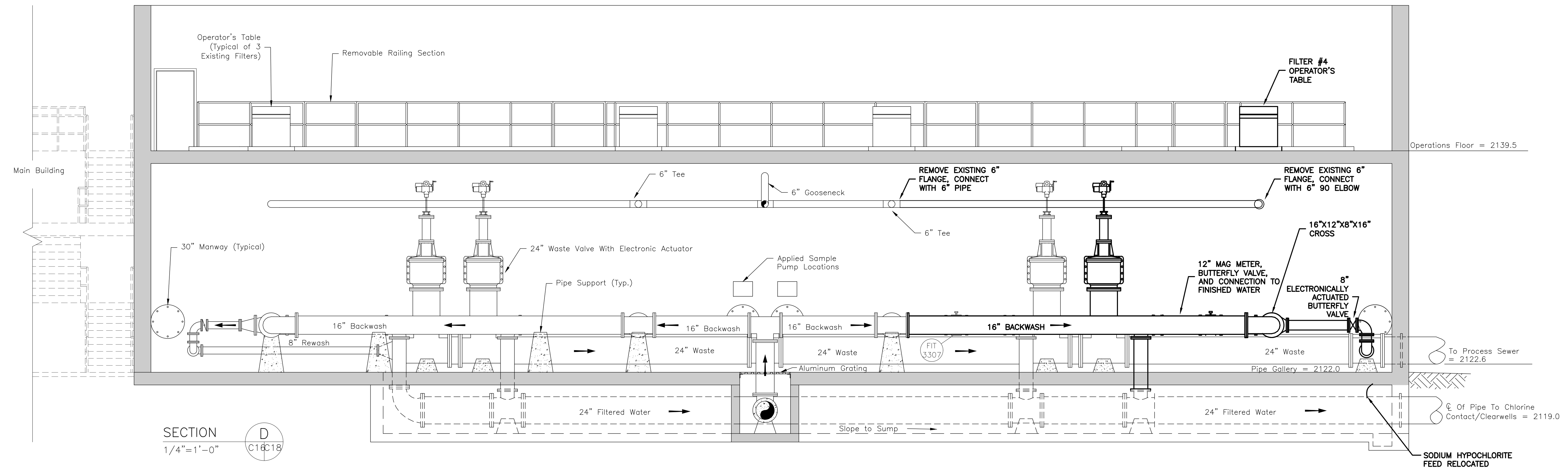
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RNJ
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5 MARCH 2024
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SHEET DESCRIPTION:
FILTER BUILDING - SECOND
FLOOR PLAN

C17



SECTION C
1/4"=1'-0" C16C18



SECTION D
1/4"=1'-0" C16C18

Peed & Bortz, L.L.C.
 CIVIL & ENVIRONMENTAL ENGINEERS
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 CHRISTIANBURG, VIRGINIA 24073
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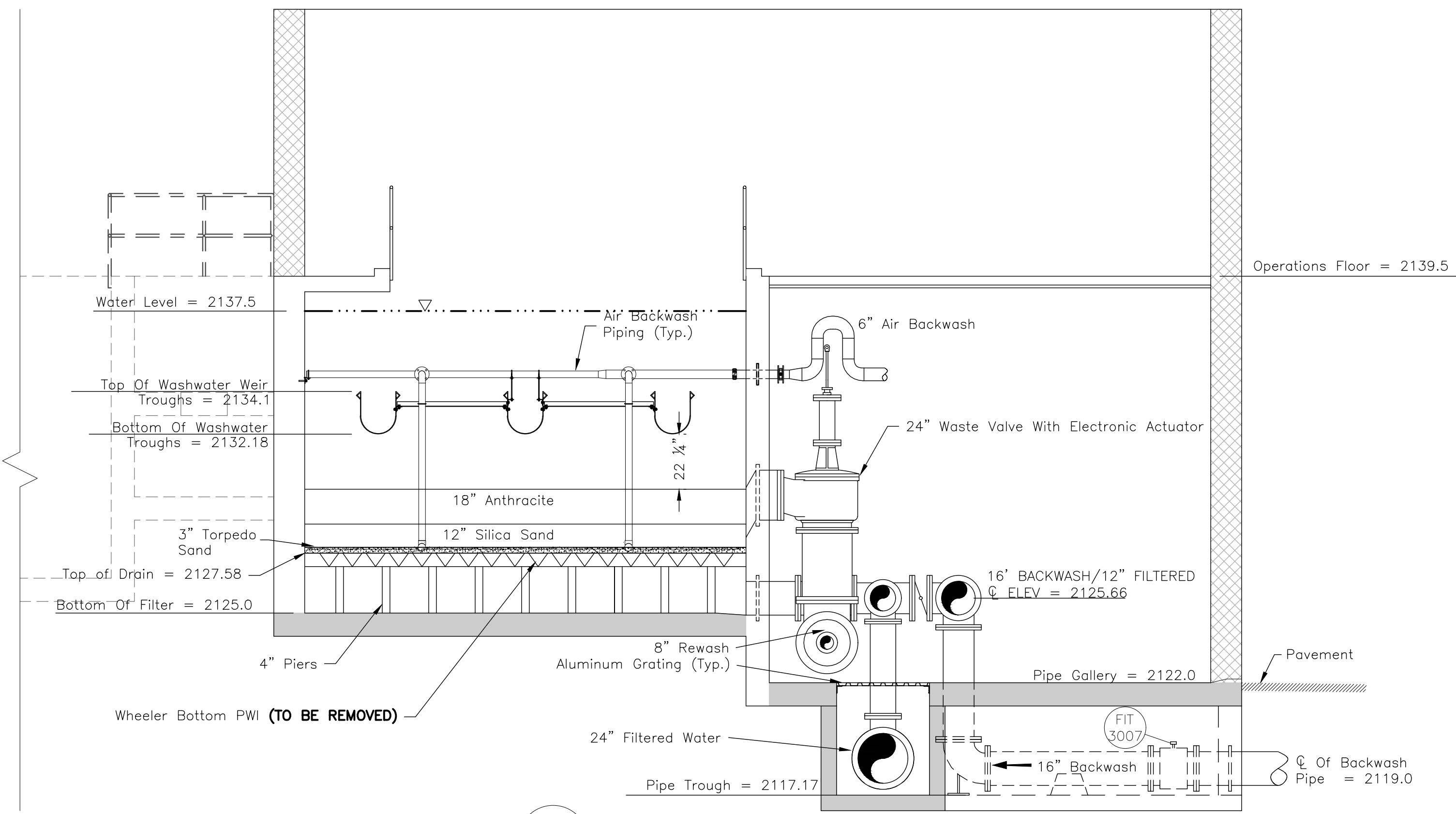
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
 AUSTINVILLE VIRGINIA

SEAL
 COMMONWEALTH OF VIRGINIA
Russell N. Jackson
 RUSSELL N. JACKSON
 3/5/2024
 Lic. No. 036479
 PROFESSIONAL ENGINEER

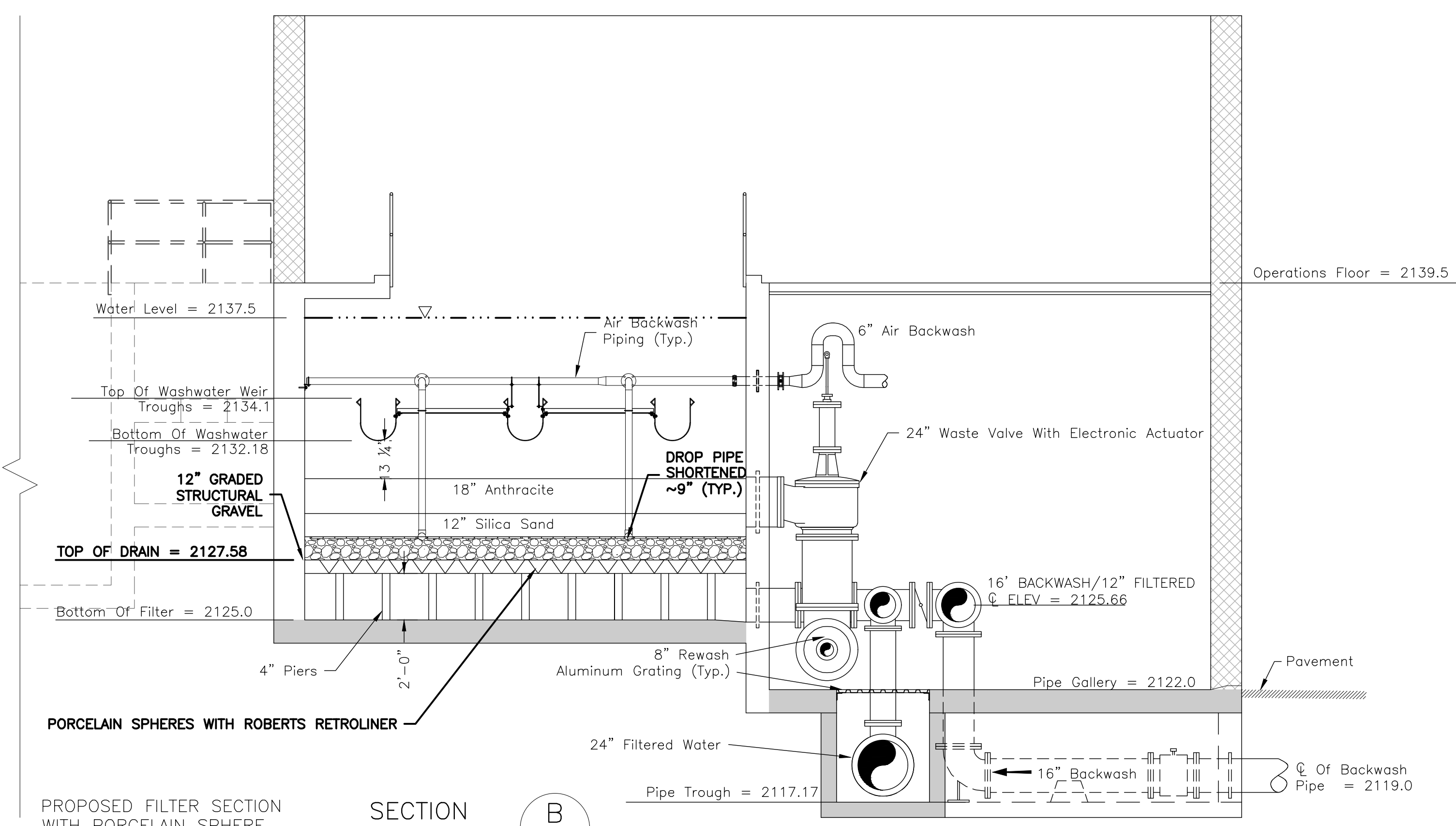
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SHEET DESCRIPTION:
 FILTER BUILDING -
 SECTIONS

C18



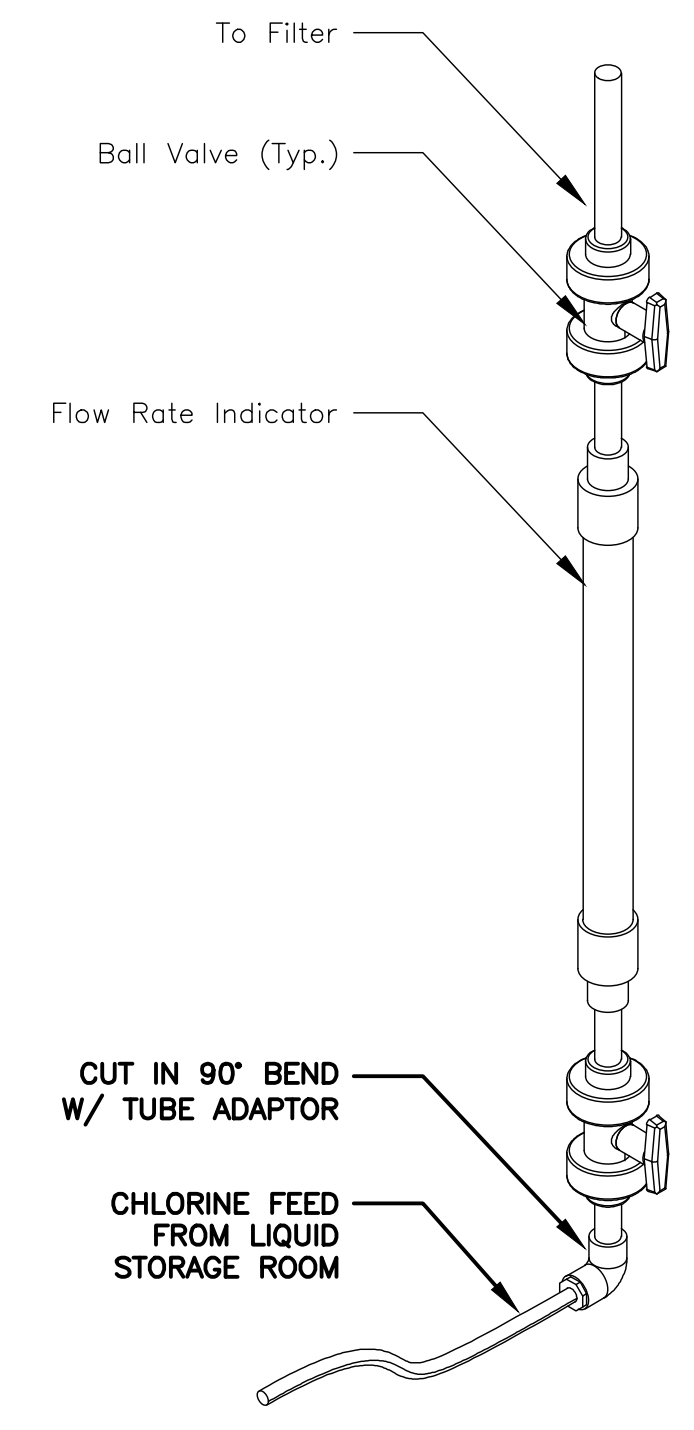
EXISTING FILTER SECTION WITH PWI INSERT UNDERDRAIN
SECTION A
1/4"=1'-0" C15C19



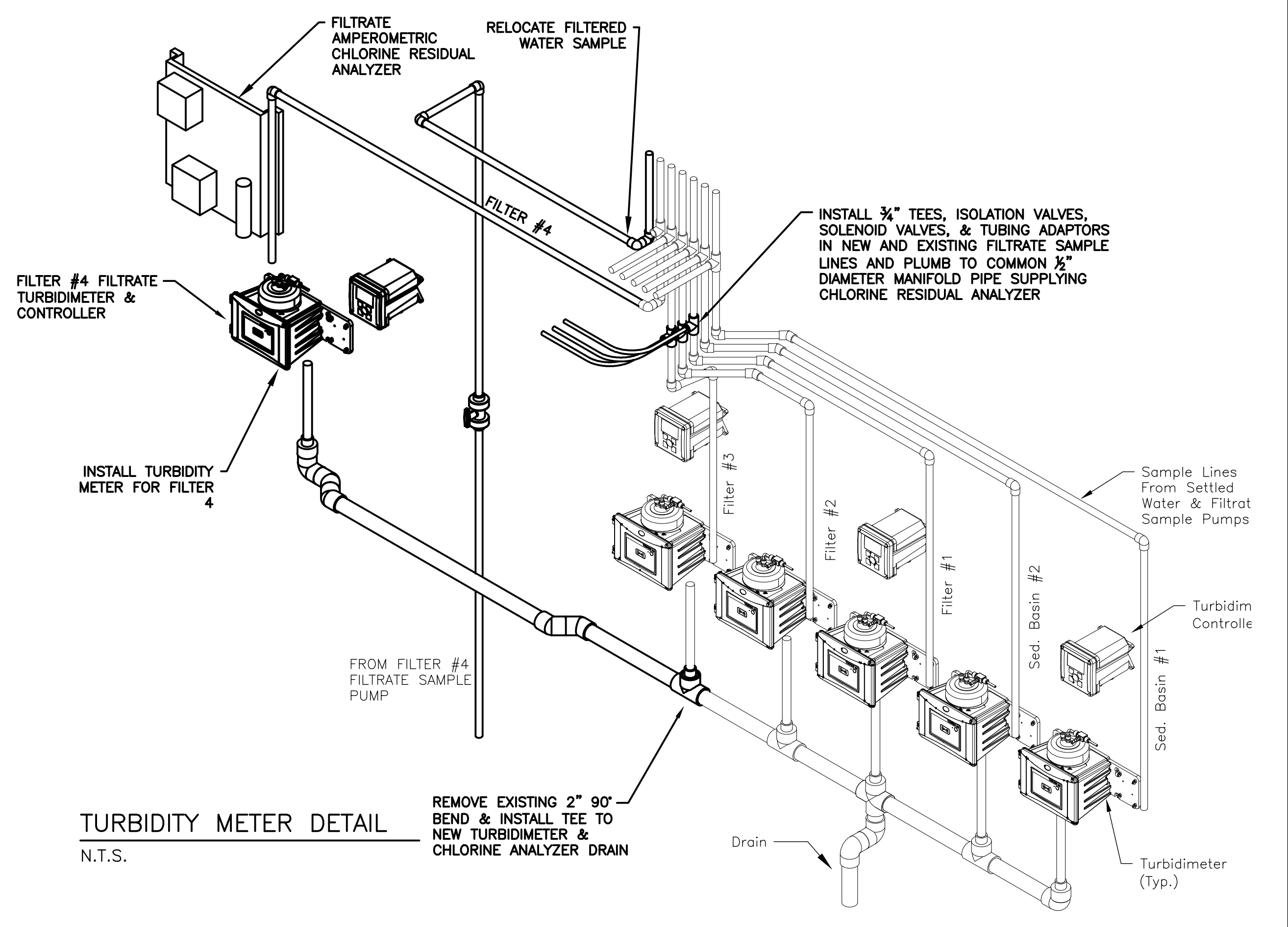
PROPOSED FILTER SECTION WITH PORCELAIN SPHERE UNDERDRAIN
SECTION B
1/4"=1'-0" C16C19

FILTER NOTES:

1. THE PROPOSED FILTER #2 & #3 IMPROVEMENTS WILL INCLUDE REMOVAL OF EXISTING MEDIA AND ROBERTS PWI POROUS PLATE WHEELER BOTTOM INSERTS. FOLLOWING INSPECTION ANY NECESSARY REPAIR OF HOPPER BOTTOM LINERS AND THIMBLES, GRADUATED PORCELAIN SPHERES WILL BE INSTALLED IN THE HOPPER BOTTOMS AND NEW MEDIA WITH SUPPORT GRAVEL WILL BE INSTALLED. THE EXISTING AIR SCOUR DIFFUSER PIPING WILL BE RAISED TO ACCOMMODATE THE ADDITIONAL 9" SUPPORT GRAVEL.
2. FILTER #1 WAS RECENTLY REBUILT (2020) TO REPLACE PWI POROUS PLATE INSERTS WITH PORCELAIN SPHERES AND NEW MEDIA.
3. FILTER #4 WILL BE DEVELOPED WITH PORCELAIN SPHERES.



FILTER CHLORINE FEED CONNECTION DETAIL
N.T.S.



TURBIDITY METER DETAIL
N.T.S.

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NEW RIVER REGIONAL WATER AUTHORITY
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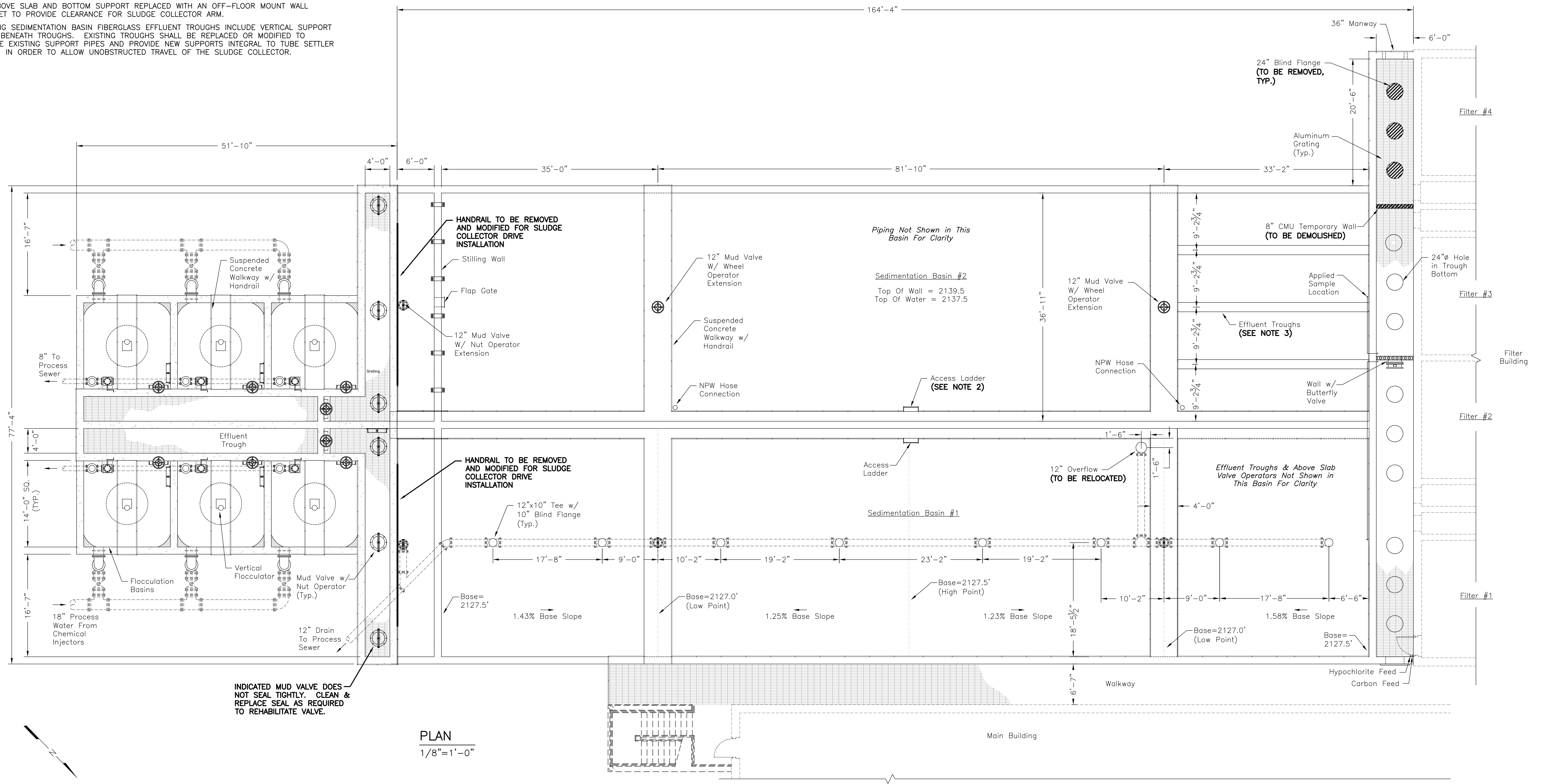
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SHEET DESCRIPTION:
FILTERS - SECTIONS &
DETAILS

C19

NOTES:

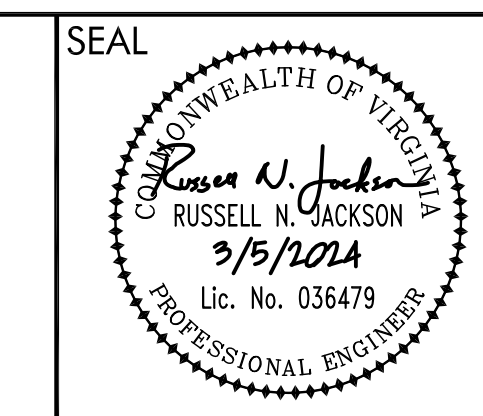
1. ALL PIPING, TROUGHS, AND OTHER BASIN ELEMENTS ARE SIMILAR FOR BOTH SEDIMENTATION BASINS. FOR CLARITY, BASIN BASE AND DRAIN PIPING IS ONLY SHOWN IN SEDIMENTATION BASIN #1 WHILE ABOVE SLAB TROUGHS AND OTHER FEATURES ARE ONLY SHOWN IN SEDIMENTATION BASIN #2.
2. EXISTING FLOOR MOUNT ACCESS LADDERS IN EACH SEDIMENTATION BASIN SHALL BE CUT TO 12" ABOVE SLAB AND BOTTOM SUPPORT REPLACED WITH AN OFF-FLOOR MOUNT WALL BRACKET TO PROVIDE CLEARANCE FOR SLUDGE COLLECTOR ARM.
3. EXISTING SEDIMENTATION BASIN FIBERGLASS EFFLUENT TROUGHS INCLUDE VERTICAL SUPPORT PIPES BENEATH TROUGHS. EXISTING TROUGHS SHALL BE REPLACED OR MODIFIED TO REMOVE EXISTING SUPPORT PIPES AND PROVIDE NEW SUPPORTS INTEGRAL TO TUBE SETTLER FRAME, IN ORDER TO ALLOW UNOBSTRUCTED TRAVEL OF THE SLUDGE COLLECTOR.



PLAN
1/8"=1'-0"

Peed & Bortz, L.L.C.
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NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



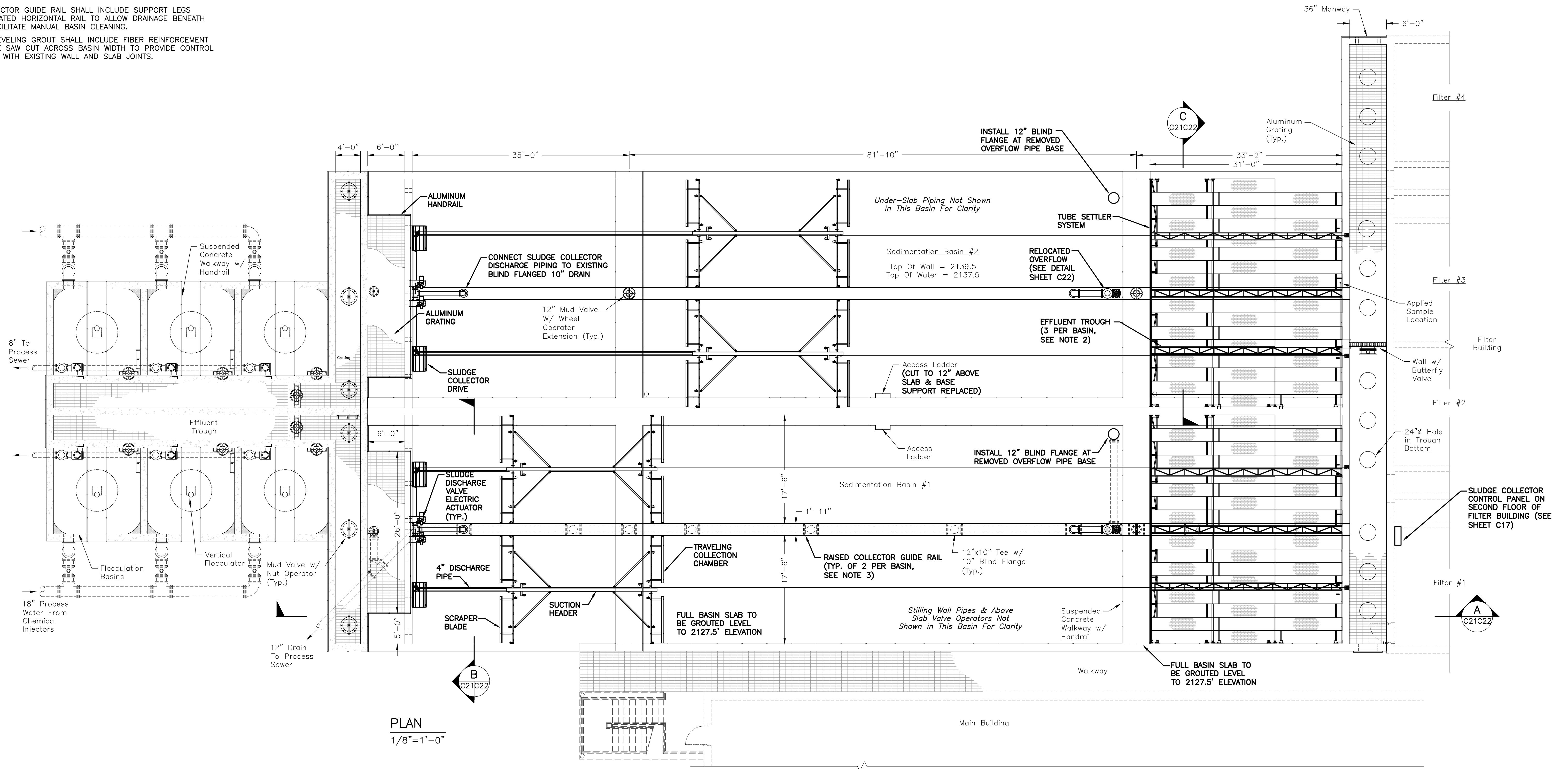
DRAWN BY: RNJ
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DATE: 5 MARCH 2024
REVISION:

SHEET DESCRIPTION:
EXISTING SEDIMENTATION
BASIN PLAN

C20

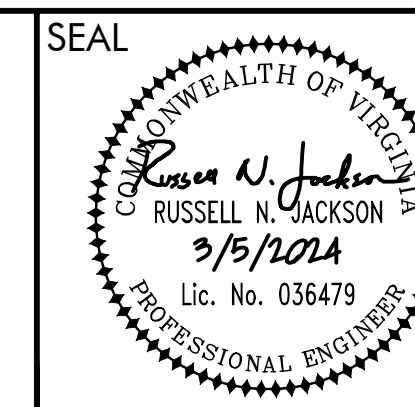
NOTES:

1. CONTRACTOR TO VERIFY BASIN DIMENSIONS FOR SLUDGE COLLECTOR AND TUBE SETTLER EQUIPMENT.
2. EXISTING FIBERGLASS EFFLUENT TROUGHS MAY BE REPLACED OR MODIFIED TO REMOVE EXISTING VERTICAL SUPPORT PIPES AND PROVIDE NEW SUPPORT FROM TUBE SETTLER FRAMES. IF TROUGHS ARE REPLACED, NEW TROUGHS SHALL MATCH EXISTING TROUGH LOCATIONS AND THROUGH WALL SIZES.
3. SLUDGE COLLECTOR GUIDE RAIL SHALL INCLUDE SUPPORT LEGS BENEATH ELEVATED HORIZONTAL RAIL TO ALLOW DRAINAGE BENEATH RAILS AND FACILITATE MANUAL BASIN CLEANING.
4. BASIN SLAB LEVELING GROUT SHALL INCLUDE FIBER REINFORCEMENT AND SHALL BE SAW CUT ACROSS BASIN WIDTH TO PROVIDE CONTROL JOINS IN LINE WITH EXISTING WALL AND SLAB JOINTS.



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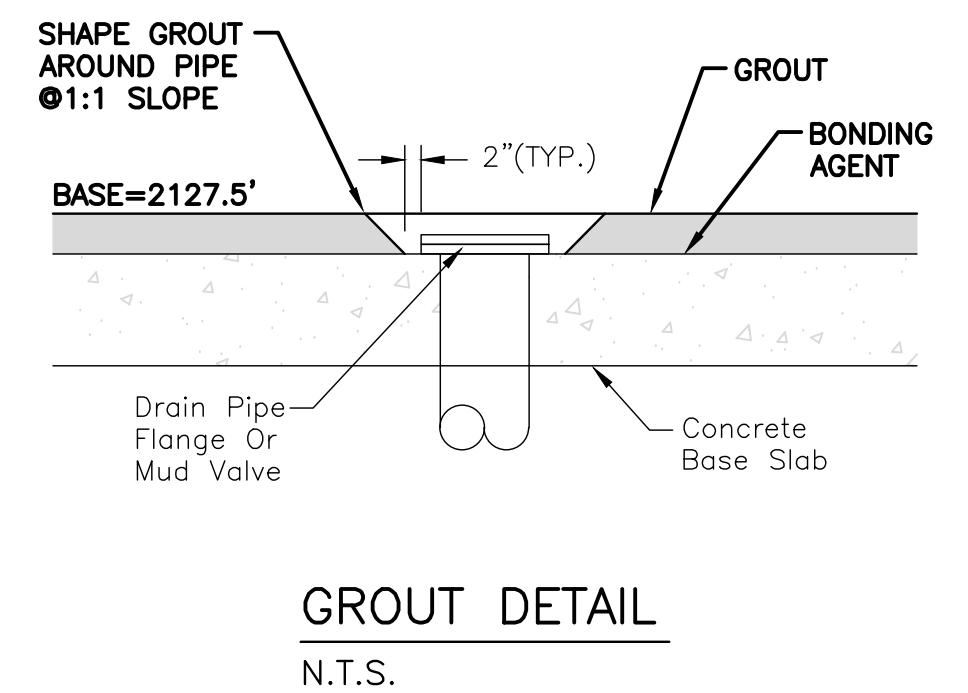
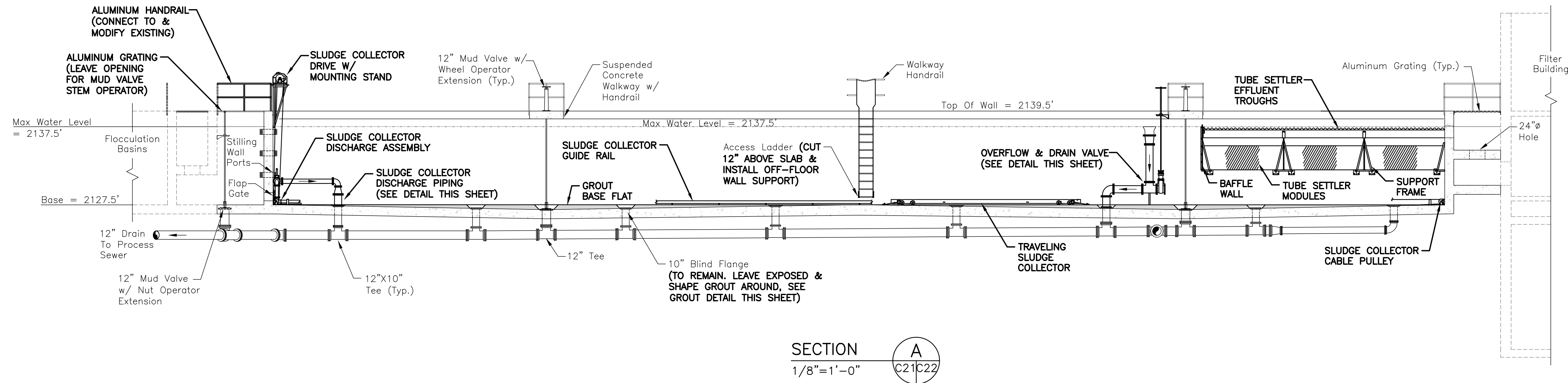
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



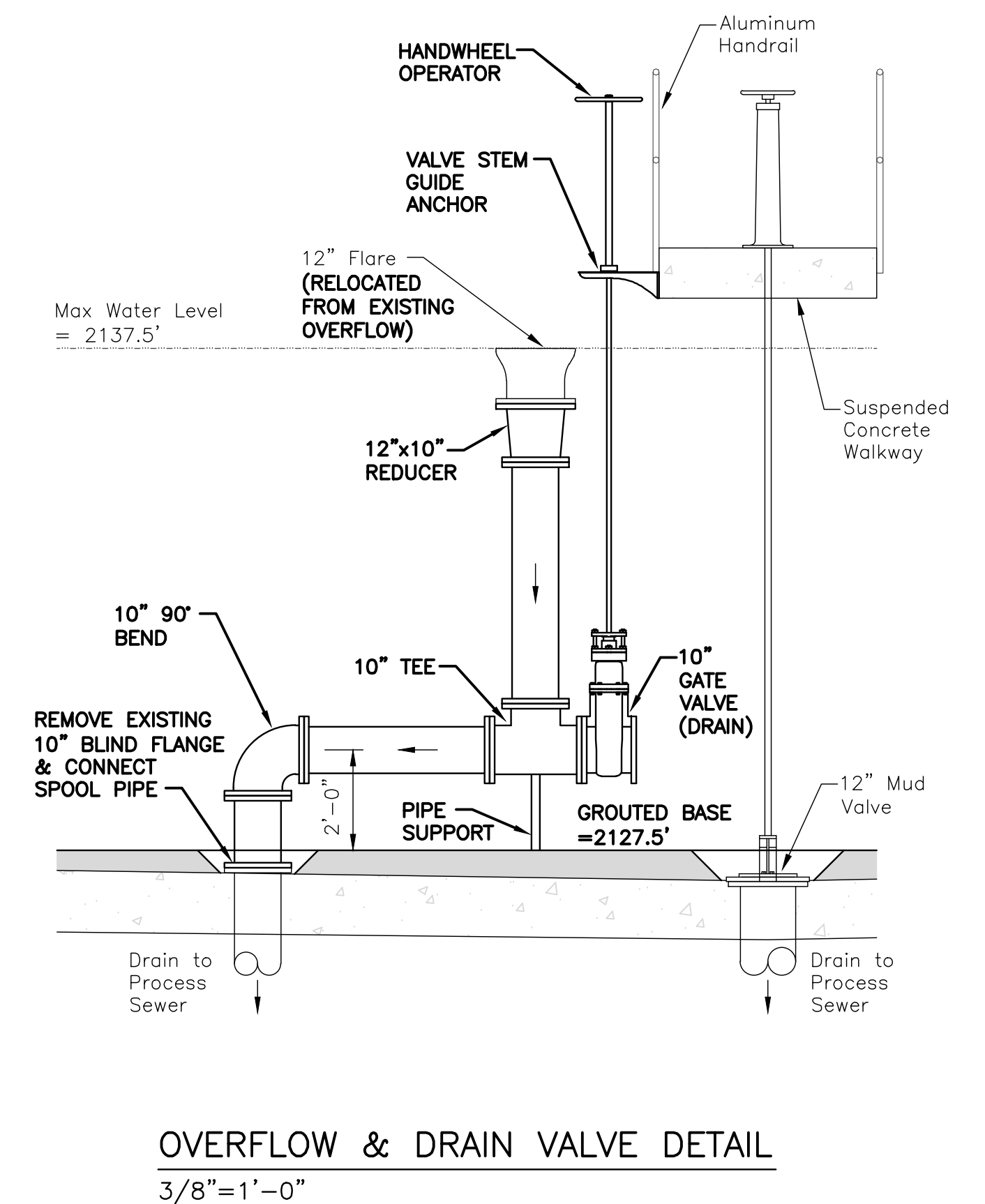
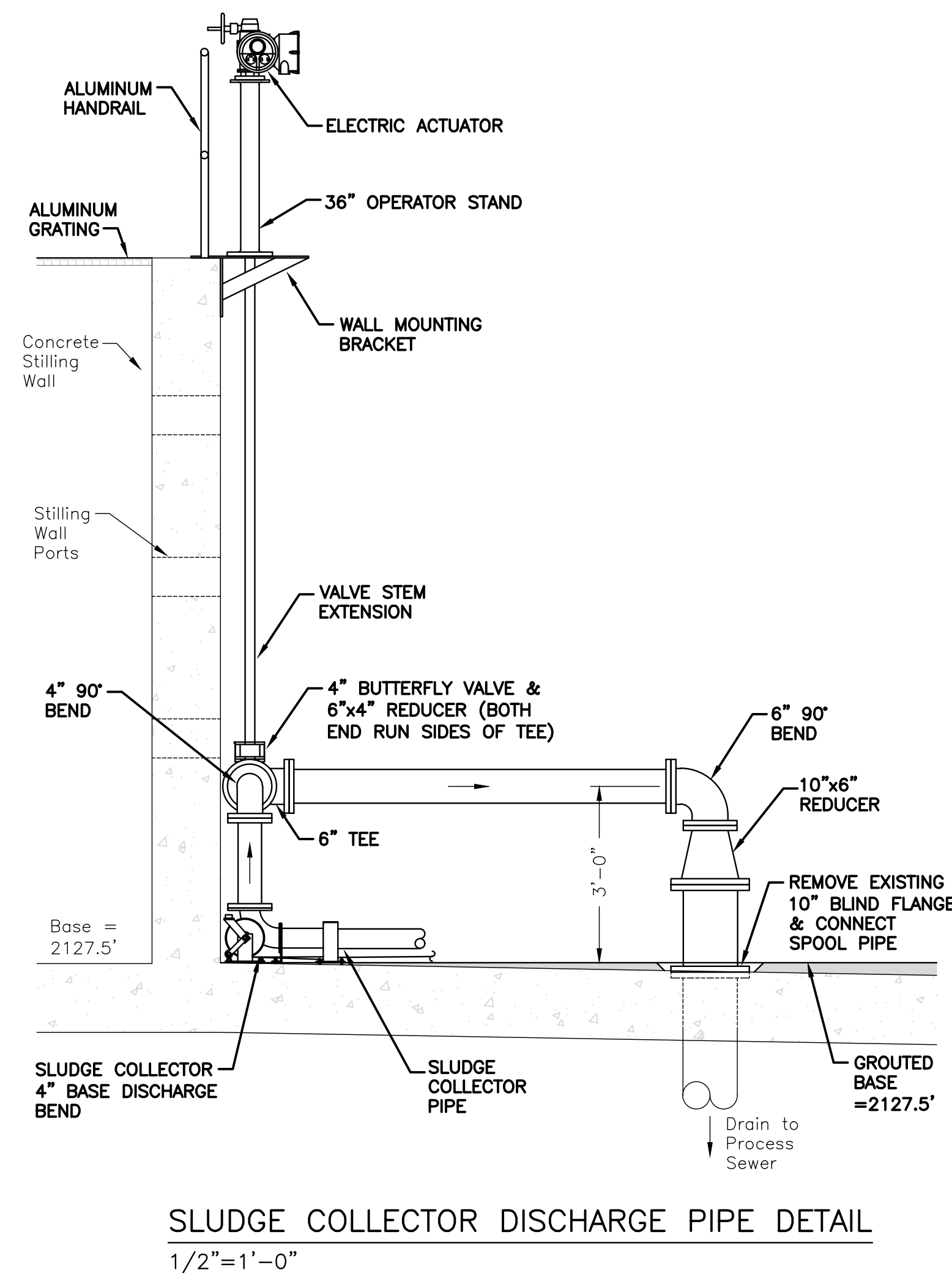
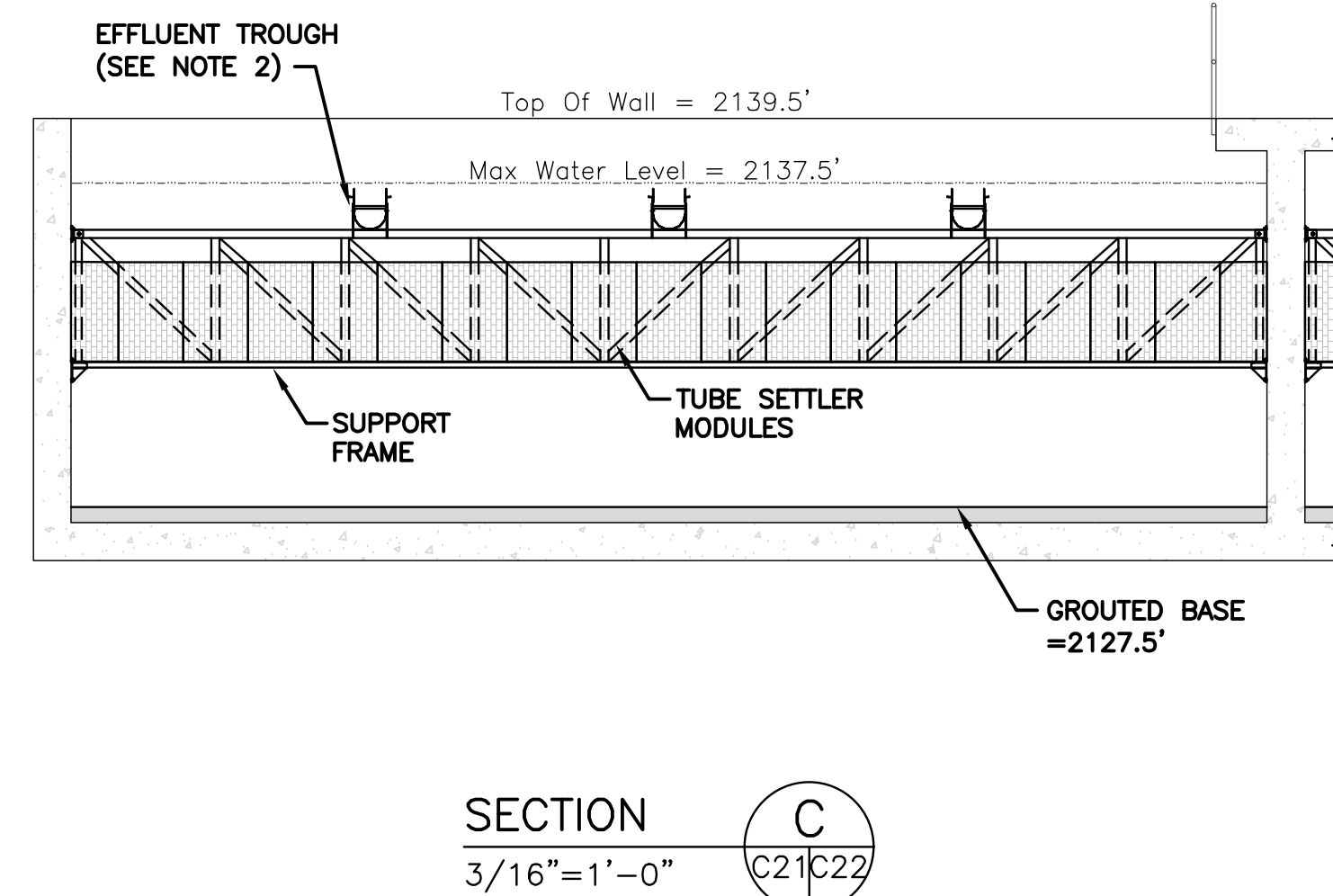
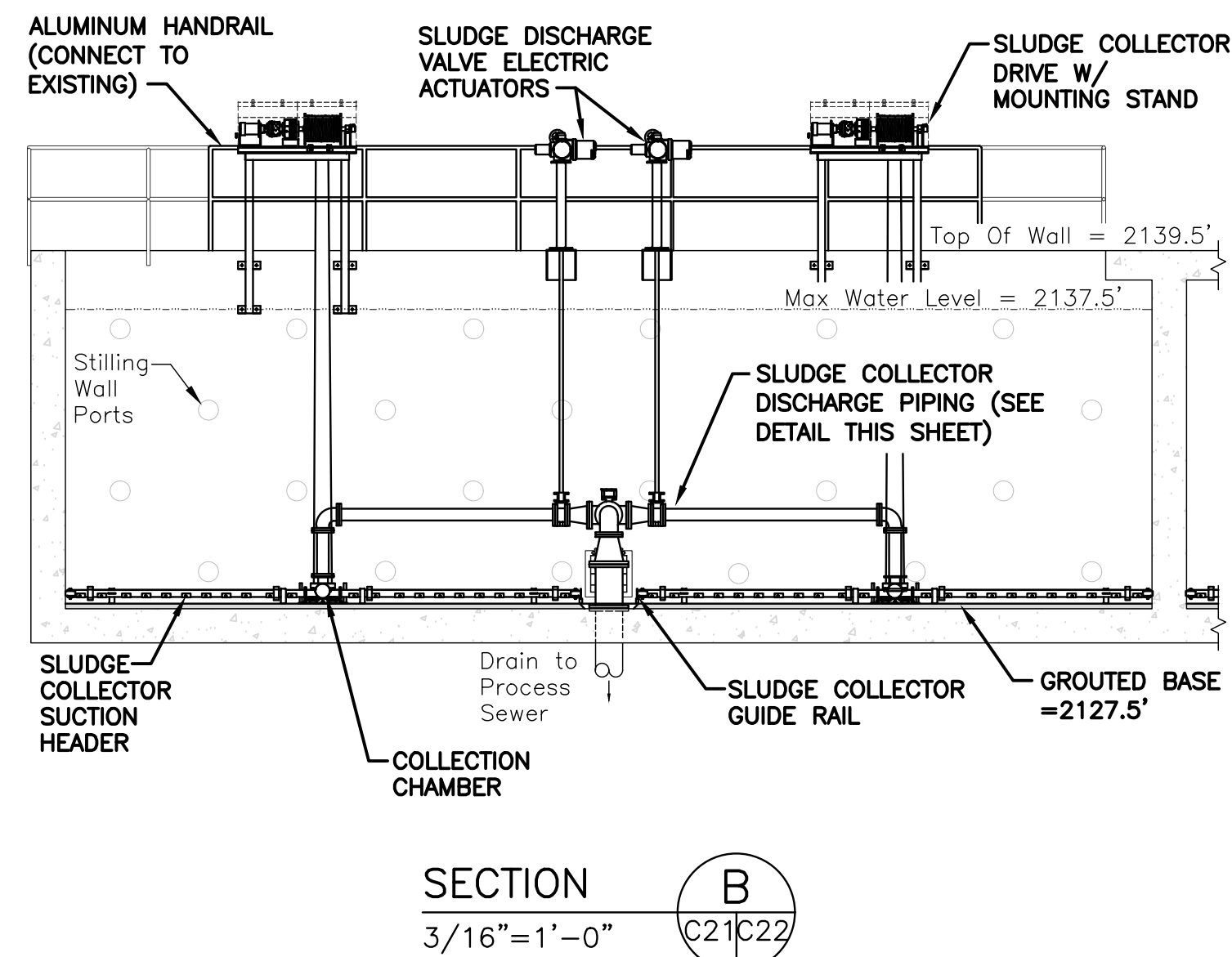
DRAWN BY: RNJ
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REVISION:

SHEET DESCRIPTION:
SEDIMENTATION BASIN
SLUDGE COLLECTOR PLAN

C21

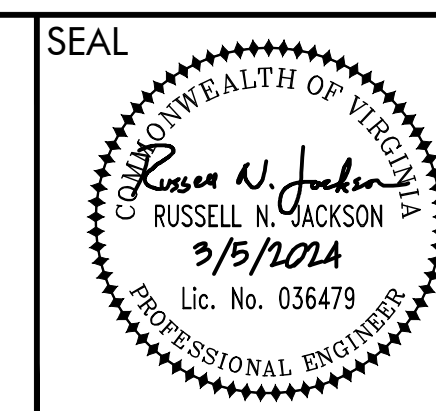


- NOTES:
1. CONTRACTOR TO VERIFY BASIN DIMENSIONS FOR SLUDGE COLLECTOR AND TUBE SETTLER EQUIPMENT.
 2. EXISTING FIBERGLASS EFFLUENT TROUGHS MAY BE REPLACED OR MODIFIED TO REMOVE EXISTING VERTICAL SUPPORT PIPES AND PROVIDE NEW SUPPORT FROM TUBE SETTLER FRAMES. IF TROUGHS ARE REPLACED, NEW TROUGHS SHALL MATCH EXISTING TROUGH LOCATIONS AND THROUGH WALL SIZES.
 3. SLUDGE COLLECTOR GUIDE RAILS SHALL INCLUDE SUPPORT LEGS TO PROVIDE MINIMUM 2" CLEARANCE BETWEEN RAIL AND BASE SLAB TO FACILITATE BASIN WASHDOWN AND CLEANING.
 4. BASIN SLAB LEVELING GROUT SHALL INCLUDE FIBER REINFORCEMENT AND SHALL BE SAW CUT ACROSS BASIN WIDTH TO PROVIDE CONTROL JOINS IN LINE WITH EXISTING WALL AND SLAB JOINTS.



Peed & Bortz, L.L.C.
 CIVIL & ENVIRONMENTAL ENGINEERS
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 CHRISTIANBURG, VIRGINIA 24073
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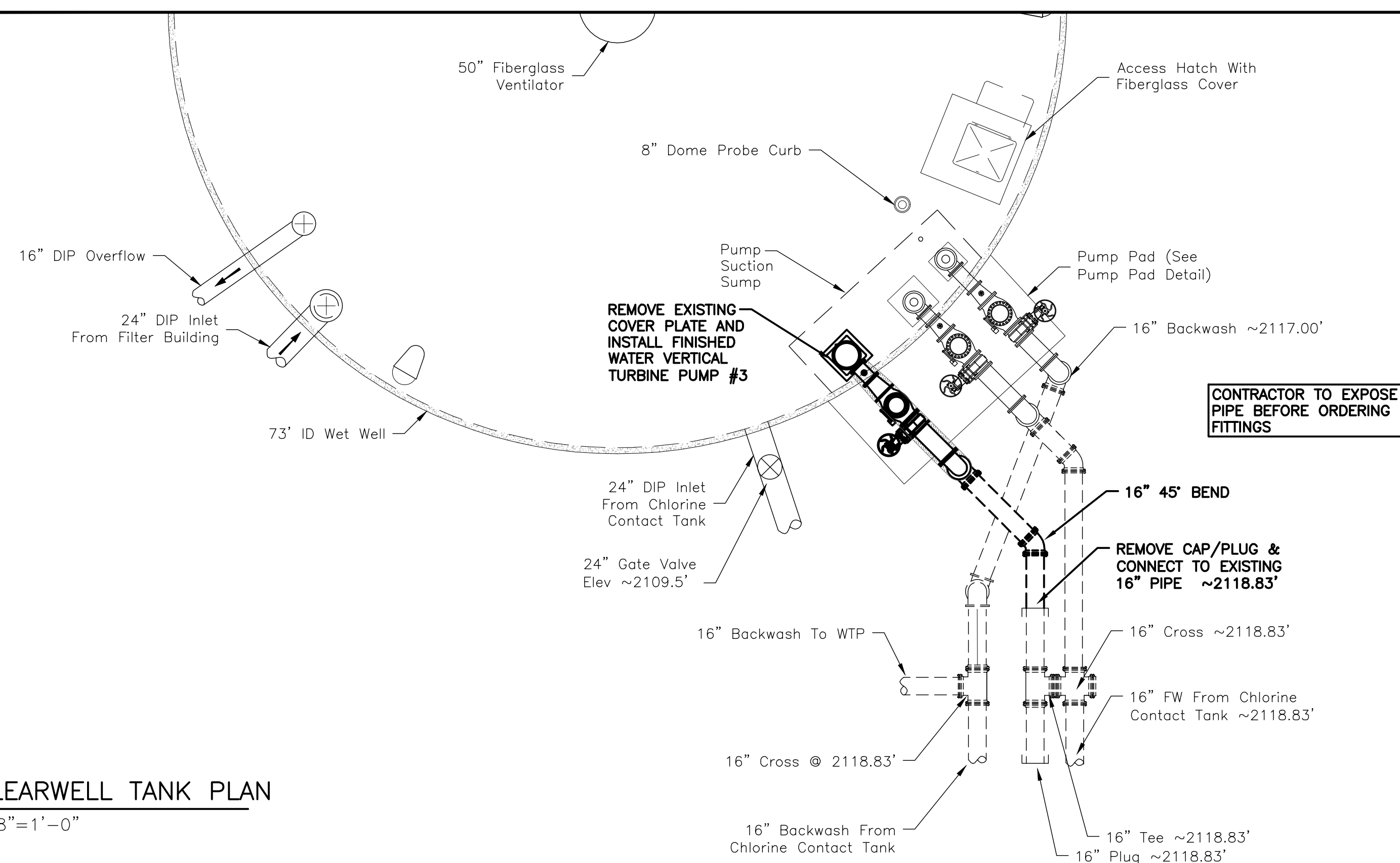
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
 AUSTINVILLE VIRGINIA



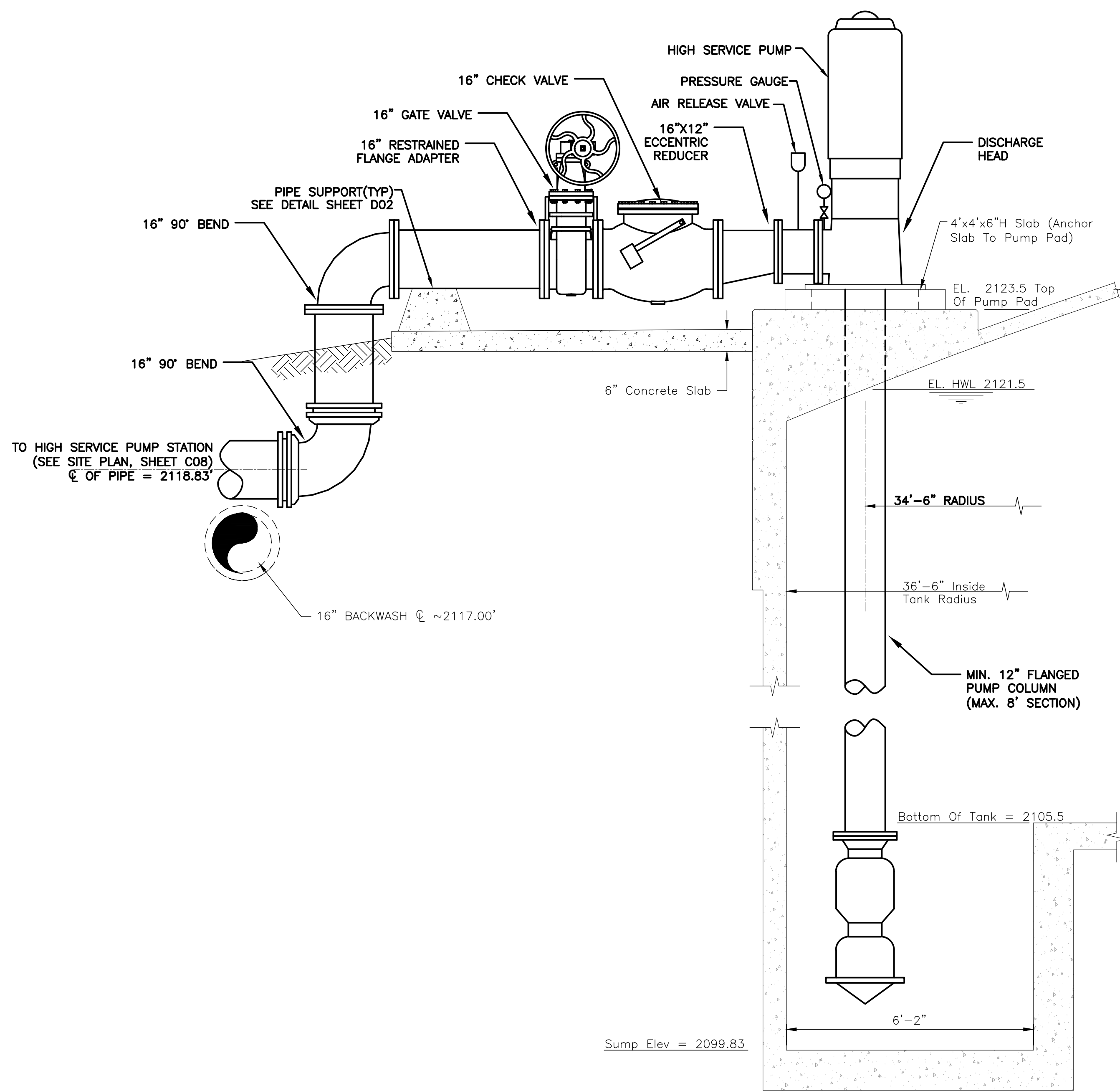
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SHEET DESCRIPTION:
 SEDIMENTATION BASIN
 SLUDGE COLLECTOR
 DETAILS

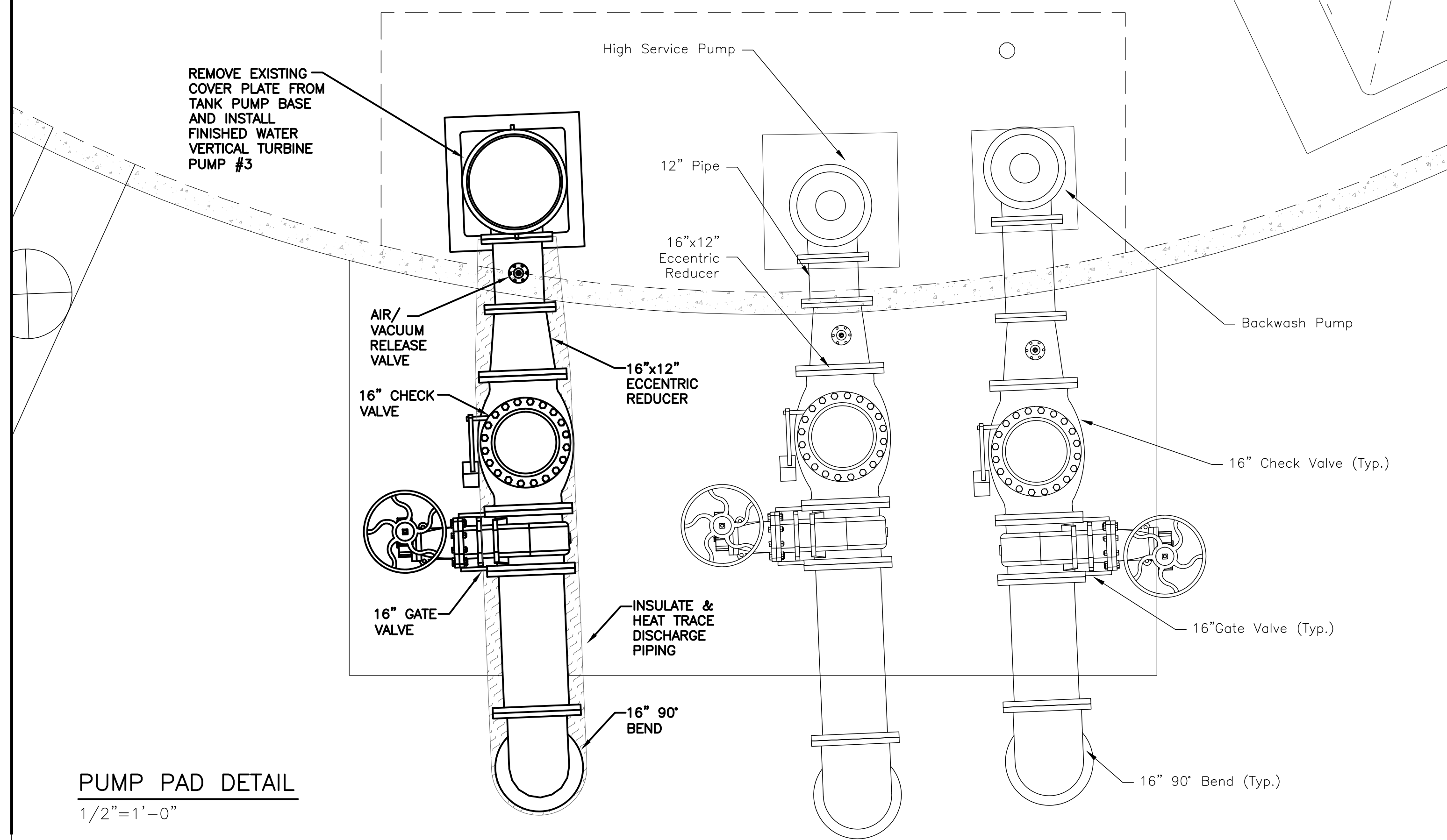
C22



CLEARWELL TANK PLAN
1/8"=1'-0"



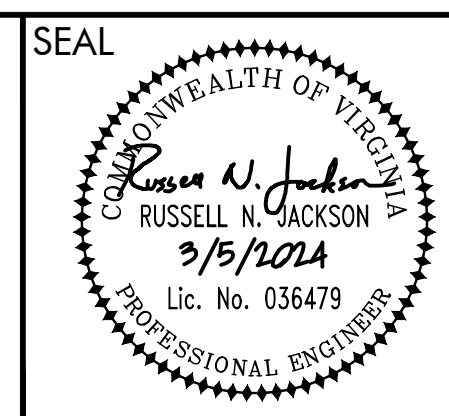
FINISHED WATER PUMP ELEVATION
1/2"=1'-0"



PUMP PAD DETAIL
1/2"=1'-0"

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NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA

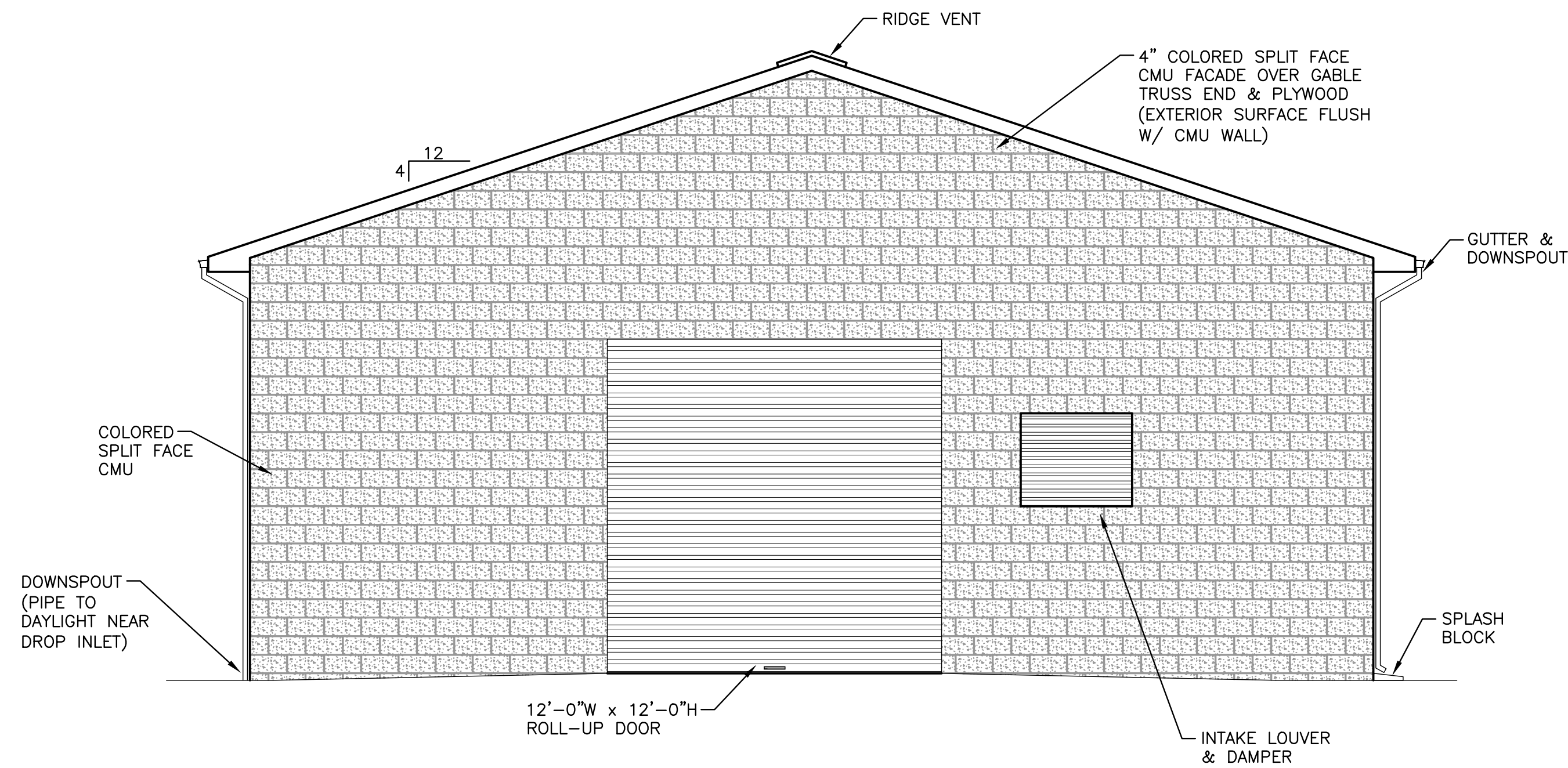


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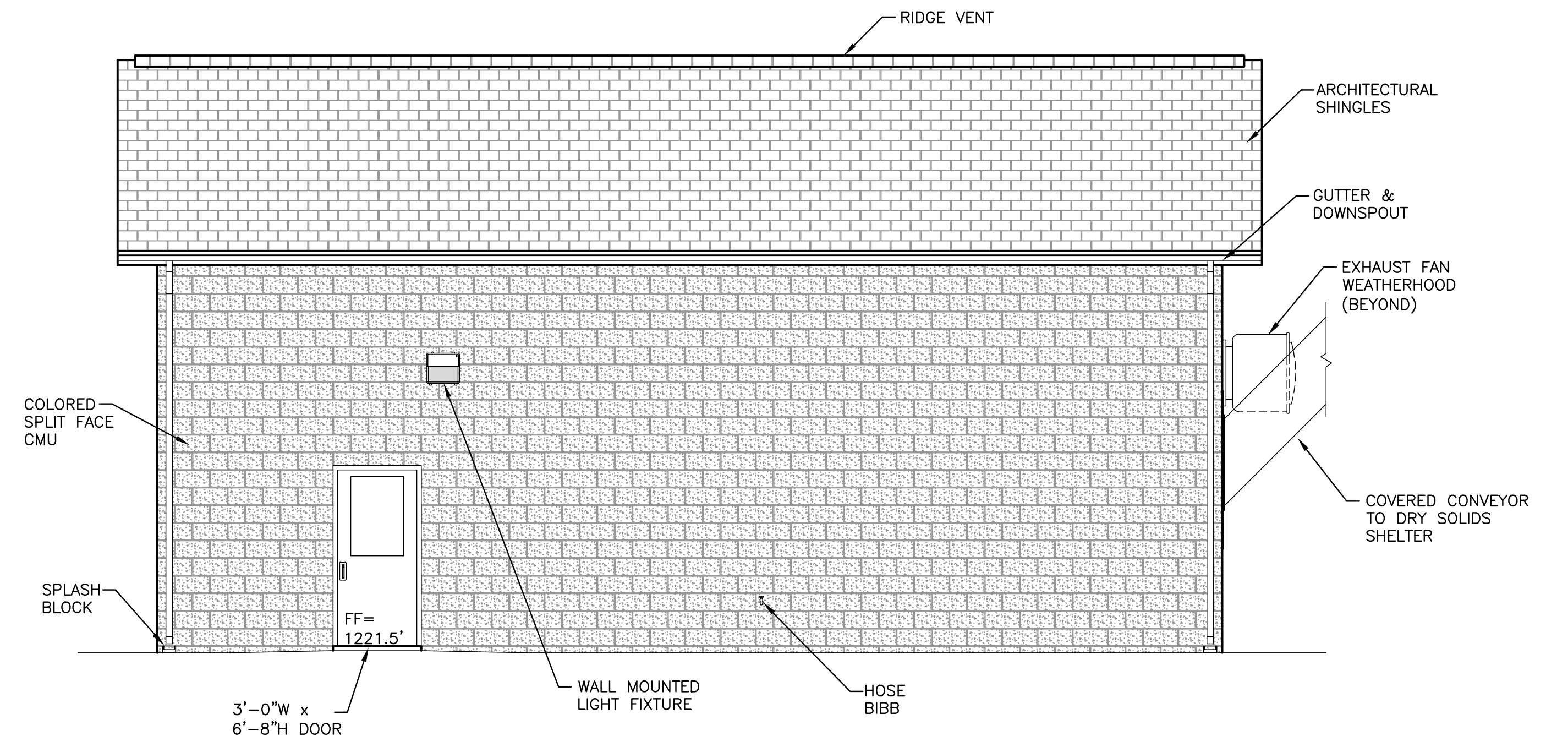
SHEET DESCRIPTION:
FINISHED WATER PUMPING IMPROVEMENTS

C23

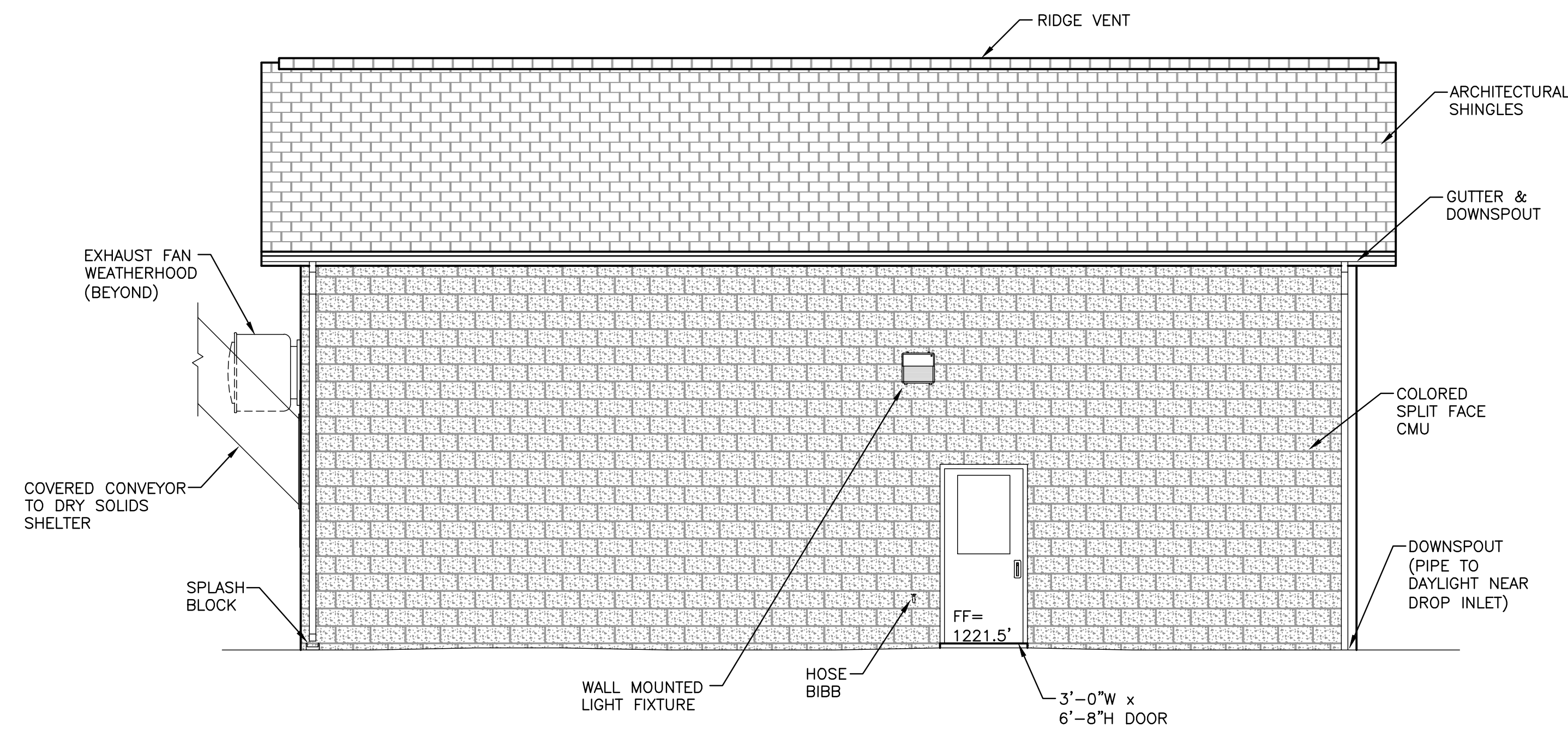
* ELEVATION LABELS DENOTE DIRECTION OF VIEW



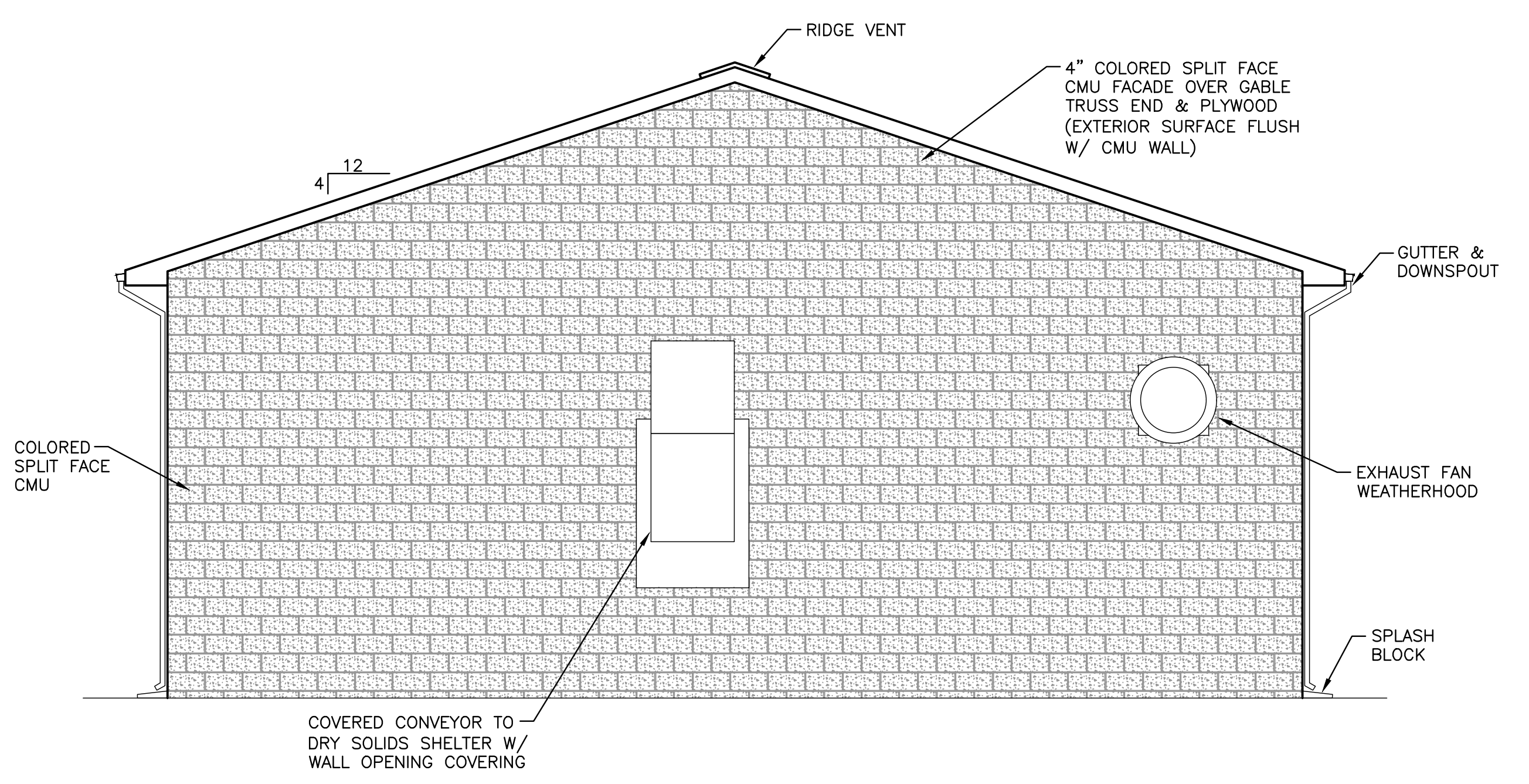
NORTHWEST ELEVATION*
1/4"=1'-0"



SOUTHWEST ELEVATION*
1/4"=1'-0"



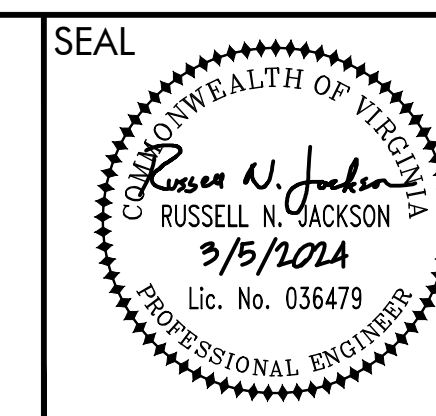
NORTHEAST ELEVATION*
1/4"=1'-0"



SOUTHEAST ELEVATION*
1/4"=1'-0"

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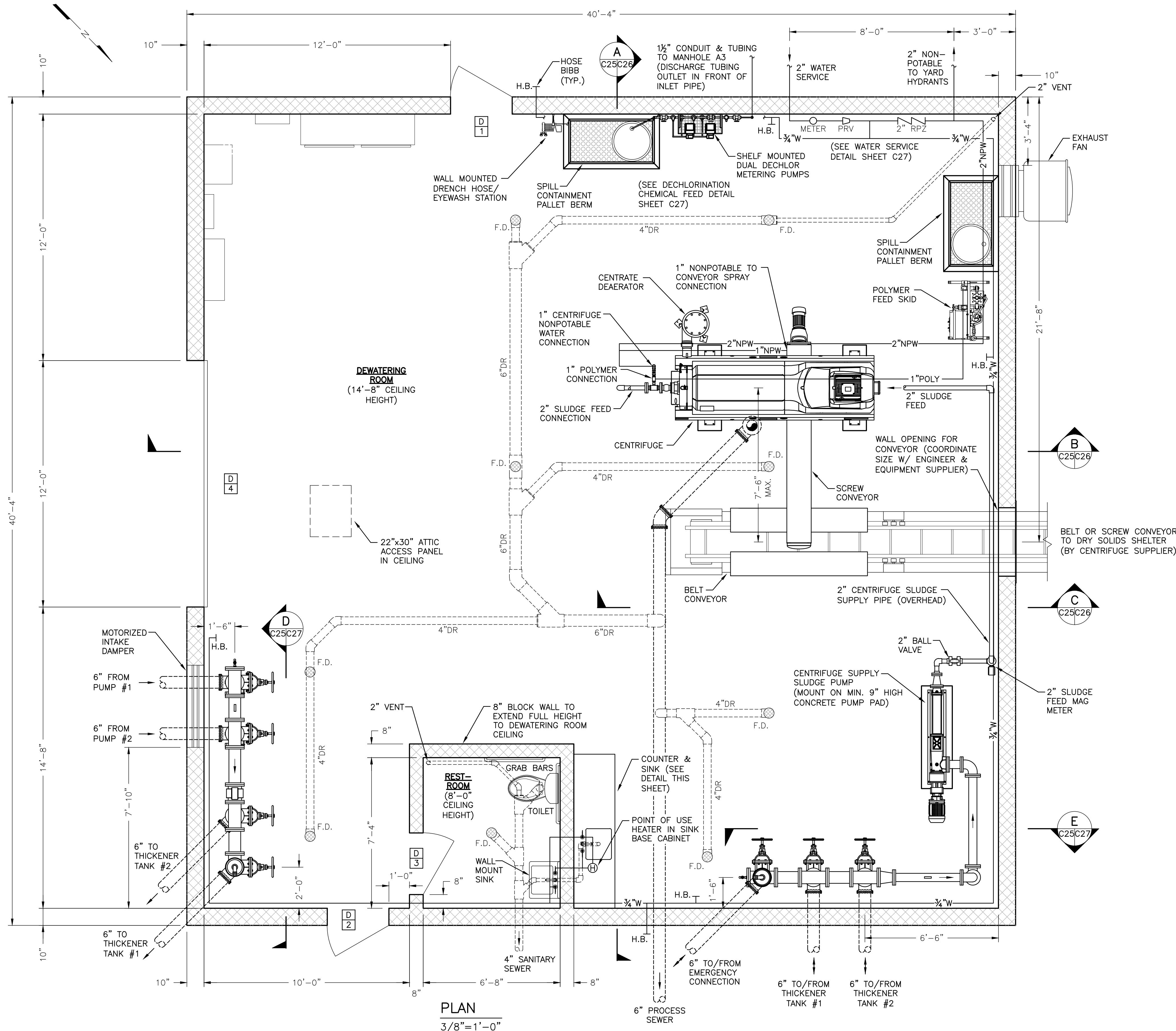
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



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SHEET DESCRIPTION:
SLUDGE DEWATERING
BUILDING ELEVATIONS

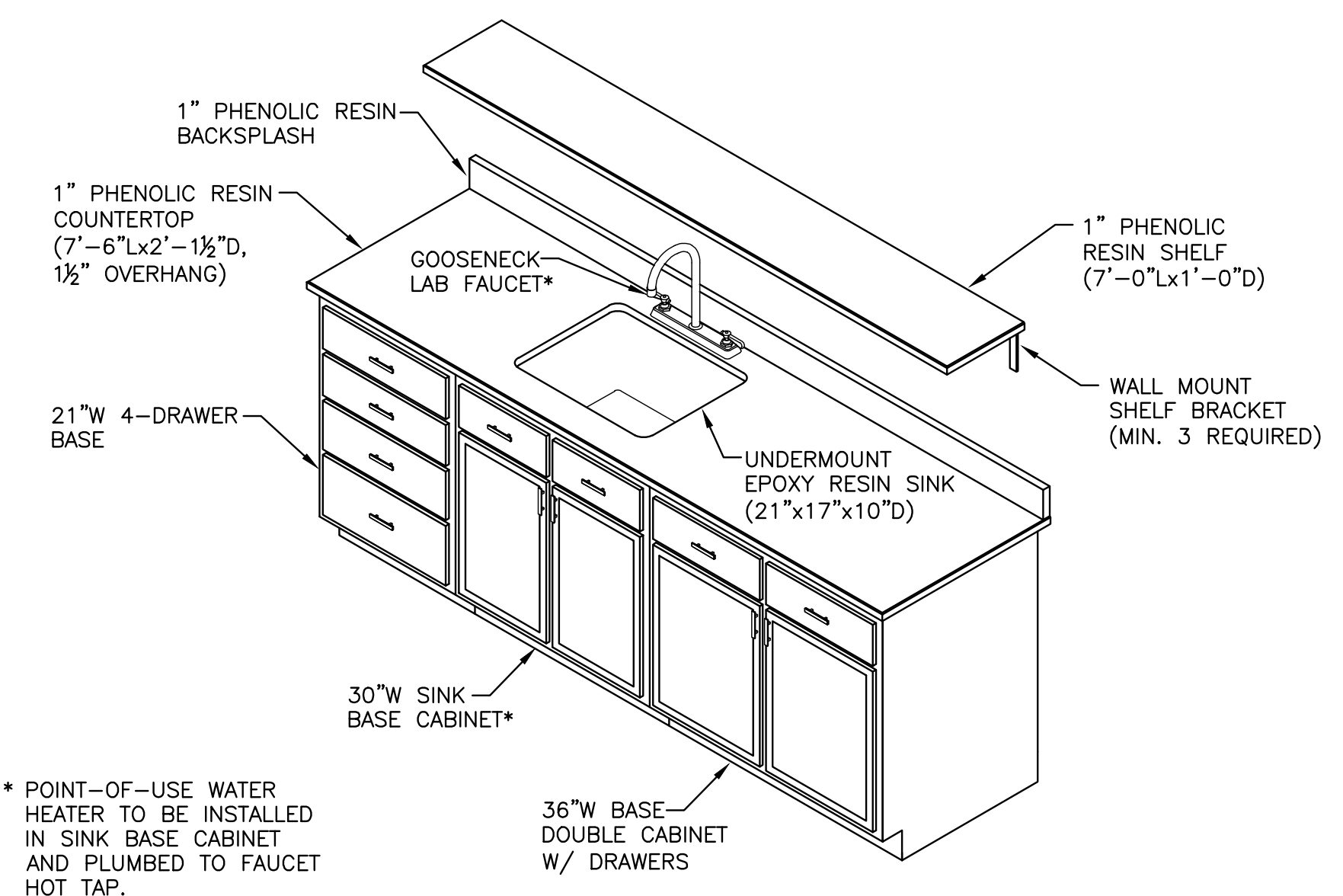
C24



PLAN
3/8" = 1'-0"

MARK	DOOR							NOTES	
	SIZE			MATERIAL	TYPE	HAND	FRAME MATERIAL		QTY
	WIDTH	HEIGHT	THICKNESS						
1	3'-0"	6'-8"	1 3/4"	METAL	EXTERIOR	LEFT REVERSE	METAL	1	EXTERIOR, 2'x3'-0" WINDOW 3'-6" A.F.F., W/ PANIC HARDWARE & LEVER OPERATOR
2	3'-0"	6'-8"	1 3/4"	METAL	EXTERIOR	RIGHT REVERSE	METAL	1	EXTERIOR, 2'x3'-0" WINDOW 3'-6" A.F.F., W/ PANIC HARDWARE & LEVER OPERATOR
3	3'-0"	6'-8"	1 3/8"	METAL	INTERIOR	RIGHT	METAL	1	BOTTOM 16"x16" LOUVER, PRIVACY KNOB OPERATOR
4	12'-0"	12'-0"	1 3/8"	METAL (INSULATED)	ROLL-UP	-	METAL	1	ELECTRIC OPERATOR

* ALL SWING DOOR CLOSURES SHALL HAVE HOLD OPEN STOPS. ALL DOORS SHALL INCLUDE WEATHER SEALS ON ALL EDGES, INCLUDING FLOOR SEAL.

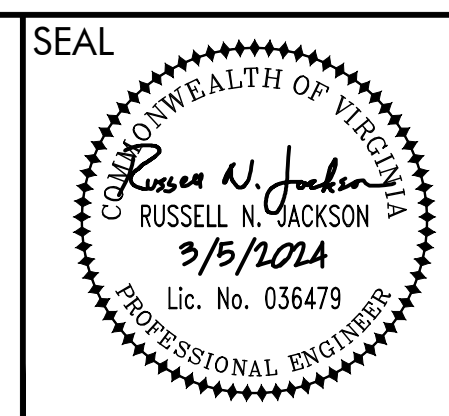


COUNTER & SINK DETAIL
N.T.S.

- NOTES:
1. SLOPE SLAB TO FLOOR DRAINS & SUMP AT MINIMUM 1/16" PER FOOT SLOPE.
 2. USE RESTRAINED JOINT FITTINGS ON ALL PRESSURE PIPE BENEATH SLAB.
 3. ALL PIPES 4" AND LARGER SHALL BE SUPPORTED AT MINIMUM 8' O.C. BY FLOOR STANDS UNLESS OTHERWISE NOTED.
 4. SUPPORT ALL PIPING 3" AND SMALLER AT MINIMUM 6' O.C. FROM WALL, FLOOR, OR CEILING.
 5. INTERIOR WALLS AND CEILINGS SHALL BE PAINTED PRIOR TO HANGING ANY PIPE OR CONDUIT.

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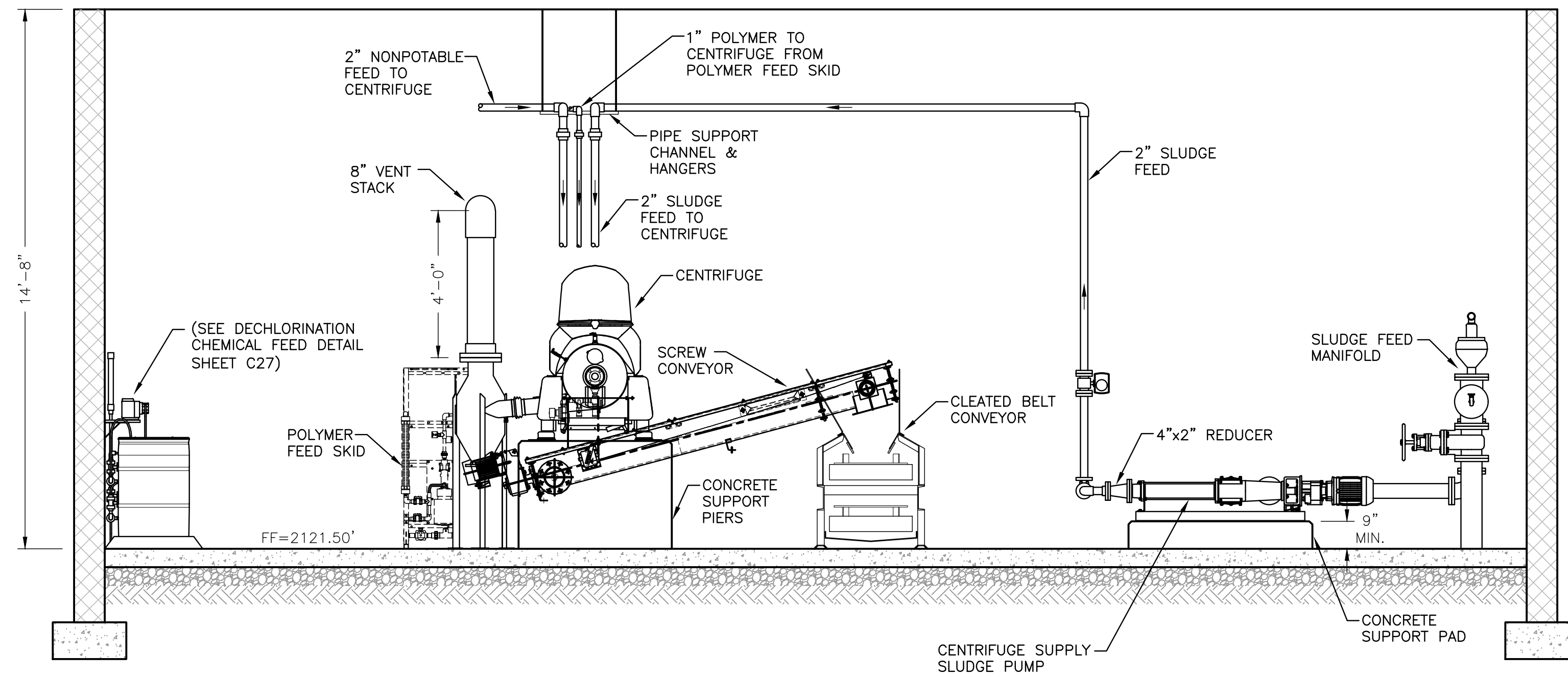
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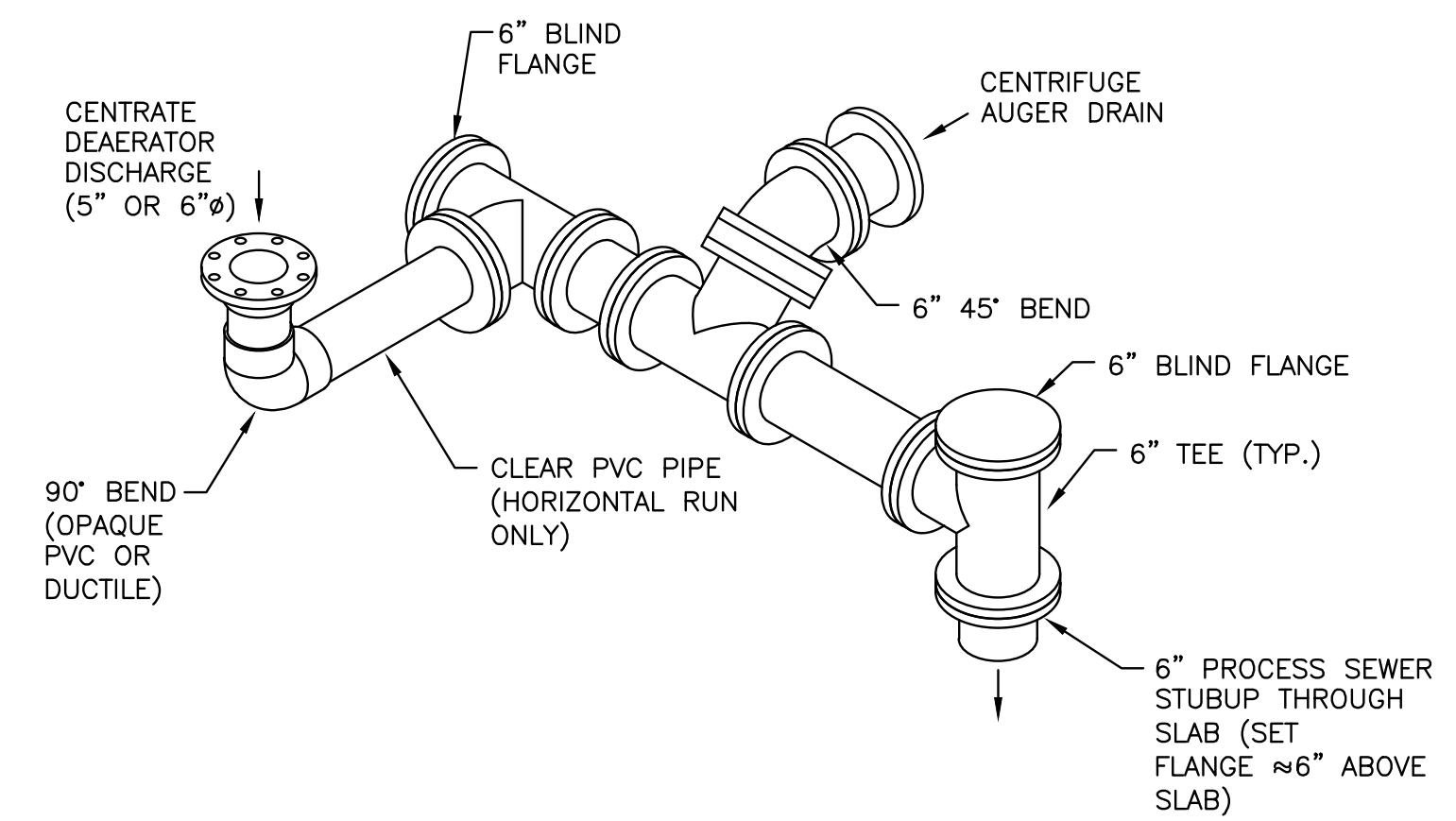
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SLUDGE DEWATERING
BUILDING PLAN

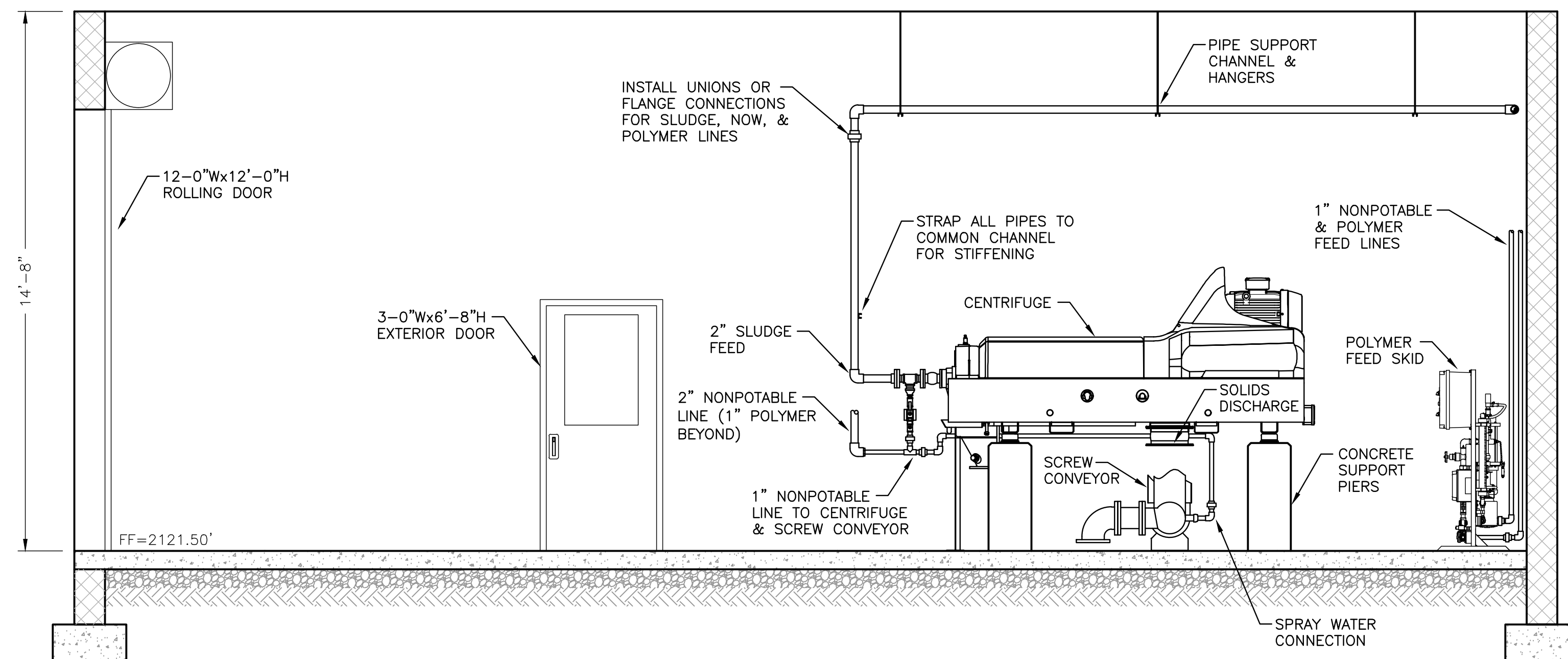
C25



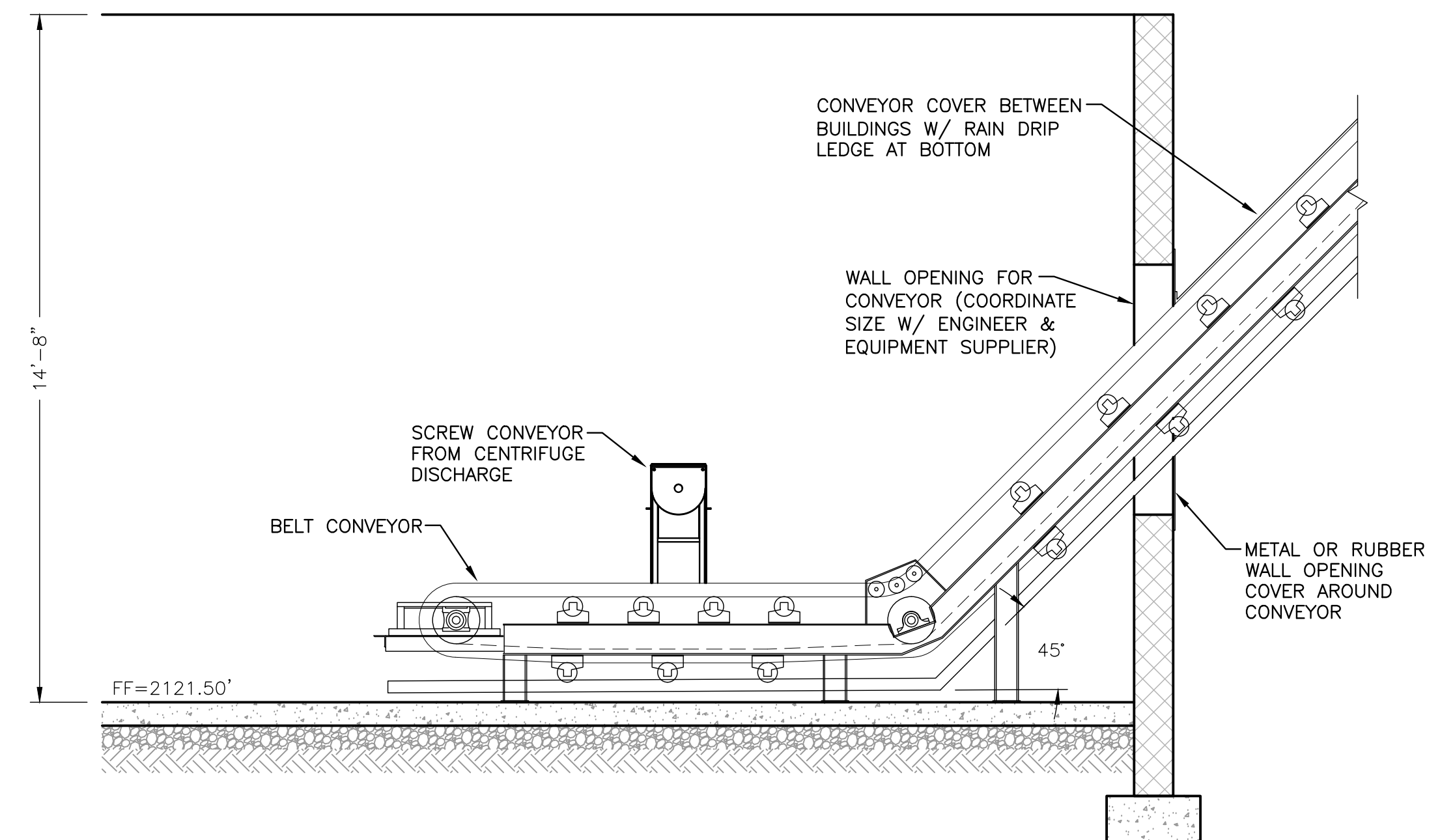
SECTION A
3/8"=1'-0" C25C26



CENTRIFUGE DRAIN PIPING DETAIL
N.T.S.



SECTION B
3/8"=1'-0" C25C26



SECTION C
3/8"=1'-0" C25C26

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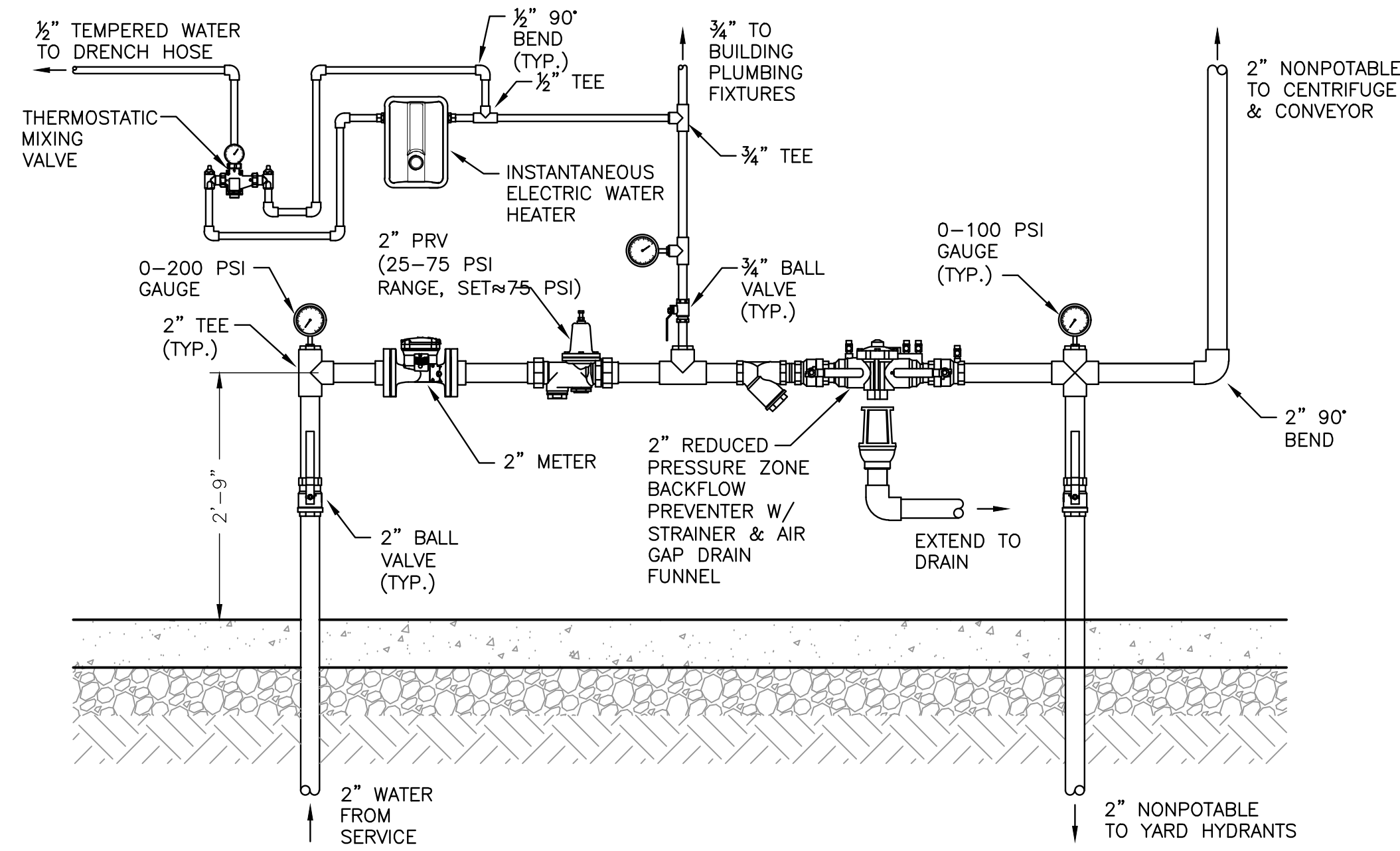
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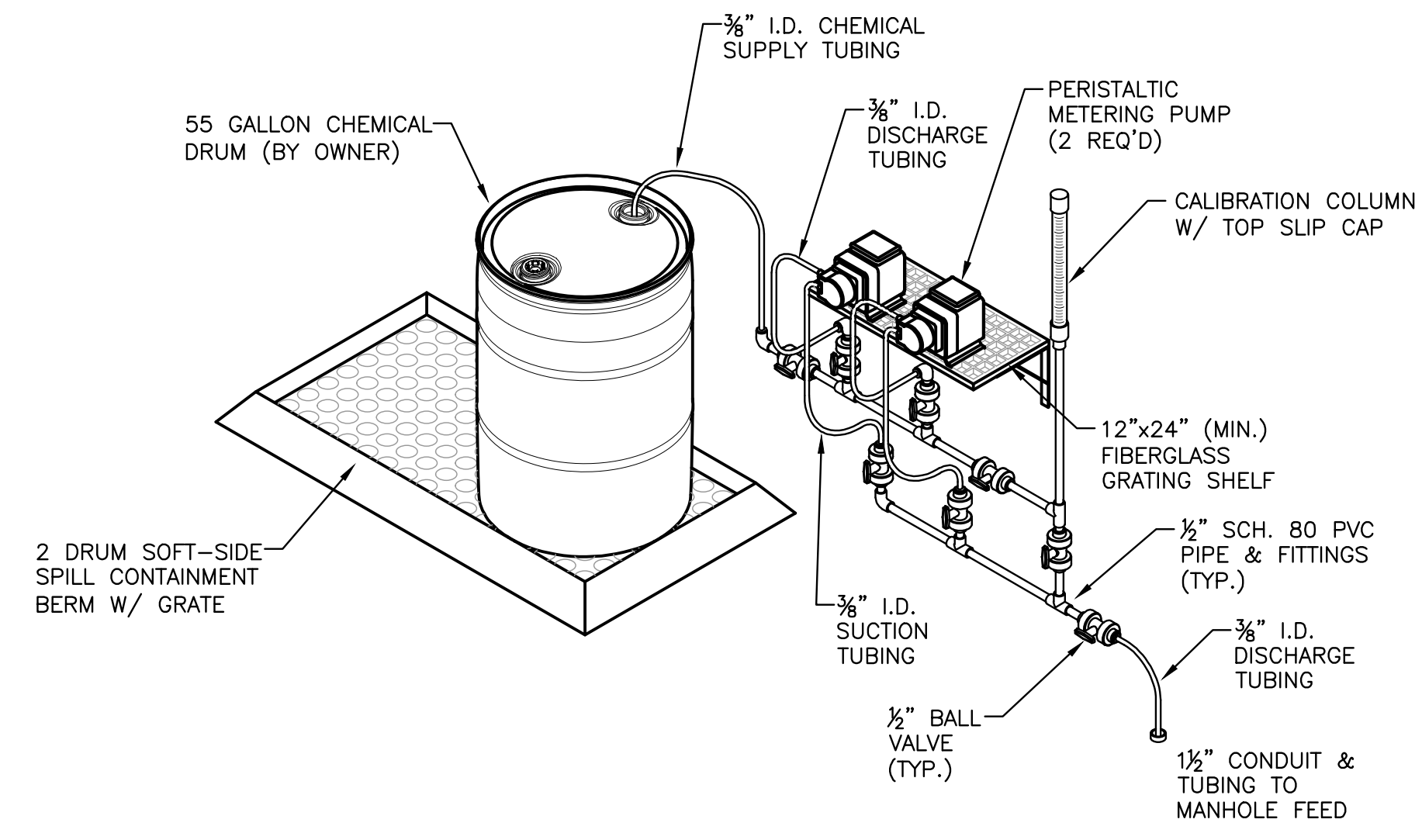
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SHEET DESCRIPTION:
SLUDGE DEWATERING
BUILDING SECTIONS

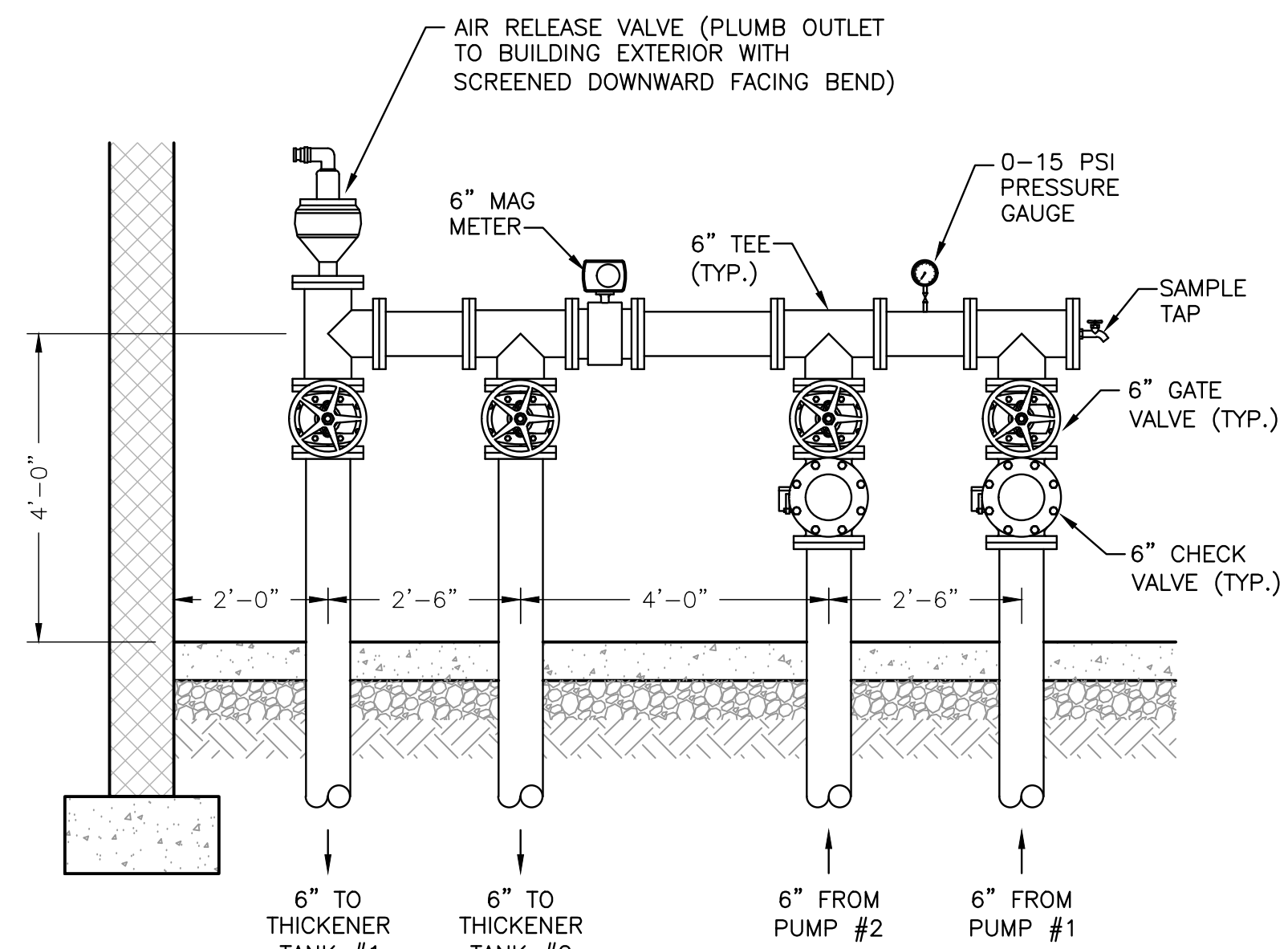
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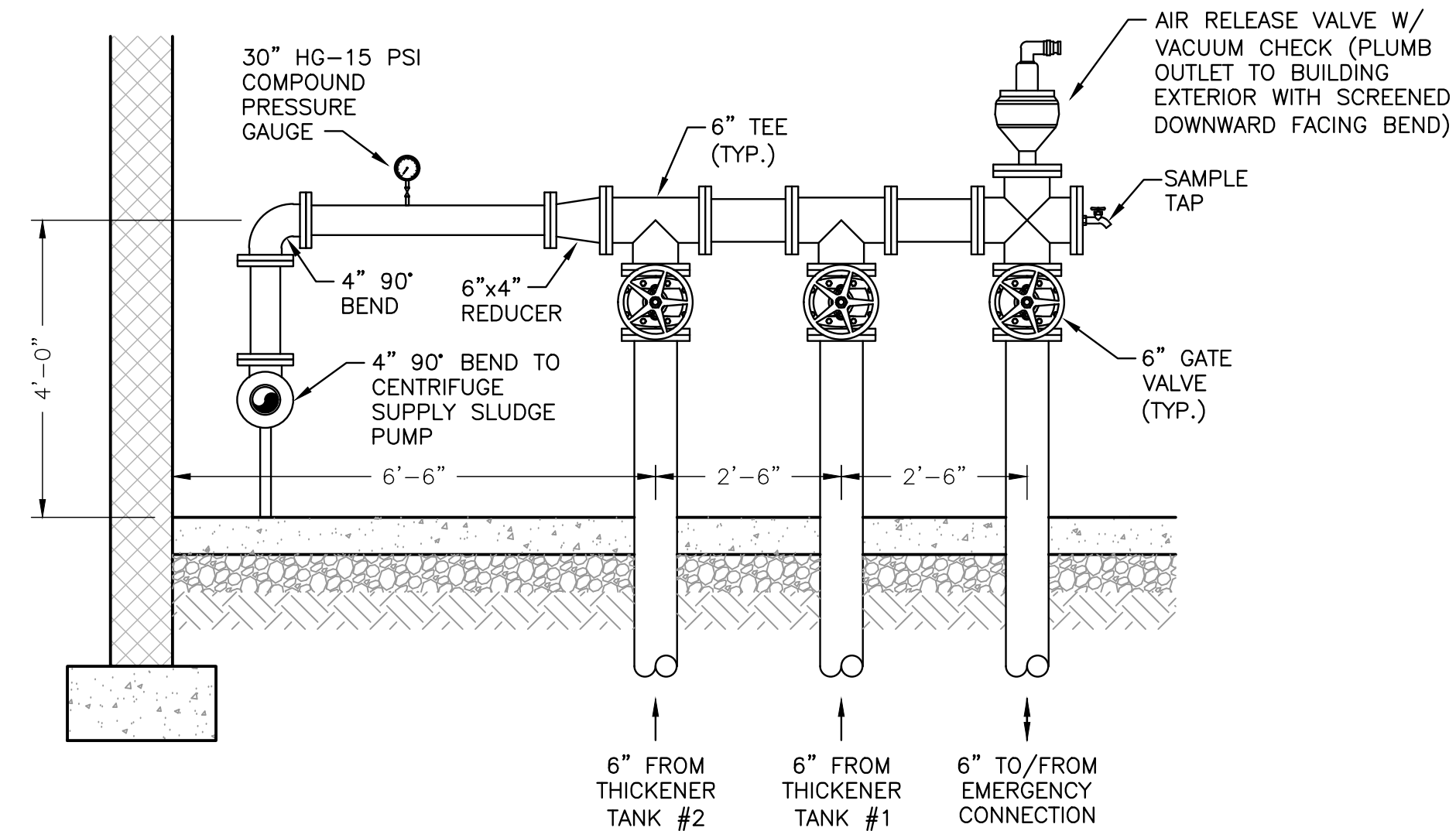
WATER SERVICE PLUMBING DETAIL
3/4"=1'-0"



DECHLOR CHEMICAL FEED DETAIL
N.T.S.



SECTION D
1/2"=1'-0" C25C27

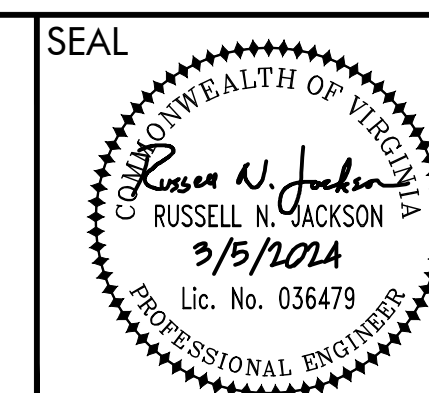


SECTION E
1/2"=1'-0" C25C27

NOTE:
INSTALL SELF ADHESIVE VINYL PIPE LABELS AND FLOW DIRECTION ARROWS ON SLUDGE PUMP (SECTION D) AND SLUDGE FEED (SECTION E) MANIFOLD PIPES. SLUDGE PUMP MANIFOLD LABELS SHALL INDICATE "PUMP #1", "PUMP #2", "THICKENER #1", AND "THICKENER #2". SLUDGE FEED MANIFOLD SHALL INDICATE "THICKENER #1", "THICKENER #2", "EMERGENCY CONNECTION". LABELS SHALL BE WHITE TEXT AND ARROWS ON BROWN BACKGROUND. TEXT SHALL BE 1/4" HIGH. ARROW BAND LABELS SHALL BE SEPARATE FROM TEXT LABELS AND SHALL BE INSTALLED TO WRAP FULLY AROUND PIPE AT BOTH ENDS OF TEXT LABELS.

Peed & Bortz, L.L.C.
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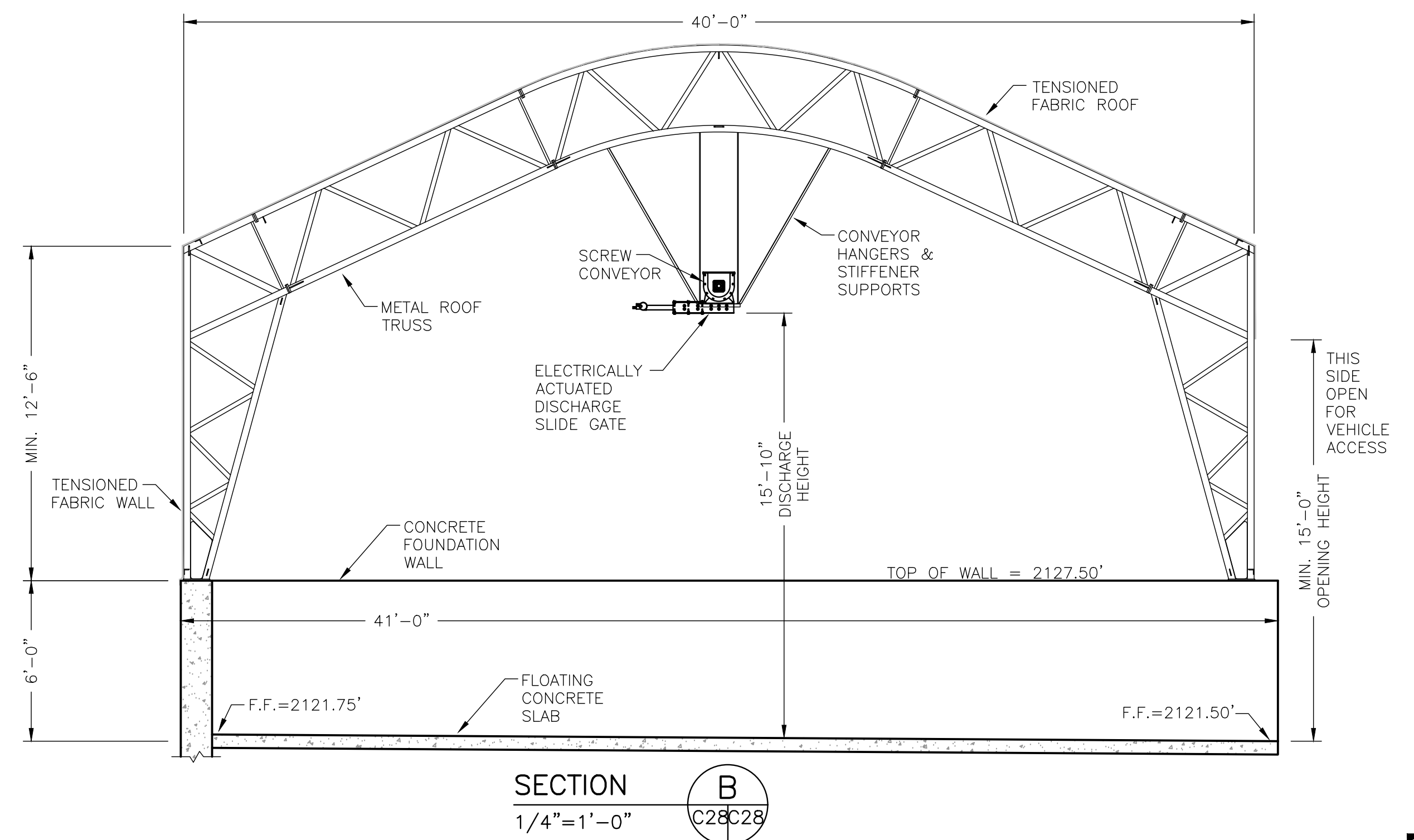
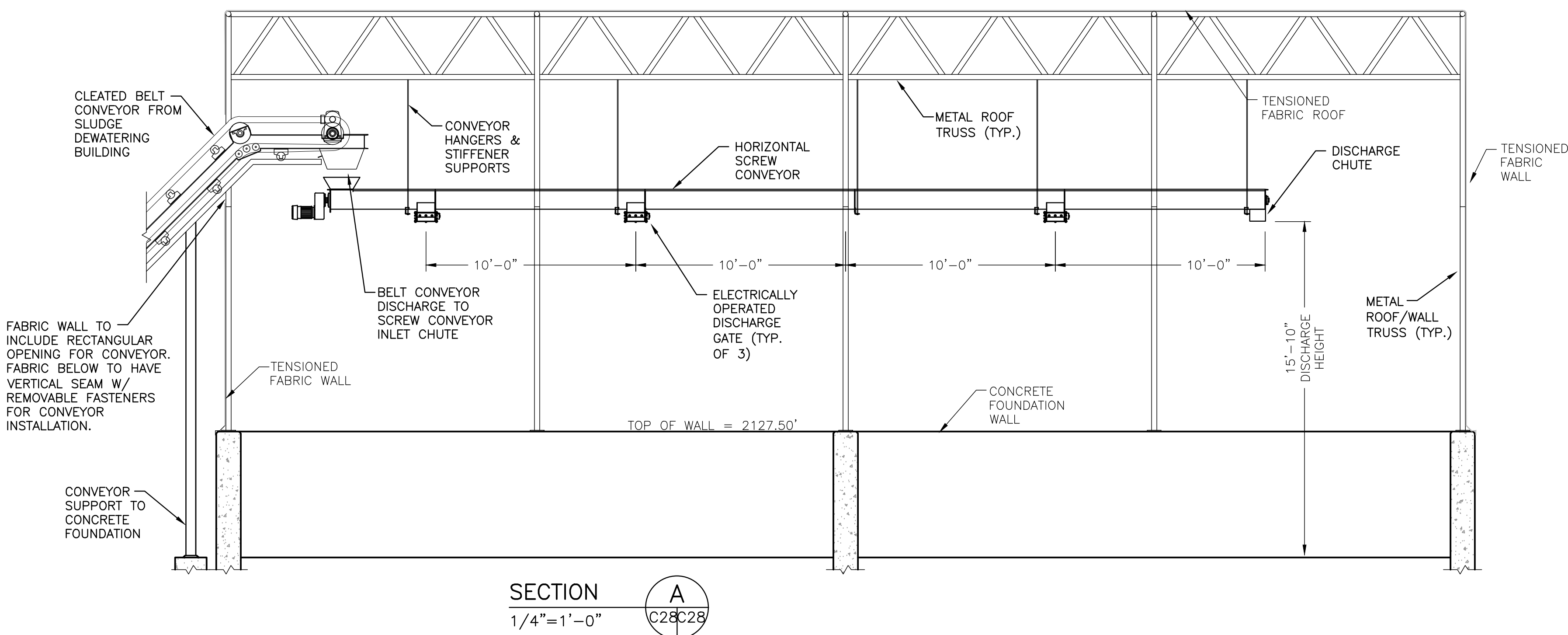
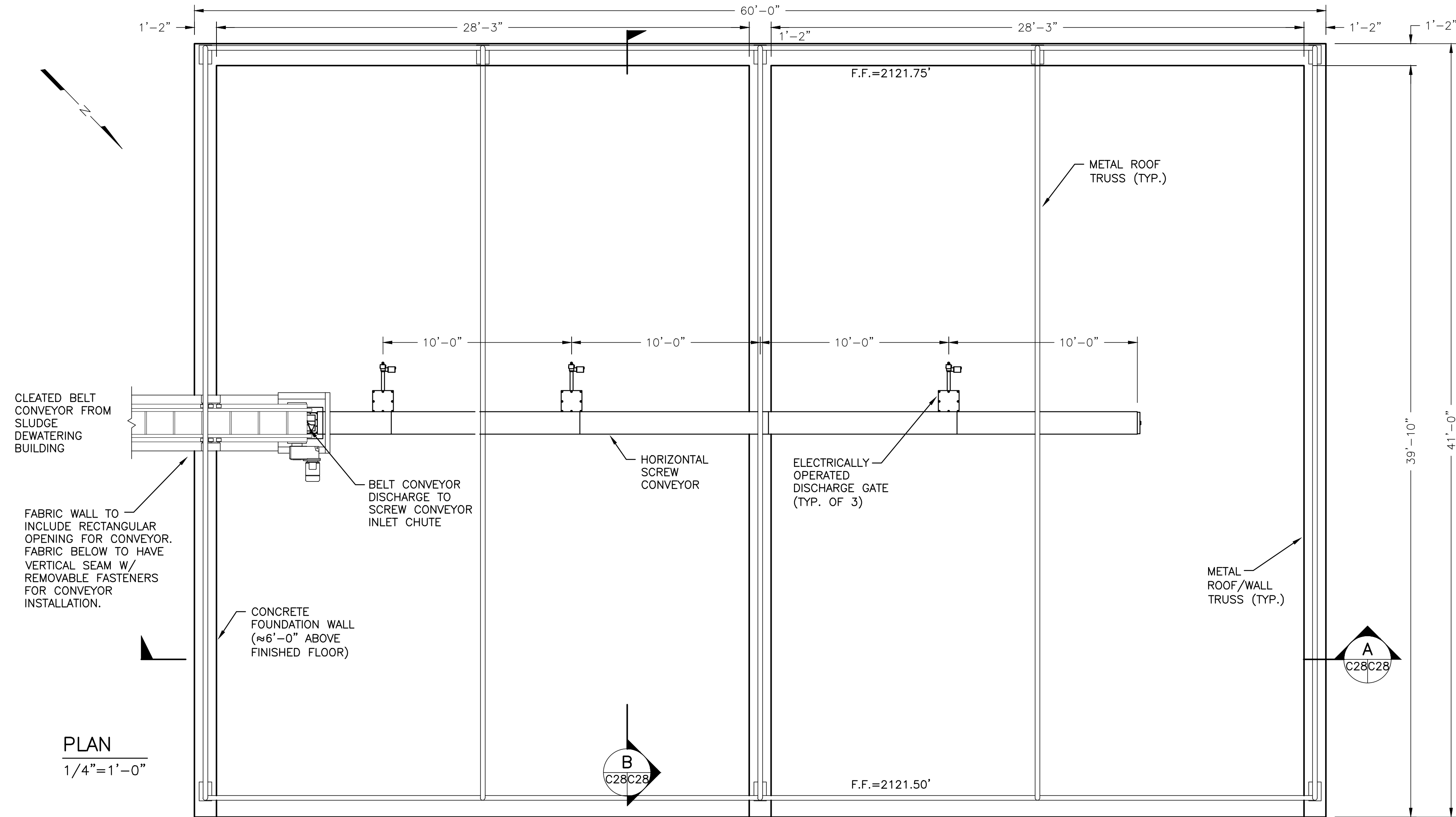
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



DRAWN BY: RNJ
REVIEW BY: RNJ
DATE: 5 MARCH 2024
REVISION:

SHEET DESCRIPTION:
SLUDGE DEWATERING
BUILDING SECTIONS &
DETAILS

C27



Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3214 FAX: (540) 394 - 3215

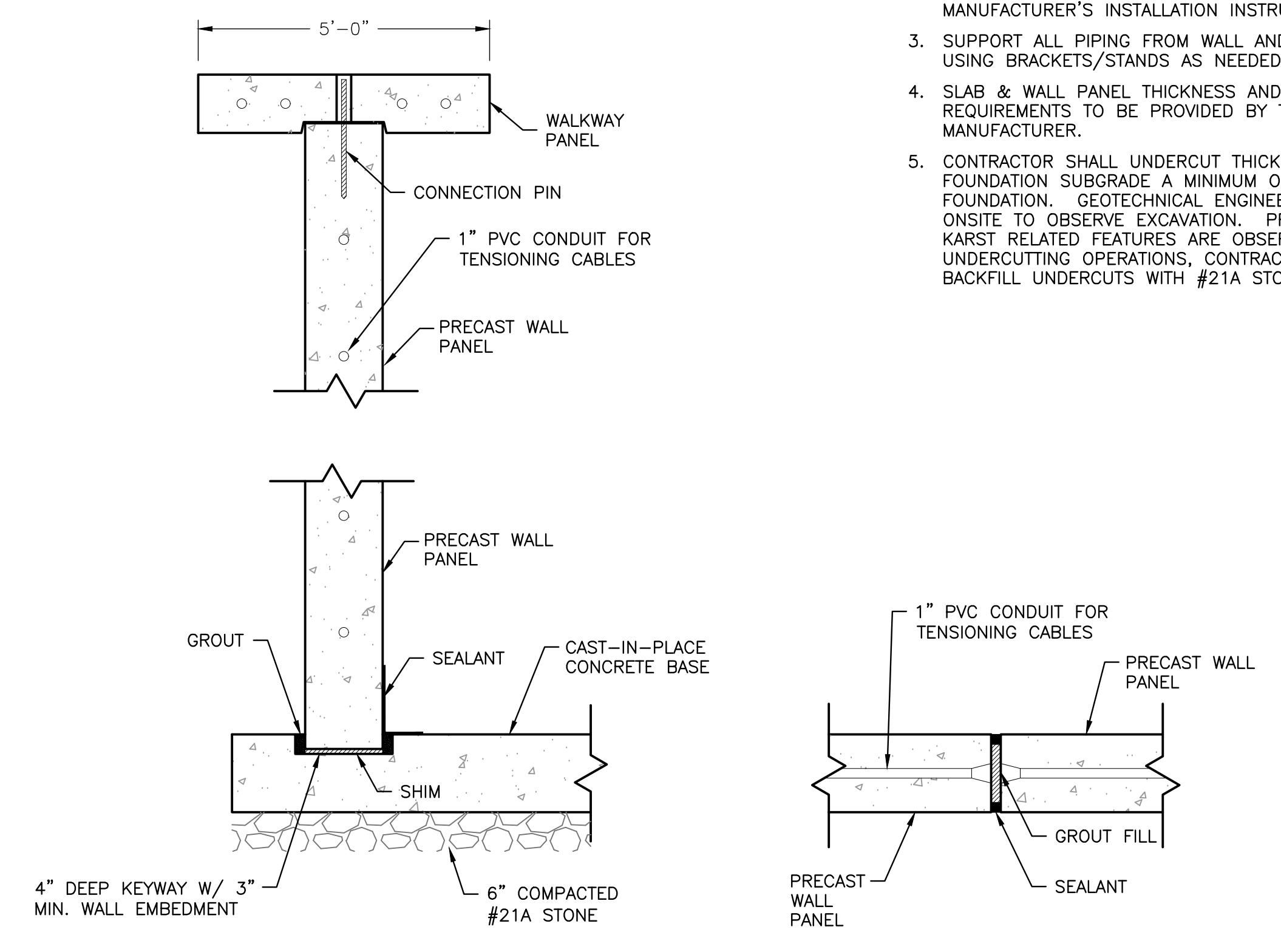
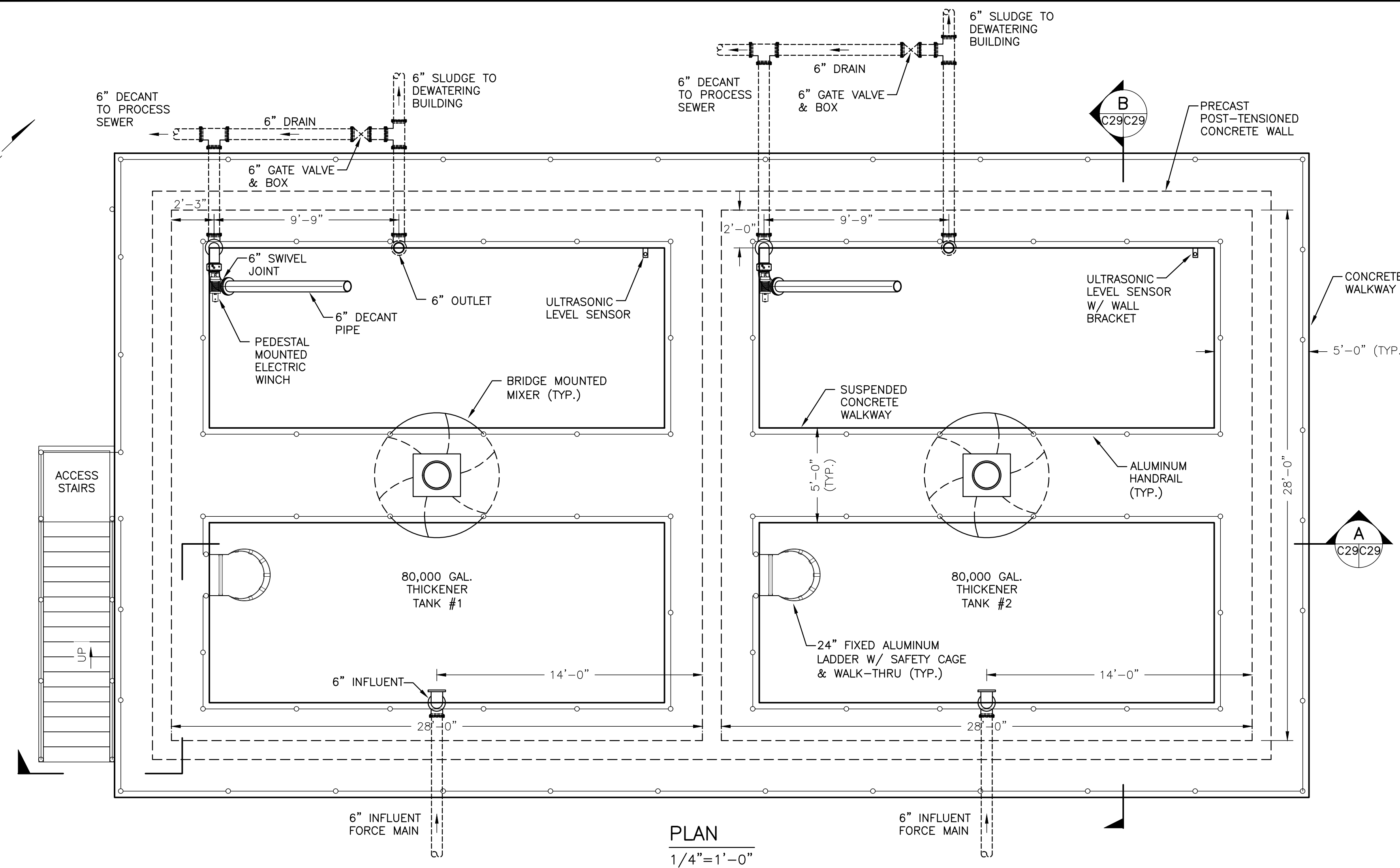
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA

SEAL
COMMONWEALTH OF VIRGINIA
Russell N. Jackson
3/5/2024
Lic. No. 036479
PROFESSIONAL ENGINEER

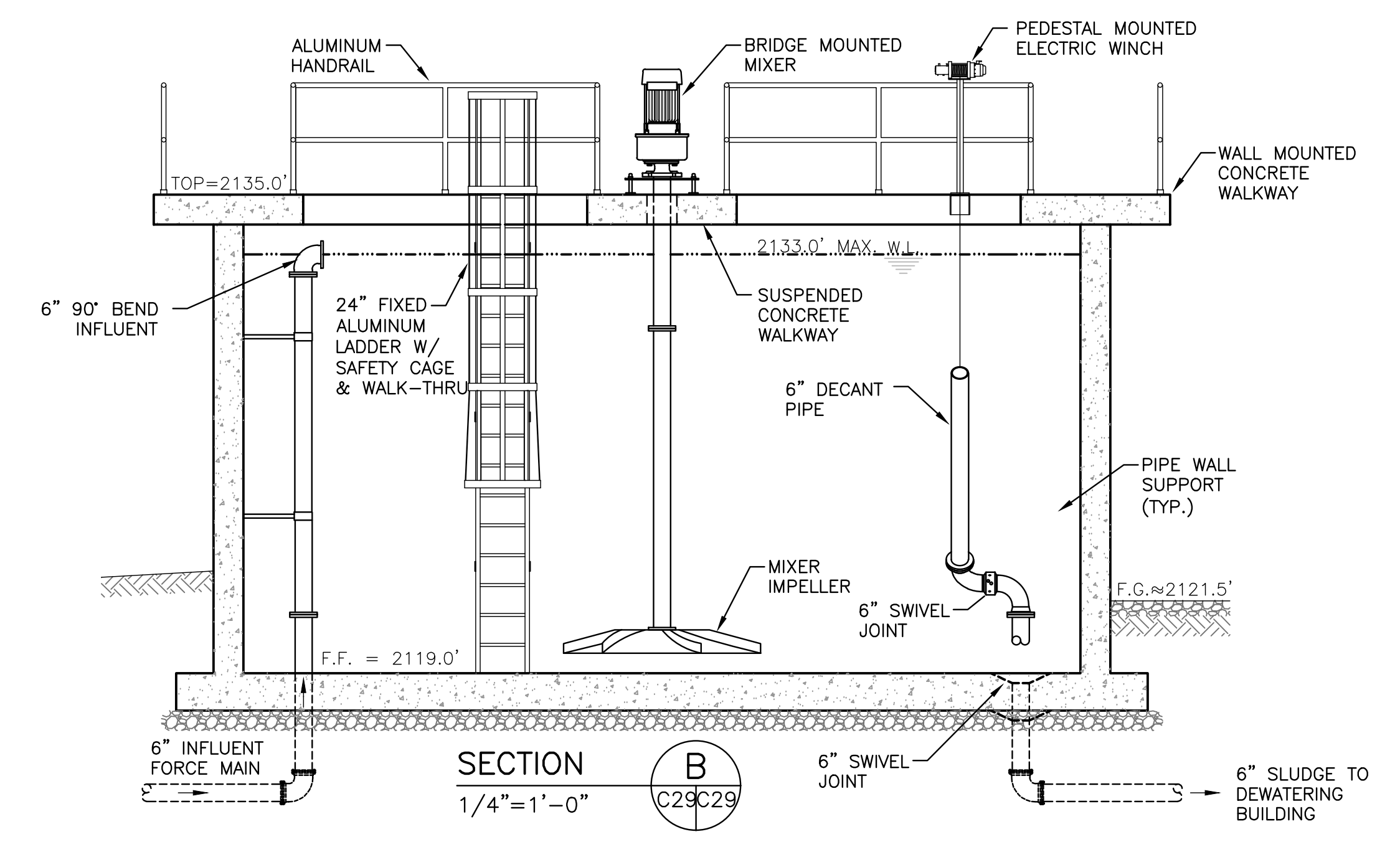
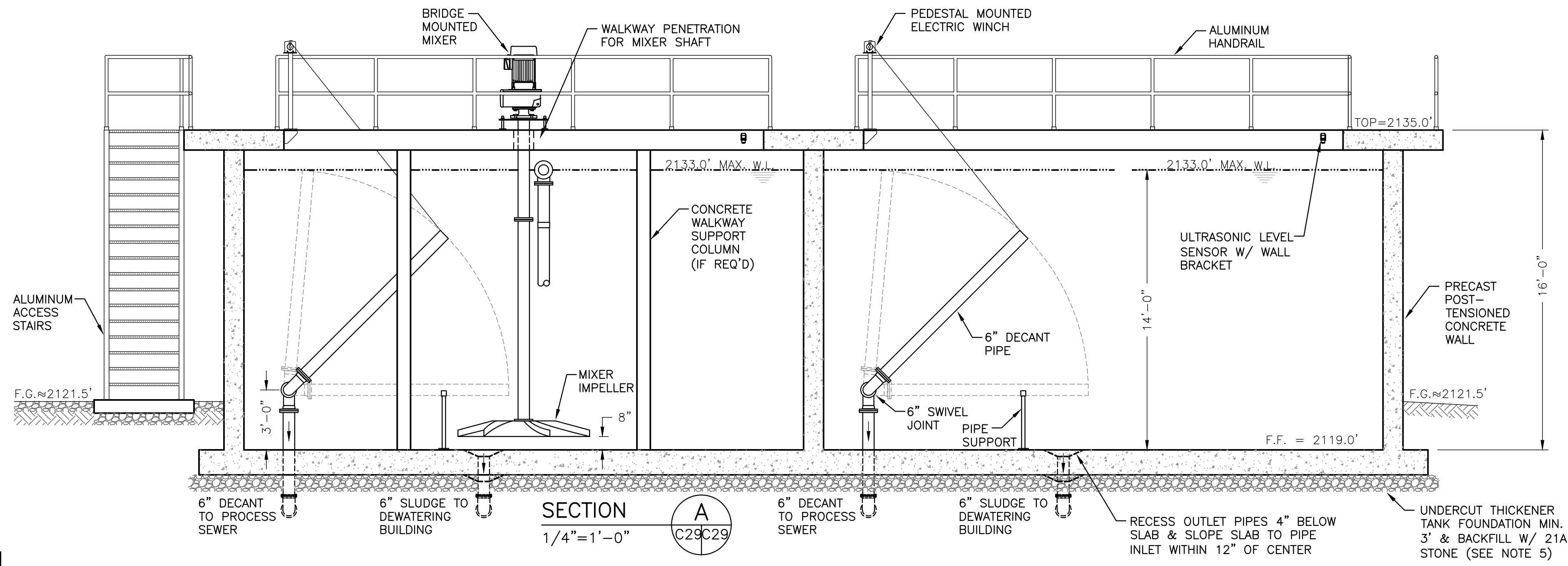
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5 MARCH 2024
REVISION:

SHEET DESCRIPTION:
DRY SOLIDS SHELTER PLAN
& SECTIONS

C28



- NOTES:**
1. CONFIRM FINAL EQUIPMENT DIMENSIONS WITH MANUFACTURER PRIOR TO FINAL LAYOUT AND ORDERING MATERIALS.
 2. EQUIPMENT MANUFACTURERS SHALL PROVIDE PROJECT-SPECIFIC ANCHORING INSTRUCTIONS AND DETAILS. CONTRACTOR SHALL FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS.
 3. SUPPORT ALL PIPING FROM WALL AND/OR FLOOR USING BRACKETS/STANDS AS NEEDED.
 4. SLAB & WALL PANEL THICKNESS AND FOUNDATION REQUIREMENTS TO BE PROVIDED BY TANK MANUFACTURER.
 5. CONTRACTOR SHALL UNDERCUT THICKENER TANK FOUNDATION SUBGRADE A MINIMUM OF 3' BENEATH FOUNDATION. GEOTECHNICAL ENGINEER SHALL BE ONSITE TO OBSERVE EXCAVATION. PROVIDED NO KARST RELATED FEATURES ARE OBSERVED DURING UNDERCUTTING OPERATIONS, CONTRACTOR SHALL BACKFILL UNDERCUTS WITH #21A STONE.



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CIVIL & ENVIRONMENTAL ENGINEERS
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CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3214 FAX: (540) 394 - 3215

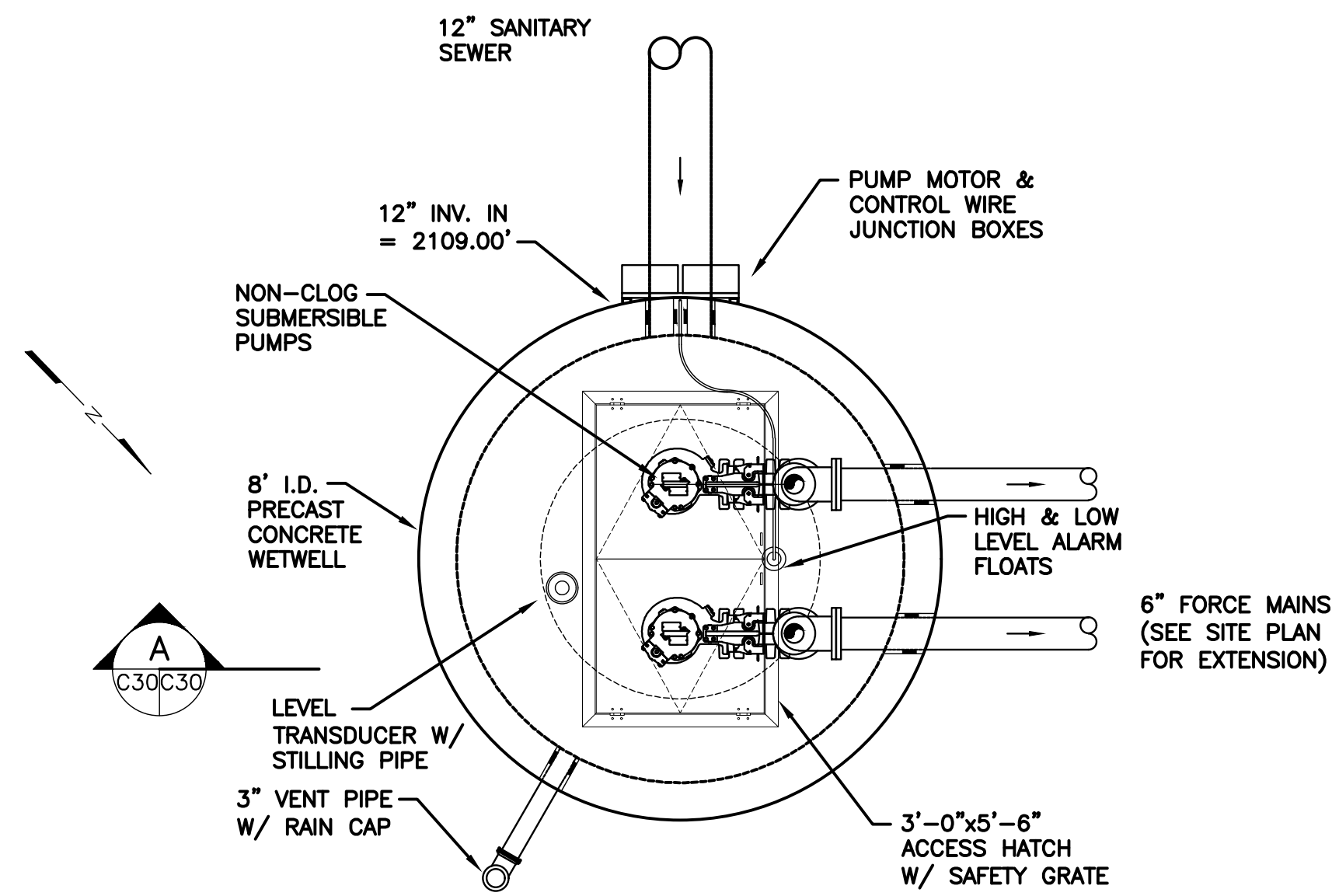
NEW RIVER REGIONAL WATER AUTHORITY
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AUSTINVILLE VIRGINIA

SEAL
COMMONWEALTH OF VIRGINIA
Russell N. Jackson
3/5/2024
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PROFESSIONAL ENGINEER

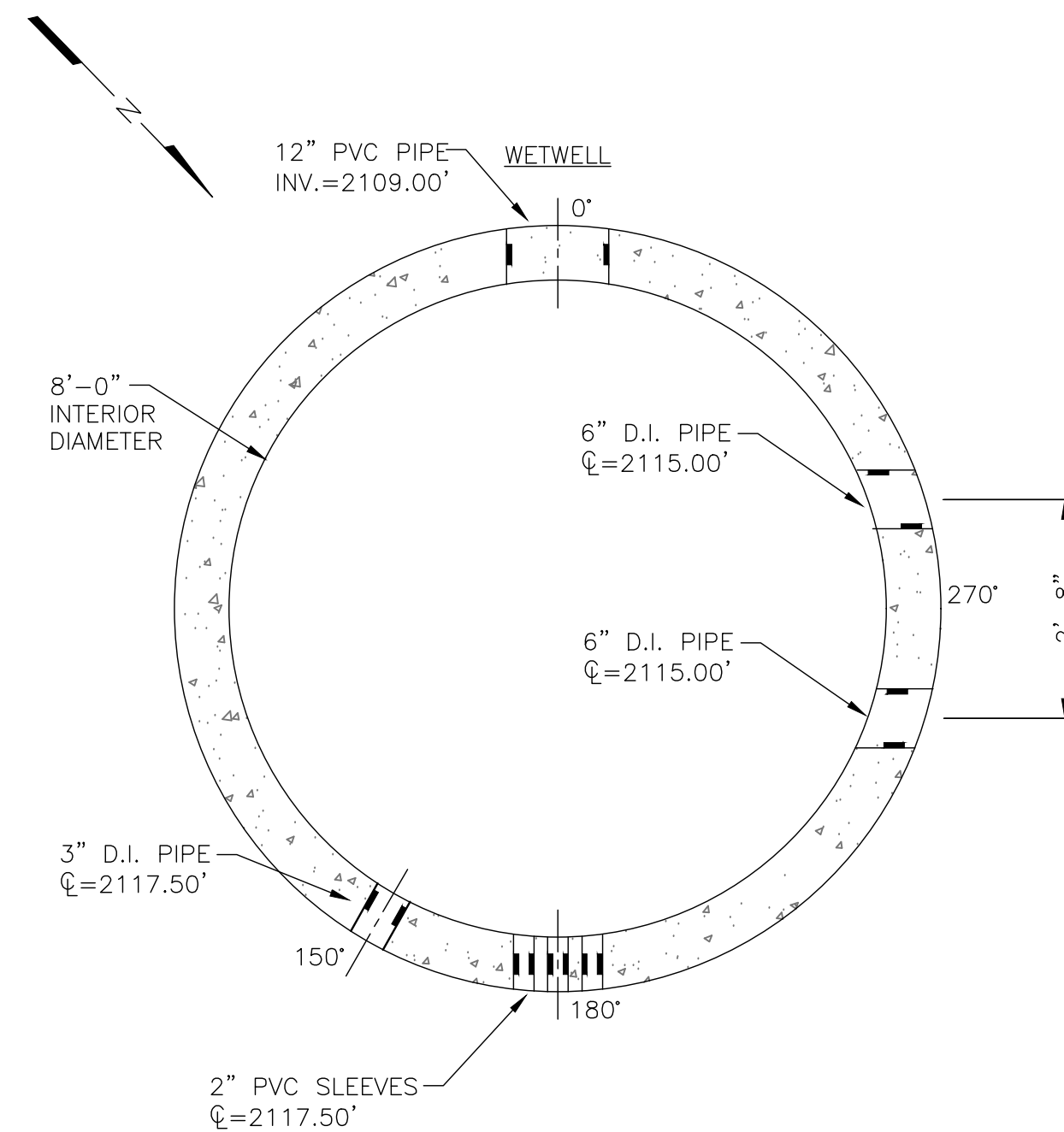
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SHEET DESCRIPTION:
SLUDGE THICKENER TANKS

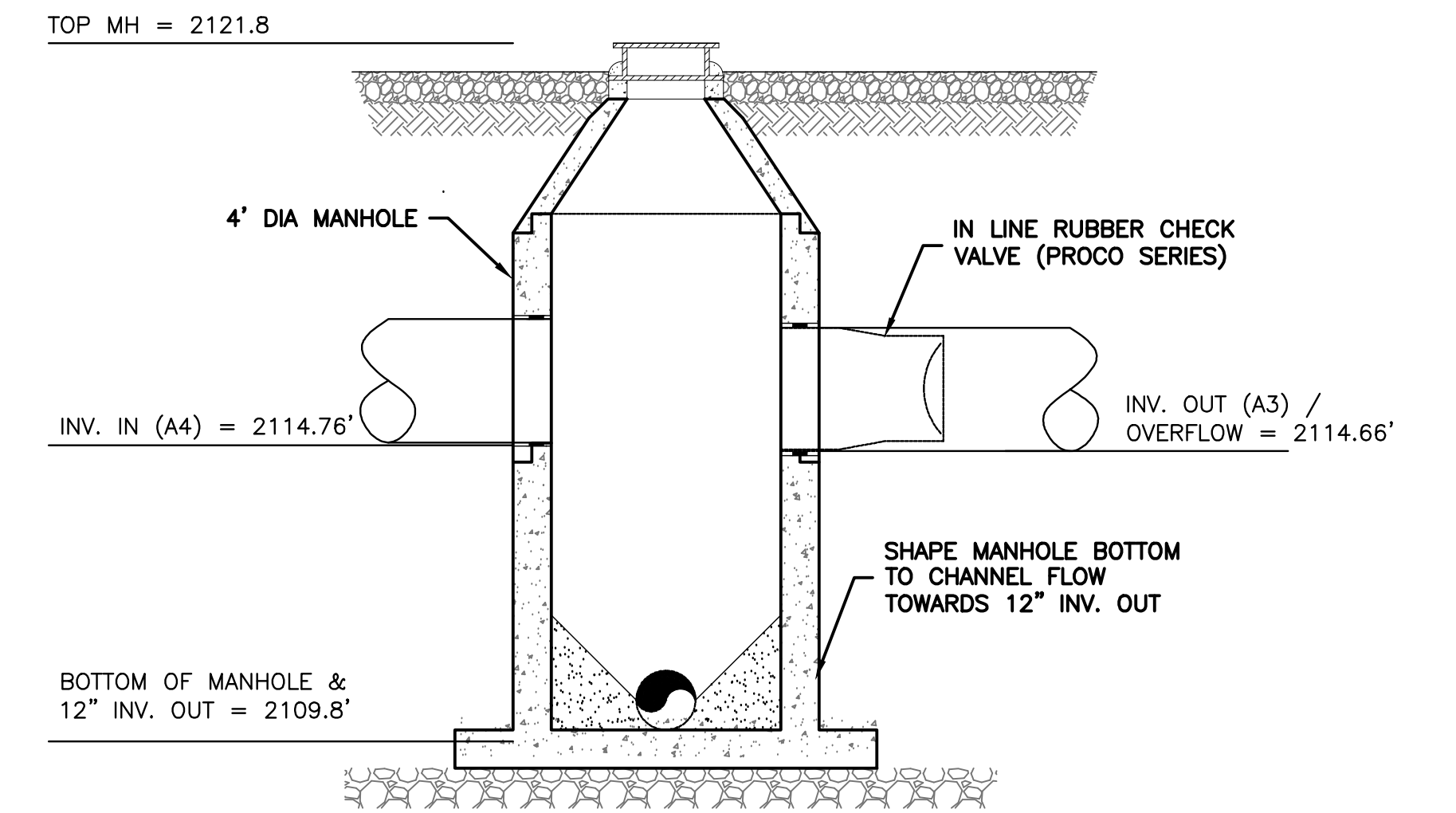
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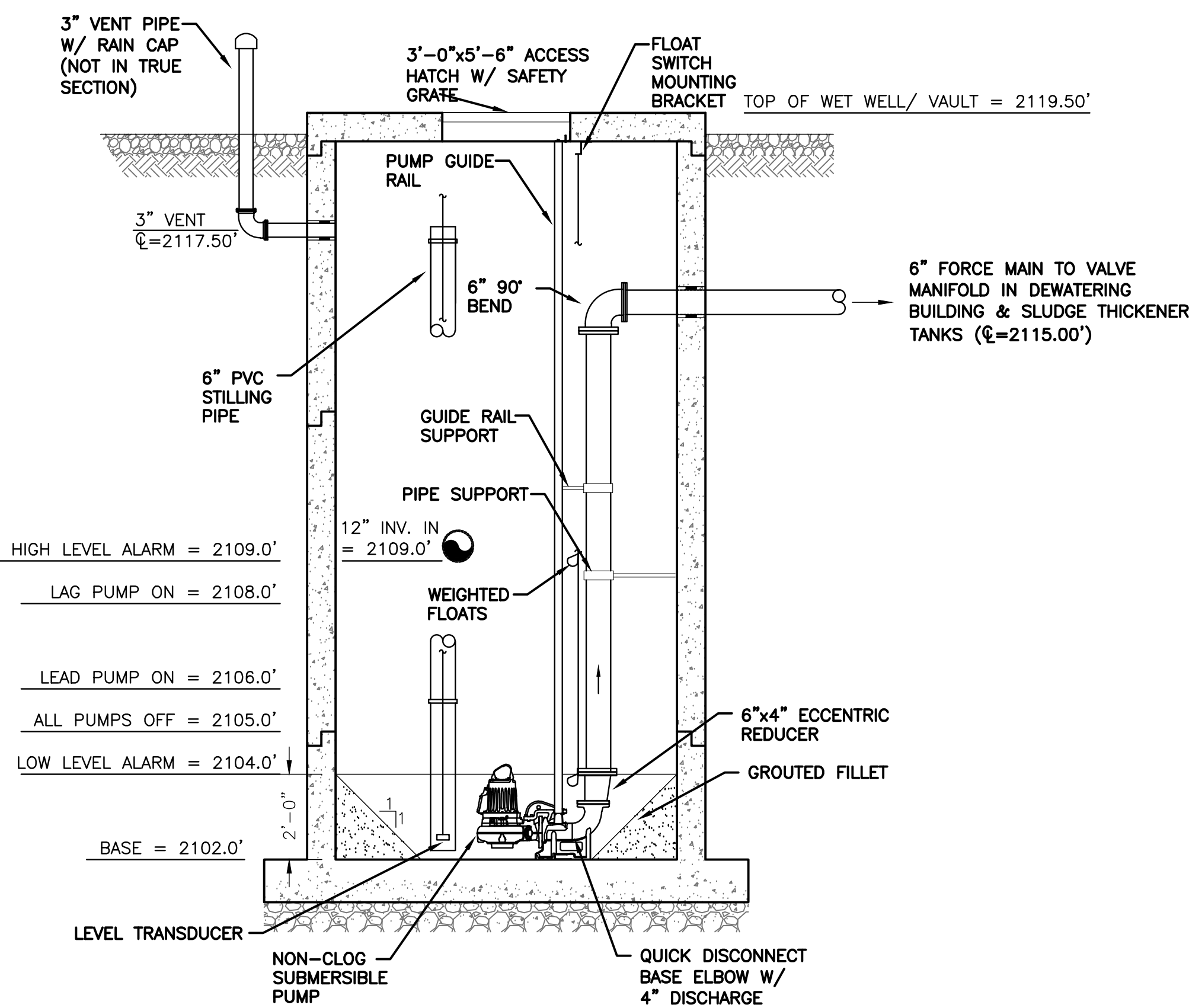
PUMP STATION PLAN
3/8"=1'-0"



PRECAST STRUCTURE PIPE PENETRATION PLAN
1/2"=1'-0"



INFLUENT MANHOLE DETAIL
3/8"=1'-0"



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

GENERAL STATION NOTES:

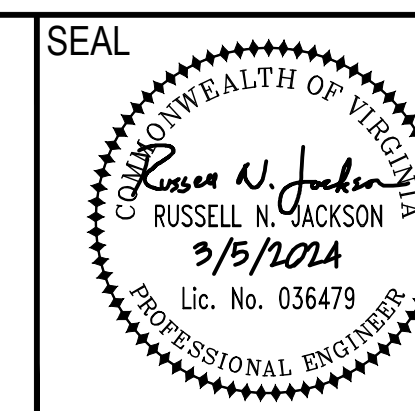
1. ALL HARDWARE WITHIN WETWELL & VALVE VAULT SHALL BE STAINLESS STEEL.
2. COAT ALL EXPOSED WETWELL AND VAULT PIPING PER SPECIFICATIONS.
3. PUMP GUIDE RAIL SUPPORT SHALL BE LOCATED AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
4. ALL HATCHES SHALL HAVE SPRING ASSIST OPEN AND LOCKING MECHANISM.
5. ALL PIPE PENETRATIONS THROUGH CONCRETE STRUCTURES SHALL BE MADE WITH WATERTIGHT SEAL OR FLEXIBLE NEOPRENE BOOTS.
6. LEVEL FLOATS SHALL BE PROVIDED WITH WEIGHTS AND SUSPENDED FROM A 4-HOLE MOUNTING BRACKET WITH STRAIN RELIEF BUSHINGS.
7. CONTRACTOR SHALL VERIFY FINAL DIMENSIONS AND INSTALLATION REQUIREMENTS OF PUMPS WITH EQUIPMENT SUPPLIERS PRIOR TO ORDERING WETWELL.

PUMP OPERATING SEQUENCE:

1. A RISE IN THE WATER LEVEL ABOVE THE "LEAD PUMP ON" FLOAT STARTS LEAD PUMP #1 OR PUMP #2, WITH LEAD PUMP ALTERNATING EACH CYCLE.
2. A CONTINUED RISE IN THE WET WELL WATER LEVEL ABOVE THE "LAG PUMP ON" FLOAT STARTS THE SECOND PUMP.
3. A CONTINUED RISE IN THE WET WELL LEVEL ABOVE THE "HIGH LEVEL ALARM" FLOAT TURNS ON THE WARNING LIGHT AND SIGNALS THE SCADA SYSTEM.
4. A DECLINE IN THE WET WELL WATER LEVEL BELOW THE "HIGH LEVEL ALARM" ELEVATION TURNS OFF THE ACTIVE ALARM LIGHT AND SCADA SIGNAL.
5. PUMPS CONTINUE TO OPERATE UNTIL THE WATER LEVEL DROPS BELOW THE "ALL PUMPS OFF" FLOAT, WHICH STOPS BOTH PUMPS.

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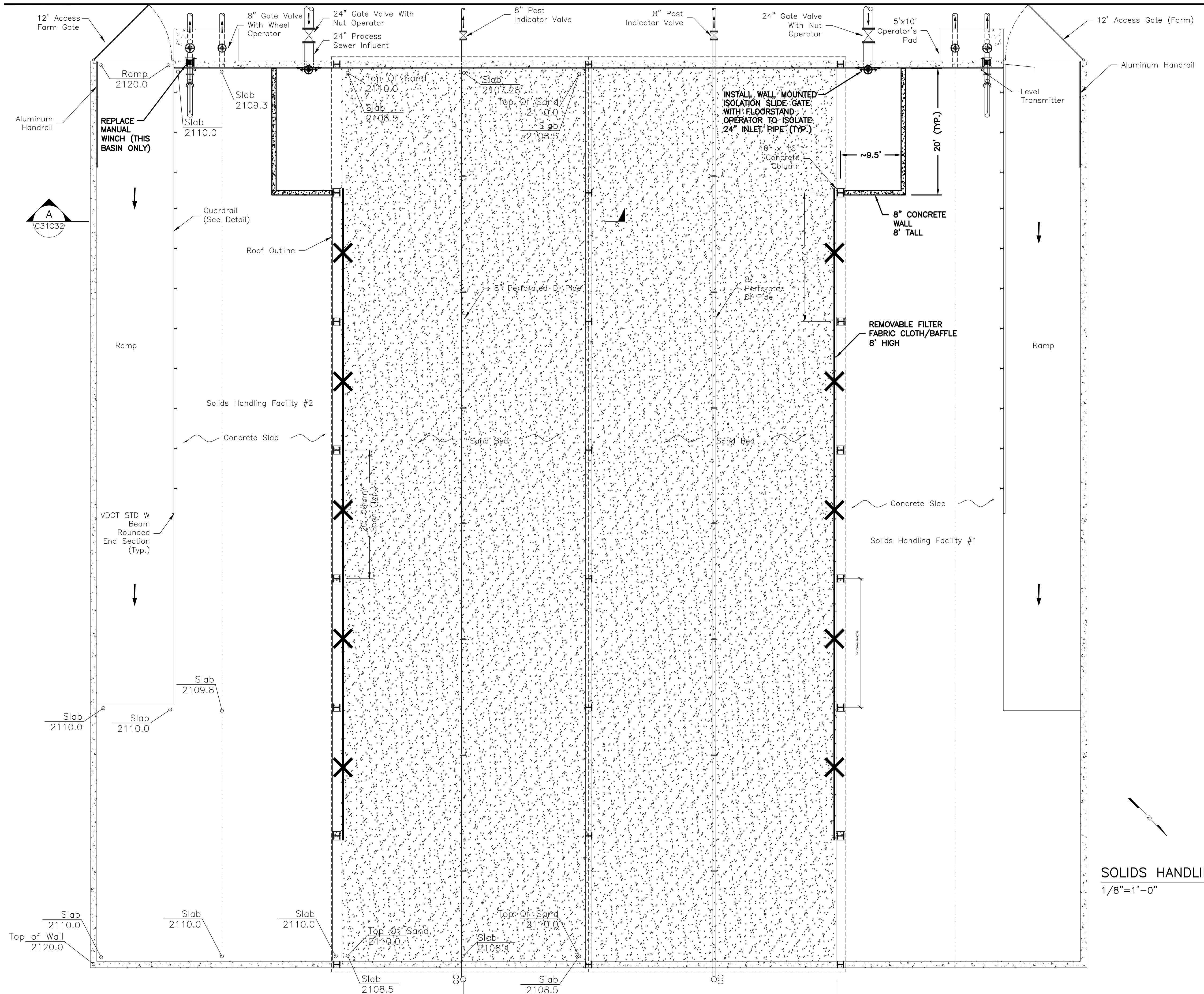
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



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SHEET DESCRIPTION:
SLUDGE PUMPING DETAILS

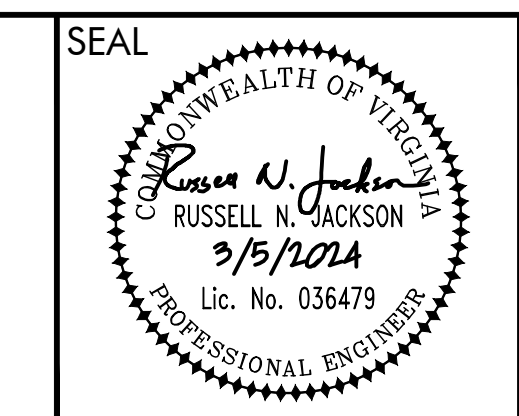
C30



SOLIDS HANDLING FACILITY PLAN
1/8"=1'-0"

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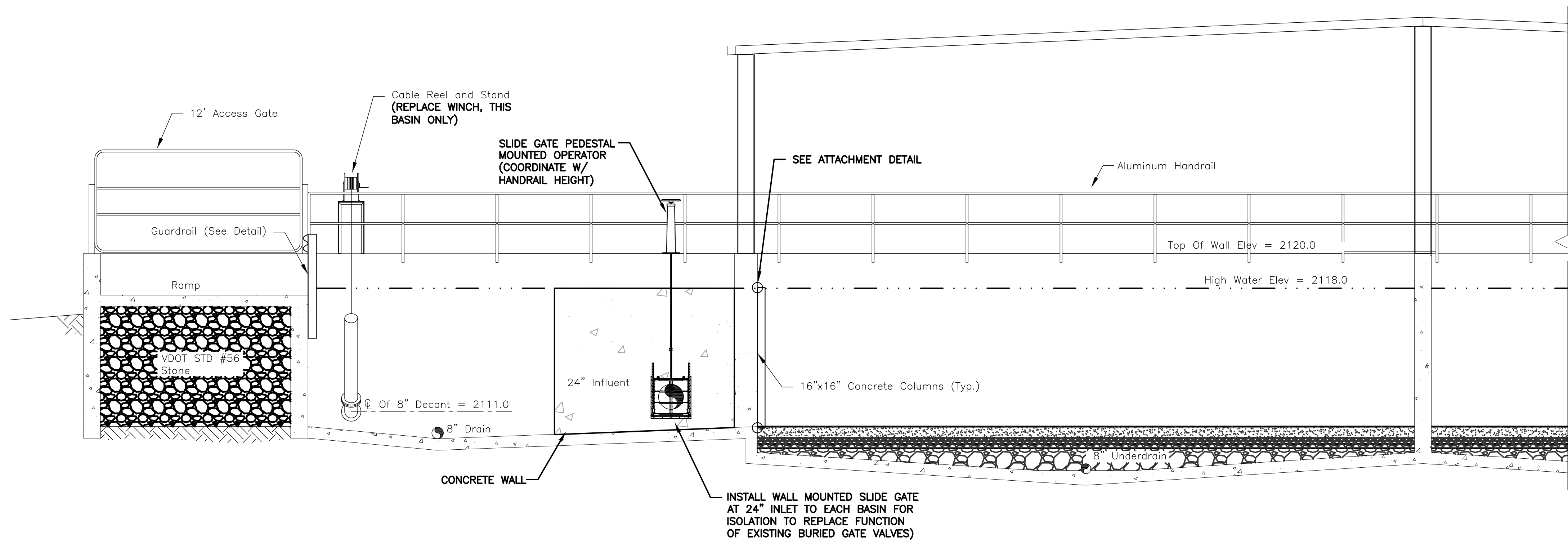
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



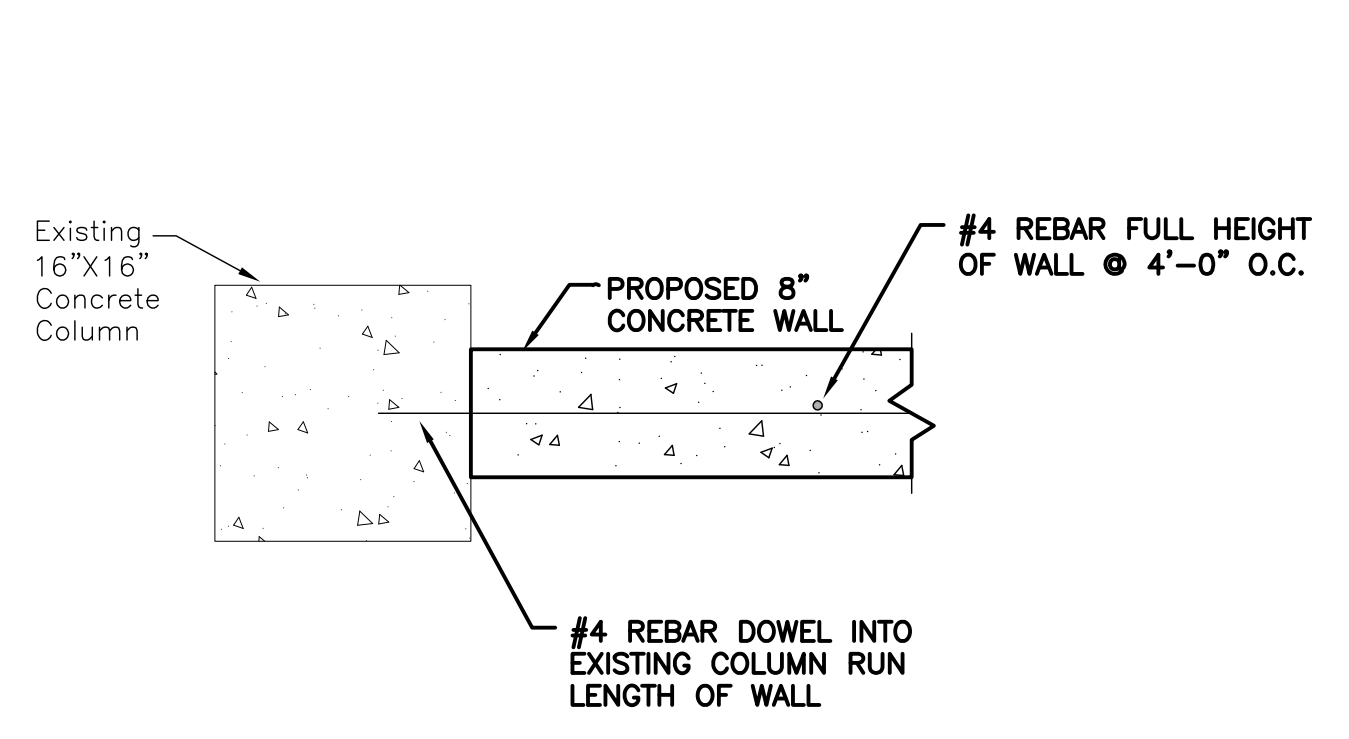
DRAWN BY: RNJ
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REVISION:

SHEET DESCRIPTION:
SOLIDS HOLDING BASIN
PLAN

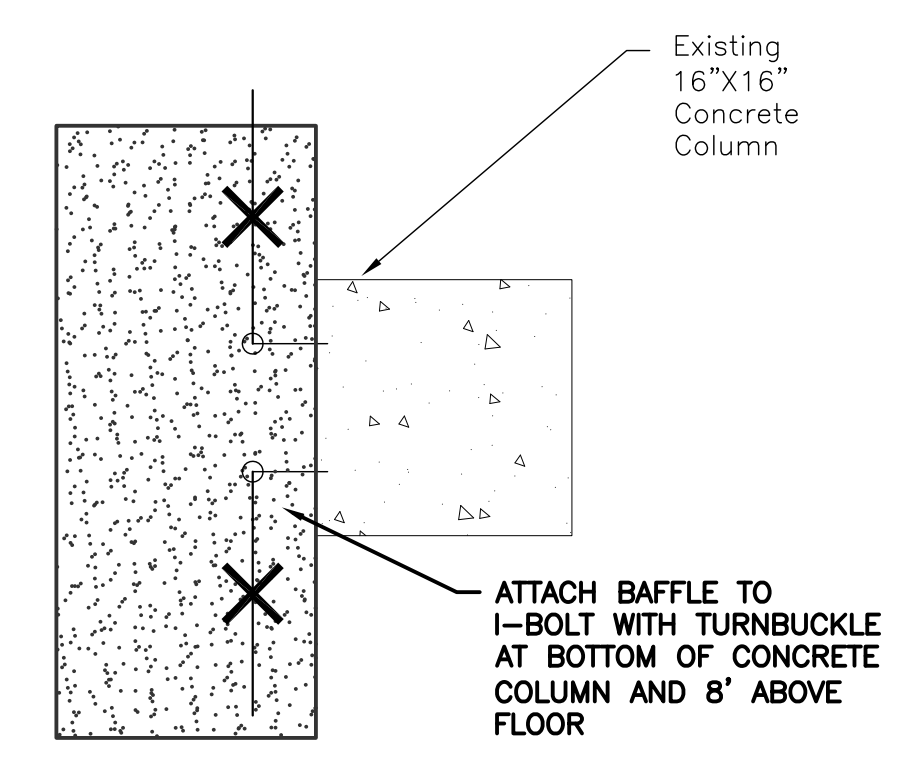
C31



SECTION A
1/4" = 1'-0"



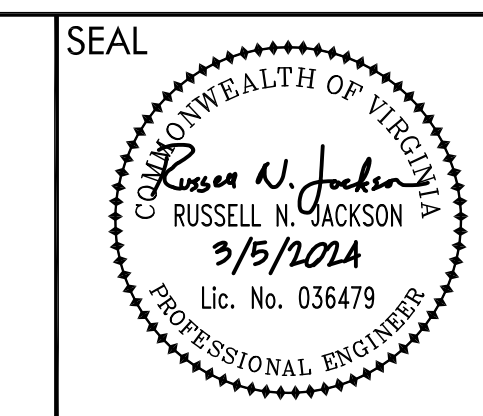
WALL JOIN DETAIL
NOT TO SCALE



FILTER FABRIC ATTACHEMENT DETAIL
NOT TO SCALE

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
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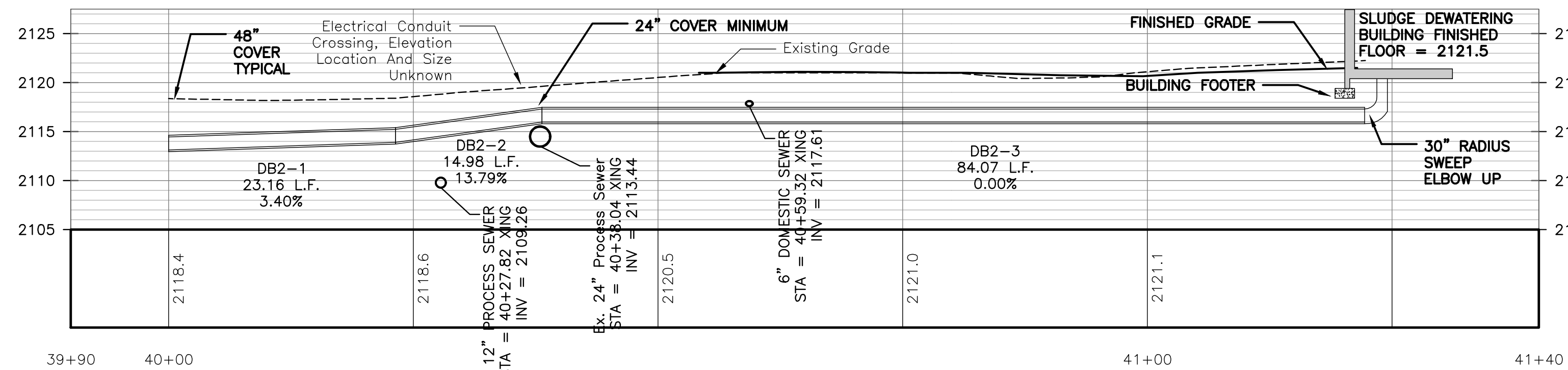
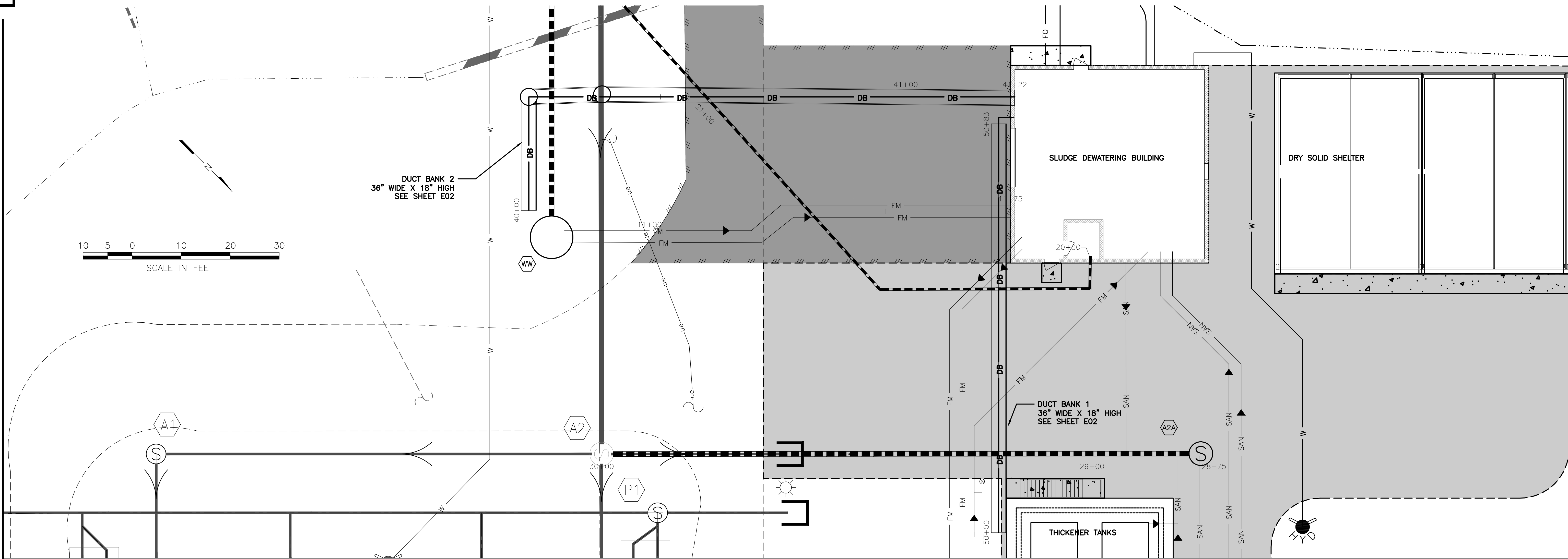
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



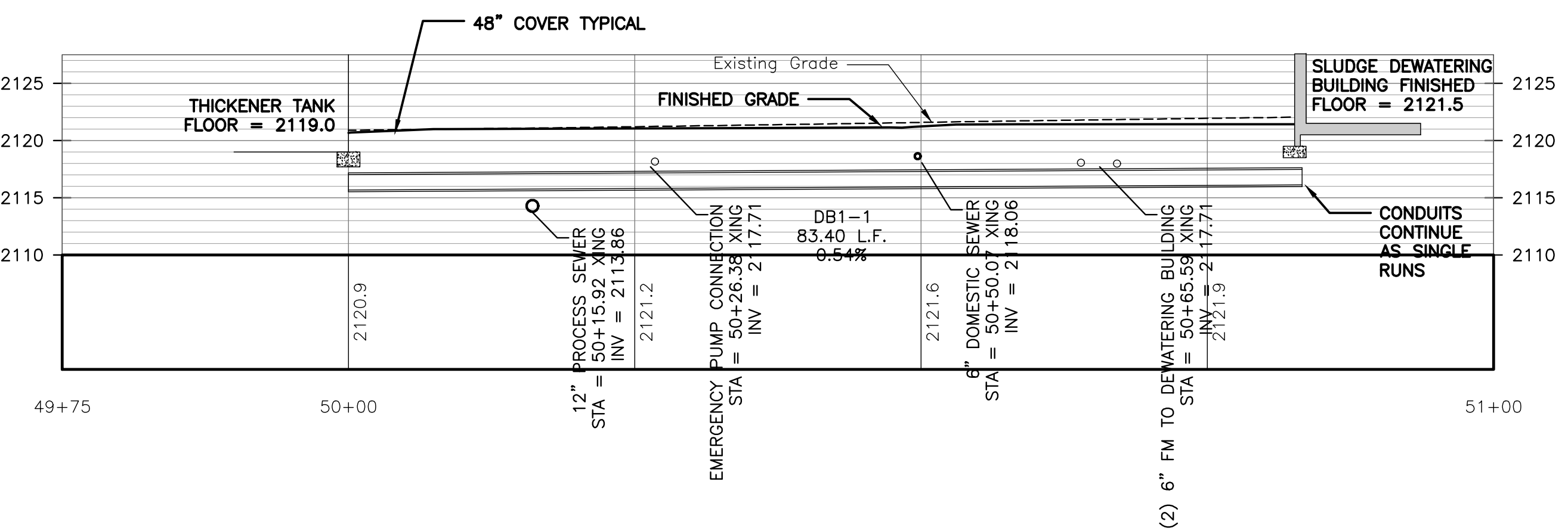
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DATE: 5 MARCH 2024
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SHEET DESCRIPTION:
SOLIDS HOLDING BASIN
SECTIONS

C32



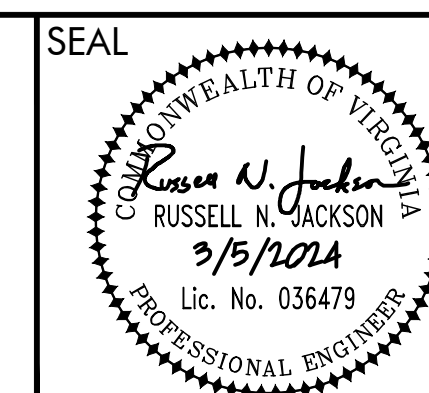
DB-2
SCALE H:1"=10', V:1"=5'



DB-1
SCALE H:1"=10', V:1"=5'

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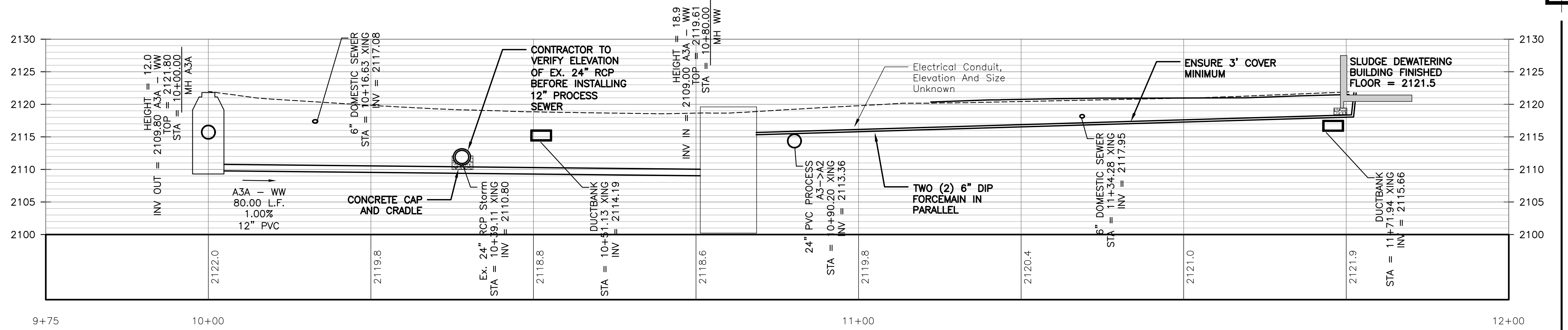
NEW RIVER REGIONAL WATER AUTHORITY
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AUSTINVILLE VIRGINIA



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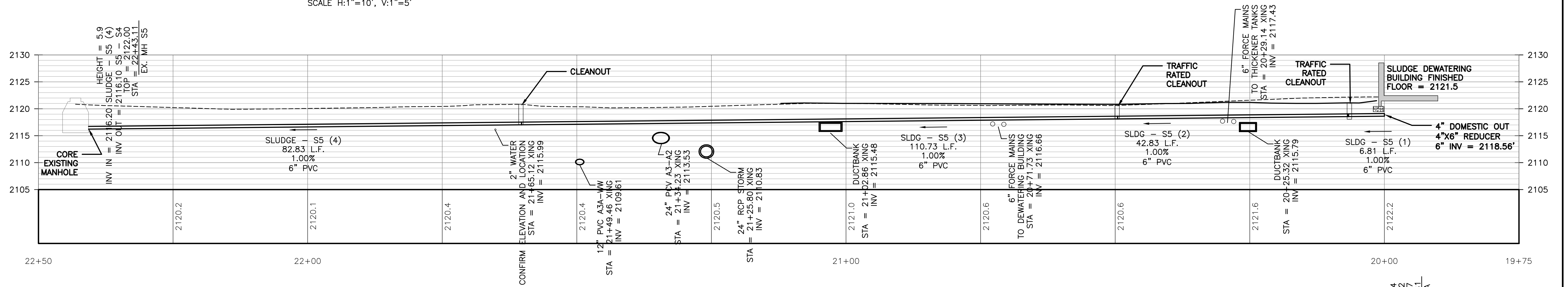
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DUCTBANK PLAN & PROFILE

C33



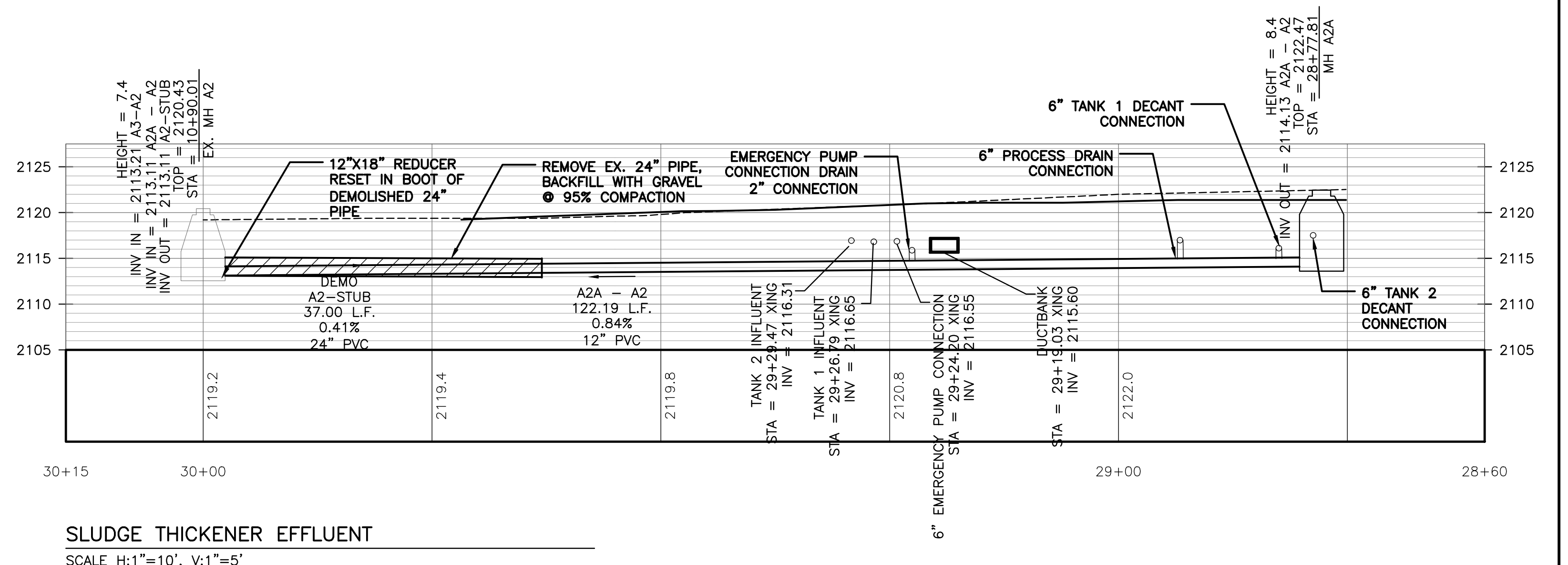
SLUDGE DEWATERING INFLUENT

SCALE H:1"=10', V:1"=5'



SLUDGE DEWATERING DOMESTIC EFFLEUNT

SCALE H:1"=10', V:1"=5'

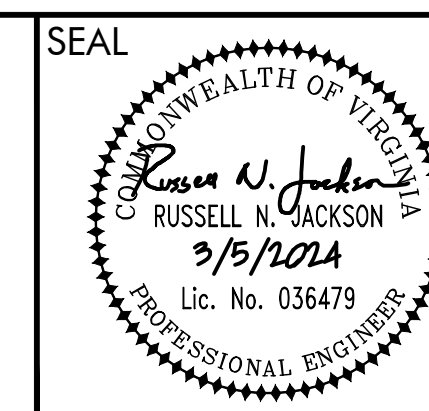


SLUDGE THICKENER EFFLUENT

SCALE H:1"=10', V:1"=5'

Peed & Bortz, L.L.C.
 CIVIL & ENVIRONMENTAL ENGINEERS
 20 MIDWAY PLAZA DRIVE - SUITE 100
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NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
 AUSTINVILLE VIRGINIA



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SHEET DESCRIPTION:
 SLUDGE DISCHARGE &
 GRAVITY SEWER PROFILES

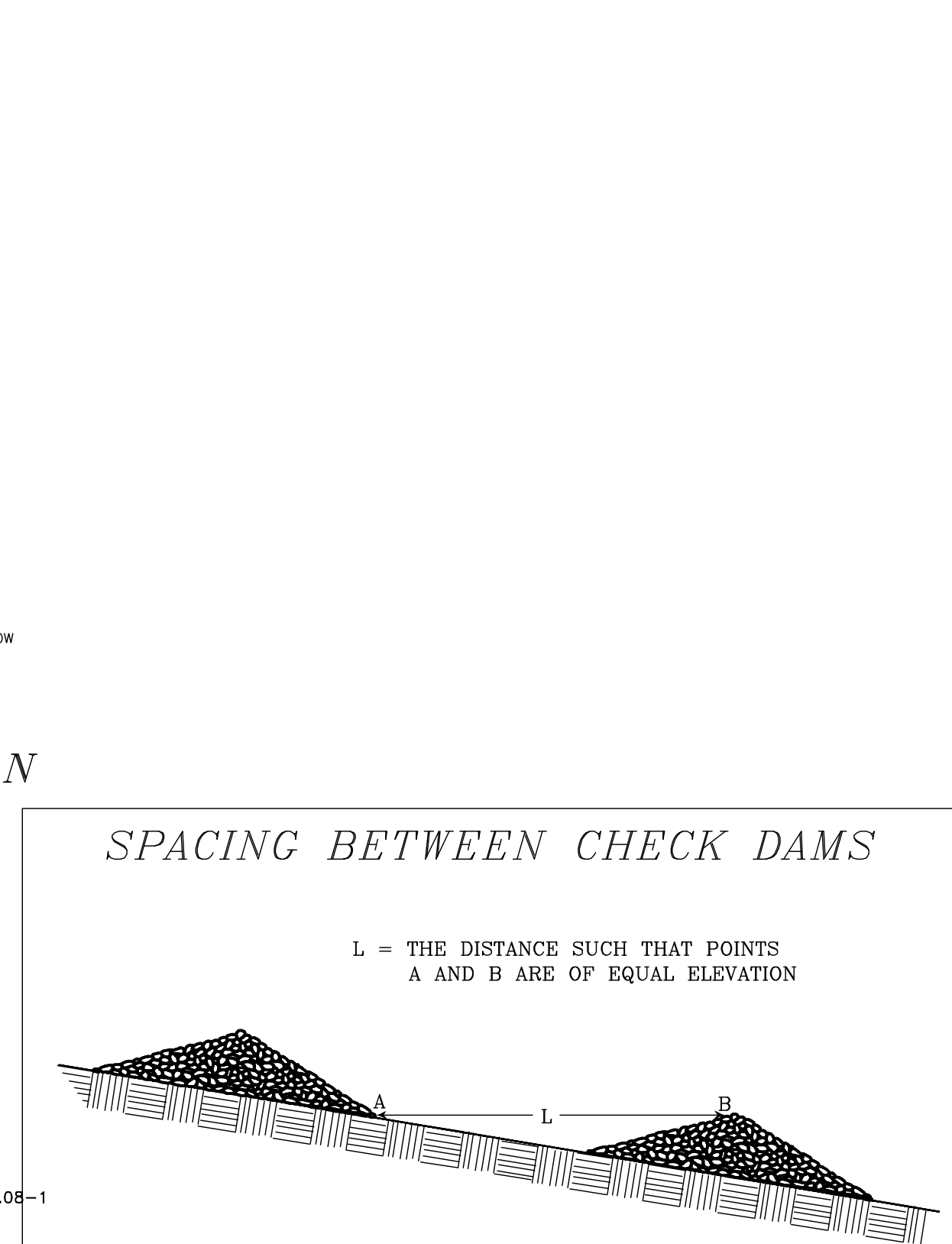
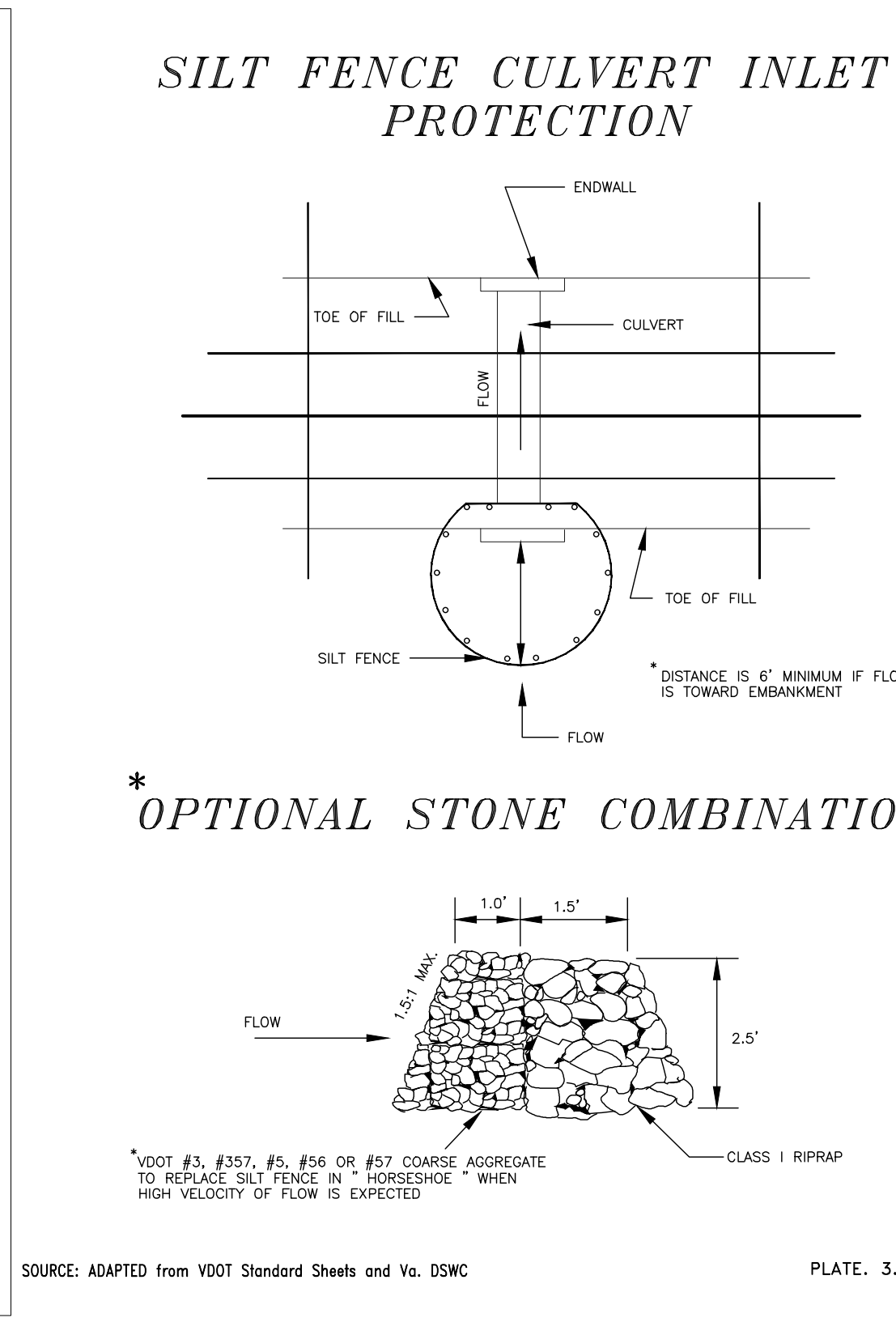
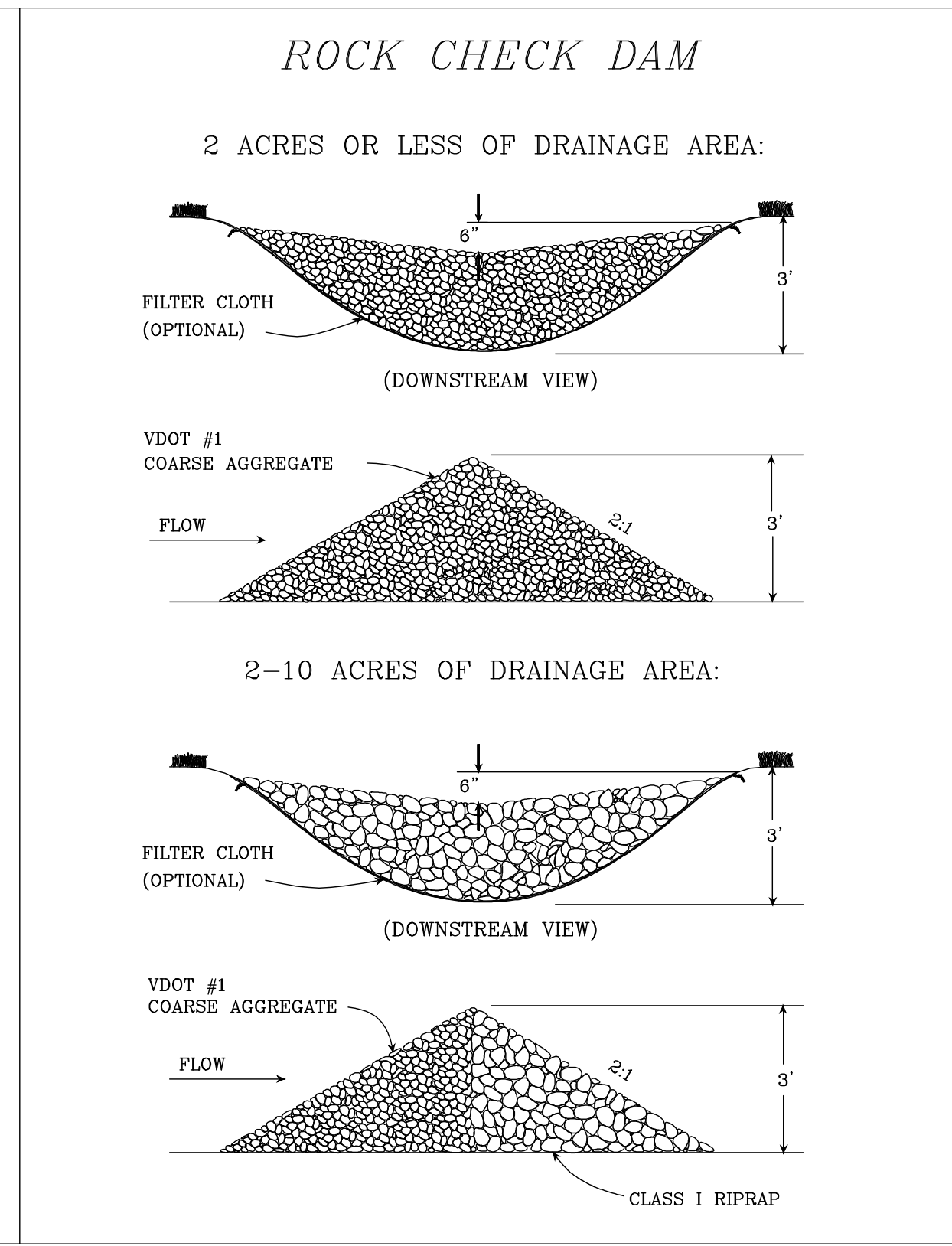
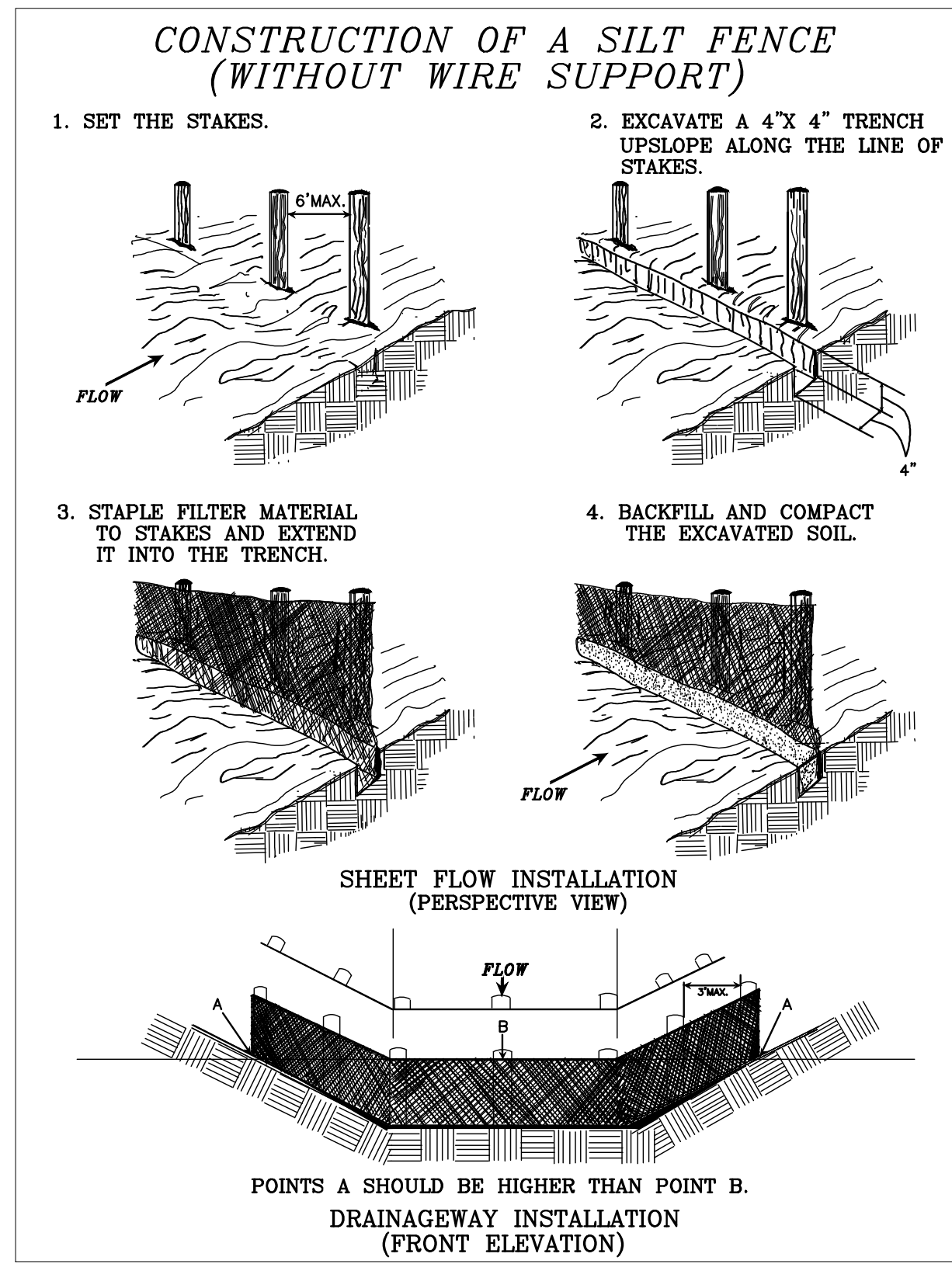
C34

VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK NOTES

- ES-1: UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CONSTRUCTED AND MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND VIRGINIA REGULATIONS 4VAC50-30 EROSION AND SEDIMENT CONTROL REGULATIONS.
- ES-2: THE PLAN APPROVING AUTHORITY MUST BE NOTIFIED ONE WEEK PRIOR TO THE PRECONSTRUCTION CONFERENCE, ONE WEEK PRIOR TO THE COMMENCEMENT OF LAND DISTURBING ACTIVITY, AND ONE WEEK PRIOR TO THE FINAL INSPECTION.
- ES-3: ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE PLACED PRIOR TO OR AS THE FIRST STEP IN CLEARING.
- ES-4: A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN WILL BE MAINTAINED ON THE SITE AT ALL TIMES.
- ES-5: PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES IN AREAS OTHER THAN INDICATED ON THESE PLANS (INCLUDING, BUT NOT LIMITED TO, OFF-SITE BORROW OR WASTE AREAS), THE CONTRACTOR WILL SUBMIT A SUPPLEMENTARY EROSION CONTROL PLAN TO THE OWNER FOR REVIEW AND APPROVAL BY THE PLAN APPROVING AUTHORITY.
- ES-6: THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF ANY ADDITIONAL EROSION CONTROL MEASURES NECESSARY TO PREVENT EROSION AND SEDIMENTATION AS DETERMINED BY THE PLAN APPROVING AUTHORITY.
- ES-7: ALL DISTURBED AREAS ARE TO DRAIN TO APPROVED SEDIMENT CONTROL MEASURES AT ALL TIMES DURING LAND DISTURBING ACTIVITIES AND DURING SITE DEVELOPMENT UNTIL FINAL STABILIZATION IS ACHIEVED.
- ES-8: DURING DEWATERING OPERATIONS, WATER WILL BE PUMPED INTO AN APPROVED FILTERING DEVICE.
- ES-9: THE CONTRACTOR WILL INSPECT ALL EROSION CONTROL MEASURES PERIODICALLY AND AFTER EACH RUNOFF PRODUCING RAINFALL EVENT. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY.

GENERAL EROSION AND SEDIMENT CONTROL NOTES

- 1. ALL SOIL EROSION & SEDIMENT CONTROL MEASURES WILL BE ACCOMPLISHED IN STRICT ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS CONTAINED IN THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION.
- 2. ALL WORK WILL BE SUBJECT TO INSPECTION BY WYTHE COUNTY.
- 3. ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES AS SHOWN ON THE PLAN WILL BE PLACED IN ADVANCE OF THE WORK BEING PERFORMED, AS FAR AS PRACTICAL.
- 4. THE CONTRACTOR SHALL PROVIDE ALL EROSION AND SEDIMENT CONTROL MEASURES REQUIRED BY THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" AND THE VIRGINIA DEPARTMENT OF TRANSPORTATION. THE CONTRACTOR SHALL NOT DISTURB MORE THAN 10,000 SQUARE FEET OF AREA AT A TIME WHICH SHALL BE RESTORED IMMEDIATELY AFTER WORK IS COMPLETED. THE CONTRACTOR SHALL PREPARE AN EROSION AND SEDIMENT CONTROL PLAN SHOWING ALL PROPOSED PROJECT EROSION AND SEDIMENT CONTROL MEASURES. THIS DOCUMENT SHALL BE SUBMITTED TO THE ENGINEER AT THE PRE-CONSTRUCTION CONFERENCE.
- 5. IN NO CASE DURING CONSTRUCTION WILL WATER RUNOFF BE DIVERTED OR ALLOWED TO FLOW TO LOCATIONS WHERE ADEQUATE PROTECTION HAS NOT BEEN PROVIDED.
- 6. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO LEAVE THE SITE ADEQUATELY PROTECTED AGAINST EROSION, SEDIMENTATION, OR ANY DAMAGE TO ANY ADJACENT PROPERTY AT THE END OF EACH DAY'S WORK.
- 7. FOR THE EROSION CONTROL KEY SYMBOLS SHOWN ON THE PLANS, REFER TO THE VIRGINIA UNIFORM CODING SYSTEM FOR EROSION AND SEDIMENT CONTROL PRACTICES CONTAINED IN THE VIRGINIA EROSION CONTROL HANDBOOK, LATEST EDITION, AND THE EROSION AND SEDIMENT CONTROL LEGEND, LOCATED ON THIS SHEET.
- 8. THE CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION OF ANY ADDITIONAL EROSION CONTROL MEASURES NECESSARY TO PREVENT EROSION AND SEDIMENTATION.
- 9. THE CONTRACTOR WILL INSPECT ALL EROSION CONTROL MEASURES PERIODICALLY AND AFTER EACH RUNOFF-PRODUCING RAINFALL EVENT. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES WILL BE MADE IMMEDIATELY.
- 10. FOR PERMANENT SOIL STABILIZATION REFER TO SPECIFICATIONS AND SEEDING SCHEDULE LOCATED ON D03.
- 11. EROSION AND SEDIMENT CONTROLS SHALL BE MAINTAINED UNTIL UPSTREAM DISTURBED AREAS ARE STABILIZED.
- 12. PROPERTIES ADJOINING THE SITE WILL BE KEPT CLEAN OF MUD OR SILT CARRIED FROM THE SITE BY VEHICULAR TRAFFIC OR RUNOFF.
- 13. DURING CONSTRUCTION OF THE PROJECT, SOIL STOCKPILES WILL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. THE CONTRACTOR IS RESPONSIBLE FOR THE TEMPORARY PROTECTION AND PERMANENT STABILIZATION OF ALL SOIL STOCKPILES ON SITE AS WELL AS SOIL INTENTIONALLY TRANSPORTED FROM THE PROJECT SITE.
- 14. SILT WILL BE REMOVED FROM SILT FENCES WHEN THE SILT REACHES APPROXIMATELY ONE HALF OF THE HEIGHT OF THE BARRIER.
- 15. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL EROSION CONTROL MEASURES FOR ONE (1) YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION UNLESS RELEASE IN WRITING BY THE OWNER.
- 16. UNDERGROUND UTILITIES WILL BE INSTALLED IN ACCORDANCE WITH MS-16 REQUIREMENTS AND AS SHOWN BELOW:
NO MORE THAN 500 LINEAR FEET OF TRENCH WILL BE OPENED AT ONE TIME. EXCAVATED MATERIALS WILL BE PLACED ON THE UPHILL SIDE OF TRENCHES. EFFLUENT FROM DEWATERING OPERATIONS SHALL BE FILTERED OR PASSED THROUGH AN APPROVED SEDIMENT TRAPPING DEVICE, OR BOTH, AND DISCHARGED IN A MANNER THAT DOES NOT ADVERSELY AFFECT FLOWING STREAMS OR OFF-SITE PROPERTY. MATERIALS USED FOR BACKFILLING TRENCHES SHALL BE PROPERLY COMPACTED IN ORDER TO MINIMIZE EROSION AND PROMOTE STABILIZATION. RESTABILIZATION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THESE REGULATIONS.



SOURCE: Adapted from Installation of Straw and Fabric Filter Barriers for Sediment Control, VA. DSWC Sherwood and Wyan

PLATE. 3.05-2 SOURCE: VA. DSWC

PLATE. 3.20-1 Xref BORDER

SOURCE: ADAPTED FROM VDOT Standard Sheets and Va. DSWC

SOURCE: VA. DSWC

PLATE. 3.20-2

VIRGINIA EROSION AND SEDIMENT MINIMUM STANDARDS

- 1. Permanent or temporary soil stabilization shall be applied to denuded areas within seven days after final grade is reached on any portion of the site. Temporary soil stabilization shall be applied within seven days to denuded areas that may not be at final grade but will remain dormant for longer than 14 days. Permanent stabilization shall be applied to areas that are to be left dormant for more than one year.
- 2. During construction of the project, soil stock piles and borrow areas shall be stabilized or protected with sediment trapping measures. The applicant is responsible for the temporary protection and permanent stabilization of all soil stockpiles on site as well as borrow areas, and soil intentionally transported from the project site.
- 3. A permanent vegetative cover shall be established on denuded areas not otherwise permanently stabilized. Permanent vegetation shall not be considered established until a ground cover is achieved that is uniform, mature enough to survive and will inhibit erosion.
- 4. Sediment basins and traps, perimeter dikes, sediment barriers and other measures intended to trap sediment shall be constructed as a first step in any land-disturbing activity and shall be made functional before upslope land disturbance takes place.
- 5. Stabilization measures shall be applied to earthen structures such as dams, dikes and diversions immediately after installation.
- 6. Sediment traps and sediment basins shall be designed and constructed based upon the total drainage area to be served by the trap or basin.
- 6.a. The minimum storage capacity of a sediment trap shall be 134 cubic yards per acre of drainage area and the trap shall only control drainage areas less than three acres.
- 6.b. Surface runoff from disturbed areas that is comprised of flow from drainage areas greater than or equal to three acres shall be controlled by a sediment basin. The minimum storage capacity of a sediment basin shall be 134 cubic yards per acre of drainage area. The outfall system shall, at a minimum, maintain the structural integrity of the basin during a 25-year storm of 24-hour duration. Runoff coefficients used in runoff calculations shall correspond to a bare earth condition or those conditions expected to exist while the sediment basin is utilized.
- 7. Cut and fill slopes shall be designed and constructed in a manner that will minimize erosion. Slopes that are found to be eroding excessively within one year of permanent stabilization shall be provided with additional slope stabilizing measures until the problem is corrected.
- 8. Concentrated runoff shall not flow down cut or fill slopes unless contained within an adequate temporary or permanent channel, flume or slope drain structure.
- 9. Whenever water seeps from a slope face, adequate drainage or other protection shall be provided.
- 10. All storm sewer inlets that are made operable during construction shall be protected so that sediment-laden water cannot enter the conveyance system without first being filtered or otherwise treated to remove sediment.
- 11. Before newly constructed stormwater conveyance channels or pipes are made operational, adequate outlet protection and any required temporary or permanent channel lining shall be installed in both the conveyance channel and receiving channel.
- 12. When work in a live watercourse is performed, precautions shall be taken to minimize encroachment, control sediment transport and stabilize the work area to the greatest extent possible during construction. Nonerodible material shall be used for the construction of causeways and cofferdams. Earthen fill may be used for these structures if armored by nonerodible cover materials.
- 13. When a live watercourse must be crossed by construction vehicles more than twice in any six-month period, a temporary vehicular stream crossing constructed of nonerodible material shall be provided.
- 14. All applicable federal, state and local requirements pertaining to working in or crossing live watercourses shall be met.
- 15. The bed and banks of a watercourse shall be stabilized immediately after work in the watercourse is completed.
- 16. Underground utility lines shall be installed in accordance with the following standards in addition to other applicable criteria:
 - 16.a. No more than 500 linear feet of trench may be opened at one time.
 - 16.b. Excavated material shall be placed on the uphill side of trenches.
 - 16.c. Effluent from dewatering operations shall be filtered or passed through an approved sediment trapping device, or both, and discharged in a manner that does not adversely affect flowing streams or off-site property.
 - 16.d. Material used for backfilling trenches shall be properly compacted in order to minimize erosion and promote stabilization.
 - 16.e. Restabilization shall be accomplished in accordance with this chapter.
 - 16.f. Applicable safety requirements shall be complied with.
- 17. Where construction vehicle access routes intersect paved or public roads, provisions shall be made to minimize the transport of sediment by vehicular tracking onto the paved surface. Where sediment is transported onto a paved or public road surface, the road surface shall be cleaned thoroughly at the end of each day. Sediment shall be removed from the roads by shoveling or sweeping and transported to a sediment control disposal area. Street washing shall be allowed only after sediment is removed in this manner. This provision shall apply to individual development lots as well as to larger land-disturbing activities.
- 18. All temporary erosion and sediment control measures shall be removed within 30 days after final site stabilization or after the temporary measures are no longer needed, unless otherwise authorized by the VESCP authority. Trapped sediment and the disturbed soil areas resulting from the disposition of temporary measures shall be permanently stabilized to prevent further erosion and sedimentation.
- 19. Properties and waterways downstream from development sites shall be protected from sediment deposition, erosion and damage due to increases in volume, velocity and peak flow rate of stormwater runoff for the stated frequency storm of 24-hour duration in accordance with the following standards and criteria. Stream restoration and relocation projects that incorporate natural channel design concepts are not man-made channels and shall be exempt from any flow rate capacity and velocity requirements for natural or man-made channels:
 - 19.a. Concentrated stormwater runoff leaving a development site shall be discharged directly into an adequate natural or man-made receiving channel, pipe or storm sewer system. For those sites where runoff is discharged into a pipe or pipe system, downstream stability analyses at the outfall of the pipe or pipe system shall be performed.
 - 19.b. Adequacy of all channels and pipes shall be verified in the following manner:
 - 19.b.1. The applicant shall demonstrate that the total drainage area to the point of analysis within the channel is 100 times greater than the contributing drainage area of the project in question; or
 - 19.b.2. Natural channels shall be analyzed by the use of a two-year storm to verify that stormwater will not overtop channel banks nor cause erosion of channel bed or banks;
 - 19.b.2.a. All previously constructed man-made channels shall be analyzed by the use of a 10-year storm to verify that stormwater will not overtop its banks and by the use of a two-year storm to demonstrate that stormwater will not cause erosion of channel bed or banks; and
 - 19.b.2.b. Pipes and storm sewer systems shall be analyzed by the use of a 10-year storm to verify that stormwater will be contained within the pipe or system.
 - 19.b.2.c. If existing natural receiving channels or previously constructed man-made channels or pipes are not adequate, the applicant shall:
 - 19.c.1. improve the channels to a condition where a 10-year storm will not overtop the banks and a two-year storm will not cause erosion to the channel, the bed, or the banks;
 - 19.c.2. Improve the pipe or pipe system to a condition where the 10-year storm is contained within the appurtenances;
 - 19.c.3. Develop a site design that will not cause the pre-development peak runoff rate from a two-year storm to increase when runoff outfalls into a natural channel or will not cause the pre-development peak runoff rate from a 10-year storm to increase when runoff outfalls into a man-made channel; or
 - 19.c.4. Provide a combination of channel improvement, stormwater detention or other measures which is satisfactory to the VESCP authority to prevent downstream erosion.
 - 19.d. The applicant shall provide evidence of permission to make the improvements.
 - 19.e. All hydrologic analyses shall be based on the existing watershed characteristics and the ultimate development condition of the subject project.
 - 19.f. If the applicant chooses an option that includes stormwater detention, he shall obtain approval from the VESCP of a plan for maintenance of the detention facilities. The plan shall set forth the maintenance requirements of the facility and the person responsible for performing the maintenance.
 - 19.g. Outfall from a detention facility shall be discharged to a receiving channel, and energy dissipators shall be placed at the outfall of all detention facilities as necessary to provide a stabilized transition from the facility to the receiving channel.
 - 19.h. All on-site channels must be verified to be adequate.
 - 19.i. Increased volumes of sheet flows that may cause erosion or sedimentation on adjacent property shall be diverted to a stable outlet, adequate channel, pipe or pipe system, or to a detention facility.
 - 19.j. In applying these stormwater management criteria, individual lots or parcels in a residential, commercial or industrial development shall not be considered to be separate development projects. Instead, the development, as a whole, shall be considered to be a single development project. Hydrologic parameters that reflect the ultimate development condition shall be used in all engineering calculations. All measures used to protect properties and waterways shall be employed in a manner which minimizes impacts on the physical, chemical and biological integrity of rivers, streams and other waters of the state.
 - 19.k. Any plan approved prior to July 1, 2014, that provides for stormwater management that addresses any flow rate capacity and velocity requirements for natural or man-made channels shall satisfy the flow rate capacity and velocity requirements for natural or man-made channels if the practices are designed to (i) detain the water quality volume and to release it over 48 hours; (ii) detain and release over a 24-hour period the expected rainfall resulting from the one year, 24-hour storm; and (iii) reduce the allowable peak flow rate resulting from the 1.5, 2, and 10-year, 24-hour storms to a level that is less than or equal to the peak flow rate from the site assuming it was in a good forested condition, achieved through multiplication of the forested peak flow rate by a reduction factor that is equal to the runoff volume from the site when it was in a good forested condition divided by the runoff volume from the site in its proposed condition, and shall be exempt from any flow rate capacity and velocity requirements for natural or man-made channels as defined in any regulations promulgated pursuant to § 62.1-44.15:54 or 62.1-44.15:65 of the Act.
 - 19.m. For plans approved on and after July 1, 2014, the flow rate capacity and velocity requirements of § 62.1-44.15:52 A of the Act and this subsection shall be satisfied by compliance with water quantity requirements in the Stormwater Management Act (§ 62.1-44.15:24 et seq. of the Code of Virginia) and attendant regulations, unless such land-disturbing activities (i) are in accordance with provisions for time limits on applicability of approved design criteria in 9VAC25-870-47 or grandfathering in 9VAC25-870-48 of the Virginia Stormwater Management Program (VSMP) Regulation, in which case the flow rate capacity and velocity requirements of § 62.1-44.15:52 A of the Act shall apply, or (ii) are exempt pursuant to § 62.1-44.15:34 C 7 of the Act.
 - 19.n. Compliance with the water quantity minimum standards set out in 9VAC25-870-66 of the Virginia Stormwater Management Program (VSMP) Regulation shall be deemed to satisfy the requirements of this subdivision 19.

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3214 FAX : (540) 394 - 3215

NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA

SEAL
COMMONWEALTH OF VIRGINIA
Russell N. Jackson
3/5/2014
Lic. No. 036479
PROFESSIONAL ENGINEER

DRAWN BY:
RNJ
REVIEW BY:
RNJ
DATE:
5 MARCH 2024
REVISION:

SHEET DESCRIPTION:
STANDARD E&S NOTES
AND DETAILS

D01

**TABLE 3.32-C
SITE SPECIFIC SEEDING MIXTURES
FOR APPALACHIAN/MOUNTAIN AREA**

Minimum Care Lawn	Total Lbs. Per Acre
- Commercial or Residential	200-250 lbs.
- Kentucky 31 or Turf-Type Tall Fescue	90-100%
- Improved Perennial Ryegrass *	0-10%
- Kentucky Bluegrass	0-10%
High-Maintenance Lawn	
Minimum of three (3) up to five (5) varieties of bluegrass from approved list for use in Virginia.	125 lbs.
General Slope (3:1 or less)	
- Kentucky 31 Fescue	128 lbs.
- Red Top Grass	2 lbs.
- Seasonal Nurse Crop **	20 lbs.
150 lbs.	
Low-Maintenance Slope (Steeper than 3:1)	
- Kentucky 31 Fescue	108 lbs.
- Red Top Grass	2 lbs.
- Seasonal Nurse Crop **	20 lbs.
- Crownvetch ***	20 lbs.
150 lbs.	

* Perennial Ryegrass will germinate faster and at lower soil temperatures than fescue, thereby providing cover and erosion resistance for seedbed.

** Use seasonal nurse crop in accordance with seeding dates as stated below:
 March, April through May 15th Annual Rye
 May 16th through August 15th Foxtail Millet
 August 16th through September, October Annual Rye
 November through February Winter Rye

*** If Flatpea is used, increase to 30 lbs./acre. All legume seed must be properly inoculated. Weeping Lovegrass may also be included in any slope or low-maintenance mixture during warmer seeding periods; add 10-20 lbs/acre in mixes.

III - 302

EROSION AND SEDIMENT CONTROL NARRATIVE

PROJECT DESCRIPTION:

The purpose of this plan is to expand the existing New River Regional Water Authority WTP to 6MGD. The project will add a sludge dewatering building, a dry solids shelter, and two thickener tanks along with a gravel and asphalt road to access them. The remaining work takes place inside existing facilities. Total area disturbed will be 0.95 acres with 0.45 acres left as impervious.

EXISTING SITE CONDITIONS:

The site is an active water treatment plant. The disturbed area drains into an existing storm pond that was designed for the WTP, and ultimately drains into the new river.

ADJACENT PROPERTY:

Several houses exist to the west of the site. To the south of the site is a Waste Water Treatment Plant. The area to the east is undeveloped, to the north is the New River.

OFF-SITE AREAS:

Any off-site area disturbed by the contractor will have to be protected with any required erosion control measures. Work will take place inside the existing raw water pump station, there are no other off-site areas planned at this time.

SOILS:

The following soils information is according to the SCS soils information from the NRCS Web Soil Survey. The soils of this site consists entirely of Shottower loam, 2 - 7% slopes.

CRITICAL EROSION AREAS:

The critical erosion areas are insuring that the site drains to the existing storm pond.

EROSION AND SEDIMENT CONTROL MEASURES:

The purpose of the control measures will be to prevent sediment deposition into the New River. Unless otherwise indicated, all vegetative and structural erosion and sediment control practices shall be constructed and maintained according to minimum standards and specifications of the handbook. The minimum standards of the VESCR shall be adhered to unless otherwise waived or approved by a variance.

COMPLY WITH MINIMUM STANDARD 16 (MS-16) FROM VESCH

MS-16: Underground utility lines shall be installed in accordance with the following standards in addition to other applicable criteria:

- No more than 500 linear feet of trench may be opened at one time.
- Excavated material shall be placed on the uphill side of trenches.
- Effluent from dewatering operations shall be filtered or passed through an approved sediment trapping device, or both, and discharged in a manner that does not adversely affect flowing streams or off-site property.
- Material used for backfilling trenches shall be properly compacted in order to minimize erosion and promote stabilization.
- Restabilization shall be accomplished in accordance with these regulations.
- Applicable safety regulations shall be complied with.

STRUCTURAL PRACTICES:

- Silt Fence Barrier 3.05: Install silt fence downstream of disturbed areas if not in compliance with MS-16 or as required due to poor stabilization of surface. Use Super Silt Fence where indicated.
- Inlet Protection - 3.07: Install inlet protection on existing drop inlets.
- Diversion Dike - 3.09: Install diversion dikes above new ditches to divert sediment to stabilized channels.
- Rock Check Dams - 3.20: Install rock check dams in the flow line of proposed ditches and outlet to existing ditches as shown on plan.

VEGETATIVE PRACTICES:

- Temporary and Permanent Seeding (3.31 & 3.32): Temporary seeding will occur within 7 days after grading and permanent seeding will occur within 15 days. seed mix shall depend upon the recommendations of the VESC handbook and the time of year.
- Mulching (3.35): Mulch shall be applied as required to all areas with grass seeding or landscape plantings.

MANAGEMENT STRATEGIES:

- Construction will be sequenced so that grading operations can begin and end as quickly as possible.
- Runoff from disturbed areas not stabilized per MS-16 will be directed into sediment traps, check dams, or through silt fence.
- Temporary seeding or other stabilization will follow immediately after backfill of trench.
- The job superintendent will be responsible for the installation and maintenance of all erosion and sediment control practices.
- After achieving adequate stabilization, the select temporary E&S controls will be cleaned up and removed. The inspector will determine when measures may be removed.

CONSTRUCTION SCHEDULE:

- Install perimeter controls (silt fence, check dams) prior to starting land disturbance.
- Install stormwater management infrastructure (grass swale).
- Rough grading of site.
- Final grading and permanent stabilization, permanent seeding applied.
- Remove any temporary E&S Perimeter controls, as specified by the county.

PERMANENT STABILIZATION:

All areas disturbed by construction and not paved will be stabilized with permanent seeding as soon as final grading of each area is complete. Seeding mix will consist of seeds as required by standard 3.32. Mulch per standard 3.35 will be used to protect permanent seeding areas.

MAINTENANCE:

All erosion and sediment control measures will be checked weekly and after each significant rainfall. The following areas will be checked in particular:
 1. Stabilized areas will be checked weekly to ensure that the surface coating (grass seed, stone, asphalt) is sufficient to minimize erosion runoff.
 2. The silt fence barrier shall be checked regularly and after each rainfall event for undermining or deterioration of the fabric. Sediment shall be removed when the level reaches 1/2 the height of the barrier.
 3. Seeded areas shall be checked regularly to ensure that a good stand of grass is maintained. Areas shall be fertilized and re-seeded as necessary to promote the development of a non-erosive vegetative cover.

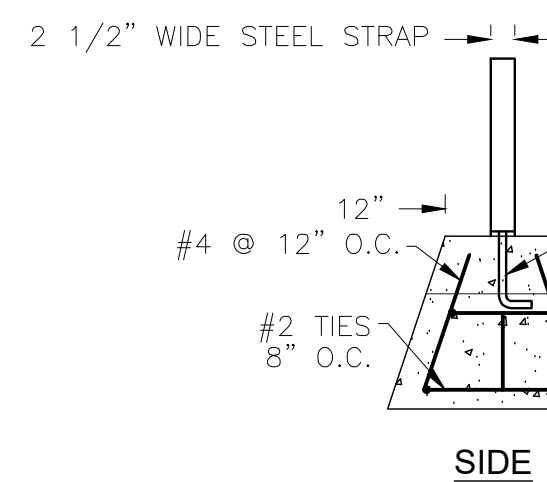
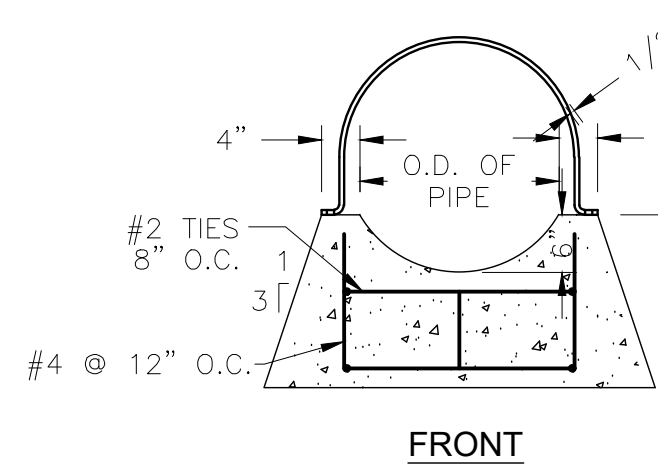
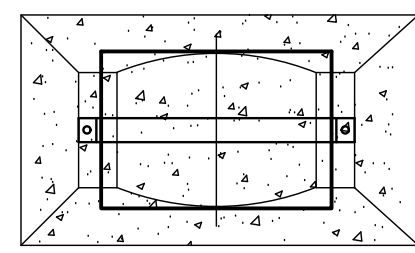
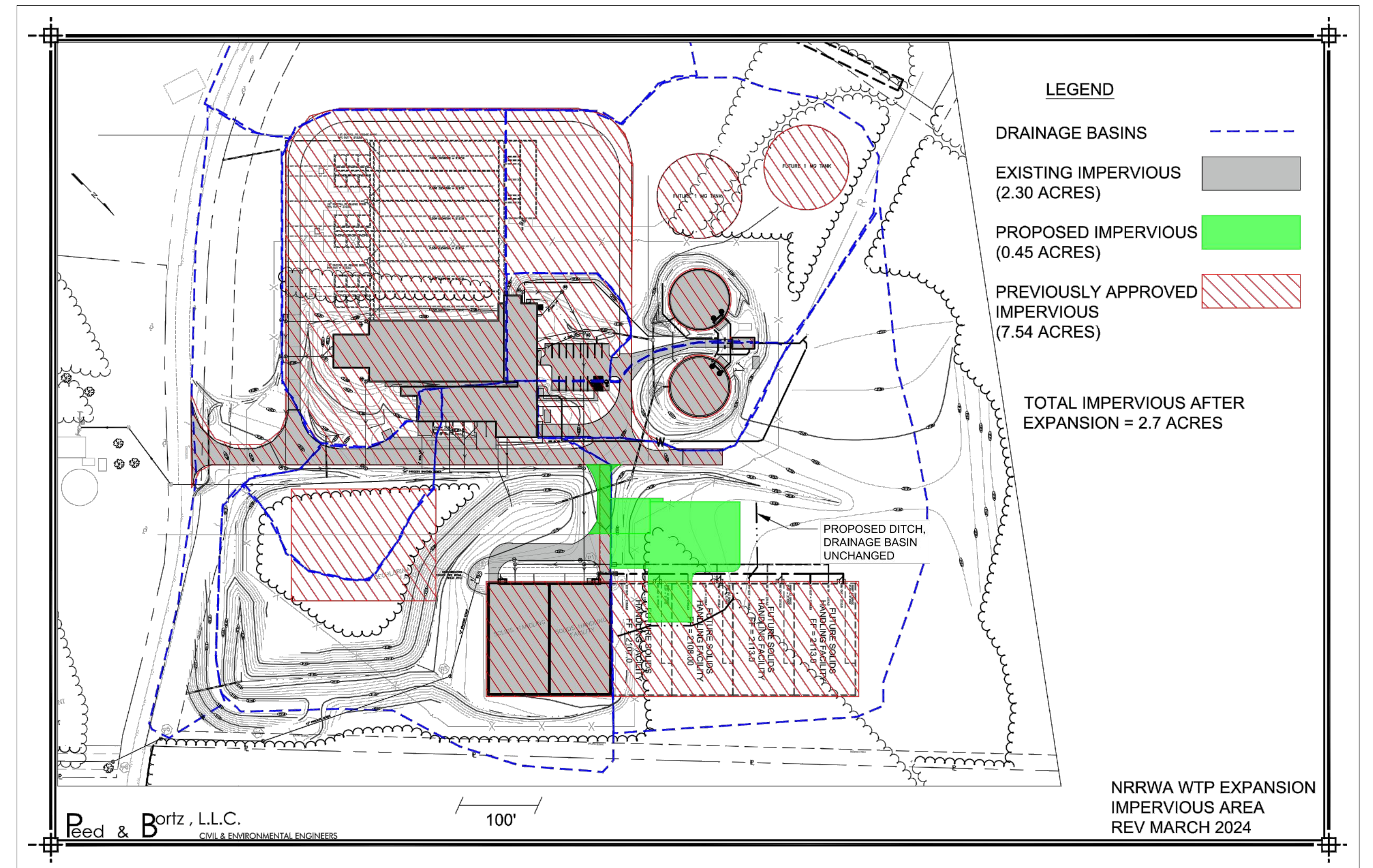
STORMWATER MANAGEMENT NARRATIVE

MS-19 REQUIREMENTS STORMWATER QUANTITY:

This project will meet MS-19 requirements by draining to an existing storm pond. The existing pond was approved in 2004 and sized for an ultimate site development of 7.54 acres. The additional 0.45 acres proposed with this plan are contained within the prior approved area. See impervious area sketch below.

STORMWATER QUALITY:

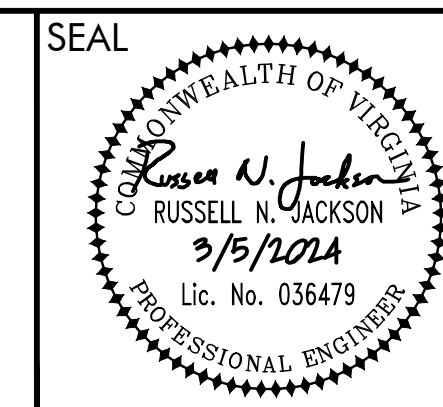
This project disturbs less than one acre of area and is therefore exempt from Stormwater Quality requirements.



EXPOSED PIPE SUPPORT DETAIL
NOT TO SCALE

Red & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3214 FAX: (540) 394 - 3215

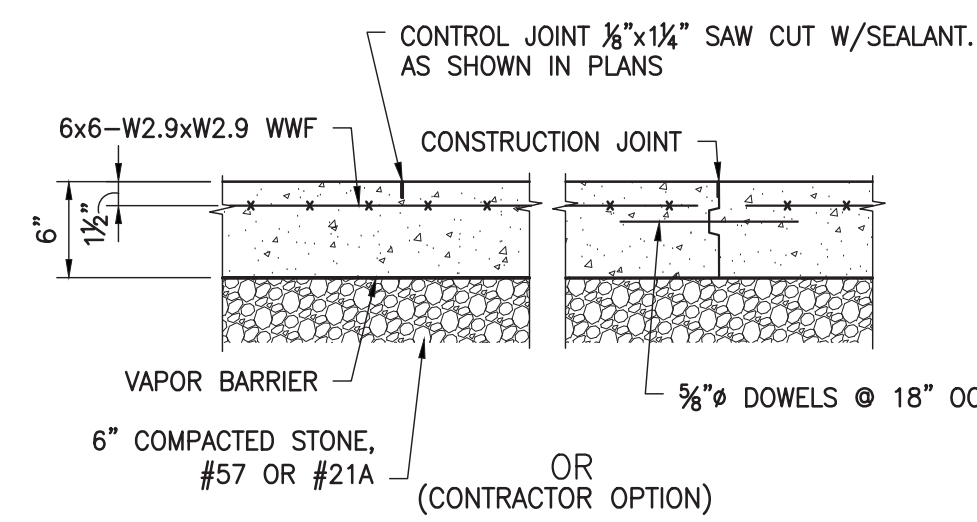
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



SEAL
DRAWN BY: RNJ
REVIEW BY: RNJ
DATE: 5 MARCH 2024
REVISION:

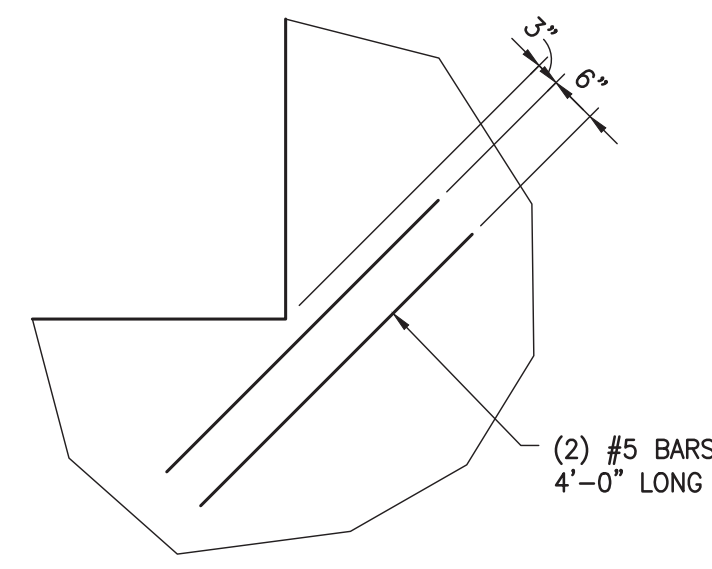
SHEET DESCRIPTION:
DETAILS AND E&S
NARRATIVE

D02



6" SLAB ON GRADE DETAIL

SCALE: 1"=1'-0"



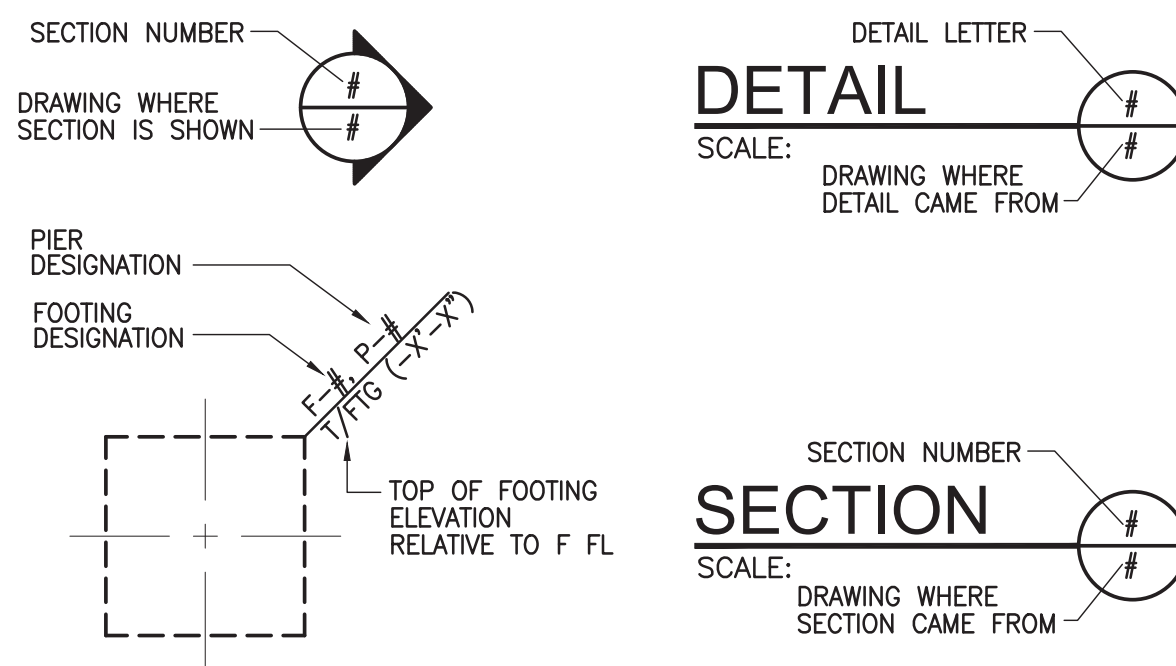
REINFORCING OF RE-ENTRANT CONCRETE CORNER

SCALE: N.T.S.

ABBREVIATIONS

ABV	ABOVE	EXIST	EXISTING	MIN	MINIMUM
AFF	ABOVE FINISHED FLOOR	F/	FACE OF	NS	NEAR SIDE
ARCH	ARCHITECT	F FL	FINISHED FLOOR	NTS	NOT TO SCALE
B/	BOTTOM	FS	FAR SIDE	OC	ON CENTER
BM	BEAM	FTG	FOOTING	OPG	OPENING
BRG	BEARING	F#	FOOTING DESIGNATION	PL	PLATE
CJ	CONTROL JOINT	HORIZ	HORIZONTAL	PSF	POUNDS PER SQUARE FOOT
CLG	CEILING	K	KIP = 1,000 POUNDS	PSI	POUNDS PER SQUARE INCH
CLR	CLEAR	LB	POUND	P#	PIER DESIGNATION
CMU	CONCRETE MASONRY UNIT	LBS	POUNDS	REF	REFERENCE
CONC	CONCRETE	LG	LONG	SIM	SIMILAR
CONT	CONTINUOUS	LL	LIVE LOAD	STL	STEEL
CYD	CUBIC YARD	LLH	LONG LEG HORIZONTAL	SW	SHORT WAY
DL	DEAD LOAD	LLV	LONG LEG VERTICAL	T/	TOP
DN	DOWN	LW	LONG WAY	TYP	TYPICAL
EA	EACH	MAX	MAXIMUM	VERT	VERTICAL
EL	ELEVATION	MTL	METAL	WWF	WELDED WIRE FABRIC
EQ	EQUAL	MFR	MANUFACTURER	W/	WITH
EW	EACH WAY				

LEGEND



SHEET INDEX

S01	STRUCTURAL NOTES, ABBREVIATIONS, AND TYPICAL DETAILS
S02	RAW WATER INTAKE STRUCTURAL DETAILS
S03	SLUDGE DEWATERING STRUCTURAL PLANS AND DETAILS
S04	DRY SOLIDS SHELTER FOUNDATION PLAN AND DETAILS

STRUCTURAL NOTES

- GENERAL REQUIREMENTS
 - THE STRUCTURE HAS BEEN DESIGNED TO RESIST DESIGN LOADS ONLY AS A COMPLETED STRUCTURE. APPLICATION OF CONSTRUCTION LOADS TO THE PARTIALLY COMPLETED STRUCTURE SHALL BE CONSIDERED BY THE CONTRACTOR AND INCLUDED IN THE DESIGN OF SHORING, BRACING, FORMWORK, AND OTHER SUPPORTING ELEMENTS PROVIDED FOR CONSTRUCTION OF THE STRUCTURE.
 - CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS, REPORTING ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK. SHOP DRAWINGS SHALL REFLECT FIELD VERIFIED DIMENSIONS BEFORE SUBMITTING TO THE ENGINEER.
 - COORDINATE ANCHOR BOLT SIZE AND LOCATIONS WITH APPROVED PRE-ENGINEERED BUILDING DRAWINGS.
- APPLICABLE CODES AND STANDARDS
 - "VIRGINIA CONSTRUCTION CODE" (2018 INTERNATIONAL BUILDING CODE).
 - ACI 318, "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE".
 - TMS 402/ACI 530/ASCE 5 "BUILDING CODE REQUIREMENTS AND SPECIFICATION FOR MASONRY STRUCTURES"
 - AISC, "MANUAL OF STEEL CONSTRUCTION - ALLOWABLE STRESS DESIGN".
 - STRUCTURAL WELDING CODE, AWS D1.1.
- DESIGN LOADS

	SLUDGE DEWATERING BUILDING	DRY SOLIDS SHELTER
3.1. LIVE LOAD		
ROOF	20 PSF	20 PSF
FLOOR	100 PSF	10,000 LBS (WHEEL LOAD)
3.2. WIND LOAD		
ULTIMATE WIND SPEED, V _{ult}	120 MPH	107 MPH
RISK CATEGORY	IV	II
EXPOSURE CATEGORY	C	C
3.3. SNOW LOAD		
GROUND SNOW LOAD, P _g	25 PSF	25 PSF
FLAT-ROOF SNOW LOAD, P _f	18.9 PSF	21.0 PSF
EXPOSURE FACTOR, C _e	0.9	1.0
IMPORTANCE FACTOR, I _s	1.2	1.0
THERMAL FACTOR, C _t	1.0	1.2
3.4. SEISMIC		
RISK CATEGORY	IV	II
IMPORTANCE FACTOR, I _e	1.50	1.0
Site Class	S ₁	S ₁
Site Class	D	D
Site Class	S _{ds}	S _{ds}
Site Class	S _{d1}	S _{d1}
DESIGN CATEGORY	B	B
BASIC FORCE RESISTING SYSTEM	ORDINARY PLAIN MASONRY SHEAR WALLS	STEEL ORDINARY CONCENTRICALLY BRACED FRAMES
DESIGN BASE SHEAR	0.265W	0.081W
RESPONSE COEFFICIENT, C _s	0.265	0.081
RESPONSE MOD FACTOR, R	1.5	3.25
ANALYSIS PROCEDURE USED	EQUIVALENT LATERAL FORCE	EQUIVALENT LATERAL FORCE
- SOIL BEARING CAPACITY
 - THE SOIL BEARING CAPACITY IS ASSUMED TO BE 2,000 PSF FOR COLUMN AND WALL FOOTINGS. VERIFY PRIOR TO CONSTRUCTION.
 - ENGINEERED FILL SHALL BE AN APPROVED MATERIAL PLACED IN HORIZONTAL LAYERS WITH A MAXIMUM LOOSE THICKNESS OF 8". EACH LAYER SHALL BE COMPACTED TO A DRY MINIMUM DRY DENSITY OF 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D 698 (STANDARD PROCTOR METHOD). FULL-TIME DENSITY TESTS SHALL BE PERFORMED TO VERIFY COMPACTION REQUIREMENTS ARE MET.
- MATERIALS
 - CONCRETE (COMPRESSIVE STRENGTH AT 28 DAYS)

FOOTING	3,000 PSI
SLABS ON GRADE	4,000 PSI
WALLS	4,000 PSI
GROUT UNDER BASE PLATES	5,000 PSI

BUILDING ENTRANCE PADS SHALL BE 6" THICK W/6x6-W2.9xW2.9 WWF PLACED ON 6" COMPACTED #58 STONE.
 - REINFORCING STEEL

REINFORCING BARS	ASTM A615, GRADE 60
WELDED WIRE FABRIC	ASTM A1064

DEVELOPMENT LENGTH

BAR SIZE	STRAIGHT	WITH HOOK	LAP SPLICE
#4	22"	6"	29"
#5	28"	8"	37"
#6	32"	10"	42"
 - STRUCTURAL AND MISCELLANEOUS STEEL

STEEL PLATE, ANGLE & CHANNEL	ASTM A36
STRUCTURAL BOLTS	ASTM F3125, GRADE A325
ANCHOR BOLTS	ASTM F1554
WELDING ELECTRODES	E70XX
 - MASONRY

CONCRETE MASONRY UNIT	f'm=1,500 PSI
MORTAR (TYPE S OR M)	f'm=1,900 PSI
GROUT	f'm=2,000 PSI

LINTELS
OPENINGS 3'-4" WIDE OR LESS SHALL BE REINFORCED MASONRY LINTELS WITH 1.5x3x3/8" BRICK LINTEL WHERE APPLICABLE. OPENINGS 8'-0" WIDE OR LESS BUT GREATER THAN 3'-4" SHALL BE REINFORCED MASONRY LINTELS WITH 1.5x3x3/8" (LLV) BRICK LINTEL WHERE APPLICABLE.

FOR MASONRY OPENINGS OVER 12 FEET WIDE, PROVIDE SOLID (OR GROUT FILLED) MASONRY JAMBS FULL HEIGHT OF THE OPENING, BY 1'-4" LENGTH.

A MINIMUM BEARING OF 8" ON EACH END SHALL BE PROVIDED FOR ALL LINTELS.

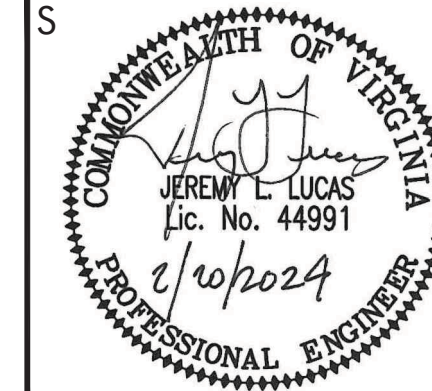
PROVIDE STANDARD TRUSS DUR-O-WALL AT 16" VERTICALLY IN MASONRY WALLS.

LOCATE #5 DOWELS INTO CONCRETE FOOTING TO MATCH VERTICAL WALL REINFORCING.

PROVIDE A CONTINUOUS BOND BEAM WITH 2-#5 BARS AT THE TOP OF EACH WALL.

Peed & Bortz, L.L.C.
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20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
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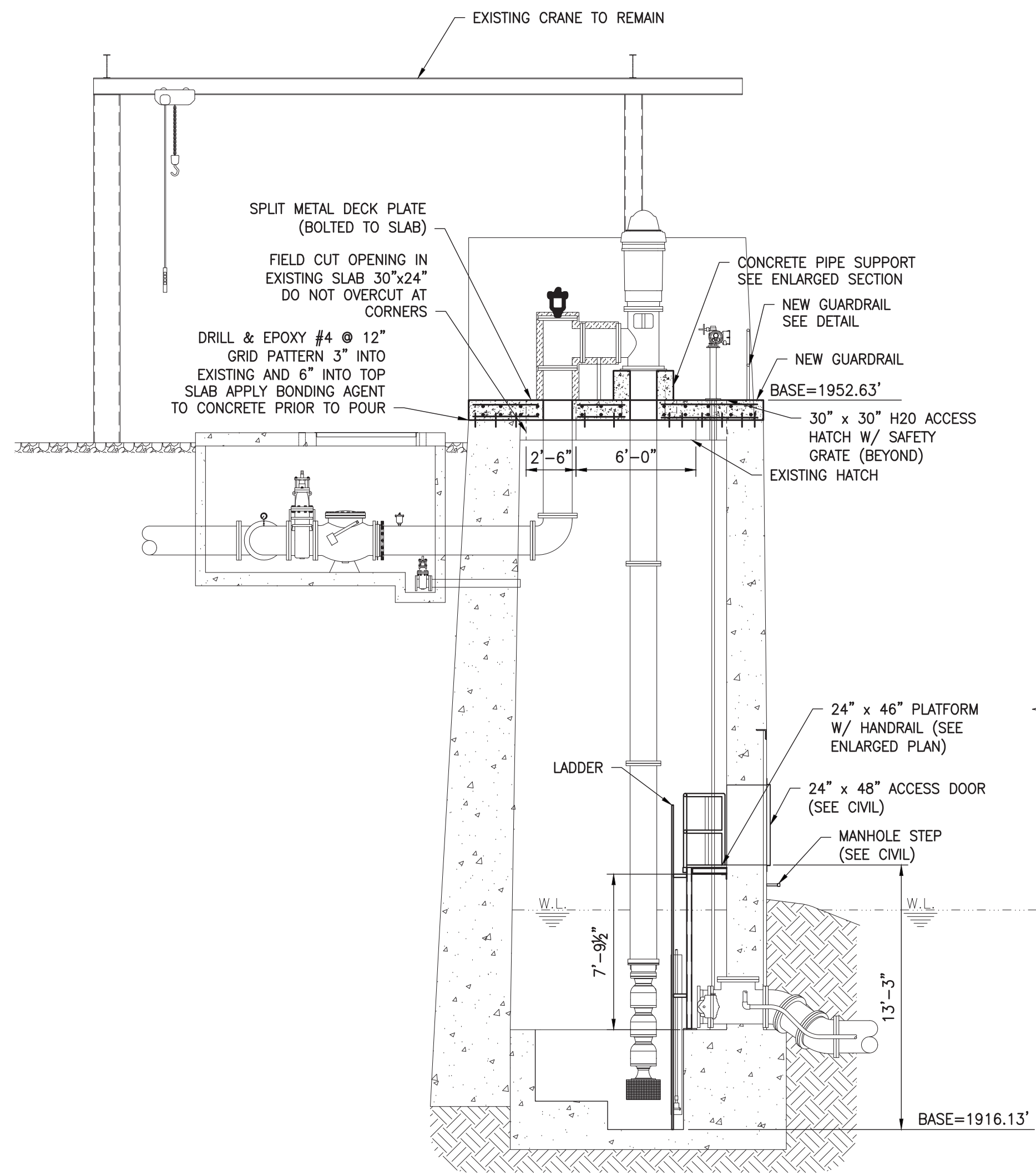


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CJF
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JLL
DATE:
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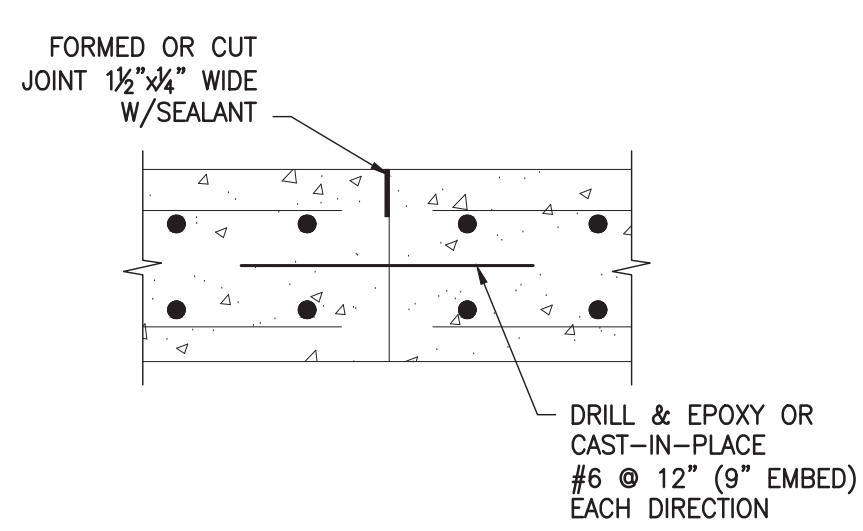
SHEET DESCRIPTION:
STRUCTURAL NOTES,
ABBREVIATIONS, AND
TYPICAL DETAILS

S01

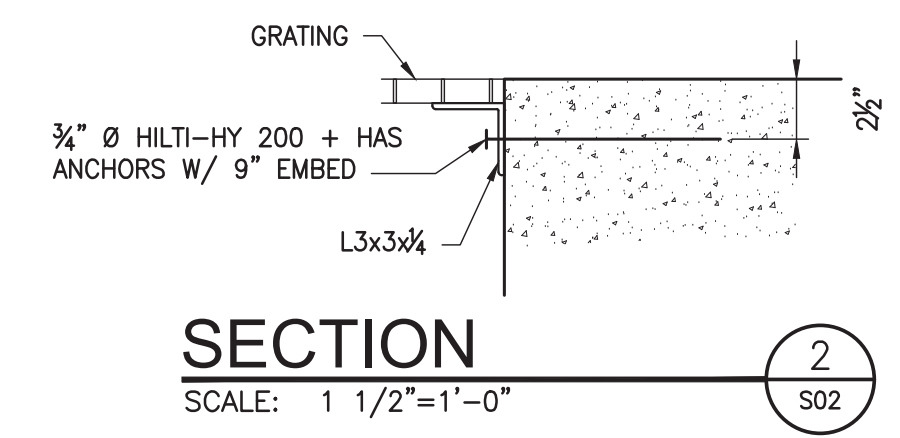




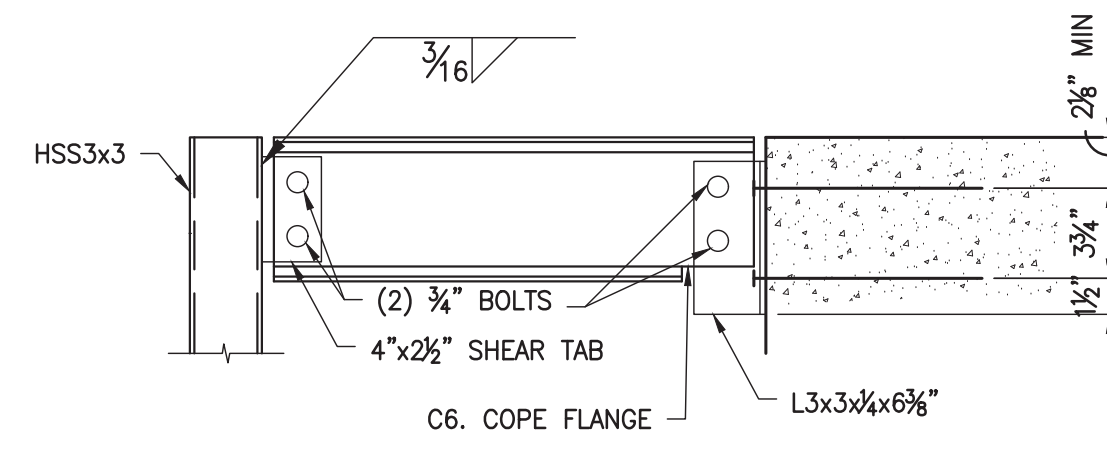
SECTION 1
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S02



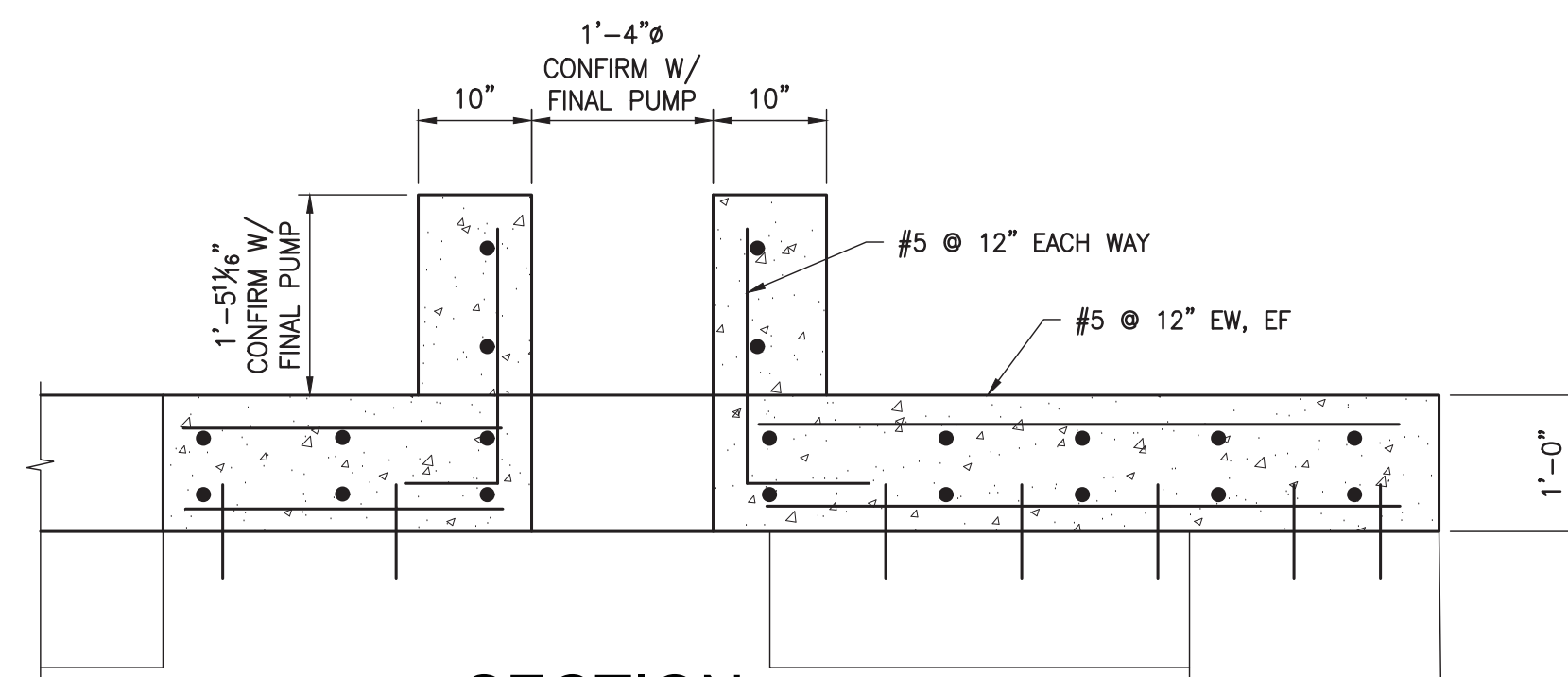
CONSTRUCTION JOINT DETAIL
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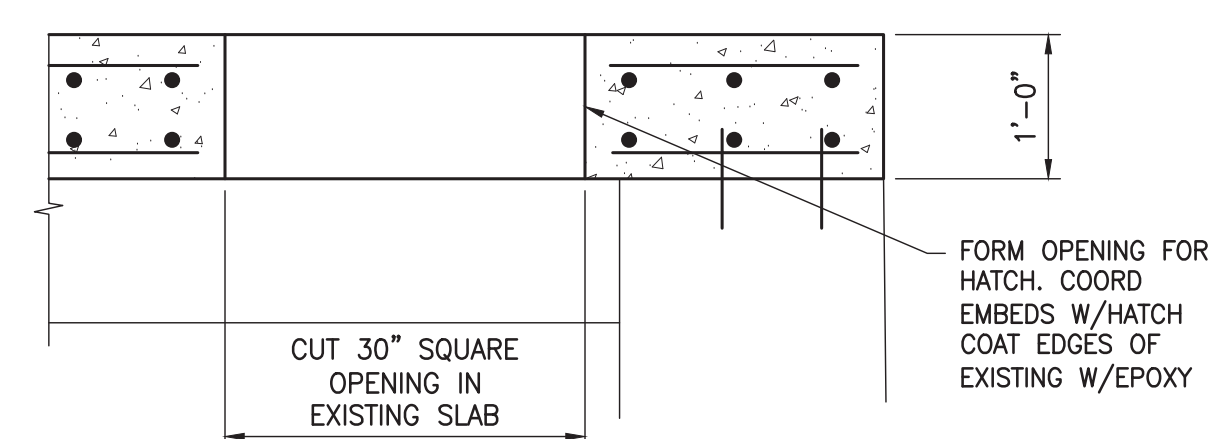
SECTION 2
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S02



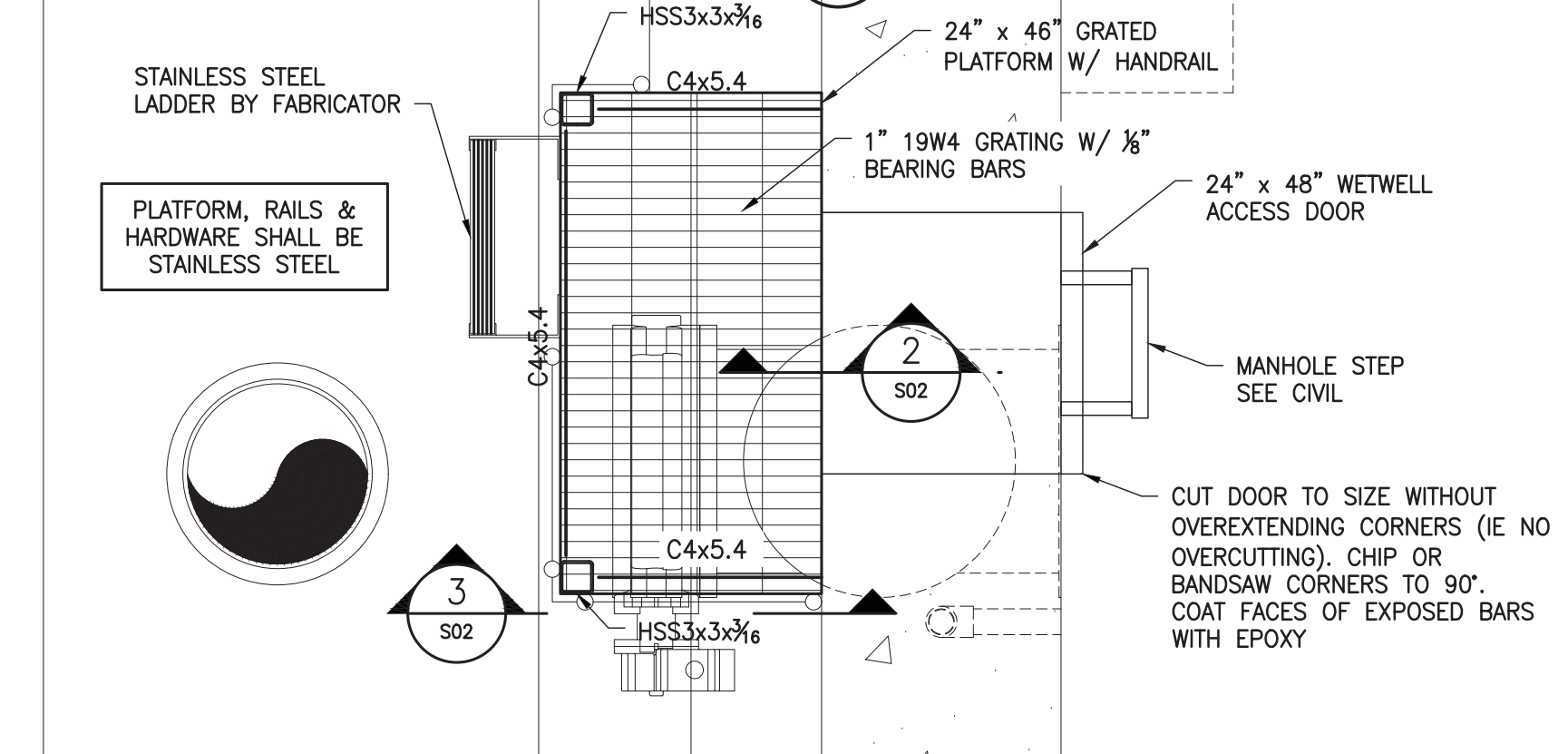
SECTION 3
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S02



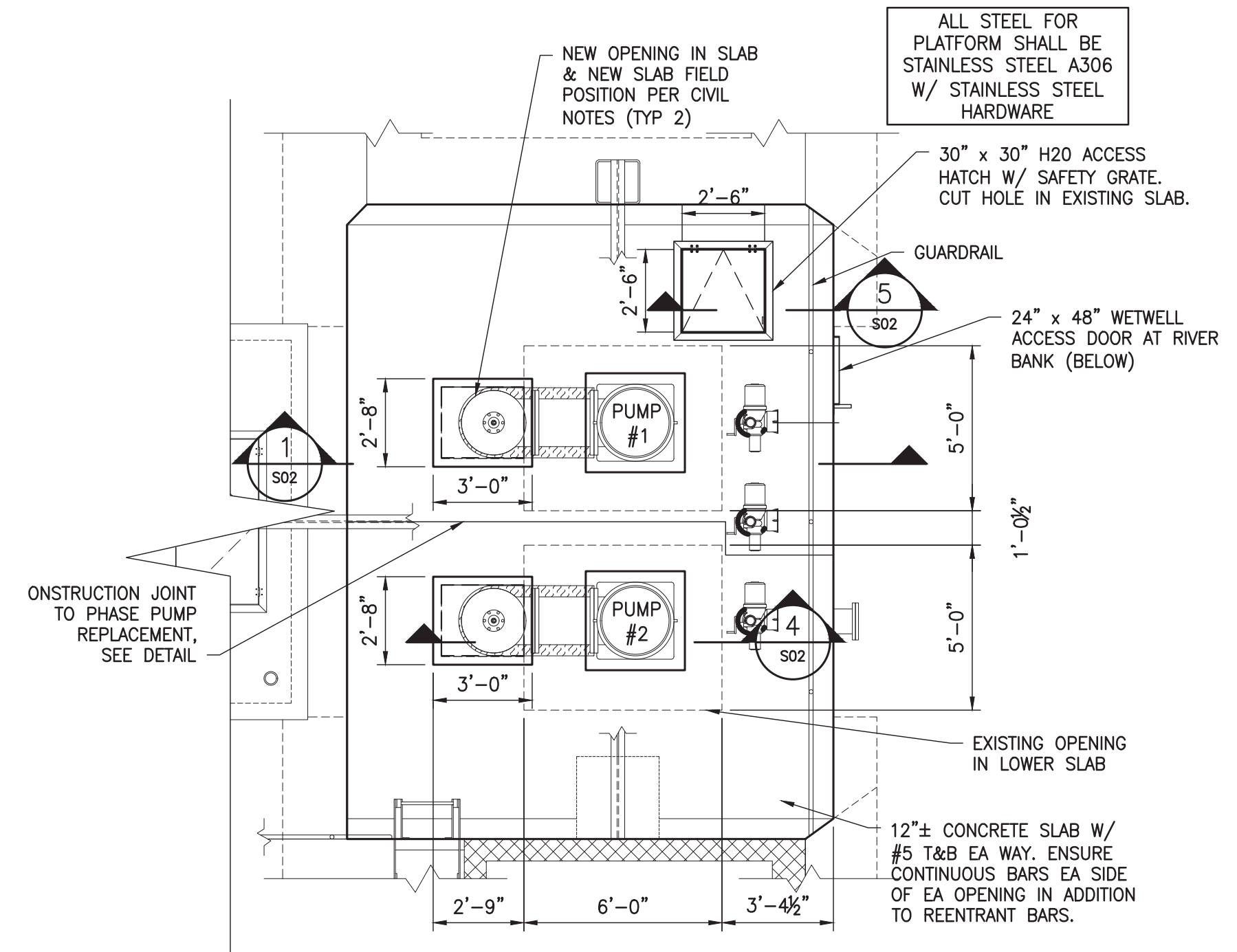
SECTION 4
SCALE: 3/4"=1'-0"
S02



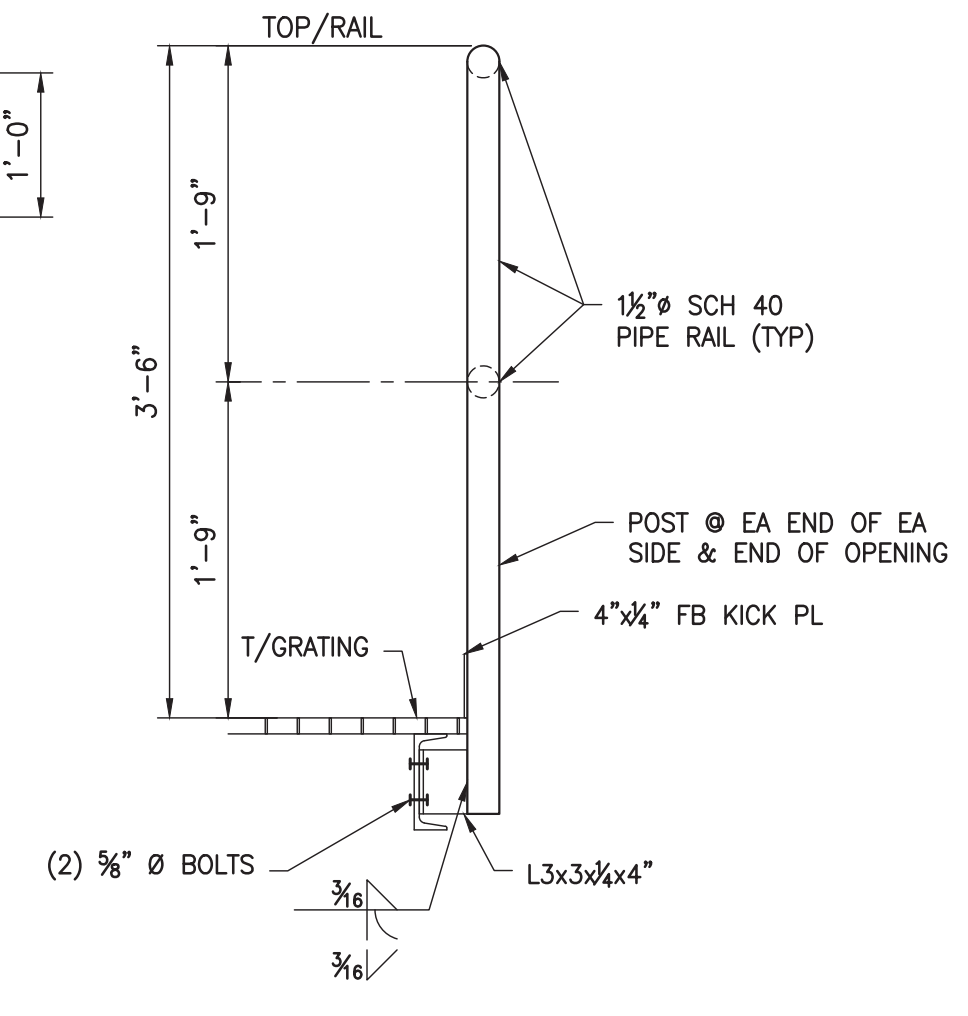
SECTION 5
SCALE: 3/4"=1'-0"
S02



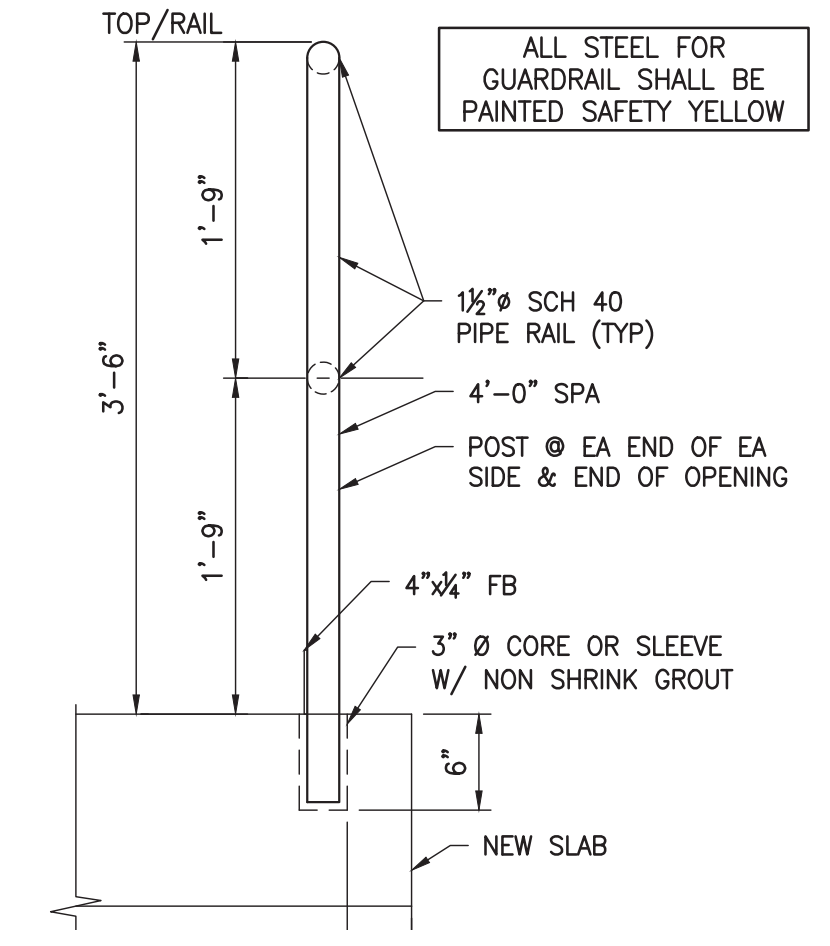
ENLARGED GRATED PLATFORM PLAN
SCALE: 3/4"=1'-0"



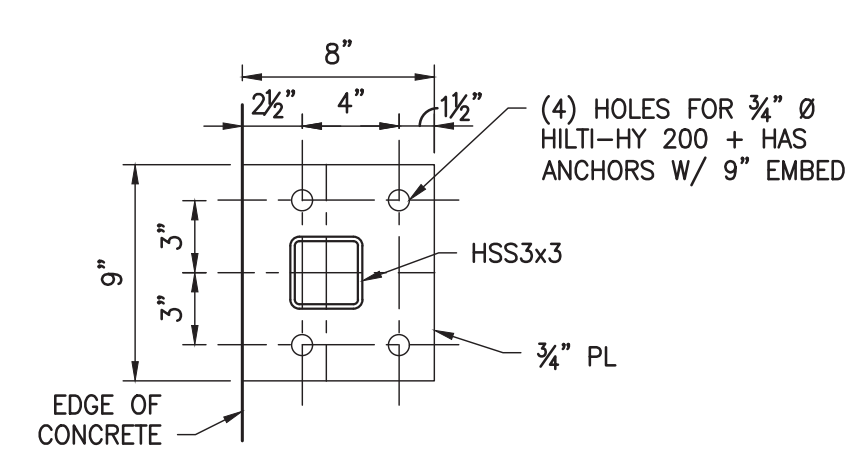
ABOVE GRADE PLAN
SCALE: 1/4"=1'-0"



GUARDRAIL ON PLATFORM DETAIL
SCALE: 1"=1'-0"



GUARDRAIL AT CONCRETE SLAB DETAIL
SCALE: 1"=1'-0"

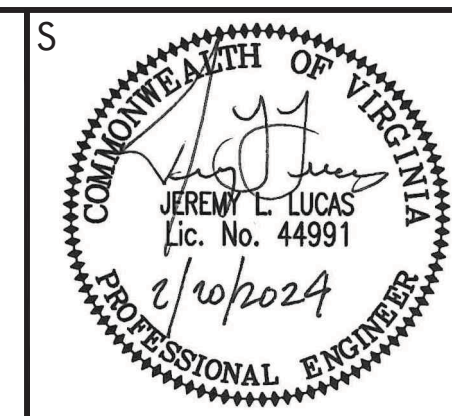


PLATFORM BASE PLATE DETAIL
SCALE: 1-1/2"=1'-0"

MASTER ENGINEERS & DESIGNERS
904 Lakeside Drive, Lynchburg, VA 24501
660-011 434-846-1350 Fax: 434-846-1351

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3211 FAX: (540) 394 - 3215

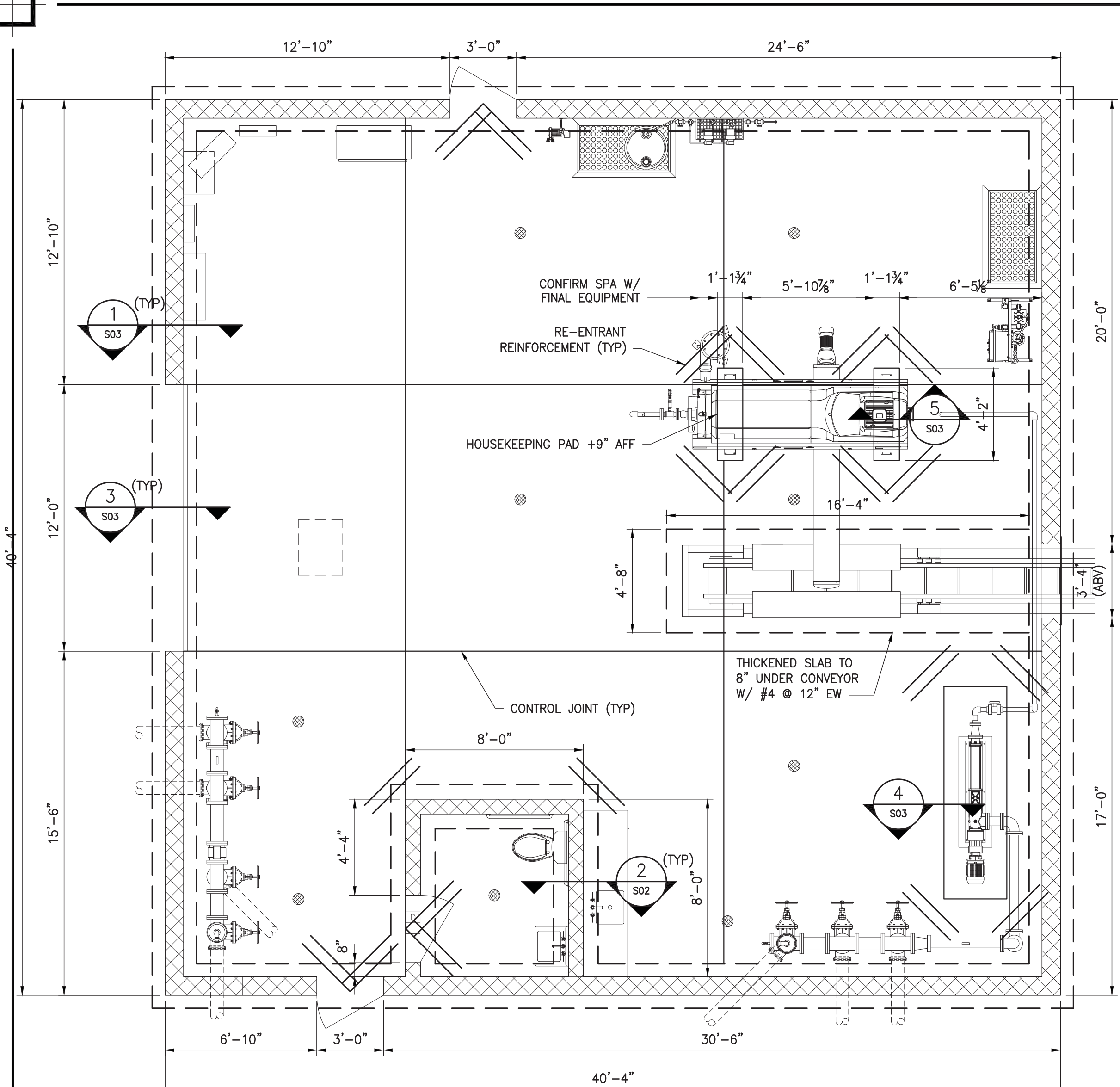
**NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION**
AUSTINVILLE VIRGINIA



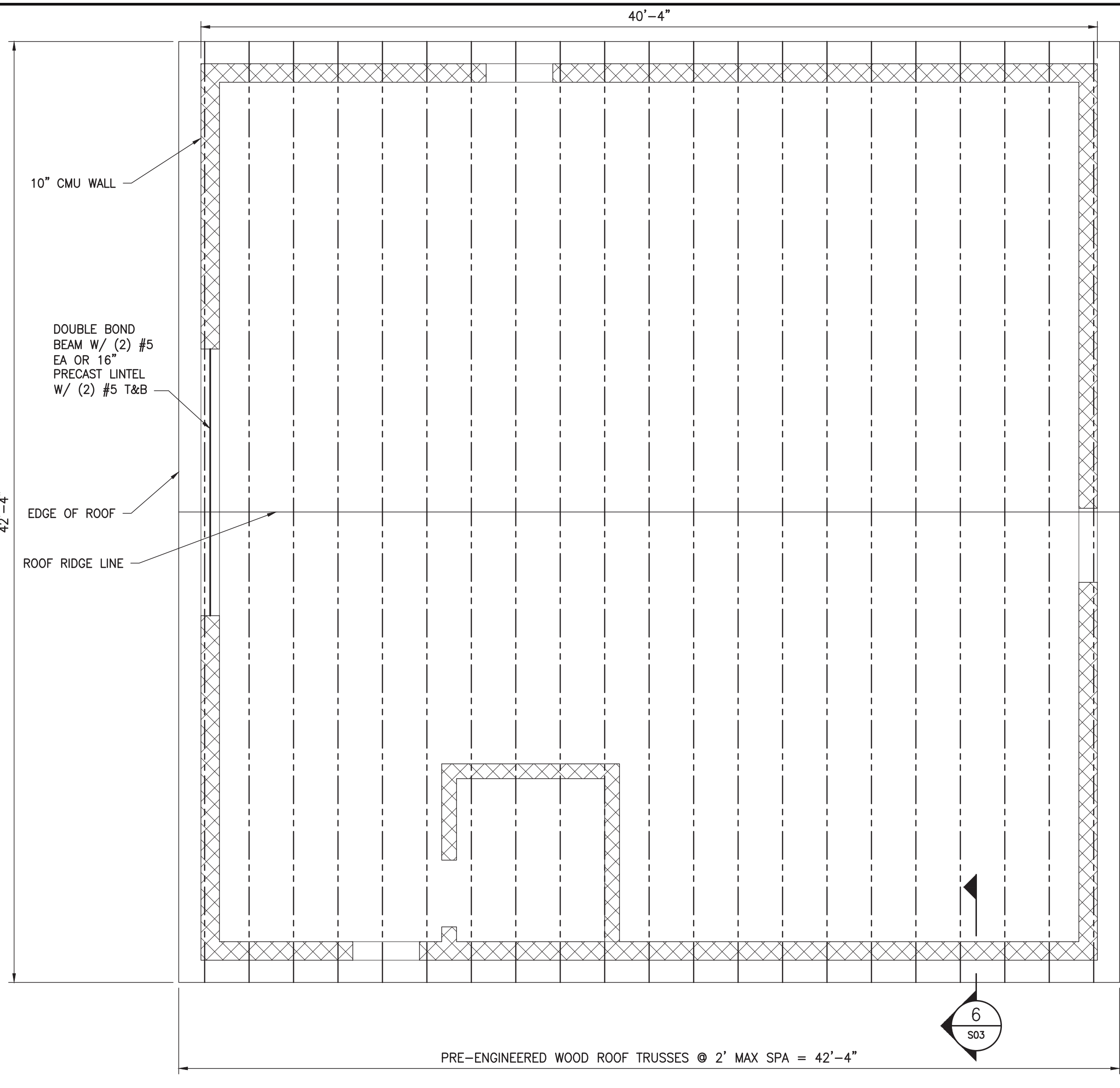
DRAWN BY: MCS
REVIEW BY: JLL
DATE: 02/20/2024
REVISION:

SHEET DESCRIPTION:
RAW WATER INTAKE
STRUCTURAL DETAILS

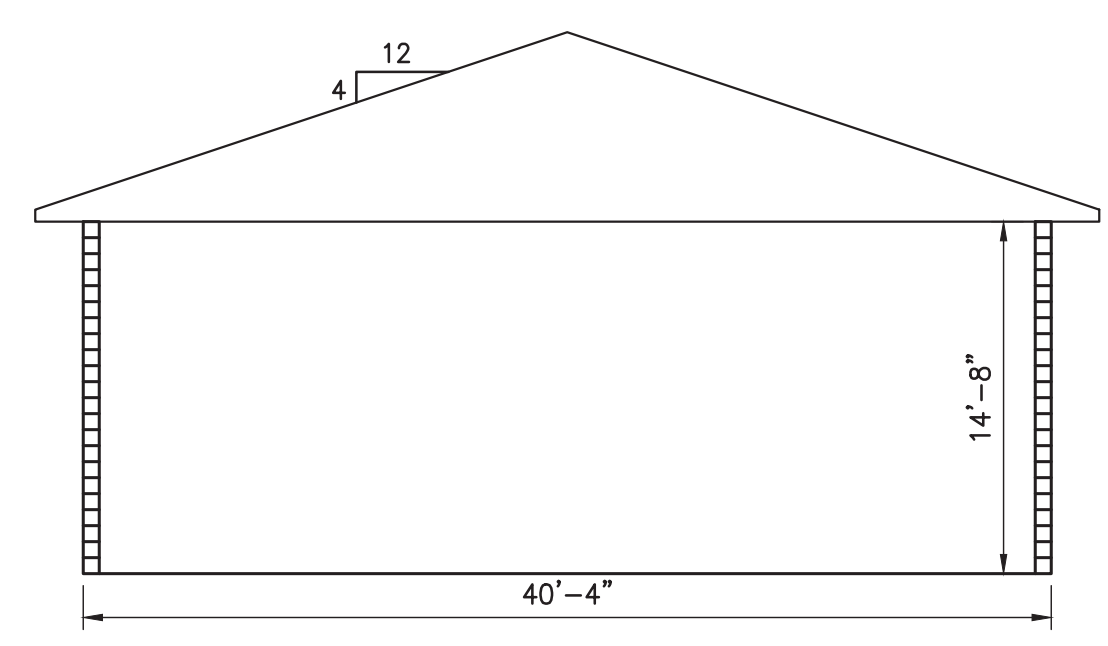
S02



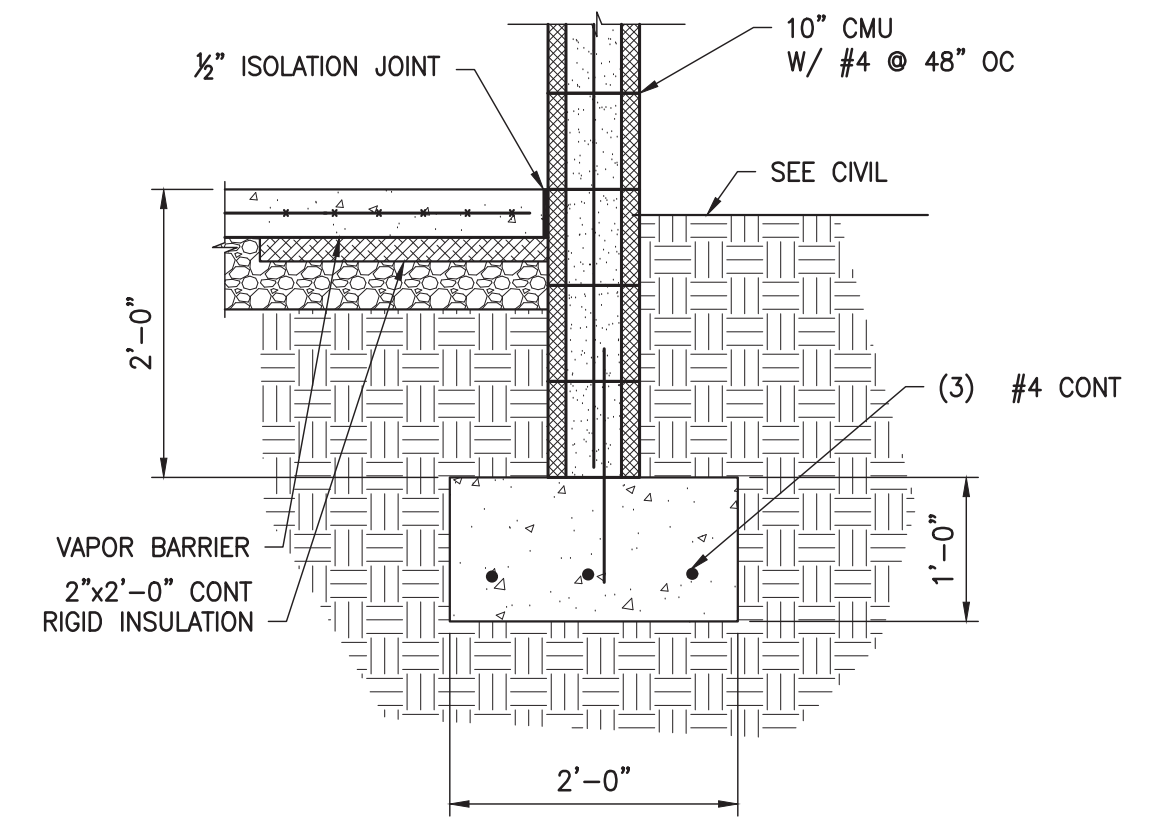
SLUDGE DEWATERING BUILDING FOUNDATION PLAN
SCALE: 1/4"=1'-0"



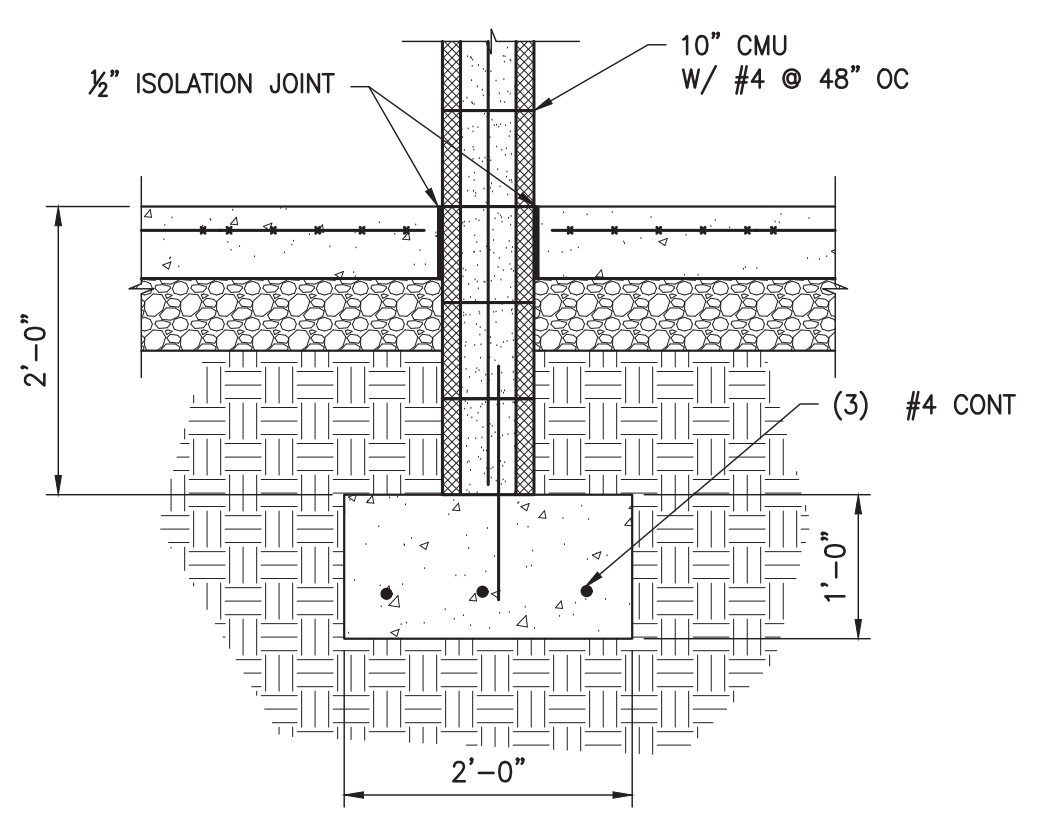
SLUDGE DEWATERING BUILDING ROOF FRAMING PLAN
SCALE: 1/4"=1'-0"



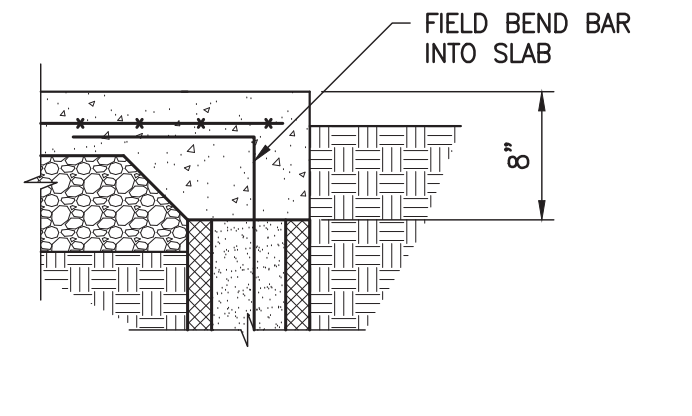
DEWATERING BUILDING TRUSS PROFILE
SCALE: N.T.S



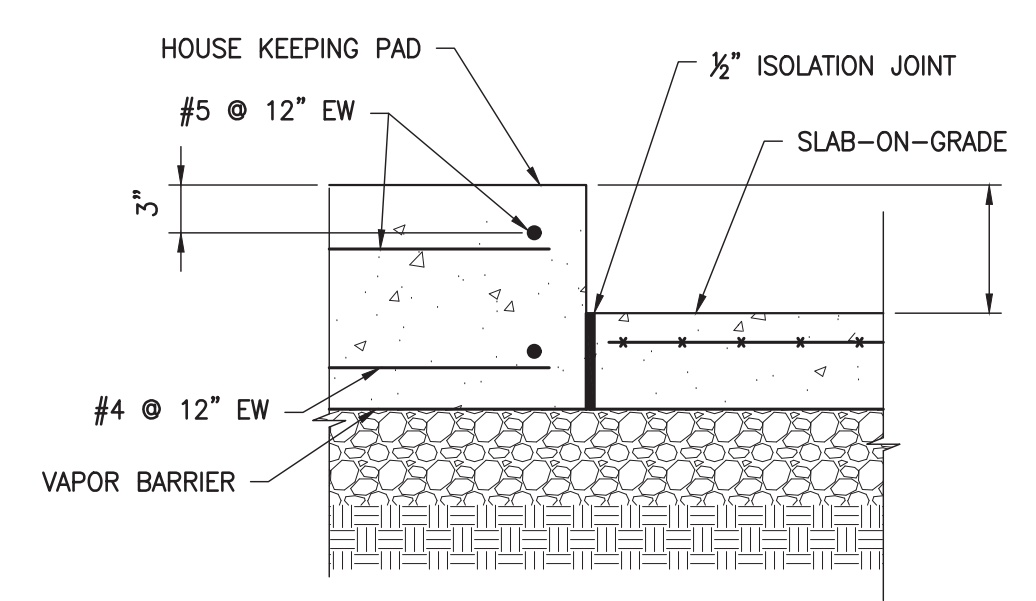
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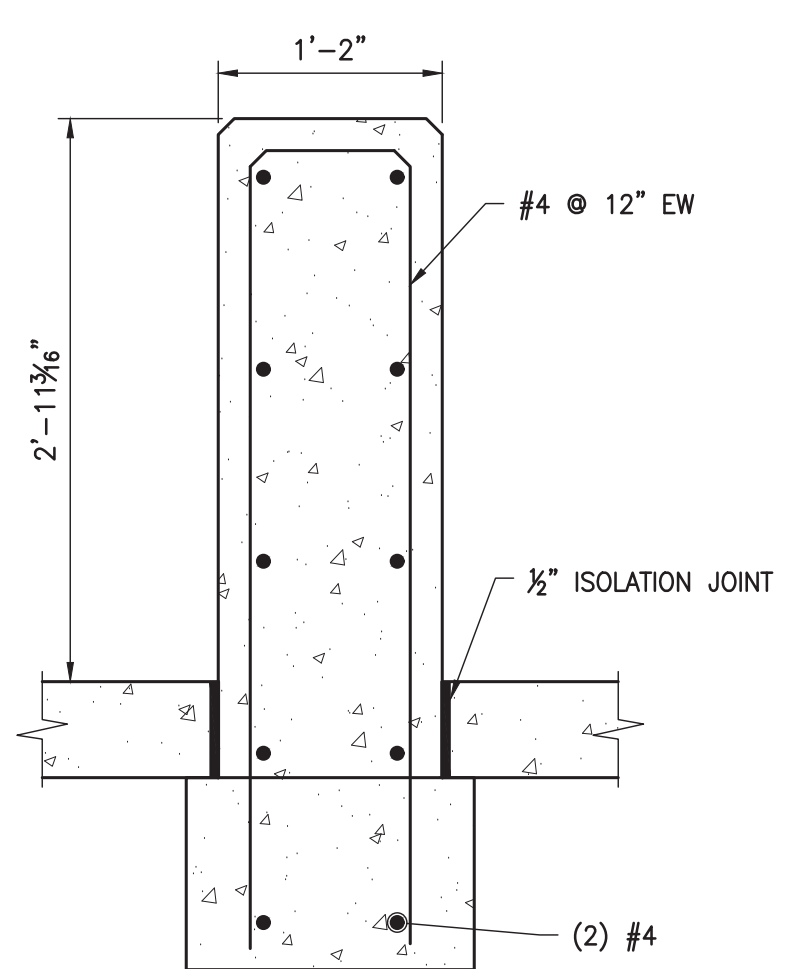
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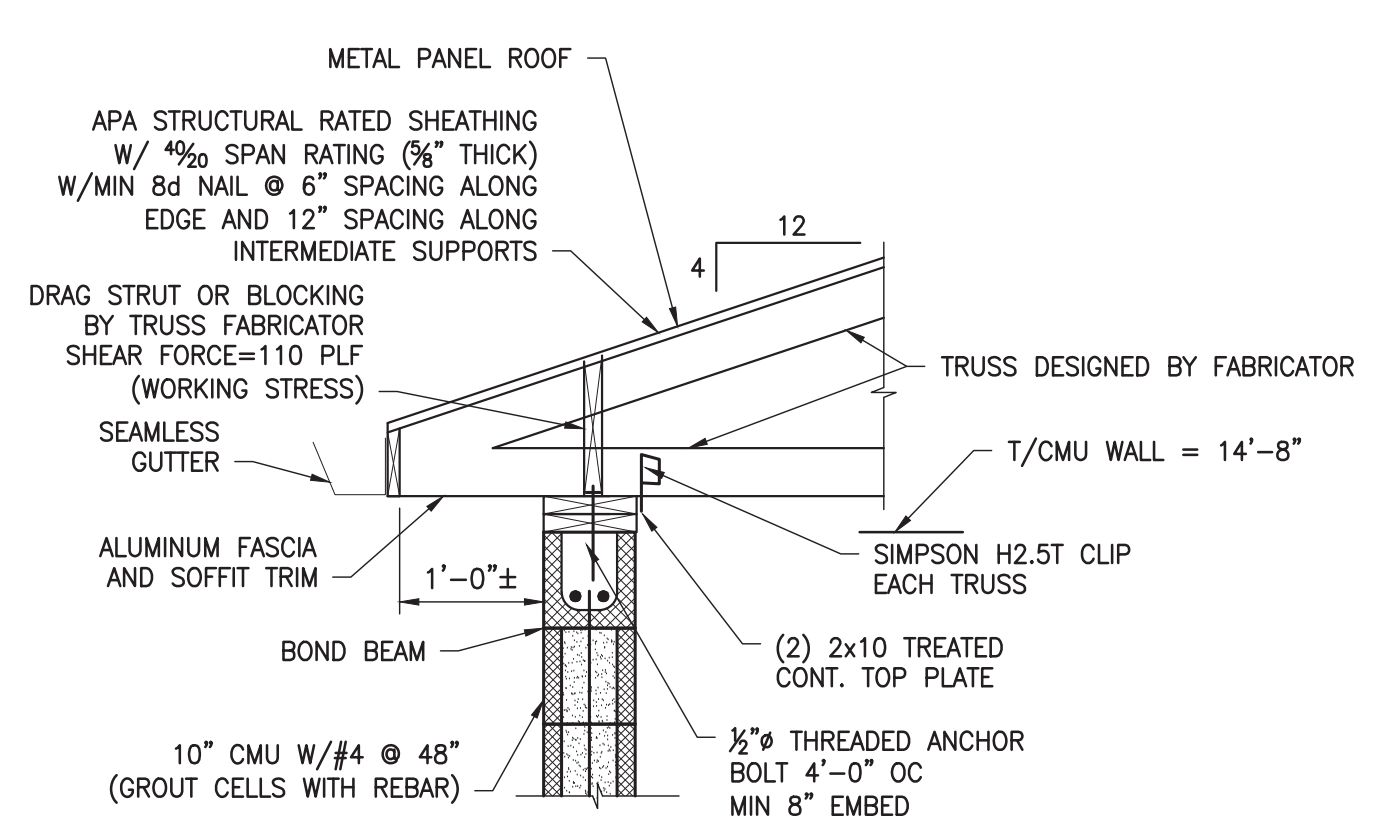
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SECTION 4
SCALE: 1"=1'-0"



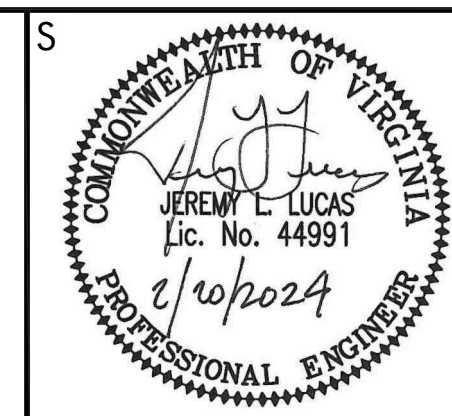
SECTION 5
SCALE: 1"=1'-0"



SECTION 6
SCALE: 3/4"=1'-0"

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CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3211 FAX: (540) 394 - 3215

NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA

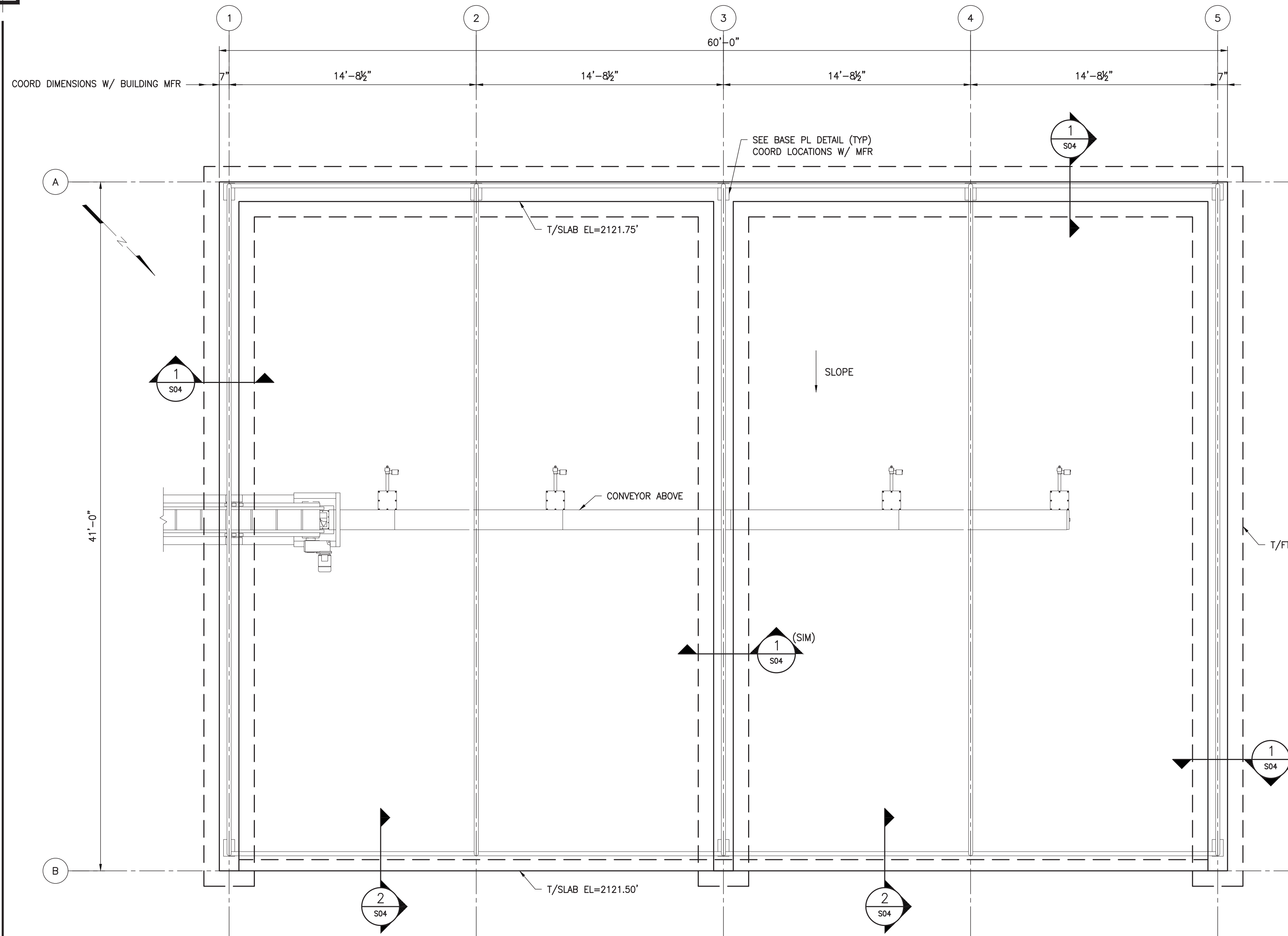


DRAWN BY: CJF
REVIEW BY: JLL
DATE: 02/20/2024
REVISION:

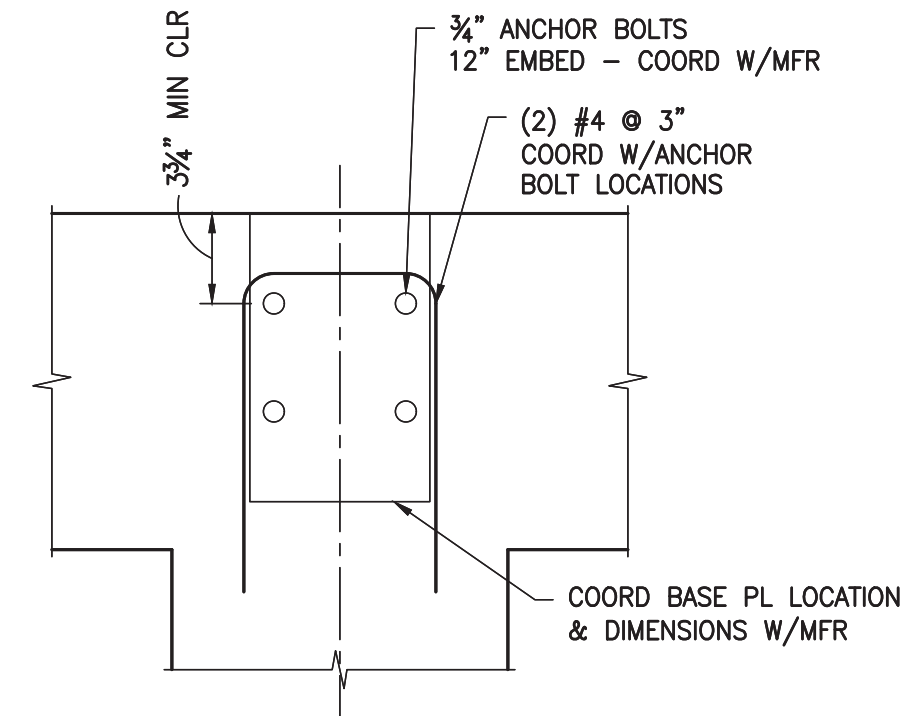
SHEET DESCRIPTION:
SLUDGE DEWATERING
BUILDING STRUCTURAL
PLANS AND DETAILS

S03

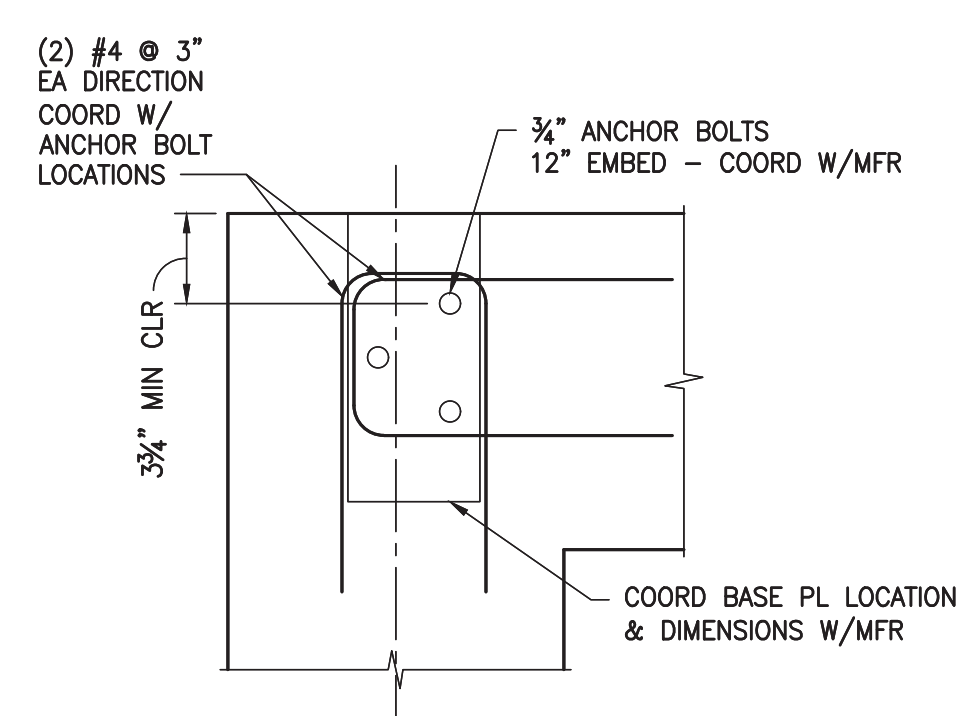
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DRY SOLIDS SHELTER FOUNDATION PLAN
SCALE: 1/4"=1'-0"

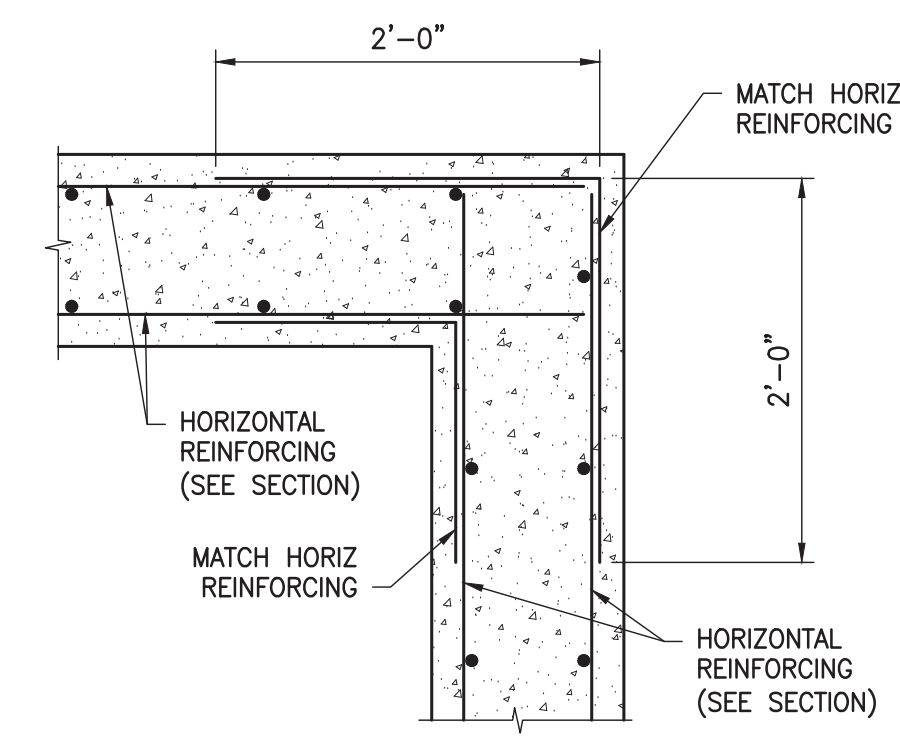


CORNER BASE PLATE

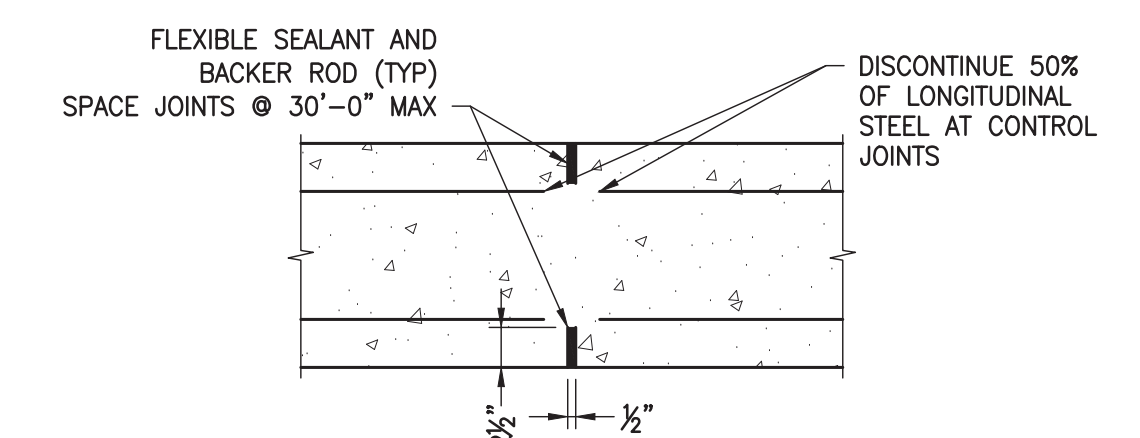


SIDE BASE PLATE

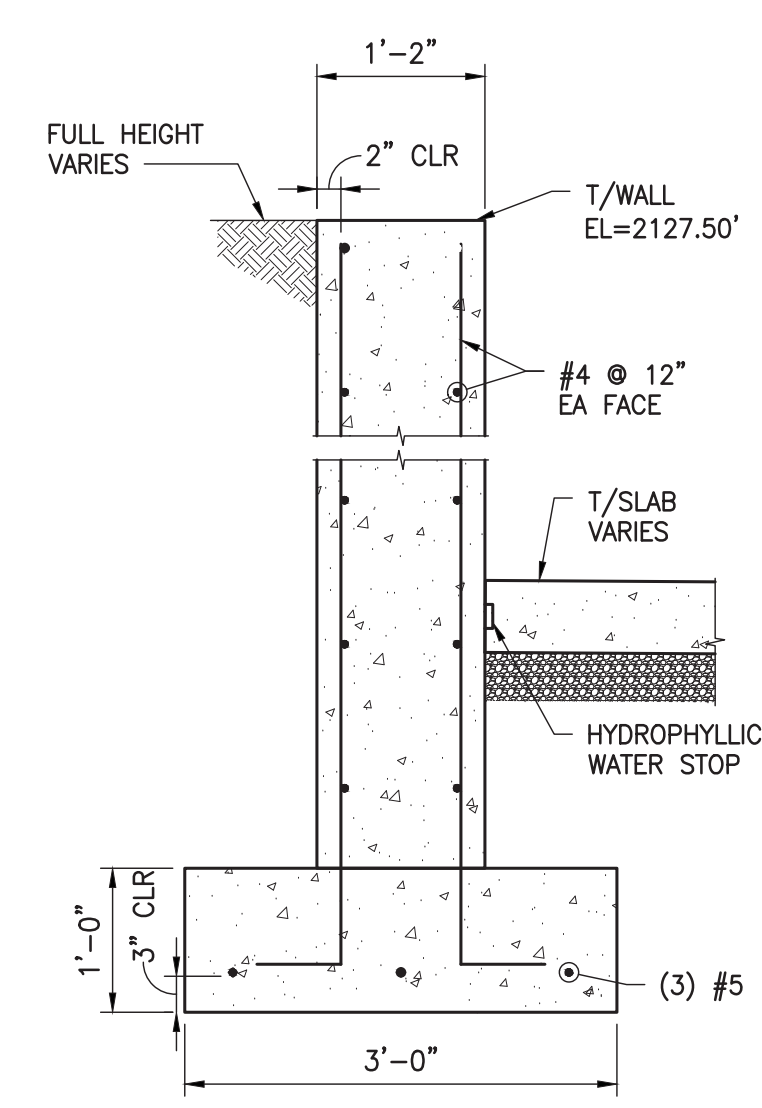
BASE PLATE DETAILS
SCALE: 1-1/2"=1'-0"



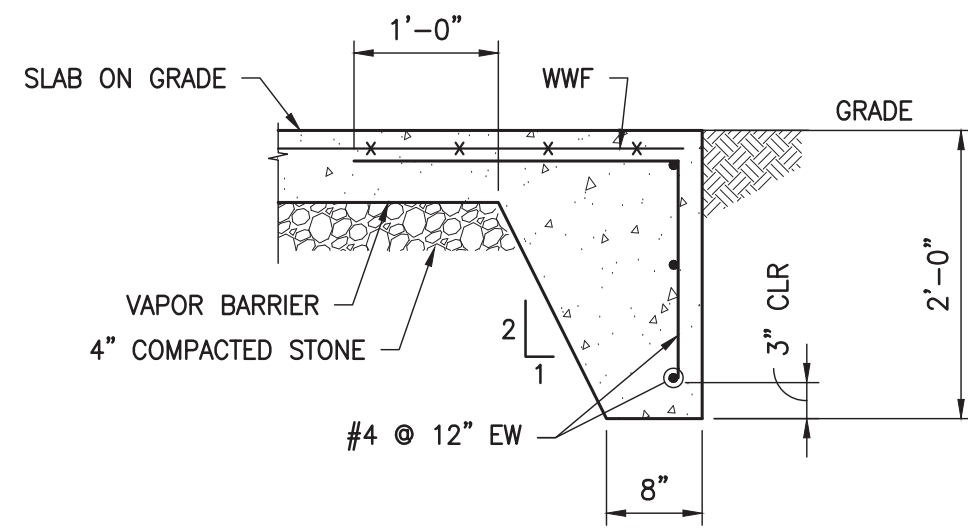
CORNER REINFORCING DETAIL
SCALE: 1"=1'-0"



TYPICAL CONCRETE WALL CONTROL JOINT
SCALE: 1"=1'-0"



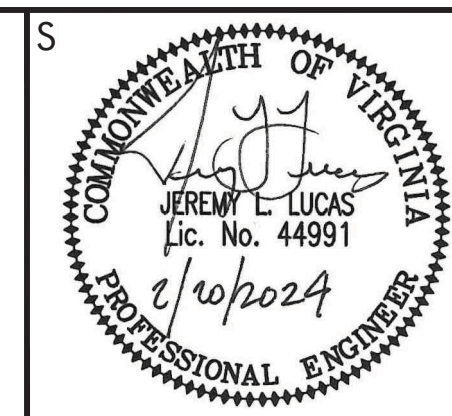
SECTION 1
SCALE: 3/4"=1'-0"



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

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CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3214 FAX: (540) 394 - 3215

NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



DRAWN BY: MCS
REVIEW BY: JLL
DATE: 02/20/2024
REVISION:

SHEET DESCRIPTION:
DRY SOLIDS SHELTER
FOUNDATION PLAN AND
DETAILS

S04

MASTER ENGINEERS & DESIGNERS
904 Lakeside Drive, Lynchburg, VA 24501
660-011 434-846-1350 Fax: 434-846-1351

SPECIFICATIONS - HEATING, VENTILATING AND AIR CONDITIONING (HVAC)

- 1.0 GENERAL
- 1.01 THE CONTRACT DOCUMENTS APPLY TO THESE SPECIFICATIONS.
- 1.02 PROVIDE ALL NECESSARY LABOR AND MATERIALS FOR THE WORK SHOWN ON THE DRAWINGS, WHICH INCLUDES REMOVAL OF EQUIPMENT AND COMPONENTS TO BE REMOVED AS WELL AS INSTALLATION OF HVAC SYSTEMS.
- 1.03 WORK SHALL MEET REQUIREMENTS OF LOCAL BUILDING CODES AND ORDINANCES, APPLICABLE REQUIREMENTS OF THE VUSBC AND NFPA.
- 1.04 SUBMIT SHOP DRAWINGS FOR THE FOLLOWING:
- A. LOUVERS AND DAMPERS
 - B. HEATING AND AIR CONDITIONING EQUIPMENT, AND FANS
 - C. INSULATION
- 1.05 PLACING IN SERVICE:
- A. BEFORE BEING PLACED INTO OPERATION, ALL EQUIPMENT REQUIRING PREOPERATIONAL ATTENTION SHALL BE SERVICED IN ACCORDANCE WITH THE REQUIREMENTS OF THESE SPECIFICATIONS AND THE MANUFACTURER'S RECOMMENDATIONS.
 - B. THIS SERVICING SHALL INCLUDE LUBRICATION, CONTROL CALIBRATIONS AND ADJUSTMENTS, AND TESTING AND ADJUSTING OF OPERATING CONTROLS.
 - C. AT THE COMPLETION OF PERFORMANCE TEST AND FOLLOWING APPROVAL OF TEST RESULTS, THE CONTRACTOR SHALL RECHECK ALL EQUIPMENT AND VERIFY THAT EACH ITEM IS FUNCTIONING CORRECTLY.
 - D. FURNISH ALL NECESSARY EQUIPMENT AND ASSUME ALL COSTS INVOLVED TO PERFORM ALL TESTING, CLEANING, AND BALANCING OPERATIONS REQUIRED.
 - E. TEST, ADJUST AND BALANCE ALL SYSTEMS UNTIL DESIGN FUNCTION AND OPERATION ARE ACHIEVED. THE CONTRACTOR SHALL ENGAGE THE SERVICES OF AN INDEPENDENT CONTRACTOR WHO SPECIALIZES IN THE PRACTICE OF TESTING, ADJUSTING AND BALANCING MECHANICAL EQUIPMENT AND SYSTEMS.
- 2.0 PRODUCTS
- 2.01 DUCTWORK:
- A. DUCT SYSTEMS SHALL BE IN ACCORDANCE WITH SMACNA DUCT CONSTRUCTION STANDARDS, THE NATIONAL FIRE PROTECTION ASSOCIATION AND MANUFACTURER'S RECOMMENDATIONS WHERE APPLICABLE.
 - B. SYSTEMS AND MATERIALS: LOW VELOCITY A/C (GENERAL USE) GALVANIZED STEEL.
 - C. FITTINGS FOR ALL DUCT SYSTEMS SHALL BE OF THE SAME MATERIAL AS THE DUCT.
 - D. MATERIALS: GALVANIZED STEEL SHALL MEET REQUIREMENTS OF ASTM A-527, "STEEL SHEET, ZINC COATED BY THE HOT-DIP PROCESS, LOC-FORMING QUALITY." MANUAL DAMPER OPERATORS SHALL BE LOCKING TYPE AS MANUFACTURED BY VENTFABRICS, INC. OR YOUNG REGULATOR COMPANY. DUCT SPECIALTIES SHALL BE MANUFACTURED BY A COMPANY NORMALLY ENGAGED IN THE PRODUCTION AND DISTRIBUTION OF THE DEVICES USED. CONTRACTOR-FABRICATED SPECIALTIES SHALL NOT BE ALLOWED.
 - E. FLEXIBLE AIR DUCT SHALL BE FLEXMASTER TYPE 8M INSULATED FLEXIBLE DUCT. THE COMPLETE DUCT SHALL CONFORM TO NFPA 90A AND BE LISTED BY UNDERWRITER'S LABORATORIES AS 181 CLASS 1 AIR DUCT.

2.04 PIPING SCHEDULE

SERVICE	SIZE	PIPE TYPE	FITTING TYPE	VALVE TYPE	VALVE MFG & NO
CONDENSATE DRAINS	ALL SIZES	SCH. 40 PVC			
REFRIGERANT	ALL SIZES	TYPE ACR CLEANED & CAPPED	WROUGHT COPPER BRAZE		

2.05 INSULATION SCHEDULE

SERVICE	TYPE INSUL.	R - VALUE (MIN)	FINISH IN CNCL. AREAS	FINISH IN FNISH AREAS	NOTES
(1) PIPING					
CONDENSATE	GLASS FIBER	R-3	INTEGRAL FIRE RETARDANT VAP BARRIER JKT		1
REFRIGERANT LOW TEMP, ALL SIZES	FLEXIBLE ELASTOMERIC	R-3	NONE	TWO COATS ARMAFLEX FINISH	
(2) DUCTWORK					
A/C SUPPLY & RETURN	FLEXIBLE GLASS FIBER	R-6	FSK VAPOR BARRIER JACKET		1, 2

- NOTES:
1. APPLY FLEXIBLE GLASS FIBER INSULATION IN CONCEALED AREAS ONLY.
 2. APPLY RIGID INSULATION AT LOCATIONS WHERE DUCTS ARE SUPPORTED FROM BELOW.

3.0 EXECUTION

- 3.01 TEST FIELD-ASSEMBLED REFRIGERANT PIPING AND APPARATUS FOR ONE HOUR WITH DRY CARBON DIOXIDE OR NITROGEN, PLUS A SMALL AMOUNT OF REFRIGERANT. TEST PRESSURES SHALL BE IN ACCORDANCE WITH THE AMERICAN STANDARD SAFETY CODE FOR MECHANICAL REFRIGERATION.
- 3.02 DUCT SYSTEMS SHALL BE BALANCED TO PROVIDE AIR QUANTITIES WITHIN TEN (10) PERCENT OF SPECIFIED REQUIREMENTS.

GENERAL NOTES

1. WHERE DUCTWORK, PIPING, OR ANY OTHER MECHANICAL EQUIPMENT IS INSTALLED ABOVE THE CEILING STRUCTURE, SUFFICIENT CLEARANCE SHALL BE PROVIDED BELOW ALL LOW POINTS OF THIS EQUIPMENT FOR THE INSTALLATION OF THE FINISHED CEILING AND ITS STRUCTURE AND ALL CEILING-MOUNTED EQUIPMENT INCLUDING CEILING-MOUNTED MECHANICAL EQUIPMENT, LIGHT FIXTURES, PLUMBING LINES, SPRINKLER HEADS, ETC. CLEARANCES REQUIRED FOR THE INSTALLATION OF THIS CEILING-MOUNTED EQUIPMENT SHALL BE VERIFIED AND COORDINATED WITH THE GENERAL CONTRACTOR AND ALL INVOLVED SUBCONTRACTORS BEFORE INSTALLING THE MECHANICAL EQUIPMENT.
2. WHERE SPACE IS LIMITED, SUCH AS IN FURRED CEILING SPACES AND CHASES, ROUTES AND CLEARANCES AND INSTALLATION PROCEDURES FOR DUCTWORK, PIPING, VALVES, AND OTHER MECHANICAL EQUIPMENT SHALL BE VERIFIED AND COORDINATED WITH OTHER WORK BEFORE EQUIPMENT IS INSTALLED.
3. ALL STRUCTURAL STEEL AND OTHER MATERIALS REQUIRED FOR OVERHEAD-SUSPENDED MECHANICAL EQUIPMENT SHALL BE PROVIDED BY MECHANICAL CONTRACTOR. ALL NECESSARY REINFORCING IN BUILDING STRUCTURE SHALL BE PROVIDED BY GENERAL CONTRACTOR.
4. GRILLE AND OTHER EQUIPMENT MOUNTING HEIGHTS WHERE SHOWN ON DRAWINGS ARE MEASURED FROM FINISHED FLOOR TO BOTTOM EDGE OF OPENING UNLESS OTHERWISE INDICATED.
5. MOUNT PROGRAMMABLE THERMOSTATS AND EXHAUST FAN TIMER SWITCHES AT 4'-0" ABOVE FINISHED FLOOR.
6. IF ANY EQUIPMENT OTHER THAN THAT SHOWN OR SPECIFIED IS FURNISHED, THE CONTRACTOR SHALL VERIFY THAT THE EQUIPMENT CAN BE INSTALLED IN THE SPACE AVAILABLE, INCLUDING PASSAGE THROUGH DOORS AND ACCESS DOORS AND ACCESS TO THOSE PARTS OF THE EQUIPMENT REQUIRING SERVICE.
7. ALL DUCTS 30" WIDE OR WIDER SHOWN RUNNING SIDE-BY-SIDE ON THE PLANS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 6" BETWEEN THEM TO PROVIDE SPACE FOR CEILING SUSPENSION DEVICES.
8. OPEN ENDS OF ALL RETURN AND EXHAUST DUCTS IN THE FURRED SPACE ABOVE THE CEILING SHALL BE COVERED WITH 1/2" MESH G.I. SECURELY ATTACHED TO THE DUCTS.
9. ALL DUCTWORK AND PIPING SHALL BE LOCATED ABOVE NEW OR EXISTING CEILING UNLESS NOTED OTHERWISE.
10. RUN CONDENSATE LINE FROM DRAINS ON AIR HANDLING UNITS TO NEARBY FLOOR DRAINS UNLESS OTHERWISE SHOWN. DRAINS SHALL BE SAME SIZE AS TAPPING ON UNIT EXCEPT NOT SMALLER THAN 1".
11. SEE SPECIFICATIONS FOR DESCRIPTION OF DUCTWORK INSULATION.
12. OFFSET DUCTS AND PIPING WHERE NECESSARY TO CLEAR OTHER WORK SUCH AS BEAMS, PIPES, ELECTRICAL EQUIPMENT, ETC., COORDINATE DUCTWORK INSTALLATION WITH OTHER TRADES TO AVOID SPACE CONFLICTS.
13. ALL CEILING-MOUNTED DIFFUSERS AND GRILLES IN FURRED CEILING SHALL BE SYMMETRICALLY LOCATED WITH RESPECT TO LIGHTING FIXTURES. DO NOT SCALE DRAWINGS FOR LOCATIONS. COORDINATE EXACT LOCATIONS WITH ELECTRICAL CONTRACTOR AND REFER TO REFLECTED CEILING PLAN.
14. WHERE CONNECTIONS OR ALTERATIONS ARE MADE TO EXISTING PIPING, OR OTHER MECHANICAL EQUIPMENT, THE EXACT LOCATION AND CONFIGURATION OF THIS EQUIPMENT SHALL BE DETERMINED ON THE JOB SITE. ROUTE AND CLEARANCES FOR NEW PIPING, OR OTHER MECHANICAL EQUIPMENT CONNECTING TO EXISTING EQUIPMENT SHALL BE VERIFIED ON THE JOB SITE BEFORE FABRICATING ANY NEW EQUIPMENT.
15. WHERE ANY PART OF BUILDING OR EXISTING EQUIPMENT IS CUT OR OTHERWISE DISFIGURED TO PERMIT INSTALLATION OF NEW EQUIPMENT OR RELOCATION OF EXISTING EQUIPMENT, THIS PART OF BUILDING OR EXISTING EQUIPMENT SHALL BE REPAIRED OR REPLACED TO MATCH EXISTING.
16. FLEXIBLE DUCTWORK SHALL BE LIMITED TO A MAXIMUM LENGTH OF 5'-0".
17. PROVIDE AND INSTALL ACCESS DOORS IN DRYWALL TO MATCH EXISTING FOR ACCESS TO ALL BALANCING DAMPERS AND EQUIPMENT.
18. AIR-BALANCE REPORT SHALL ACCOMPANY A SET OF AS-BUILT PLANS INDICATING EXACT TO-SCALE LOCATIONS AND FINAL BALANCE AIR RATES. MAINTAIN A MINIMUM OF ONE INTACT SET OF PROJECT PLANS AND SPECIFICATIONS AT JOB SITE MARKED TO SHOW ALL DEVIATIONS PERMITTED DURING CONSTRUCTION AS THE WORK IS INSTALLED. ALL MARKS SHALL BE RED IN COLOR, COMPLETE, CLEAR AND LEGIBLE.

ABBREVIATIONS

AFB	ABOVE FINISHED FLOOR
BTUH	BRITISH THERMAL UNIT PER HOUR
CD	CEILING DIFFUSER
CFM	CUBIC FEET PER MINUTE
DB	DRY BULB
DN	DOWN
(E)	EXISTING
EAT	ENTERING AIR TEMPERATURE
ETR	EXISTING TO REMAIN
FPM	FEET PER MINUTE
HP	HORSEPOWER
LAT	LEAVING AIR TEMPERATURE
MBH	THOUSAND BTU PER HOUR
MFR	MANUFACTURER
MIN	MINIMUM
MVD	MANUAL VOLUME DAMPER
NOM	NOMINAL
NTS	NOT TO SCALE
OA	OUTSIDE AIR
PD	PRESSURE DROP
RG	RETURN GRILLE
RPM	REVOLUTIONS PER MINUTE
SP	STATIC PRESSURE (INCHES OF WATER)
TYP	TYPICAL
WB	WET BULB TEMPERATURE, DEG. °F

SYMBOLS

	FAN COIL UNIT
	EXHAUST FAN
	ELECTRIC WATER HEATER
	CONDENSING UNIT
	UNIT HEATER
	WALL LOUVER
	THERMOSTAT
	FORCED AIRFLOW
	INDUCED AIRFLOW
	NEW WORK PLAN NOTE

SHEET METAL

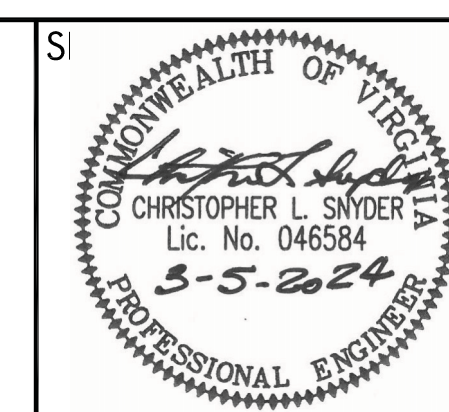
	SUPPLY DUCT UP		MANUAL VOLUME DAMPER RUSKIN MD-35 OR EQUAL
	SUPPLY DUCT DOWN		CEILING DIFFUSER
	EXHAUST OUTSIDE AIR OR RETURN DUCT UP		RETURN OR RELIEF AIR REGISTER
	EXHAUST OUTSIDE AIR OR RETURN DUCT DOWN		DENOTES EXISTING EQUIPMENT
	DUCT WITH TURNING VANES		REDUCER
	SPIN-IN FITTING WITH DAMPER		SQUARE TO ROUND
	LATERAL SQUARE TO ROUND TAKEOFF		FLEXIBLE DUCT
			ROUND DUCT

PIPING

	CONDENSATE
	RISER
	DROP

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NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



DRAWN BY:
ATE
REVIEW BY:
CLS
DATE:
3/5/2024
REVISION:

SHEET DESCRIPTION:
HVAC
LEGEND, NOTES & ABBREVIATIONS

M1

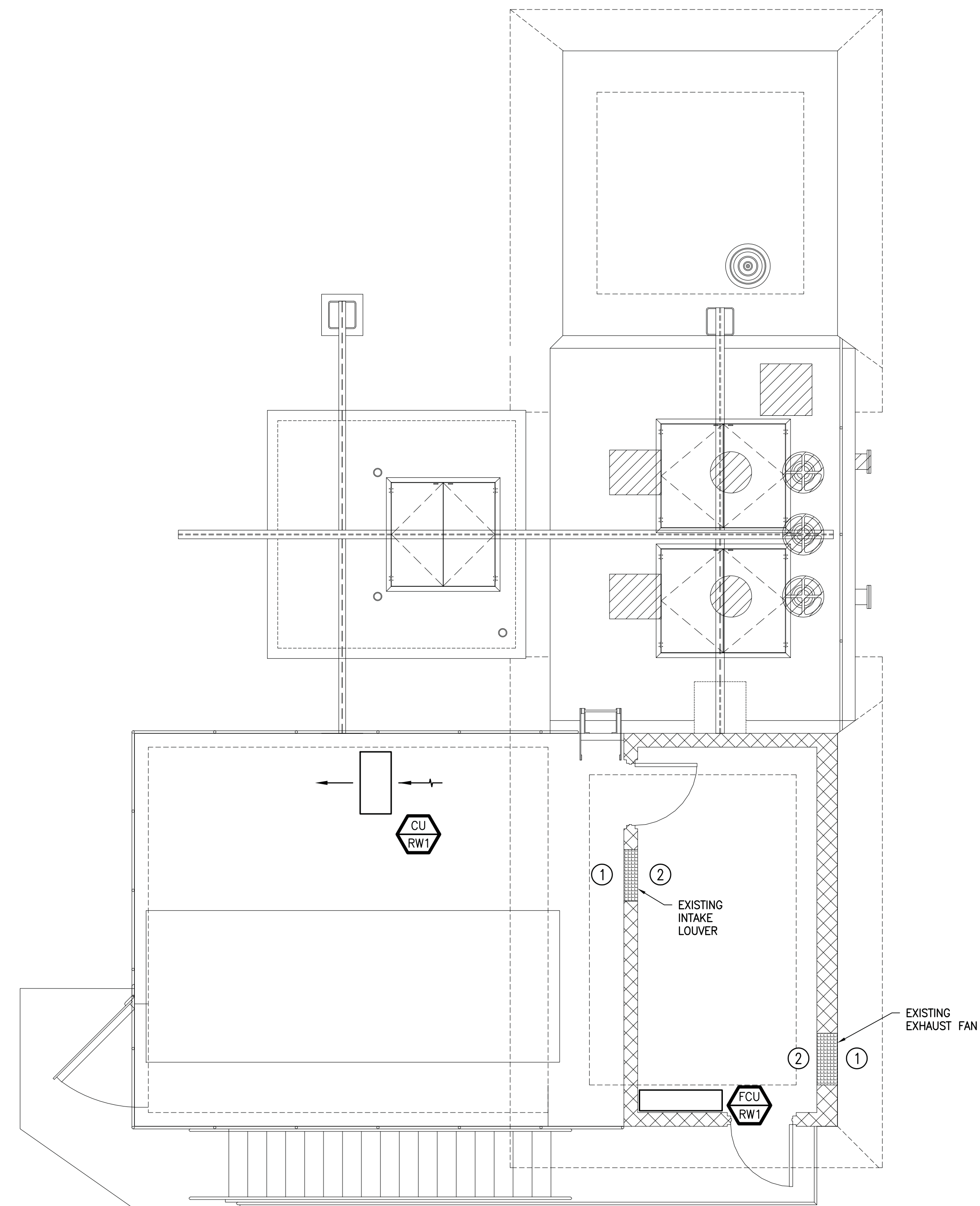


SPLIT SYSTEM AIR CONDITIONING UNIT SCHEDULE								
MARK	FCU MODEL NUMBER	CU MODEL NUMBER	SUPPLY AIR CFM	VOLTS/PH/Hz	COOLING MBH	SEER	EER	REMARKS
FCU/CU-RW1	PKA-A30KA7	PUY-A30NHA7	700	208/1/60	30.0	19.8	9.5	1, 2, 3, 4, 5

1. MODEL NUMBERS BASED ON MITSUBISHI. EQUIVALENT PRODUCTS BY DAIKIN AND FUJITSU ARE ACCEPTABLE.
2. INSTALL HARD-WIRED, PROGRAMMABLE, WALL MOUNTED THERMOSTAT BELOW INDOOR UNIT TO SENSE AND RESPOND TO ROOM AIR RETURNING TO UNIT.
3. INSTALL CONDENSATE DRAIN ROUTED TO DRIP OUTDOORS WHERE DISCHARGE WILL DRIP INDIRECTLY TO GRADE. COORDINATE WITH SITE CONDITIONS, SUPPORT AND PROTECT PIPING FROM DAMAGE AS NECESSARY.
4. FIRE-STOP ALL PENETRATIONS OF ANY FIRE RATED ASSEMBLIES AS REQUIRED TO MAINTAIN RATING OF ASSEMBLY PENETRATED.
5. MOUNT OUTDOOR UNITS ON SUITABLE EQUIPMENT PADS AND INSTALL ALL REFRIGERANT AND ELECTRICAL LINES PENETRATING WALLS OR ROOF WITH SUITABLE WEATHER-PROOF SEALS.

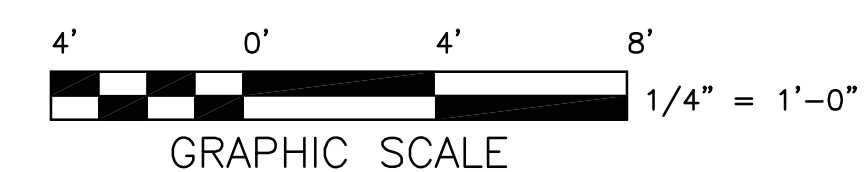
PLAN NOTES:

- ① EXISTING ELECTRICAL ROOM EXHAUST FAN AND INTAKE DAMPER MOTOR TO BE REMOVED. WALL DAMPERS SHALL REMAIN IN PLACE.
- ② CUT 2" FOAM BOARD INSULATION EQUAL TO OPENING SIZE AND INSTALL FROM INTERIOR SIDE TO FILL OPENING. COVER INTERIOR WALL OPENING WITH MINIMUM 26 GAUGE GALVANIZED SHEET METAL SEALED AND ANCHORED TO MASONRY WALL.



HVAC FLOOR PLAN

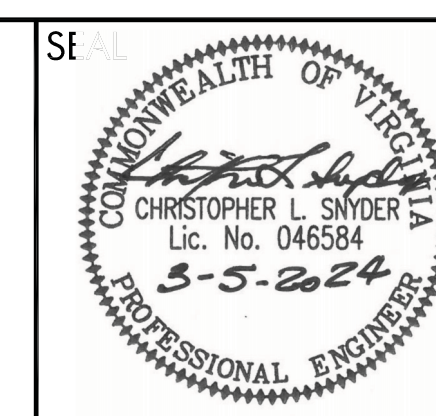
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MASTER
ENGINEERS & DESIGNERS
904 Lakeside Drive, Lynchburg, VA 24501
434-846-1350 Fax: 434-846-1351
660-011

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3211 FAX: (540) 394 - 3215

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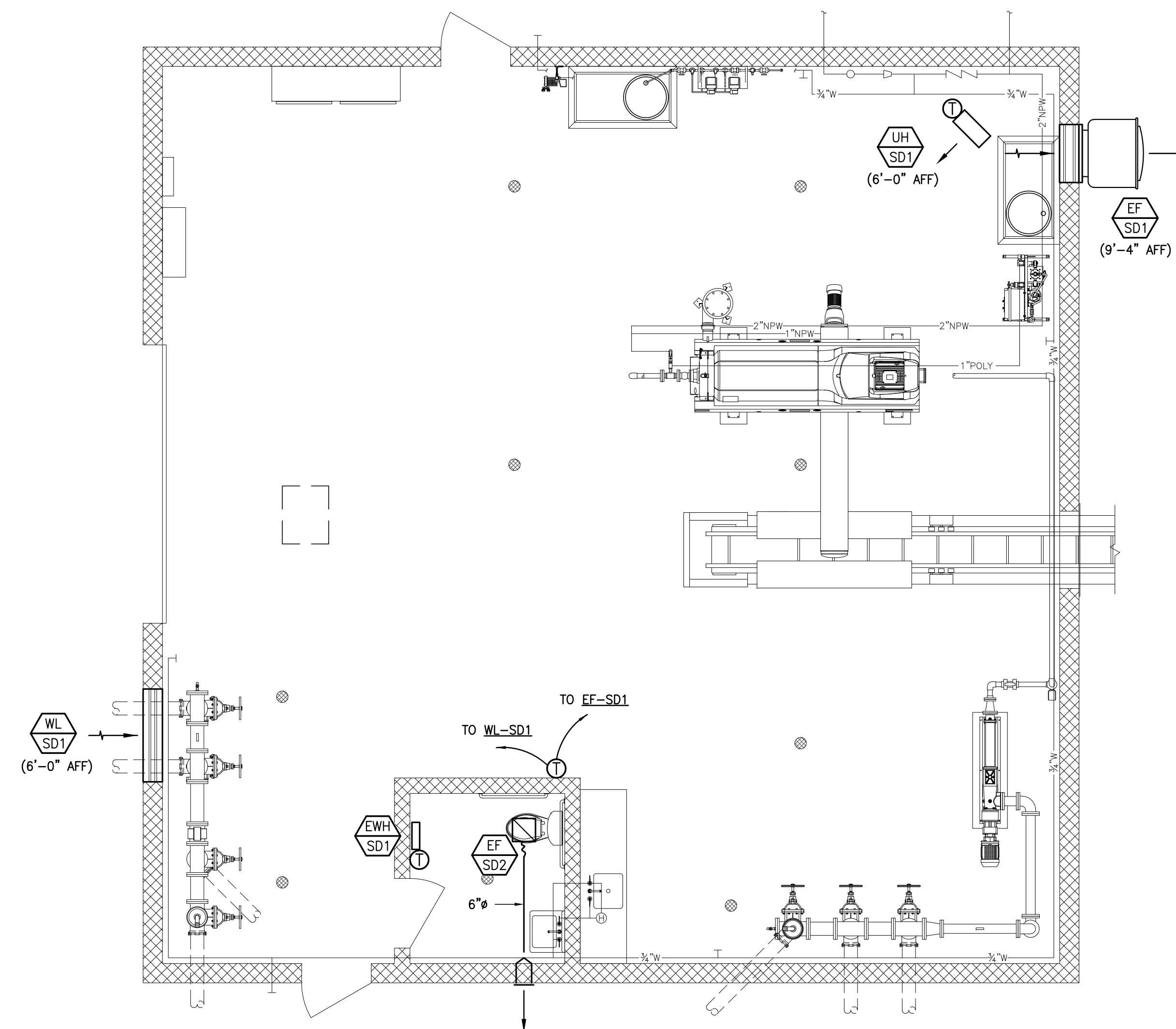


DRAWN BY: ATE
REVIEW BY: CLS
DATE: 3/5/2024
REVISION: ---

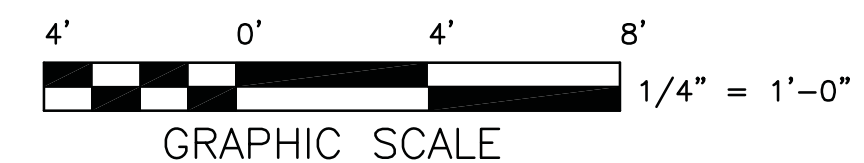
SHEET DESCRIPTION:
EXISTING RAW WATER INTAKE STRUCTURE HVAC FLOOR PLAN & SCHEDULE

M2

MISCELLANEOUS EQUIPMENT SCHEDULE		
MARK	DUTY	DESCRIPTION
WL-SD1	SLUDGE DEWATERING ROOM VENTILATION COOLING INTAKE	RUSKIN MODEL ELF-811DD OR EQUAL INTAKE LOUVER 48" W X 40" H WITH MILL FINISH, BIRDSCREEN ON REAR AND FLANGED FRAME. PROVIDE WITH 120V, TWO-POSITION CONTROL DAMPER EQUAL TO RUSKIN MODEL CD-36 WITH BLADE AND JAMB SEALS INTERLOCKED WITH EF-SD1 TO OPEN WHENEVER EF-SD1 IS RUNNING. INSTALL 1/4" MESH AND INSECT SCREEN IN FIELD-FABRICATED, REMOVABLE FRAME ON INDOOR SIDE OF DAMPER SLEEVE FOR MOTOR AND DAMPER PROTECTION AND INSECT CONTROL.
EF-SD1	SLUDGE DEWATERING ROOM VENTILATION COOLING EXHAUST	GREENHECK MODEL CUE-200-VG OR EQUAL SIDEWALL MOUNTED, DIRECT DRIVE, CENTRIFUGAL EXHAUST FAN. FAN SHALL HAVE 2HP, TEFC HIGH EFFICIENCY, 208V/3PH/60HZ MOTOR OPERATING AT 1140RPM FOR 5,400CFM EXHAUST AIR FLOW RATE AT 0.5" WG SP. PROVIDE WITH STAINLESS STEEL BIRDSCREEN IN DISCHARGE, GRAVITY OPERATED BACKDRAFT DAMPER, AND 24V WALL-MOUNTED THERMOSTAT WITH TRANSFORMER AND CONTACTORS TO ACTIVATE FAN AND OPEN MOTORIZED DAMPER AT LOUVER WL-SD1 WHENEVER INDOOR AIR TEMPERATURE EXCEEDS 80°F (ADJUSTABLE). INSTALL REMOVABLE 1/4" MESH SCREEN TO COVER AIR INLET SIDE OF DAMPER AND FAN INSIDE THE BUILDING.
EF-SD2	SLUDGE DEWATERING BUILDING TOILET ROOM EXHAUST	GREENHECK MODEL SP-B80 OR EQUAL CEILING MOUNTED, DIRECT DRIVE EXHAUST FAN. FAN SHALL HAVE ODP, 115V/1PH/60HZ MOTOR OF APPROXIMATELY 17 WATTS, OPERATING AT 900RPM FOR 75CFM EXHAUST AIR FLOW RATE AT 0.285" WG EXT SP. FAN SHALL HAVE 6" DIA DISCHARGE COLLAR, MOUNTING BRACKETS, NEOPRENE ISOLATORS, NON-YELLOWING COMPOSITE GRILLE AND BE PROVIDED WITH 10" X 3" WALL LOUVER DISCHARGE ACCESSORY FOR INSTALLATION THROUGH OUTSIDE WALL. FAN SHALL BE CONTROLLED BY WALL SWITCH OR OCCUPANCY SENSOR AS INDICATED TO ACTIVATE FAN WHEN THE ROOM IS OCCUPIED.
UH-SD1	SLUDGE DEWATERING ROOM HEAT	BERKO MODEL HUAAA1020 SUSPENDED, HORIZONTAL, FAN FORCED, ELECTRIC UNIT HEATER. HEATER SHALL HAVE 10KW HEAT CAPACITY, DELIVER 650CFM OF HEATED AIR, AND HAVE 208V/3PH/60HZ ELECTRICAL CIRCUIT CHARACTERISTICS. PROVIDE WITH SINGLE-POINT POWER CONNECTION, 24V THERMOSTAT CONTROL WITH LOW VOLTAGE CONTROL TRANSFORMER AND CONTACTOR, AUTOMATIC RESET THERMAL CUT-OUT, AND 3-POLE POWER DISCONNECT SWITCH. SUSPEND FROM BUILDING STRUCTURE USING SUITABLE CORROSION-PROTECTED HANGERS AND MOUNTING BRACKET AS NECESSARY.
EWH-SD1	SLUDGE DEWATERING BUILDING TOILET ROOM HEAT	MARKEL MODEL HF3324TD-RP OR EQUAL WALL MOUNTED, COMMERCIAL, FAN-FORCED ELECTRIC WALL HEATER. HEATER SHALL HAVE 1.5KW HEAT CAPACITY, DELIVER 175CFM OF HEATED AIR, AND HAVE 208V/1PH/60HZ ELECTRICAL CIRCUIT CHARACTERISTICS. PROVIDE WITH BUILT-IN THERMOSTAT, DISCONNECT SWITCH, AUTO-RESET THERMAL OVERLOAD, POWDER COATED 18GA STEEL GRILLE WITH EXTRUDED ALUMINUM FRONT FRAME, AND POWDER-COATED SURFACE MOUNTING ENCLOSURE.



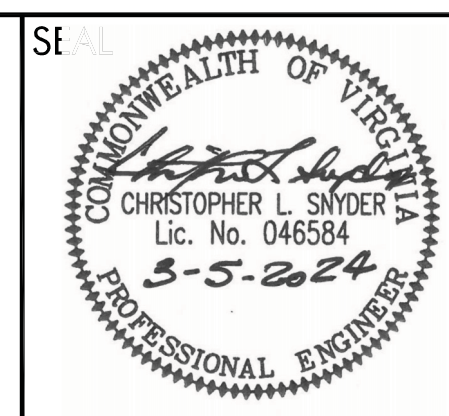
HVAC FLOOR PLAN
SCALE: 1/4"=1'-0"



MASTER
ENGINEERS & DESIGNERS
904 Lakeside Drive, Lynchburg, VA 24501
660-011 434-846-1350 Fax: 434-846-1351

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3211 FAX: (540) 394 - 3215

NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



DRAWN BY:
REVIEW BY:
DATE:
3/5/2024
REVISION:

SHEET DESCRIPTION:
SLUDGE DEWATERING BUILDING HVAC FLOOR PLAN & SCHEDULE

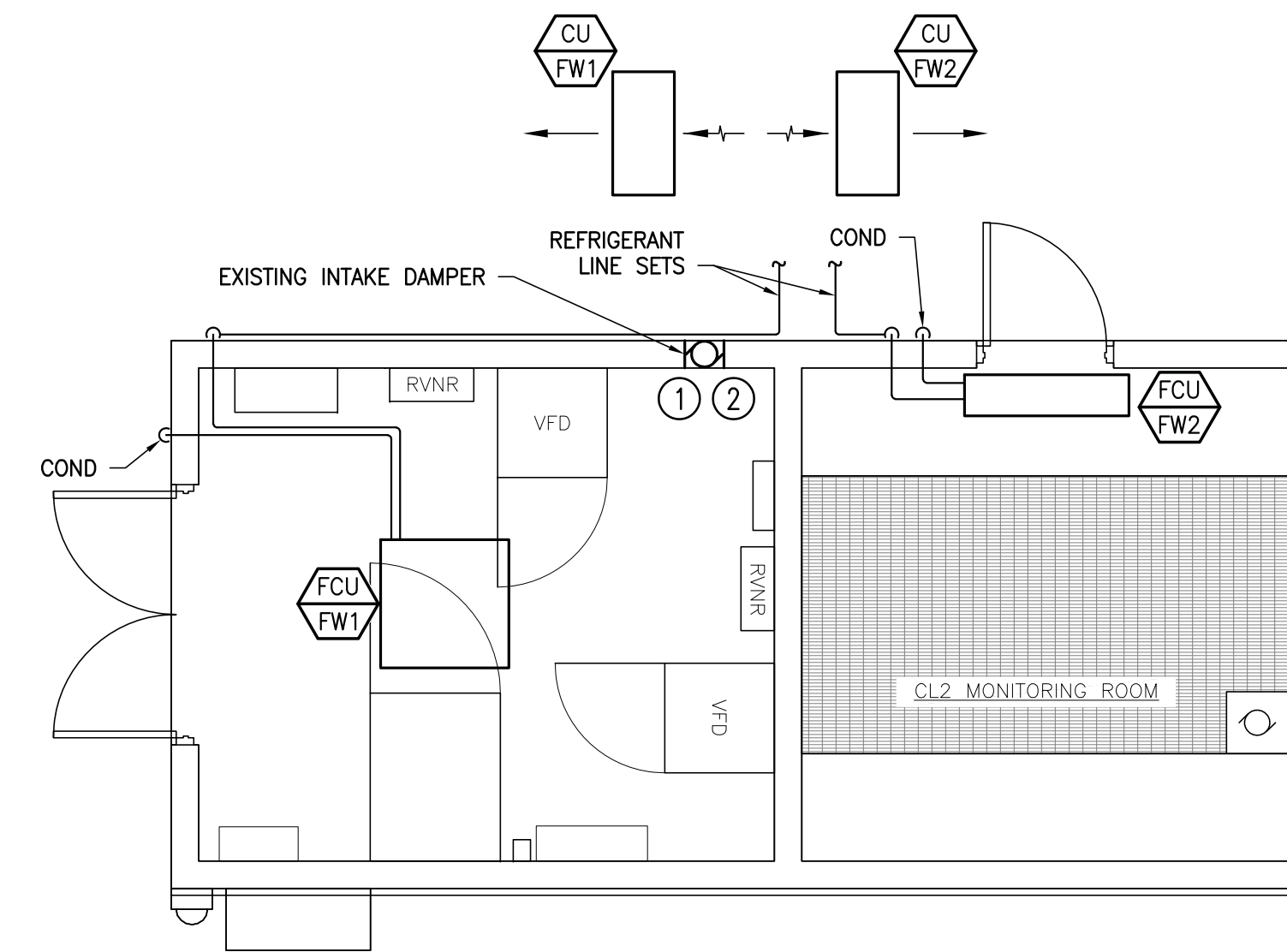
M3

SPLIT SYSTEM AIR CONDITIONING UNIT SCHEDULE								
MARK	FCU MODEL NUMBER	CU MODEL NUMBER	SUPPLY AIR CFM	VOLTS/PH/Hz	COOLING MBH	SEER	EER	REMARKS
FCU/CU-FW1	PLA-A24EA7	PUY-A24NHA7	700	208/1/60	24.0	21.4	12.2	1, 2, 3, 4, 5
FCU/CU-FW2	PKA-A30KA7	PUY-A30NHA7	700	208/1/60	30.0	19.8	9.5	1, 2, 3, 4, 5

1. MODEL NUMBERS BASED ON MITSUBISHI, EQUIVALENT PRODUCTS BY DAIKIN AND FUJITSU ARE ACCEPTABLE.
2. INSTALL HARD-WIRED, PROGRAMMABLE, WALL MOUNTED THERMOSTAT BELOW INDOOR UNIT TO SENSE AND RESPOND TO ROOM AIR RETURNING TO UNIT.
3. INSTALL CONDENSATE DRAIN ROUTED TO DRIP OUTDOORS WHERE DISCHARGE WILL DRIP INDIRECTLY TO GRADE. COORDINATE WITH SITE CONDITIONS, SUPPORT AND PROTECT PIPING FROM DAMAGE AS NECESSARY.
4. FIRE-STOP ALL PENETRATIONS OF ANY FIRE RATED ASSEMBLIES AS REQUIRED TO MAINTAIN RATING OF ASSEMBLY PENETRATED.
5. MOUNT OUTDOOR UNITS ON SUITABLE EQUIPMENT PADS AND INSTALL ALL REFRIGERANT AND ELECTRICAL LINES PENETRATING WALLS WITH SUITABLE WEATHER-PROOF SEALS.

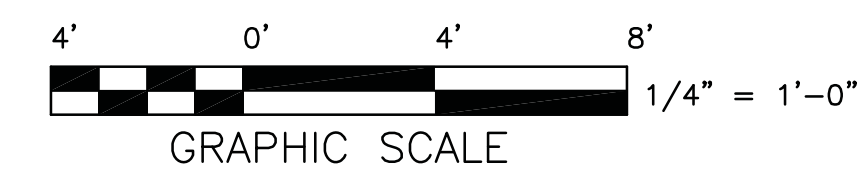
PLAN NOTES:

1. EXISTING ELECTRICAL ROOM EXHAUST FAN AND INTAKE DAMPER MOTOR TO BE REMOVED. WALL DAMPERS SHALL REMAIN IN PLACE.
2. CUT 2" FOAM BOARD INSULATION EQUAL TO OPENING SIZE AND INSTALL FROM INTERIOR SIDE TO FILL OPENING. COVER INTERIOR WALL OPENING WITH MINIMUM 26 GAUGE GALVANIZED SHEET METAL SEALED AND ANCHORED TO MASONRY WALL.



HVAC FLOOR PLAN

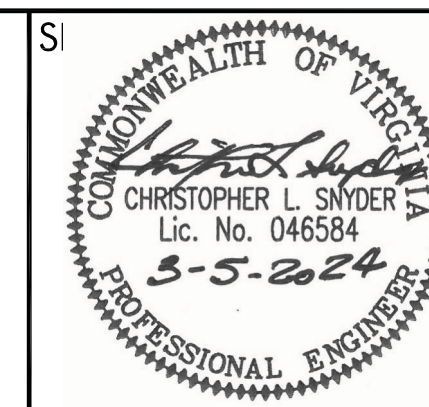
SCALE: 1/4"=1'-0"



MASTER
ENGINEERS & DESIGNERS
904 Lakeside Drive, Lynchburg, VA 24501
660-011 434-846-1350 Fax: 434-846-1351

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3211 FAX: (540) 394 - 3215

NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



DRAWN BY:
ATE
REVIEW BY:
CLS
DATE:
3/5/2024
REVISION:

SHEET DESCRIPTION:
HIGH SERVICE BUILDING HVAC FLOOR PLAN & SCHEDULE

M4

LEGENDS

RACEWAY

	CONDUIT RUN EXPOSED
	CONDUIT RUN BENEATH SLAB, BELOW GRADE OR CONCEALED WITHIN BUILDING WALLS
	CONDUIT RUN ABOVE CEILING OR CONCEALED WITHIN BUILDING WALLS
	CONDUIT TURNING UP
	CONDUIT TURNING DOWN
	HOMERUN
	JUNCTION BOX
	TICK MARKS INDICATE NUMBER OF CURRENT-CARRYING CONDUCTORS IN ADDITION TO EGC

WIRING DEVICES

	RECEPTACLE, SINGLE, NEMA 5-20R
	RECEPTACLE, DUPLEX, NEMA 5-20R
	SWITCH: 1-WAY, 3-WAY, 4-WAY

SAFETY SWITCHES

	SAFETY SWITCH, FUSIBLE
	SAFETY SWITCH, NON-FUSIBLE

LIGHTING

	FIXTURE, CEILING-MOUNTED. REGARDLESS OF FIXTURE TYPE, "A" INDICATES FIXTURE TYPE AND "a" INDICATES SWITCH LEG
	FIXTURE, EMERGENCY. UNSWITCHED UNLESS INDICATED OTHERWISE. ?????
	FIXTURE, FLUORESCENT, WALL-MOUNTED
	FIXTURE, WALL-MOUNTED
	FIXTURE, EXIT, UNSWITCHED, SINGLE-FACED, DOUBLE-FACED. ARROWS AS INDICATED ON DRAWING.

MOTOR CONTROL

	MANUAL MOTOR STARTER
	VARIABLE FREQUENCY DRIVE
	MAGNETIC MOTOR STARTER

ABBREVIATIONS

%Z	PERCENT IMPEDANCE	DCMP	DECHLORINATION METERING PUMP	KVA	KILOVOLT-AMPERES	RVNR	REDUCED-VOLTAGE, NON-REVERSING
2/C, 3/C	CONFIGURATION FOR MULTI-CONDUCTOR CABLE (2/C => TWO CONDUCTOR, ETC)	DEG	DEGREES	KW	KILOWATTS	SCADA	SUPERVISORY AND DATA ACQUISITION
AF	AMPERE FRAME	DSC	DRY SOLIDS CONVEYOR	L	LINE	SFP	SLUDGE FEED PUMP
AFF	ABOVE FINISHED FLOOR	DSS	DRY SOLIDS STORAGE	LS	LEVEL SWITCH	SPD	SURGE PROTECTIVE DEVICE
AFG	ABOVE FINISHED GRADE	DSSIU	DUCTLESS SPLIT SYSTEM INDOOR UNIT	LT	LEVEL TRANSMITTER OR LONG-TIME TRIP	SPHS	SCADA PANEL HIGH SERVICE
AHF	ACTIVE HARMONIC FILTER	DSSOU	DUCTLESS SPLIT SYSTEM OUTDOOR UNIT	LT FLEX	LIQUID-TIGHT FLEXIBLE CONDUIT	SPRW	SCADA PANEL RAW WATER
AHJ	AUTHORITY HAVING JURISDICTION	EF	EXHAUST FAN	MAX	MAXIMUM	SPST	SCADA PANEL SLUDGE TREATMENT
AIC	AMPERES INTERRUPTING CAPACITY	EGC	EQUIPMENT GROUNDING CONDUCTOR	MD	MOISTURE DETECTOR	SPS	SLUDGE PUMPING STATION
AMPS	AMPERES	EMS	ENERGY-REDUCTION MAINTENANCE SWITCH	MH	MOUNTING HEIGHT	SSP	SLUDGE STATION PUMP
AT	AMPERE TRIP	EMT	ELECTRICAL METALLIC THINWALL	MIN	MINIMUM	ST	SHORT-TIME TRIP
ATS	AUTOMATIC TRANSFER SWITCH	ET	ELECTRONIC TRIP	MSH	MOTOR SPACE HEATER	SV	SOLENOID VALVE
BCSD	BARE COPPER SOFT DRAWN	ETR	EXISTING TO REMAIN	MVOLT	MULTI-VOLT, 120 / 277 V	SYM	SYMMETRICAL
C	CONDUIT, RSC UON	EVO	ELECTRIC VALVE OPERATOR	N, NEUT	NEUTRAL	TBD	TO BE DETERMINED
CCP	CENTRIFUGE CONTROL PANEL	FHP	FRACTIONAL HORSEPOWER	N/A	NOT APPLICABLE	THD	TOTAL HARMONIC DISTORTION
CDC	CENTRIFUGE DISCHARGE CONVEYOR	FLA	FULL LOAD AMPERES	NEC	NATIONAL ELECTRICAL CODE ASSOCIATION	TM	THERMAL MAGNETIC
CDG	CONVEYOR DISCHARGE GATE	FLEX	FLEXIBLE CONDUIT	NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION	TSH	TEMPERATURE SWITCH HIGH
CDCSG	CENTRIFUGE DISCHARGE CONVEYOR SLIDE GATE	FO	FIBER OPTIC	NF	NON-FUSED	TSP	TWISTED, SHIELDED PAIR
CFG	CENTRIFUGE	FPEM	FUSE PER EQUIPMENT MANUFACTURER	P	POLE	TTCP	TREATMENT TRAIN CONTROL PANEL
CH	6" ABOVE COUNTER BACKSPLASH	FU	FUSE OR FUSED	PURSC	PLASTIC-JACKETED RIGID STEEL CONDUIT	TTM	THICKENER TANK MIXER
CKT	CIRCUIT	GEC	GROUNDING ELECTRODE CONDUCTOR	PH	PHASE	TYP	TYPICAL
CONN	CONNECTED	GF	GROUND FAULT TRIP	PURSC	PLASTIC-JACKETED RIGID STEEL CONDUIT	UON	UNLESS OTHERWISE NOTED
CP	CONTROL PANEL	GFI	GROUND FAULT INTERRUPTER	PVC	POLYVINYL CHLORIDE CONDUIT	V	VOLTS
CT	CURRENT TRANSFORMER	GND	GROUND	QTY	QUANTITY	VFD	VARIABLE FREQUENCY DRIVE
CU	COPPER OR CONDENSING UNIT	HP	HORSEPOWER OR HEAT PUMP	R&R	REMOVE & REPLACE	W /	WITH
DECHLOR	DECHLORINATION	HT	HEAT TRACE	RMS	ROOT MEAN SQUARE	WH	WATER HEATER
DBO	DEMOLITION BY OTHERS. SEE PLANS FOR OTHER DISCIPLINES.	INST	INSTANTANEOUS	RSC	RIGID STEEL CONDUIT	Y	WYE
		K	KELVIN	RTS	REMOTE TEST SWITCH		
		KCMIL	THOUSAND CIRCULAR MILS				
		KV	KILOVOLTS				

DRAWING LIST

GENERAL

E01 LEGENDS, NOTES & ABBREVIATIONS
E02 SITE PLAN

RAW WATER INTAKE BUILDING

E03 DEMOLITION PLAN FIRST FLOOR
E04 DEMOLITION PLAN SECOND FLOOR
E05 NEW WORK PLAN FIRST FLOOR
E06 NEW WORK PLAN SECOND FLOOR
E07 ONE LINE DIAGRAM EXISTING CONDITION
E08 ONE LINE DIAGRAM REWORKED CONDITION
E09 PANELBOARD SCHEDULES
E10 PANELBOARD SCHEDULES

HIGH SERVICE BUILDING

E11 DEMOLITION PLAN
E12 NEW WORK PLAN
E13 ONE LINE DIAGRAM EXISTING CONDITION
E14 ONE LINE DIAGRAM REWORKED CONDITION
E15 PANELBOARD SCHEDULES
E16 PANELBOARD SCHEDULES

SLUDGE TREATMENT

E17 SLUDGE DEWATERING BUILDING & DRY SLUDGE STORAGE SHELTER POWER PLAN
E18 SLUDGE DEWATERING BUILDING & DRY SLUDGE STORAGE SHELTER POWER PART PLANS

E19 SLUDGE DEWATERING BUILDING & DRY SLUDGE STORAGE SHELTER LIGHTING PLAN

E20 THICKENER TANK & SLUDGE PUMPING STATION PLANS
E21 SLUDGE DEWATERING PANELBOARD SCHEDULES
E22 PANELBOARD SCHEDULES & ONE LINE DIAGRAM

MAIN BUILDING

E23 GROUND FLOOR
E24 SECOND FLOOR

FILTER BUILDING

E25 GROUND FLOOR
E26 SECOND FLOOR
E27 SEDIMENTATION BASIN SLUDGE COLLECTION SYSTEM
E28 SLUDGE COLLECTOR SYSTEM WIRING DIAGRAM

MISCELLANEOUS

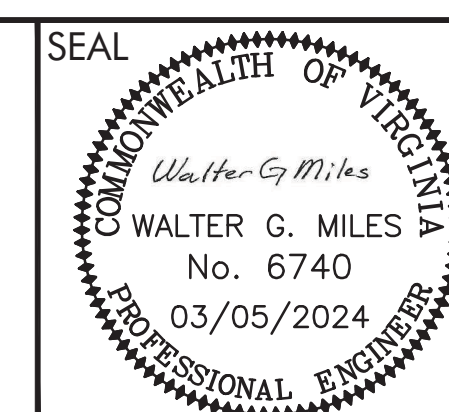
E29 LIGHT FIXTURE SCHEDULE
E30 NAMEPLATE DETAILS
E31 RACK DETAILS

HSI PROJECT NO. 23-04-12



Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3211 FAX: (540) 394 - 3215

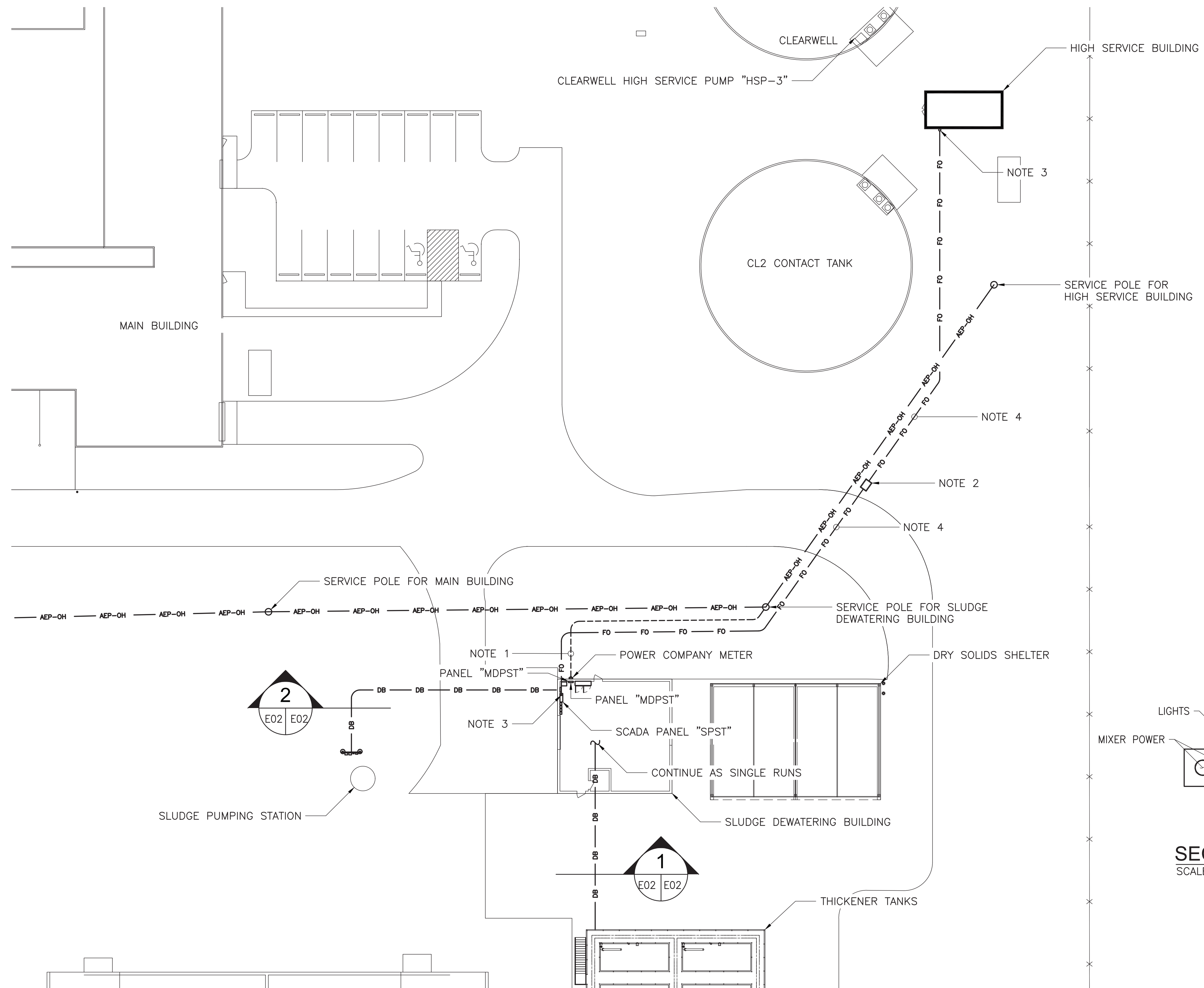
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



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3/5/2024
REVISION:

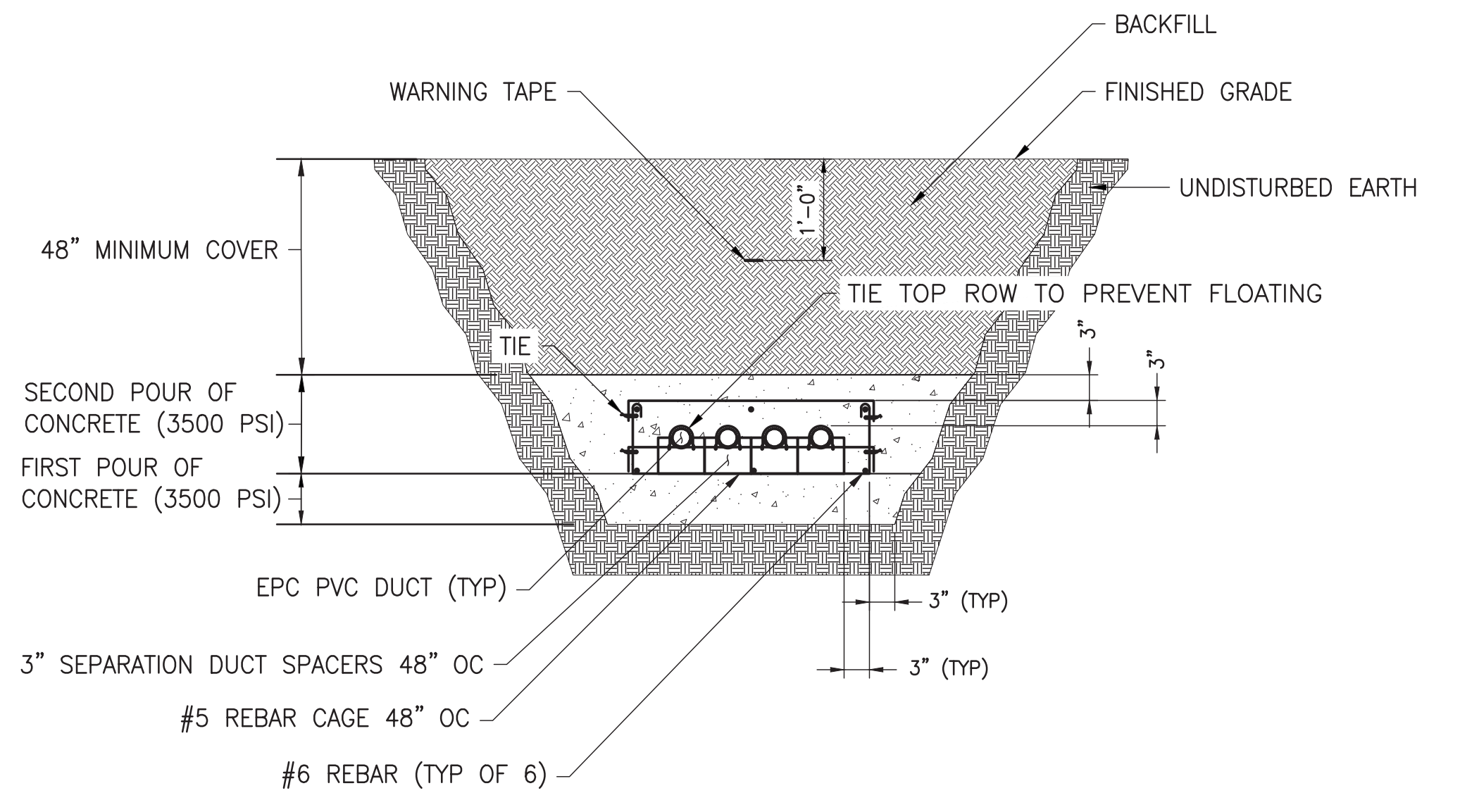
SHEET DESCRIPTION:
GENERAL LEGENDS, NOTES & ABBREVIATIONS

E01



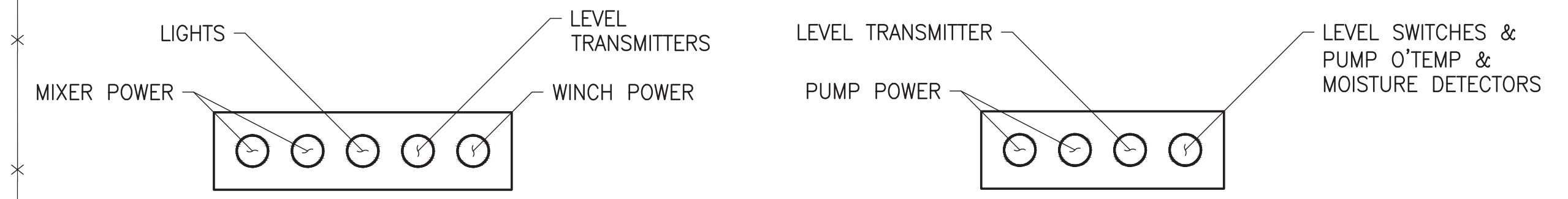
NOTES

1. FOR CONDUIT QUANTITY, TYPE, SIZE AND FILL, SEE ONE LINE DIAGRAM - SLUDGE DEWATERING BUILDING.
2. 24" x 36" x ??" PULLBOX.
3. 30" RADIUS SWEEP ELBOW UP
4. 2" EMPTY PVC FOR FIBER OPTIC CABLE



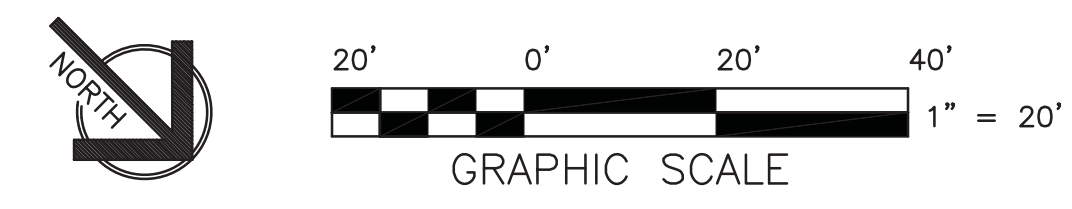
TYPICAL DUCTBANK CONSTRUCTION

SCALE: NONE



SECTION 1
SCALE: NONE

SECTION 2
SCALE: NONE



HSI PROJECT NO. 23-04-12

MASTER ENGINEERS & DESIGNERS
904 Lakeside Drive, Lynchburg, VA 24501
434-846-1350 Fax: 434-846-1351
660-011

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3211 FAX: (540) 394 - 3215

NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA

SEAL
COMMONWEALTH OF VIRGINIA
Walter G. Miles
No. 6740
03/05/2024
PROFESSIONAL ENGINEER

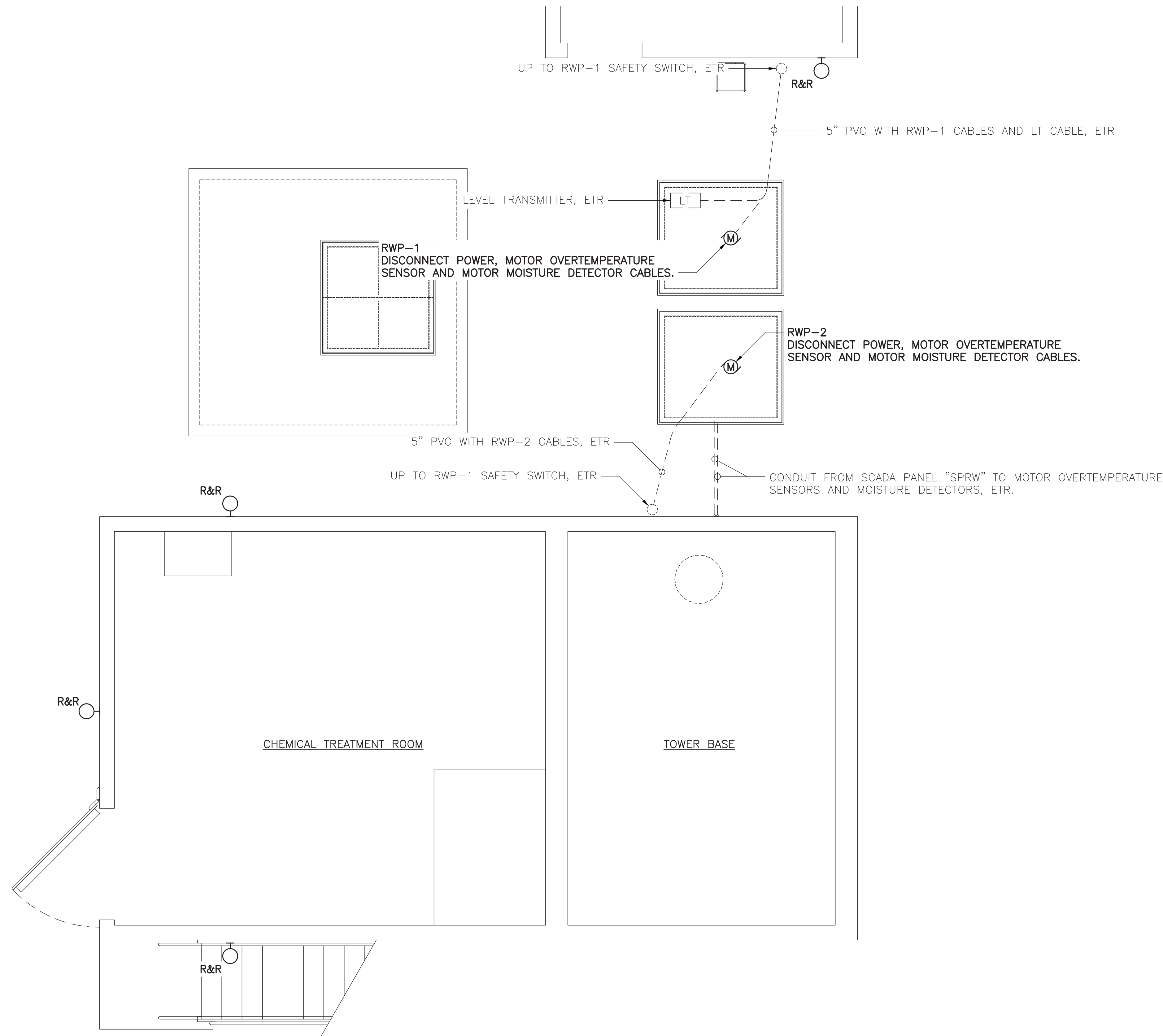
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DATE: 3/5/2024
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SHEET DESCRIPTION:
GENERAL SITE PLAN

E02

NOTES

- FOR CONDUIT QUANTITY, TYPE, SIZE AND FILL, SEE ONE LINE DIAGRAM - EXISTING CONDITIONS.

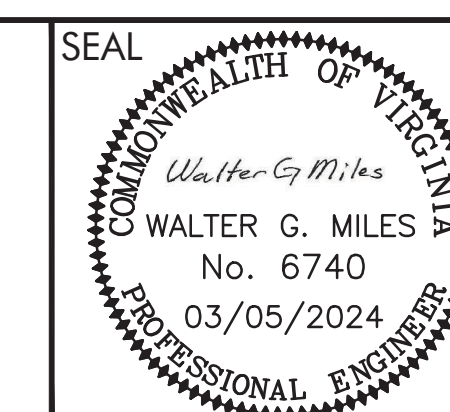


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MASTER
ENGINEERS & DESIGNERS
904 Lakeside Drive, Lynchburg, VA 24501
434-846-1350 Fax: 434-846-1351
660-011

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3211 FAX : (540) 394 - 3215

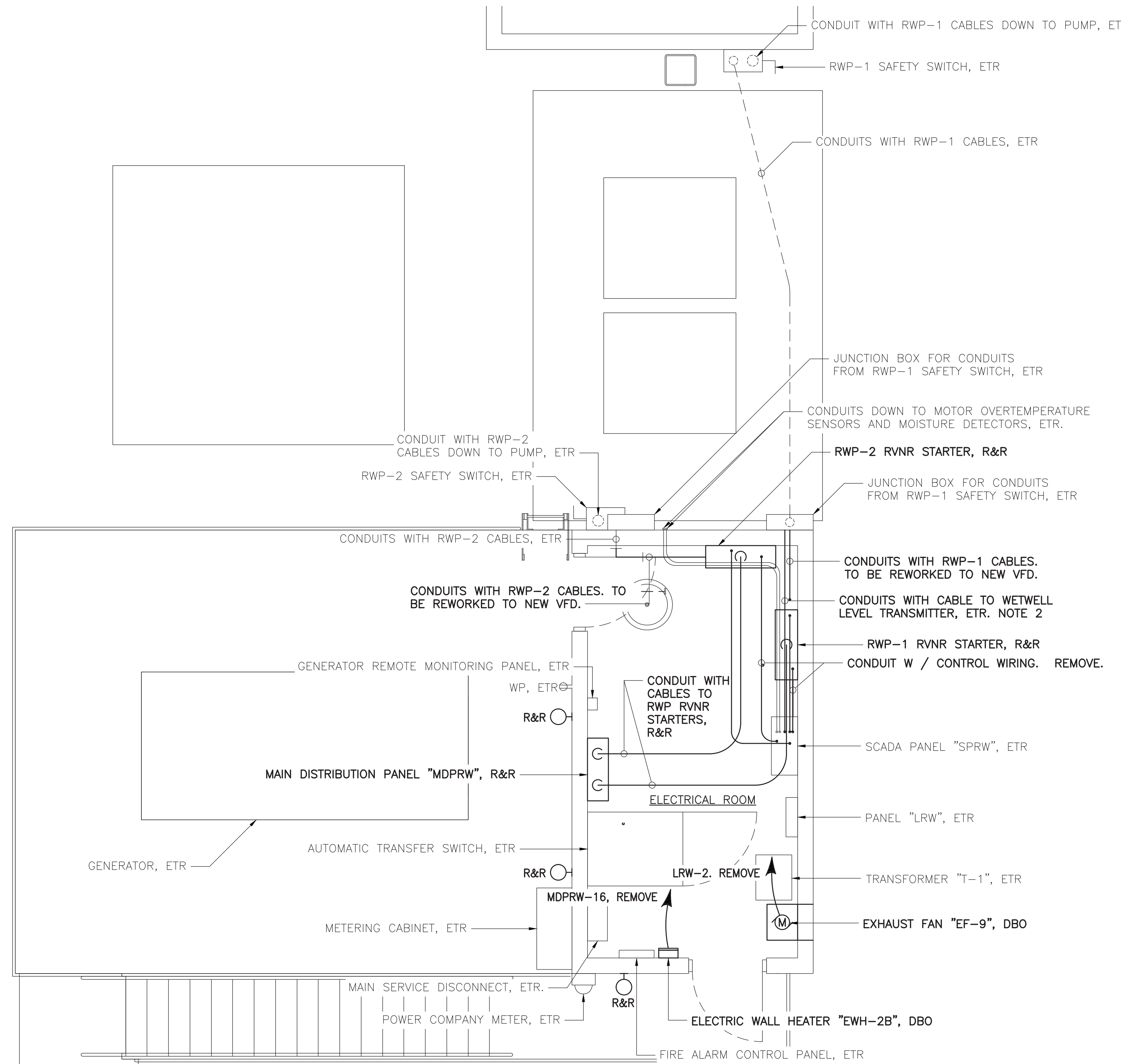
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WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



DRAWN BY:
REVIEW BY:
DATE:
3/5/2024
REVISION:

SHEET DESCRIPTION:
RAW WATER INTAKE
BUILDING
DEMOLITION PLAN
FIRST FLOOR

E03



NOTES

1. FOR CONDUIT QUANTITY, TYPE, SIZE AND FILL, SEE ONE LINE DIAGRAM – EXISTING CONDITIONS.
2. WETWELL LEVEL TRANSDUCER CABLE ENTERS RWP-1 JUNCTION BOX. IT THEN ENTERS ONE OF THE CONDUITS TO RWP-1 SAFETY SWITCH. FROM THERE, IT ENTERS ONE OF THE CONDUITS TO RWP-1.

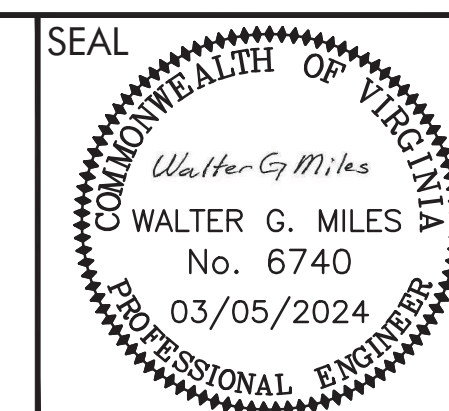
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MASTER
ENGINEERS & DESIGNERS
904 Lakeside Drive, Lynchburg, VA 24501
434-846-1350 Fax: 434-846-1351
660-011

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3211 FAX : (540) 394 - 3215

NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



DRAWN BY:	
REVIEW BY:	
DATE:	3/5/2024
REVISION:	

SHEET DESCRIPTION:
RAW WATER INTAKE BUILDING DEMOLITION PLAN SECOND FLOOR

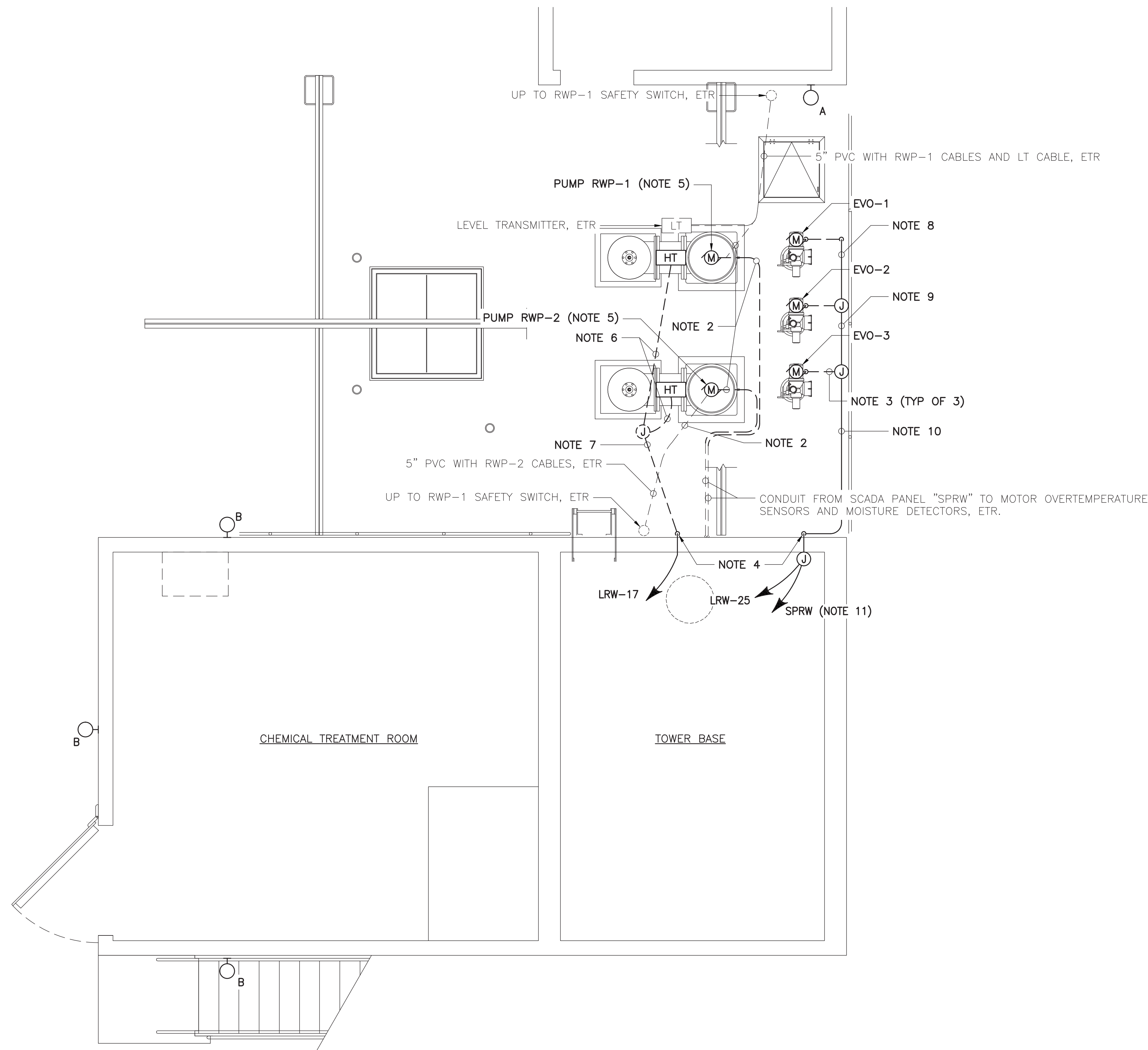
E04

GENERAL NOTES

- GN1. EQUIPMENT THAT IS EXISTING TO REMAIN IS SHOWN LIGHT. NEW EQUIPMENT IS SHOWN HEAVY.
- GN2. ALL CONDUIT SHALL BE RIGID ALUMINUM.

NOTES

- 1. FOR CONDUIT QUANTITY, TYPE, SIZE AND FILL, SEE ONE LINE DIAGRAM – REWORKED CONDITIONS.
- 2. WHERE CONDUIT ENTERS WETWELL, EXTEND CONDUIT PJRSC TOWARD BASE OF PUMP MOTOR AND TURN UP ADJACENT TO ASSOCIATED MOTOR TERMINAL BOX. TRANSITION TO LT FLEX FOR CONNECTION TO PUMP MOTOR.
- 3. RUN PJRSC WITHIN WETWELL. TURN UP ADJACENT TO VALVE OPERATOR TERMINAL BOX. TRANSITION TO LT FLEX FOR CONNECTION TO MOTOR.
- 4. TURN UP ON WALL AND INTO ELECTRICAL ROOM. RUN BELOW CEILING TO DESTINATION.
- 5. CONNECT POWER CABLES AND OVERTEMPERATURE SENSOR CABLE. REUSE MOISTURE DETECTOR CABLE FOR MOTOR SPACE HEATER.
- 6. 2/C #12 W / EGC & 2/C #16 – 1" C
- 7. 2/C #12 W / EGC & TWO 2/C #16 – 1 1/4" C
- 8. 3/C #12 W / EGC & 4/C #16 – 1" C
- 9. 3/C #12 W / EGC & TWO, 4/C #16 – 1" C
- 10. 3/C #12 W / EGC & THREE, 4/C #16 – 1 1/4" C
- 11. THREE 4/C #16 – 1" C



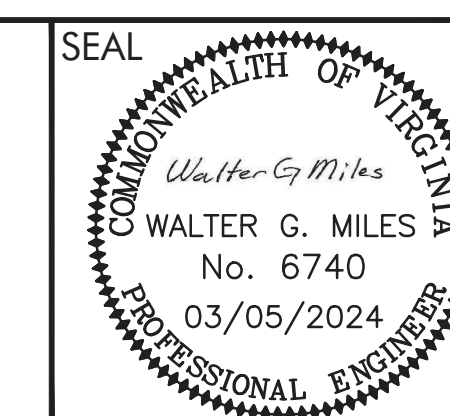
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MASTER
ENGINEERS & DESIGNERS
904 Lakeside Drive, Lynchburg, VA 24501
434-846-1350 Fax: 434-846-1351
660-011

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CIVIL & ENVIRONMENTAL ENGINEERS
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CHRISTIANSBURG, VIRGINIA 24073
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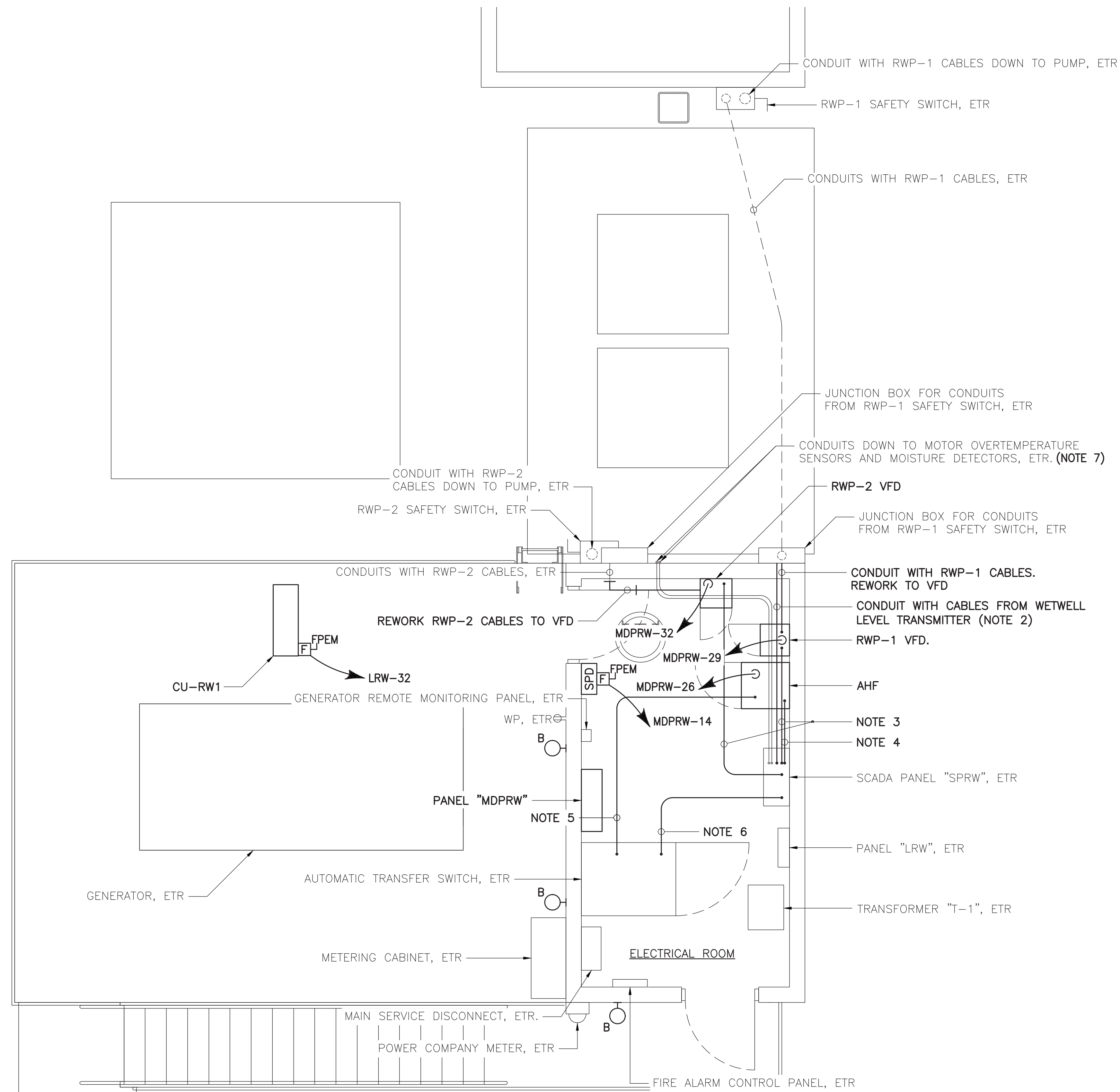
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WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



DRAWN BY:
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DATE:
3/5/2024
REVISION:

SHEET DESCRIPTION:
RAW WATER INTAKE
BUILDING
NEW WORK PLAN
FIRST FLOOR

E05



GENERAL NOTES

- GN1. EQUIPMENT THAT IS EXISTING TO REMAIN IS SHOWN LIGHT. NEW EQUIPMENT IS SHOWN HEAVY.
- GN2. ALL CONDUIT SHALL BE RIGID ALUMINUM.

NOTES

1. FOR CONDUIT QUANTITY, TYPE, SIZE AND FILL, SEE ONE LINE DIAGRAM - REWORKED CONDITIONS.
2. CABLES ARE PRESENTLY ROUTED THROUGH EXISTING RWP-1 RVNR STARTER. EXTEND CONDUIT TO SCADA PANEL, PULL CABLES TO SCADA PANEL AND RECONNECT.
3. 6/C #16 & TWO, 2/C #16 TSP - 1 1/4" C.
 - 6/C #16 FOR PUMP START COMMAND, PUMP RUNNING STATUS AND PUMP FAULT.
 - TWO, 2/C #16 TSP FOR SPEED REFERENCE AND FEEDBACK.
4. 8/C #16 - 1" C FOR AHF POWER ON, RUN, FAULT AND AT CAPACITY STATUS.
5. 4 #10 - 3/4" FOR AHF CT WIRING, INSTALL AHF CT'S IN ATS.
6. EMPTY 3/4" C FOR ETHERNET CABLE FROM ATS POWER METER TO SPRW. INSTALL POWER METER IN ATS.
7. DISCONNECT CONDUIT FOR MOISTURE DETECTORS FROM SCADA PANEL "SPRW" AND EXTEND ONE TO RWP-1 VFD AND THE OTHER TO RWP-2 VFD. REMOVE CABLES AND INSTALL 2/C #16 FROM EACH PUMP TO RESPECTIVE VFD. USE FOR POWER TO MOTOR SPACE HEATERS.

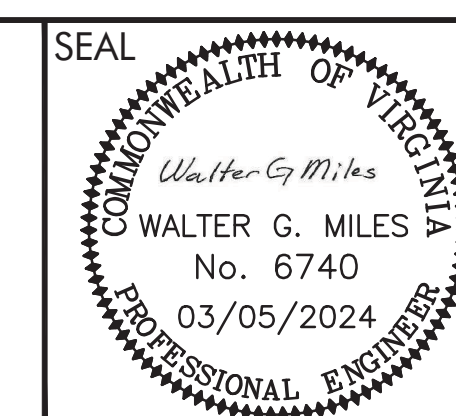
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660-011

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3211 FAX : (540) 394 - 3215

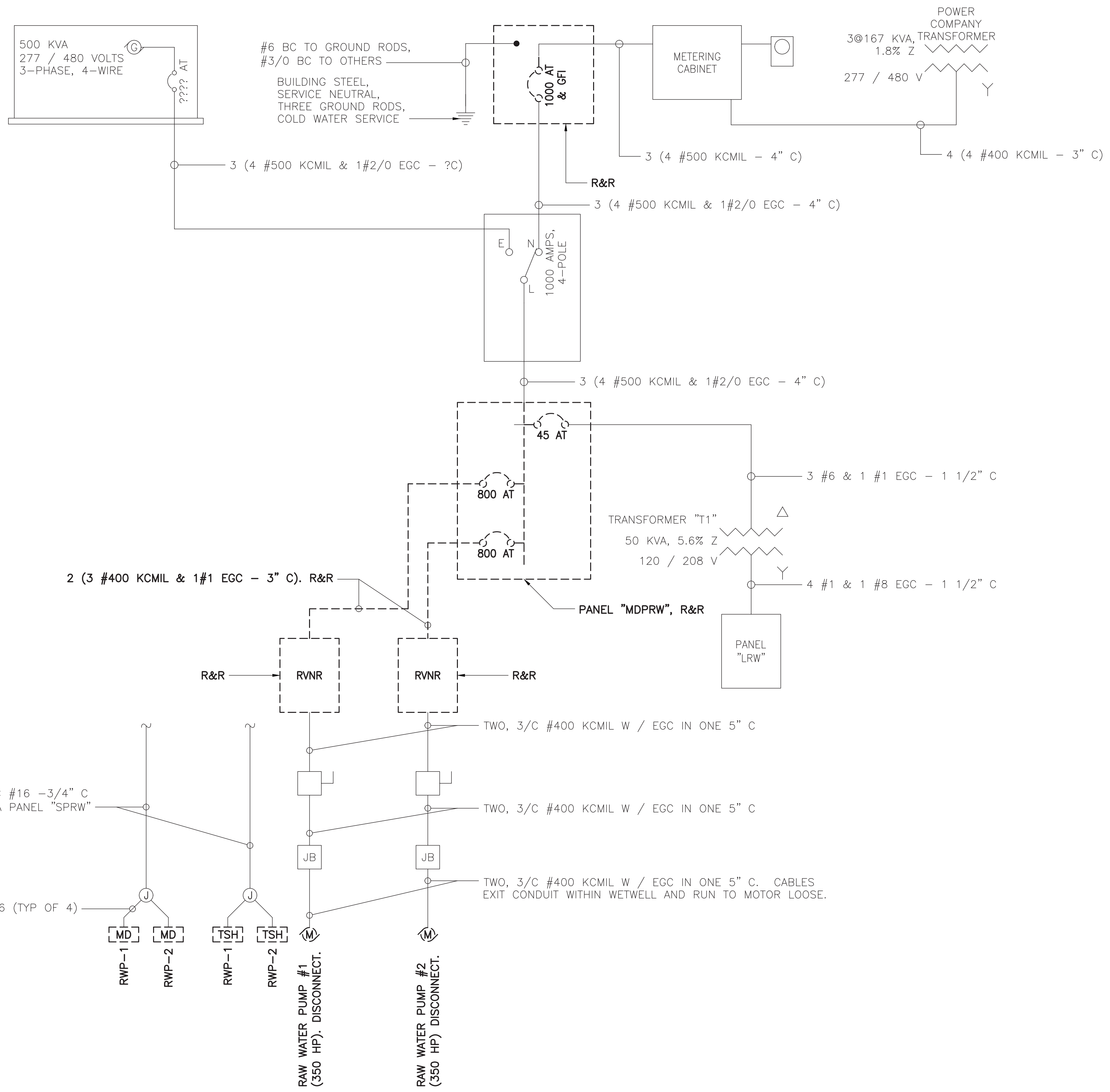
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



DRAWN BY:	
REVIEW BY:	
DATE:	3/5/2024
REVISION:	

SHEET DESCRIPTION:
RAW WATER INTAKE BUILDING
NEW WORK PLAN
SECOND FLOOR

E06

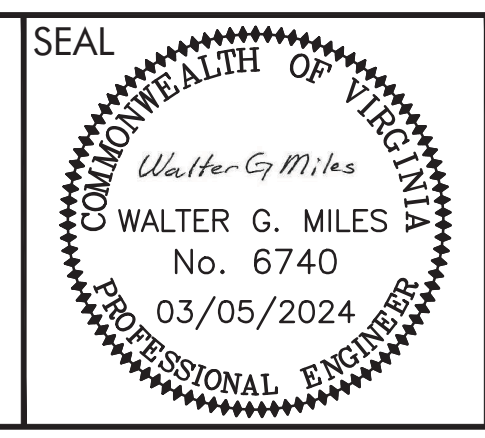


HSI PROJECT NO. 23-04-12

MASTER
ENGINEERS & DESIGNERS
904 Lakeside Drive, Lynchburg, VA 24501
434-846-1350 Fax: 434-846-1351
660-011

Peed & Bortz, L.L.C.
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20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3211 FAX : (540) 394 - 3215

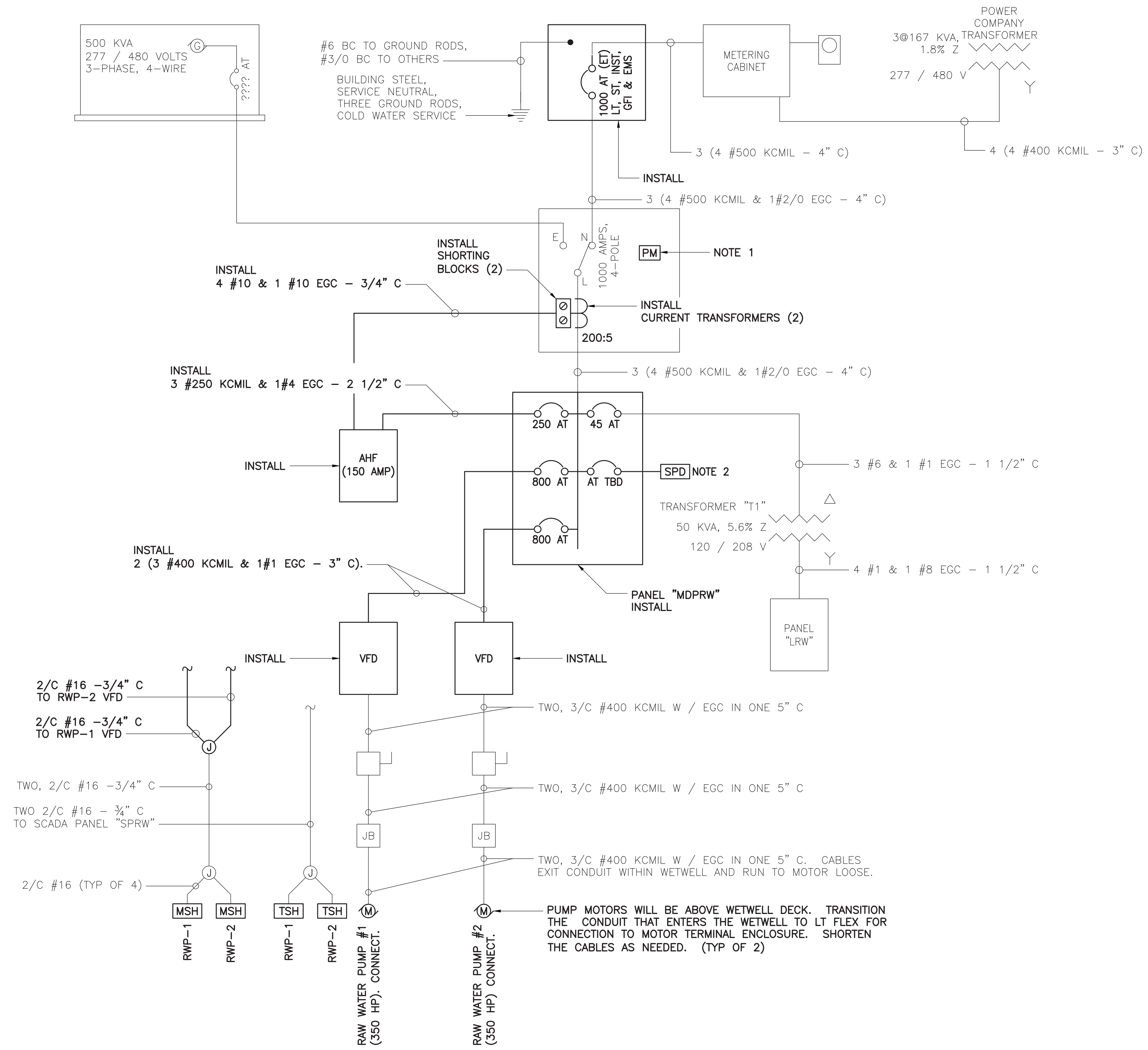
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



DRAWN BY:
REVIEW BY:
DATE:
3/5/2024
REVISION:

SHEET DESCRIPTION:
RAW WATER INTAKE
BUILDING
ONE LINE DIAGRAM
EXISTING CONDITION

E07
JN: 22-18



NOTES

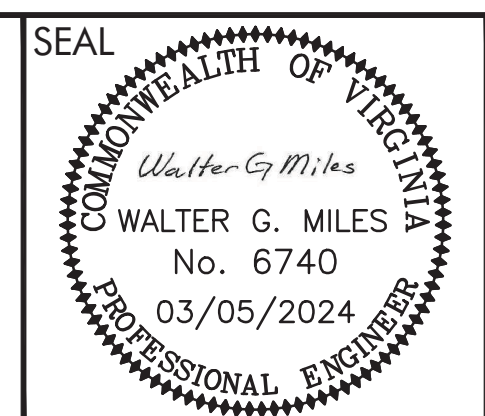
1. INSTALL ASCO MODEL 5210 DIGITAL POWER METER.
2. SIZE CONDUCTORS PER SPD MANUFACTURER. SIZE CONDUIT PER NEC.

HSI PROJECT NO. 23-04-12

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NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



DRAWN BY:	
REVIEW BY:	
DATE:	3/5/2024
REVISION:	

SHEET DESCRIPTION:
RAW WATER INTAKE BUILDING
ONE LINE DIAGRAMS
REWORKED CONDITION

E08

PANEL "MDPRW" SCHEDULE (Existing Condition)

PANELBOARD CHARACTERISTICS:

VOLTS: 277 / 480
PHASES: 3
WIRES: 4

SOLID NEUTRAL
GROUND BAR
SHORT CIRCUIT RATING: 42,000 RMS SYM AMPS

MANUFACTURER, CAT. NO: SIEMENS, P4E60ML120FTS
MAIN LUGS: 1200 AMPERES, TOP ENTRY

CKT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE
				A	B	C	P	AF	AT	PHASE	NEUT.	EGC	
1	1	SPACE & BUS ONLY					1	125					
3	2	LIGHTS	1.20		4.3		1	125	20			EXISTING TO REMAIN	
5	3	ELECTRIC WALL HEATER UPSTAIRS	4.80			17.3	1	125	20			REMOVE	
7	4	SPARE					1	125	20				
9	5	SPARE					1	125	20				
11	6	SPARE					1	125	20				
2	7	SPACE & BUS ONLY					1	125					
4	8	ELECTRIC WALL HEATER DOWNSTAIRS	4.80		17.3		1	125	20			EXISTING TO REMAIN	
6	9	LIGHTS	1.20			4.3	1	125	20			EXISTING TO REMAIN	
8	10	SPARE					1	125	20				
10	11												
12	12	LIGHTS: POLE	1.20		2.5		2	125	20			EXISTING TO REMAIN	
	13				10.5								
15	14	AIR COMPRESSOR (7.5 HP)	8.75		10.5		3	125	20			EXISTING TO REMAIN	
	15					10.5							
21	16	RAW WATER PUMP #1 (350 HP)	329.50		397.0		3	1200	800			SEE ONE LINE DIAGRAMS	
	17				397.0								
	18					397.0							
16	19	PANEL "LRW" VIA TRANSFORMER "T1"	10.64		9.7		3	125	45			EXISTING TO REMAIN	
	20					17.2							
	21												
22	22	RAW WATER PUMP #2 (350 HP)					3	1200	800			SEE ONE LINE DIAGRAMS	
	23												
	24												
TOTALS			362.09		417.2	448.9	443.2						

PANEL "MDPRW" SCHEDULE (Replacement)

PANELBOARD CHARACTERISTICS:

VOLTS: 277 / 480
PHASES: 3
WIRES: 4

SOLID NEUTRAL
GROUND BAR
SHORT CIRCUIT RATING: 42,000 RMS SYM AMPS

MAIN LUGS: 1200 AMPERES
INCOMING LINE: 1200 AMPERES, TOP ENTRY

CKT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE
				A	B	C	P	AF	AT	TRIP TYPE	PHASE	NEUT.	
1	1	SPACE & BUS ONLY					1	125					
2	2	LIGHTS	1.20		4.3		1	125	20			TM	EXISTING TO REMAIN
3	3	ELECTRIC WALL HEATER DOWNSTAIRS	4.80			17.3	1	125	20			TM	EXISTING TO REMAIN
4	4	LIGHTS	1.20		4.3		12	125	20			TM	EXISTING TO REMAIN
5	5												
	6	LIGHTS: POLE	1.2		2.5		3	125	20			TM	EXISTING TO REMAIN
	7												
	8	SPACE & BUS ONLY					1	125					
	9	"					"	"					
	10	"					"	"					
	11	"					"	"					
	12	"					"	"					
14	13												
	14	SURGE PROTECTIVE DEVICE					3	125	TBD			TM	SIZE BREAKER, WIRE & CONDUIT PER SPD MANUFACTURER'S RECOMMENDATION
	15												
17	16	AIR COMPRESSOR (7.5 HP)	8.75		10.5		3	125	20			TM	SEE ONE LINE DIAGRAMS
	17					10.5							
	18												
20	19	PANEL "LRW" VIA TRANSFORMER "T1"	15.88		19.0		3	125	45			TM	EXISTING TO REMAIN
	20					27.2							
	21												
	22					13.3							
	23	SPACE & BUS ONLY					3	250					
	24												
26	25	ACTIVE HARMONIC FILTER (150 AMPERE)	124.50		150.0		3	250	250			LT, INST, GF, EMS	SEE ONE LINE DIAGRAMS
	26					150.0							
	27												
29	28	RAW WATER PUMP #1 (350 HP)	329.50		397.0		3	1200	800			LT, INST, GF, EMS	SEE ONE LINE DIAGRAMS
	29					397.0							
	30												
32	31	RAW WATER PUMP #2 (350 HP)					3	1200	800			LT, INST, GF, EMS	SEE ONE LINE DIAGRAMS
	32												
	33												
	34	SPACE & BUS ONLY					3	1200					
	35												
	36												
TOTALS			487.03		580.9	591.6	590.7						

NOTES:

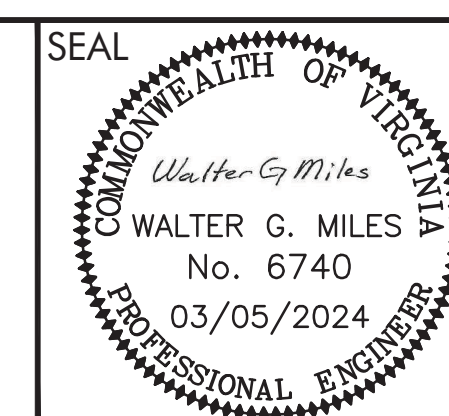
ADJUST QUANTITY OF SINGLE-POLE SPACE & BUS ONLYS TO MAKE PANELBOARD HEIGHT EQUAL TO EXISTING PANELBOARD.

HSI PROJECT NO. 23-04-12



Peed & Bortz, L.L.C.
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NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



DRAWN BY:
REVIEW BY:
DATE:
3/5/2024
REVISION:

SHEET DESCRIPTION:
RAW WATER INTAKE
BUILDING
PANELBOARD
SCHEDULES

E09

PANEL "LRW" SCHEDULE, (Existing to Remain)

PANELBOARD CHARACTERISTICS:
 VOLTS: 120 / 208 SOLID NEUTRAL MANUFACTURER, CAT. NO: SIEMENS, P1C42BL100CTS
 PHASES: 3 GROUND BAR MAIN BREAKER: 100 AF, 3P, 100 AT
 WIRES: 4 SHORT CIRCUIT RATING: 10,000 RMS SYM AMPS INCOMING LINE: TOP

CKT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE
				A	B	C	P	AF	AT	PHASE	NEUT.	EGC	
1	1	REC. UPSTAIRS	0.40	3.3			1	100	20	EXISTING TO REMAIN			
3	3	GENERATOR MATT HEATER	1.00		8.3		1	100	20	EXISTING TO REMAIN			
5	5	GENERATOR BATTERY CHARGER	1.00			8.3	1	100	20	EXISTING TO REMAIN			
7	7	SPARE					1	100	20				
9	9	REC. DOWNSTAIRS	1.60		13.3		1	100	20	EXISTING TO REMAIN			
11	11	CHEMICAL PUMP (FHP)	0.20			1.7	1	100	20	EXISTING TO REMAIN			
13	13	SCADA PANEL "SPRW"	0.60	5.0			1	100	20	EXISTING TO REMAIN			
15	15	SPARE					1	100	20				
17	17	SPARE					1	100	20				
19	19	SPARE					1	100	20				
21	21	SPARE					1	100	20				
23		SPACE & BUS ONLY											
25		"											
27		"											
29		"											
31		"											
33		"											
35		"											
37		"											
39		"											
41		"											
2	2	EXHAUST FAN (UPSTAIRS, DOWNSTAIRS) (FHP)	0.20	1.7			1	100	20	REMOVE UPSTAIRS			
4	4	EXHAUST FAN (UPSTAIRS, DOWNSTAIRS) (FHP)	0.20		1.7		1	100	20	REMOVE UPSTAIRS			
6	6	REC. HEAT TAPE	0.60			5.0	1	100	20	EXISTING TO REMAIN			
8	8	REC. OUTSIDE	1.20	10.0			1	100	20	EXISTING TO REMAIN			
10	10	AIR COMPRESSOR (1/4 HP, ASSUMED)	0.67		5.6		1	100	20	EXISTING TO REMAIN			
12	12	FIRE ALARM CONTROL PANEL	0.60			5.0	1	100	20	EXISTING TO REMAIN			
14	14	SPARE					1	100	20				
16	16	SPARE					1	100	20				
18	18	SPARE					1	100	20				
20	20	SPARE					1	100	20				
22	22				2.4								
24	24	ELECTRIC HOIST (1/2 HP, ASSUMED)	0.87			2.4	3	100	15	EXISTING TO REMAIN			
26	26				2.4								
28	28	FLOW METER	1.00			8.3				EXISTING TO REMAIN			
30	30	LEVEL TRANSMITTER	0.50			4.2				EXISTING TO REMAIN			
32		SPACE & BUS ONLY											
34		"											
36		"											
38		"											
40		"											
42		"											
TOTALS			10.64	22.4	39.7	26.6							

PANEL "LRW" SCHEDULE, (Existing to Remain) (Provide new panel directory)

PANELBOARD CHARACTERISTICS:
 VOLTS: 120 / 208 SOLID NEUTRAL MANUFACTURER, CAT. NO: SIEMENS, P1C42BL100CTS
 PHASES: 3 GROUND BAR MAIN BREAKER: 100 AF, 3P, 100 AT
 WIRES: 4 SHORT CIRCUIT RATING: 10,000 RMS SYM AMPS INCOMING LINE: TOP

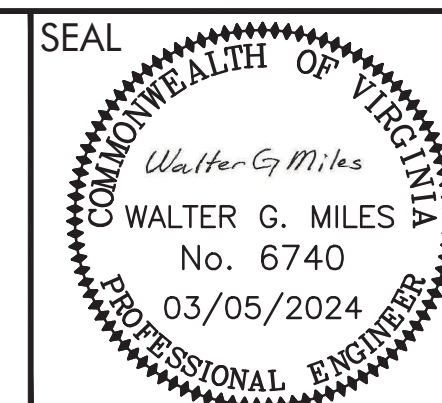
CKT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE
				A	B	C	P	AF	AT	PHASE	NEUT.	EGC	
1	1	REC. UPSTAIRS	0.40	3.3			1	100	20	EXISTING TO REMAIN			
3	3	GENERATOR MATT HEATER	1.00		8.3		1	100	20	EXISTING TO REMAIN			
5	5	GENERATOR BATTERY CHARGER	1.00			8.3	1	100	20	EXISTING TO REMAIN			
7	7	SPARE					1	100	20				
9	9	REC. DOWNSTAIRS	1.60		13.3		1	100	20	EXISTING TO REMAIN			
11	11	CHEMICAL PUMP (FHP)	0.20			1.7	1	100	20	EXISTING TO REMAIN			
13	13	SCADA PANEL "SPRW"	0.60	5.0			1*	100	20	EXISTING TO REMAIN			
15	15	PUMP DISCHARGE HEAT TRACING	0.20		1.7		1	100	20	2/C #12 W / EGC - 3/4" C			
17	17	PUMP HEAT TRACE	0.20			1.7	1	100	20	2/C #12 W / EGC - 3/4" C			
19	19	SPARE					1	100	20				
21	21	SPARE					1	100	20				
23						2.4							
25	25	EVO'S #1, #2 & #3	0.87	2.4			3	100	15	3/C #12 W / EGC - 3/4" C			
27						2.4							
29	29	SPARE					1	100	20				
31	31	SPARE					1	100	20				
33	33	SPARE					1	100	20				
35	35	SPARE					1	100	20				
37	37	SPARE					1	100	20				
39	39	SPARE					1	100	20				
41	41	SPARE					1	100	20				
2	2	EXHAUST FAN (DOWNSTAIRS) (FHP)	0.20	1.7			1	100	20	EXISTING TO REMAIN			
4	4	SPARE	0.20		1.7		1	100	20	REMOVE UPSTAIRS			
6	6	REC. HEAT TAPE	0.60			5.0	1	100	20	EXISTING TO REMAIN			
8	8	REC. OUTSIDE	1.20	10.0			1	100	20	EXISTING TO REMAIN			
10	10	AIR COMPRESSOR (1/4 HP, ASSUMED)	0.67		5.6		1	100	20	EXISTING TO REMAIN			
12	12	FIRE ALARM CONTROL PANEL	0.60			5.0	1	100	20	EXISTING TO REMAIN			
14	14	SPARE					1	100	20				
16	16	SPARE					1	100	20				
18	18	SPARE					1	100	20				
20	20	SPARE					1	100	20				
22	22				2.4								
24	24	ELECTRIC HOIST (1/2 HP, ASSUMED)	0.87			2.4	3	100	15	EXISTING TO REMAIN			
26	26				2.4								
28	28	FLOW METER **	1.00			8.3	1	100	20	EXISTING TO REMAIN			
30	30	LEVEL TRANSMITTER **	0.50			4.2	1	100		EXISTING TO REMAIN			
32	32	CU-RW	3.97	19.1			2	100	30	2 #10 & 1 #10 EGC - 3/4" C			
34					19.1								
36		SPACE & BUS ONLY											
38		"											
40		"											
42		"											
TOTALS			15.88	43.9	62.9	30.7							

*=> INSTALL HANDLE LOCKING DEVICE
 **=> FLOWMETER AND LEVEL TRANSMITTER BREAKERS MAY BE IN A DIFFERENT LOCATION. REFLECT ACTUAL LOCATIONS IN NEW PANEL DIRECTORY.



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 CHRISTIANBURG, VIRGINIA 24073
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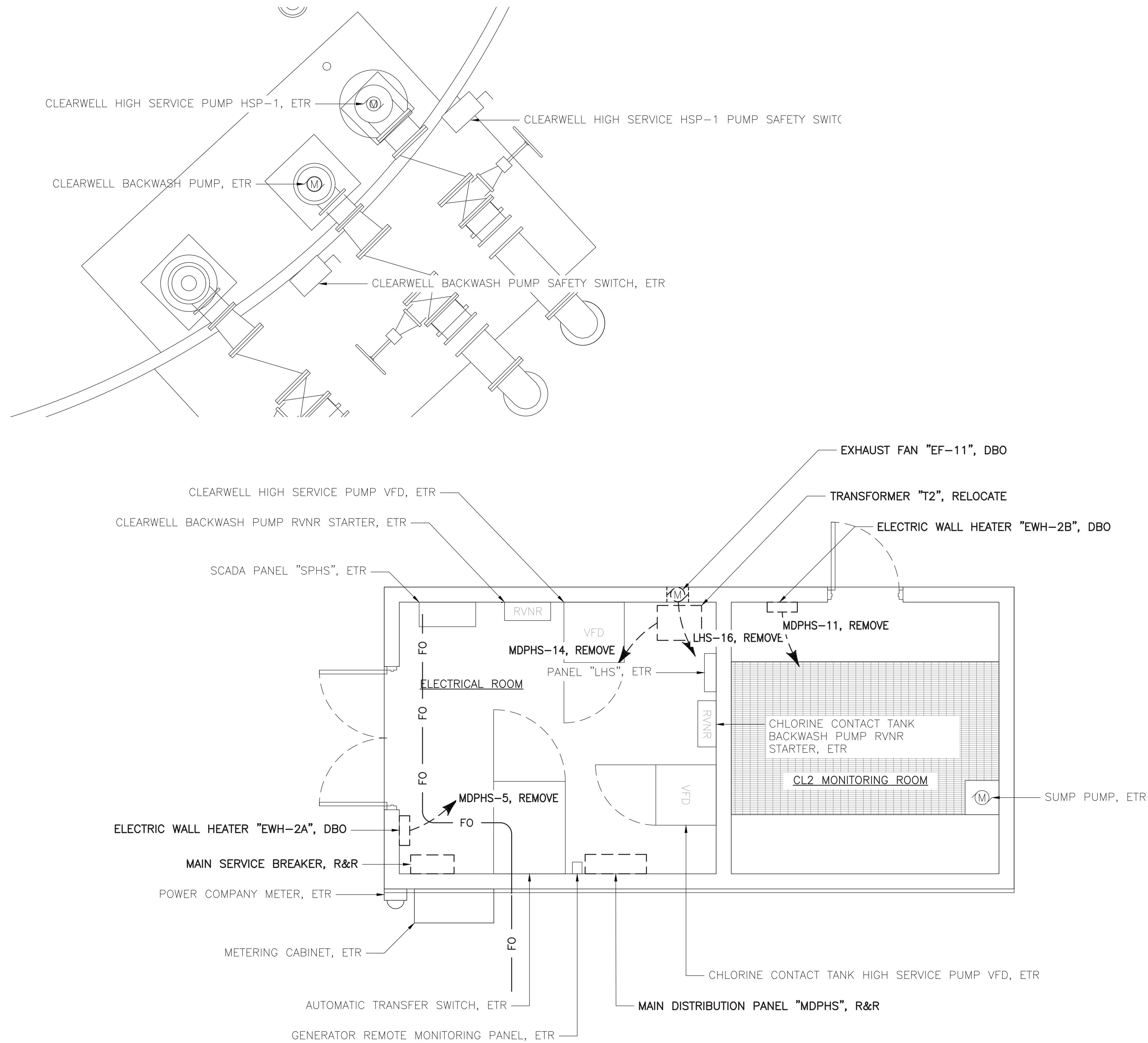
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



DRAWN BY:
 REVIEW BY:
 DATE:
 3/5/2024
 REVISION:

SHEET DESCRIPTION:
RAW WATER INTAKE
BUILDING
PANELBOARD
SCHEDULES

E10



NOTES

- 1. FOR CONDUIT QUANTITY, TYPE, SIZE AND FILL, SEE ONE LINE DIAGRAM - EXISTING CONDITIONS.

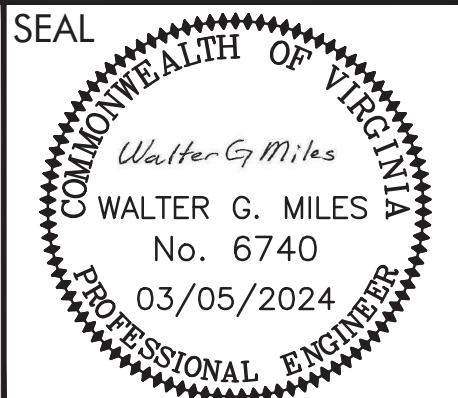
HSI PROJECT NO. 23-04-12



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660-011

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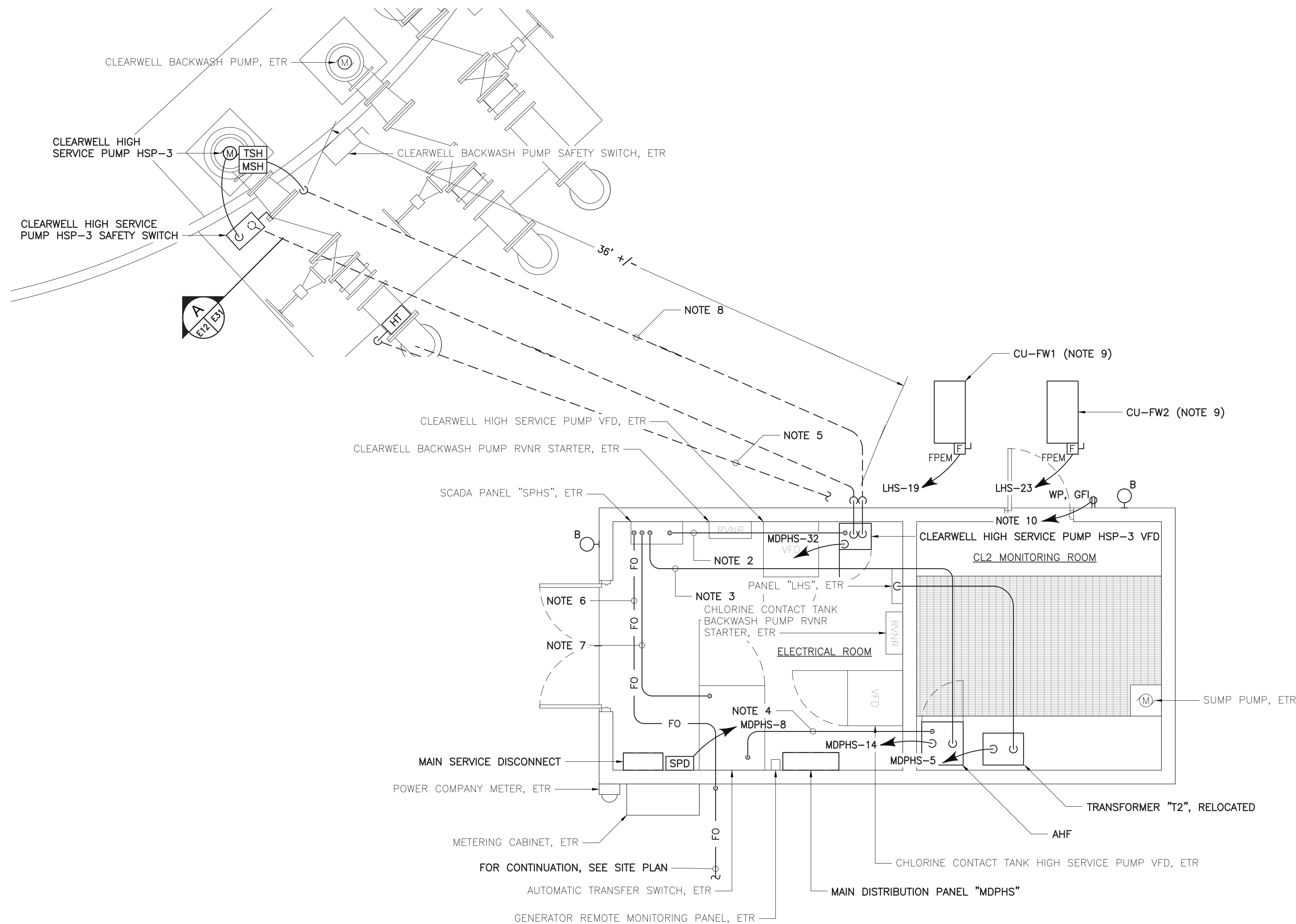
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



DRAWN BY:
REVIEW BY:
DATE: 3/5/2024
REVISION:

SHEET DESCRIPTION:
HIGH SERVICE BUILDING
DEMOLITION PLAN

E11



GENERAL NOTES

GN1. ALL CONDUIT SHALL BE RIGID ALUMINUM WITHIN BUILDING.

NOTES

1. FOR CONDUIT QUANTITY, TYPE, SIZE AND FILL, SEE ONE LINE DIAGRAM - REWORKED CONDITIONS.
2. 6/C #16 & TWO 2/C #16 TSP - 1 1/4" C.
 - 6/C #16 FOR PUMP START, PUMP RUNNING STATUS & FAULT.
 - TWO, 2/C #16 TSP FOR VFD SPEED & SPEED REFERENCE.
3. 8/C #16 - 1" C FOR AHF POWER ON, RUN, FAULT AND AT CAPACITY STATUS.
4. 4 #10 - 3/4" FOR AHF CT WIRING, INSTALL AHF CT'S IN AT'S.
5. ONE 2/C #12 W / EGC (POWER) & ONE 2/C #16 (MONITORING) - 1" C. AT BUILDING, TURN UP AND TURN IN TO BUILDING TO JUNCTION BOX NEAR CEILING. FROM JUNCTION BOX, RUN 2/C #12 W / EGC - 3/4" C TO PANEL "LHS" CIRCUIT 17. FROM JUNCTION BOX, RUN 2/C #16 - 3/4" C TO SCADA PANEL "SPHS".
6. EMPTY 3/4" C FOR FIBER OPTIC CABLE. OUTSIDE OF BUILDING, TRANSITION USING MOGUL CONDULET TO CONDUIT SIZE INDICATED ON SITE PLAN.
7. EMPTY 3/4" C FOR ETHERNET CABLE FROM AT'S POWER METER TO SPRW. INSTALL POWER METER IN AT'S.
8. TWO, 2/C #16 - 3/4" C
9. SEE DRAWING M4 FOR LOCATION
10. TIE INTO EXISTING RECEPTACLE CIRCUIT.
11. RECEPTACLES SHALL BE GFI TYPE, FLUSH-MONTED. INSTALL RED DOT CAT. NO. CKLSVU COVER WITH WATERTIGHT GASKET ON RECEPTACLE OUTLET BOXES

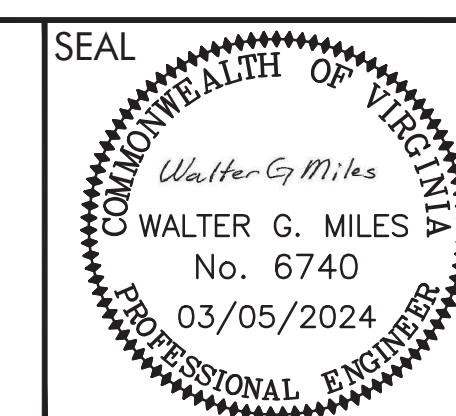
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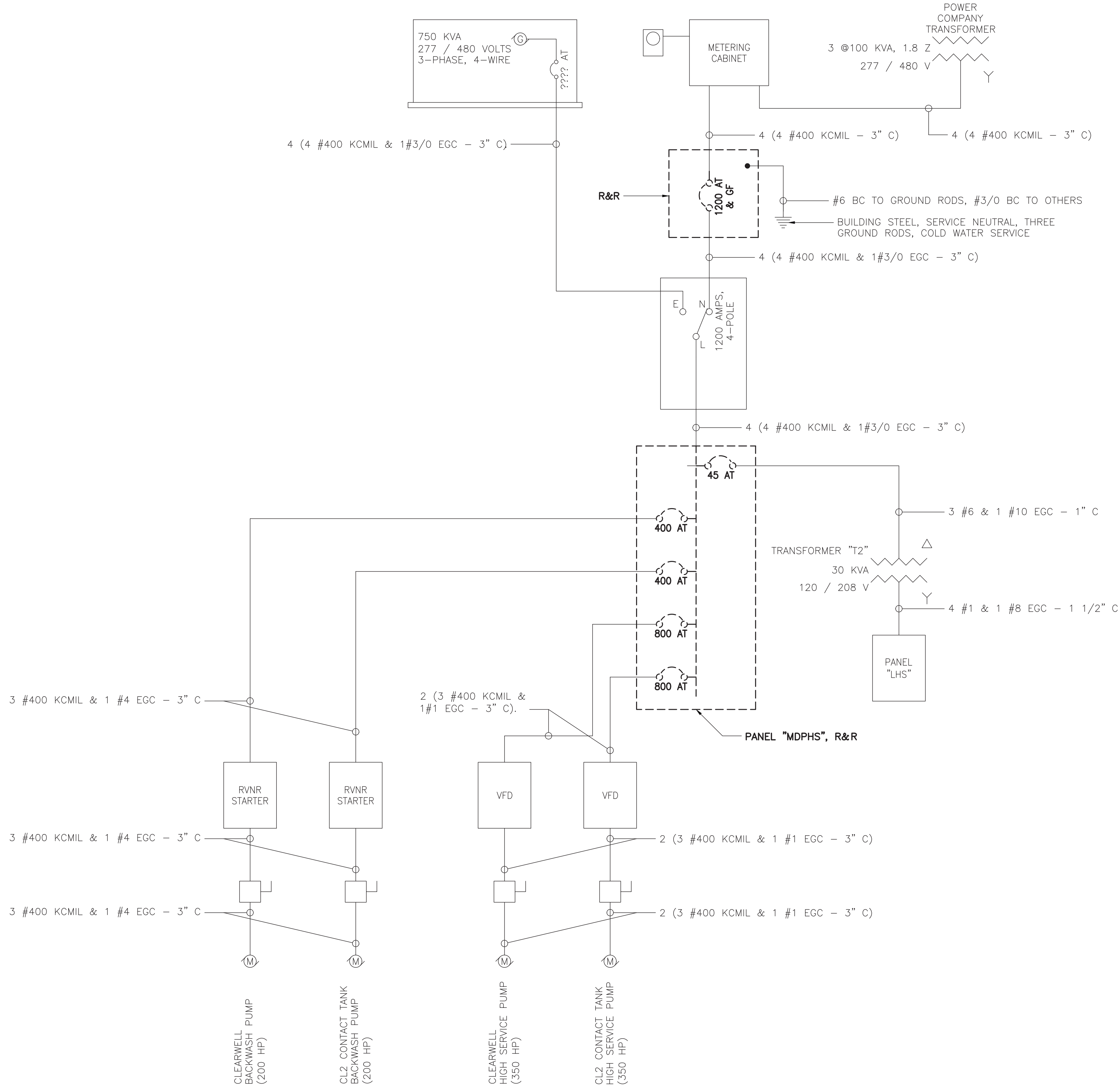
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



DRAWN BY:	
REVIEW BY:	
DATE:	3/5/2024
REVISION:	

SHEET DESCRIPTION:	HIGH SERVICE BUILDING
	NEW WORK PLAN

E12

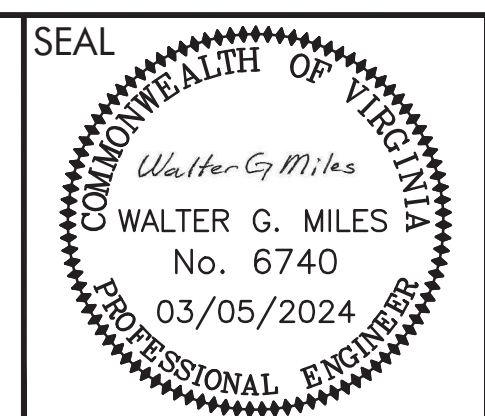


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PHONE: (540) 394 - 3222 FAX : (540) 394 - 3215

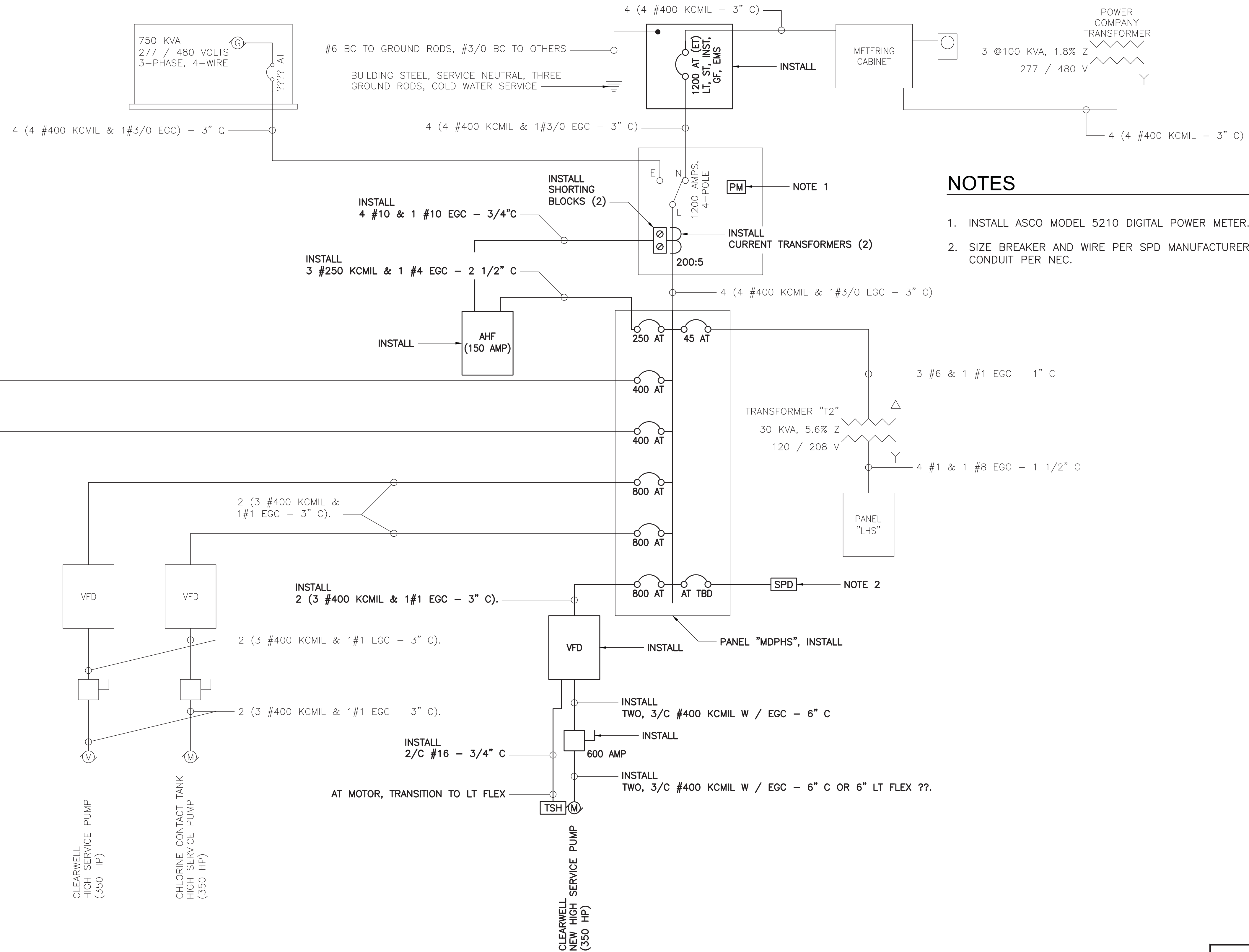
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WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



DRAWN BY:
REVIEW BY:
DATE:
3/5/2024
REVISION:

SHEET DESCRIPTION:
HIGH SERVICE BUILDING
ONE LINE DIAGRAM
EXISTING CONDITION

E13



NOTES

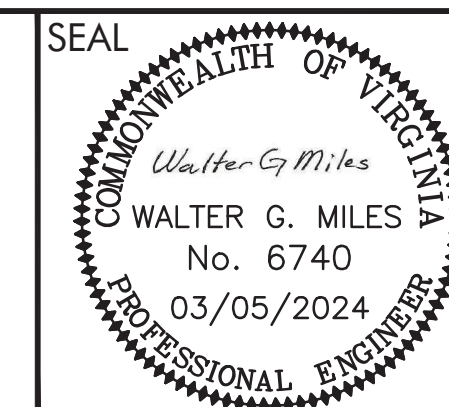
1. INSTALL ASCO MODEL 5210 DIGITAL POWER METER.
2. SIZE BREAKER AND WIRE PER SPD MANUFACTURER'S RECOMMENDATION. SIZE CONDUIT PER NEC.

HSI PROJECT NO. 23-04-12

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AUSTINVILLE VIRGINIA



DRAWN BY:
REVIEW BY:
DATE:
3/5/2024
REVISION:

SHEET DESCRIPTION:
HIGH SERVICE BUILDING
ONE LINE DIAGRAM
REWORKED CONDITION

E14

PANEL "LHS" SCHEDULE (Existing to Remain)

PANELBOARD CHARACTERISTICS:

VOLTS: 120/208
PHASES: 3
WIRES: 4

SOLID NEUTRAL
GROUND BAR
SHORT CIRCUIT RATING: 10,000 RMS SYM AMPS

MANUFACTURER, CAT. NO: SIEMENS, P1C42BL100CTS
MAIN BREAKER: 100 AF, 3P, 100 AT, TOP ENTRY

CKT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE
				A	B	C	P	AF	AT	PHASE	NEUT.	EGC	
1	1	REC. FRONT	1.20	10.0			1	100	20			EXISTING TO REMAIN	
3	3	SUMP PUMP	0.70		5.8		1	100	20			EXISTING TO REMAIN	
5	5	BATTERY CHARGER	0.30			2.5	1	100	20			EXISTING TO REMAIN	
7	7	TURBIDITY METER	1.00	8.3			1	100	20			EXISTING TO REMAIN	
9	9	PH METER & FLOW MAGMETER	1.00		8.3		1	100	20			EXISTING TO REMAIN	
11	11	REC. FRONT	1.20			10.0	1	100	20			EXISTING TO REMAIN	
13	13	SPARE					1	100	20				
15	15	SCADA PANEL	0.60		5.0		1	100	20			EXISTING TO REMAIN	
17	17	EXHAUST FAN (FHP)	0.60			5.0	1	100	20			REMOVE	
19	19	SPACE & BUS ONLY					1	100					
21	21	"					"	"					
23	23	"					"	"					
25	25	"					"	"					
27	27	"					"	"					
29	29	"					"	"					
31	31	"					"	"					
33	33	"					"	"					
35	35	"					"	"					
37	37	"					"	"					
39	39	"					"	"					
41	41	"					"	"					
2	2	GENERATOR BLOCK HEATER & BATTERY HEATER	5.00	24.0			2	100	50			EXISTING TO REMAIN	
6	6	REC. SIDE	1.20		24.0		1	100	20			EXISTING TO REMAIN	
8	8	REC. SIDE	1.20	10.0			1	100	20			EXISTING TO REMAIN	
10	10	HEAT TAPE	1.00		8.3		1	100	20			EXISTING TO REMAIN	
12	12	WALL HEATER	1.50			12.5	1	100	20			REMOVE	
14	14	WALL HEATER	1.50	12.5			1	100	20			REMOVE	
16	16	EXHAUST FAN (FHP)	0.60		5.0		1	100	20			REMOVE	
18	18	SPARE					1	100	20				
20	20	SPACE & BUS ONLY					1	100					
22	22	"					"	"					
24	24	"					"	"					
26	26	"					"	"					
28	28	"					"	"					
30	30	"					"	"					
32	32	"					"	"					
34	34	"					"	"					
36	36	"					"	"					
38	38	"					"	"					
40	40	"					"	"					
42	42	"					"	"					
TOTALS			18.60	64.9	56.5	40.0							

PANEL "LHS" SCHEDULE (Reworked conditions) (Provide new panel directory)

PANELBOARD CHARACTERISTICS:

VOLTS: 120/208
PHASES: 3
WIRES: 4

SOLID NEUTRAL
GROUND BAR
SHORT CIRCUIT RATING: 10,000 RMS SYM AMPS

MANUFACTURER, CAT. NO: SIEMENS, P1C42BL100CTS
MAIN BREAKER: 100 AF, 3P, 100 AT, TOP ENTRY

CKT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			NO. & WIRE SIZE			CONDUIT SIZE
				A	B	C	P	AF	AT	PHASE	NEUT.	EGC	
1	1	REC. FRONT	1.20	10.0			1	100	20			EXISTING TO REMAIN	
3	3	SUMP PUMP	0.70		5.8		1	100	20			EXISTING TO REMAIN	
5	5	BATTERY CHARGER	0.30			2.5	1	100	20			EXISTING TO REMAIN	
7	7	TURBIDITY METER	1.00	8.3			1	100	20			EXISTING TO REMAIN	
9	9	PH METER & FLOW MAGMETER	1.00		8.3		1	100	20			EXISTING TO REMAIN	
11	11	REC. FRONT	1.20			10.0	1	100	20			EXISTING TO REMAIN	
13	13	SPARE					1	100	20				
15	15	SCADA PANEL "SPHS"	0.60		5.0		1	100	20			EXISTING TO REMAIN	
17	17	PUMP "HSP-3" HEAT TAPE	0.10			0.8	1	100	20			2/C #12 W/ EGC- 3/4" C	
19	19	CU-FW1	3.95	19.0			2	100	30			2 #10 & 1 #12 EGC- 3/4" C	
21	21	"		19.0									
23	23	CU-FW2	3.95			19.0	2	100	30			2 #10 & 1 #12 EGC- 3/4" C	
25	25	"		19.0									
27	27	SPACE & BUS ONLY					"	"					
29	29	"					"	"					
31	31	"					"	"					
33	33	"					"	"					
35	35	"					"	"					
37	37	"					"	"					
39	39	"					"	"					
41	41	"					"	"					
2	2	GENERATOR BLOCK HEATER & BATTERY HEATER	5.00	24.0			2	100	50			EXISTING TO REMAIN	
6	6	REC. SIDE	1.20		24.0		1	100	20			EXISTING TO REMAIN	
8	8	REC. SIDE	1.20	10.0			1	100	20			EXISTING TO REMAIN	
10	10	HEAT TAPE	1.00		8.3		1	100	20			EXISTING TO REMAIN	
12	12	SPARE					1	100	20				
14	14	SPARE					1	100	20				
16	16	SPARE					1	100	20				
18	18	SPARE					1	100	20				
20	20	SPACE & BUS ONLY					1	100					
22	22	"					"	"					
24	24	"					"	"					
26	26	"					"	"					
28	28	"					"	"					
30	30	"					"	"					
32	32	"					"	"					
34	34	"					"	"					
36	36	"					"	"					
38	38	"					"	"					
40	40	"					"	"					
42	42	"					"	"					
TOTALS			22.40	90.4	70.5	42.3							

MASTER ENGINEERS & DESIGNERS
904 Lakeside Drive, Lynchburg, VA 24501
660-011 434-846-1350 Fax: 434-846-1351

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3220 FAX : (540) 394 - 3215

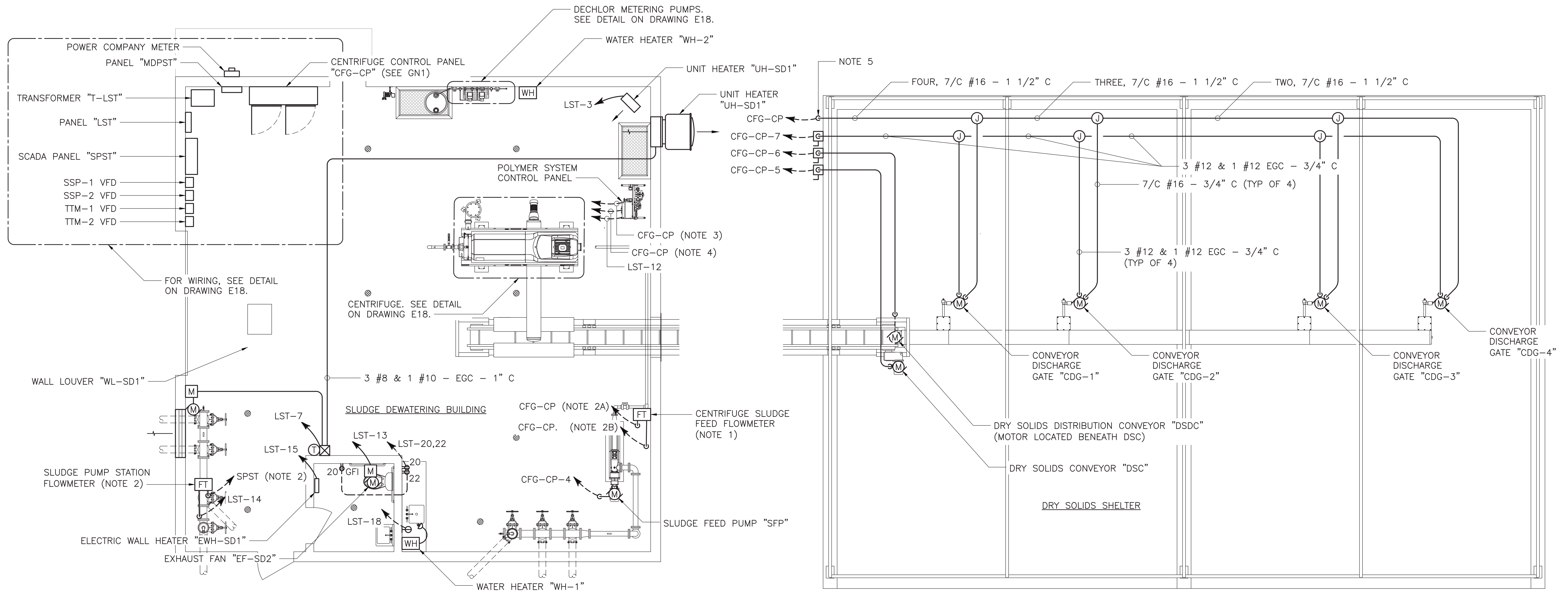
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA

SEAL
COMMONWEALTH OF VIRGINIA
Walter G. Miles
No. 6740
03/05/2024
PROFESSIONAL ENGINEER

DRAWN BY:
REVIEW BY:
DATE:
3/5/2024
REVISION:

SHEET DESCRIPTION:
**HIGH SERVICE BUILDING
PANELBOARD SCHEDULES**

E16



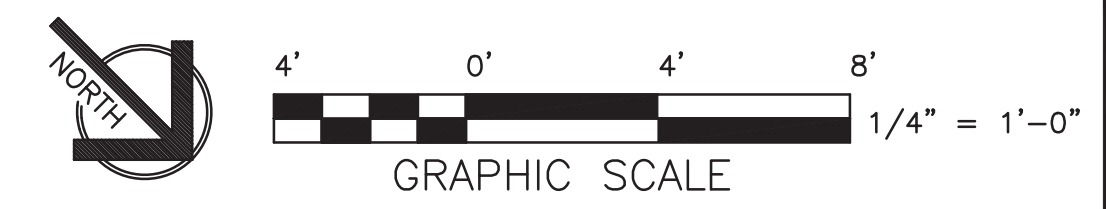
GENERAL NOTES (Drawings E17 & E18)

- GN1. UNDERGROUND CONDUITS WILL BE ENTERING THE BUILDING FROM THE SLUDGE PUMPING STATION AND THICKENER TANKS AND WILL CONTINUE BELOW THE FLOOR SLAB TO THEIR RESPECTIVE DESTINATIONS.
- GN2. ALL POWER, INSTRUMENTATION AND CONTROL WIRING TO AND FROM CENTRIFUGE CONTROL PANEL "CFG-CP" AND CONVEYOR CONTROL PANEL "C-CP" IS BASED UPON THE CENTRIFUGE BASE BID. REFER TO CENTRIFUGE MANUFACTURER'S SHOP DRAWINGS BEFORE BEGINNING WORK. REPORT DISCREPANCIES TO ENGINEER FOR RESOLUTION.
- GN3. RECEPTACLES
 - SHALL BE GFI TYPE, FLUSH-MOUNTED.
 - INSTALL RED DOT CAT. NO. CKLSVU COVER WITH WATERTIGHT GASKET ON RECEPTACLE OUTLET BOXES.
- GN4. ALL EXPOSED CONDUIT SHALL BE RIGID ALUMINUM.

NOTES (Drawing E17)

1. SEE MANUFACTURER'S INSTRUCTIONS REGARDING GROUNDING. IF PIPING IS PLASTIC, RUN 1 #8 BCSD EGC - 3/4" PVC TO PANEL "MDPST" AND BOND TO ITS GROUND BAR. APPLY TAG TO EGC STATING "FLOWMETER GROUND".
2. CENTRIFUGE SLUDGE FEED FLOWMETER
 - 2A. ONE 2/C #16 TSP & ONE 2/C #16 - 1" C
 - 2B. 2 #12 & 1 #12 EGC - 3/4" C
3. 8/C #16 W / EGC - 1" C
4. TWO, 2/C #16 TSP - 3/4" C
5. INSTALL MOGUL "C" CONDULET IN VERTICAL RUN TO FACILITATE WIRE PULLING.

HSI PROJECT NO. 23-04-12



MASTER
ENGINEERS & DESIGNERS
904 Lakeside Drive, Lynchburg, VA 24501
434-846-1350 Fax: 434-846-1351
660-011

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3211 FAX: (540) 394 - 3215

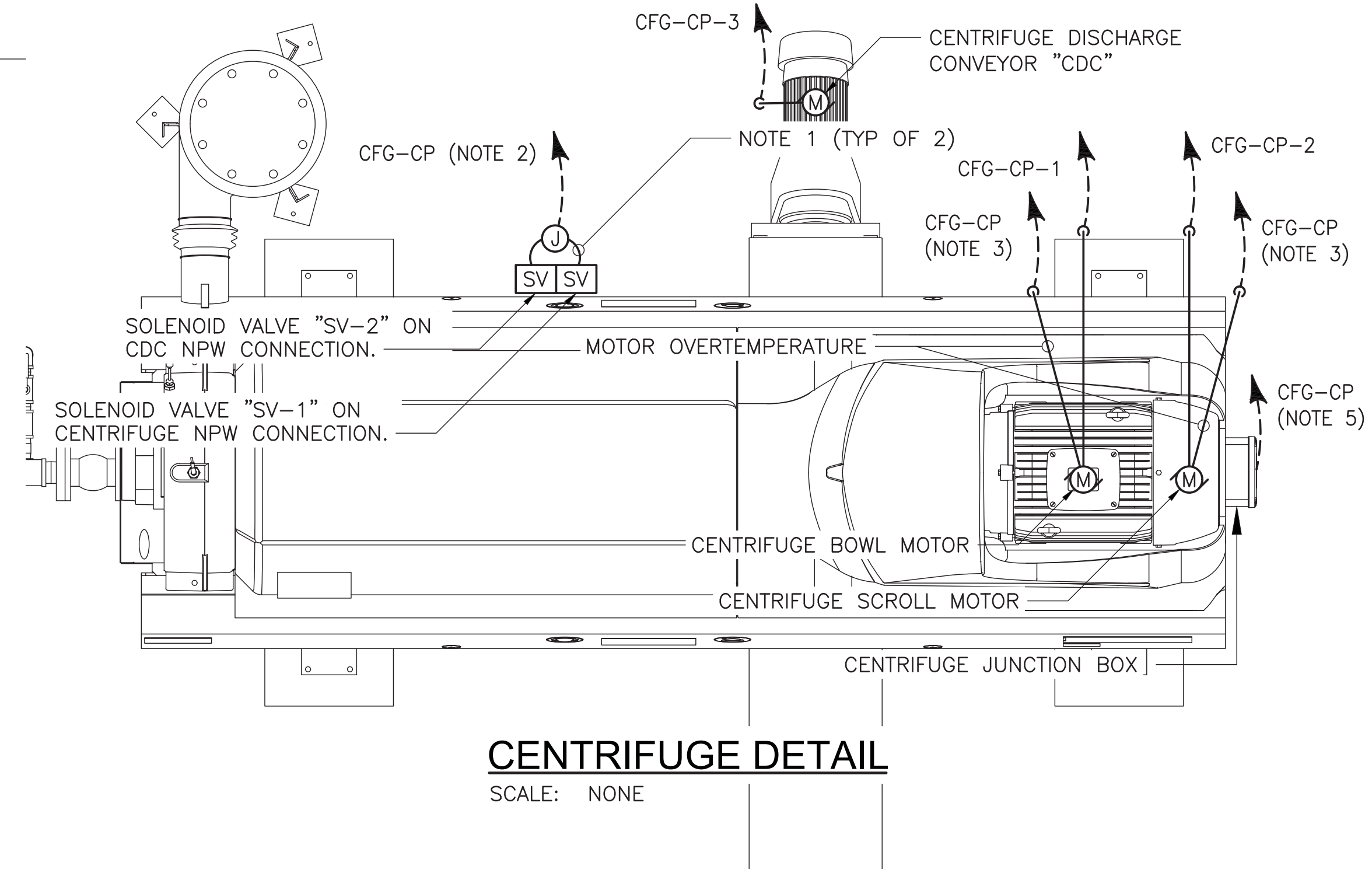
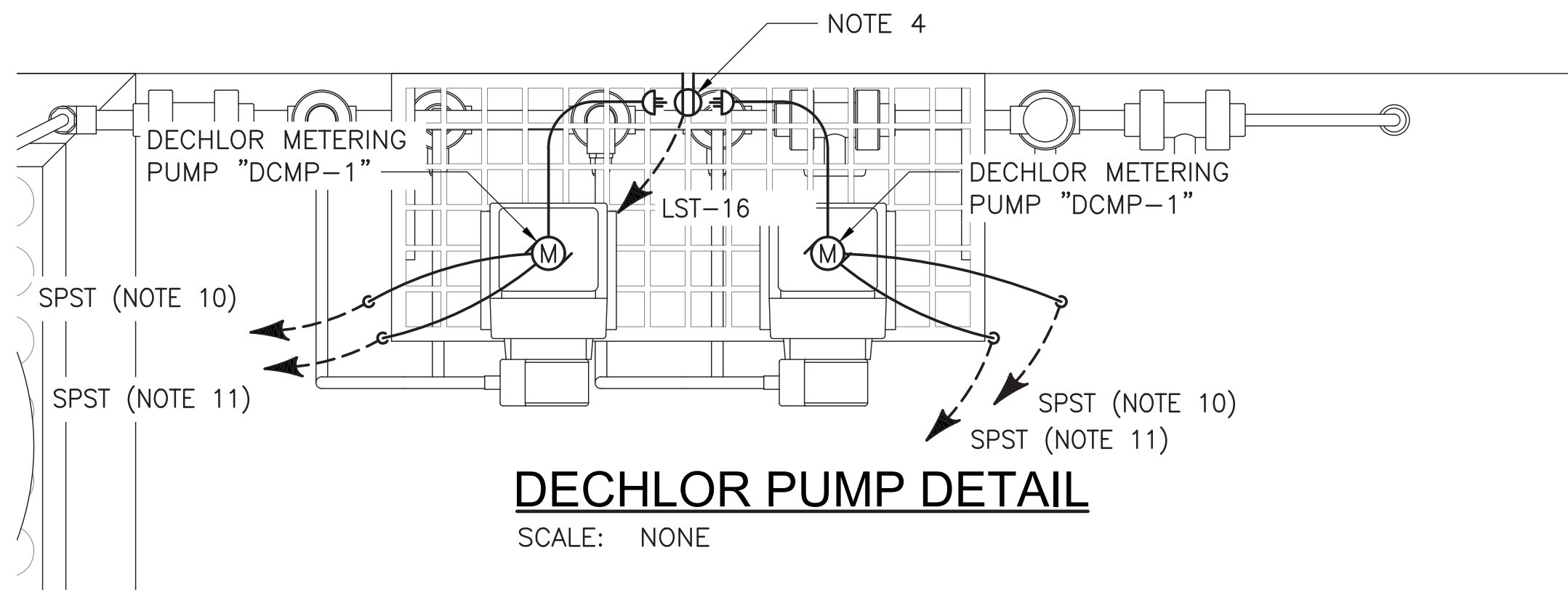
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA

SEAL
COMMONWEALTH OF VIRGINIA
Walter G. Miles
No. 6740
03/05/2024
PROFESSIONAL ENGINEER

DRAWN BY:	
REVIEW BY:	
DATE:	3/5/2024
REVISION:	

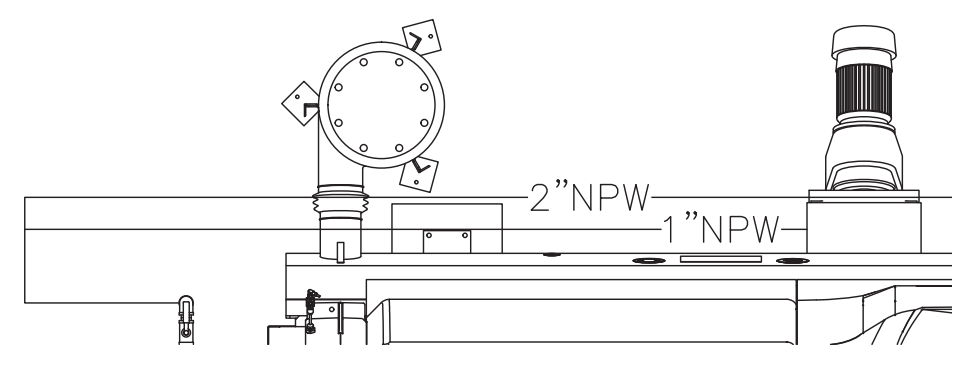
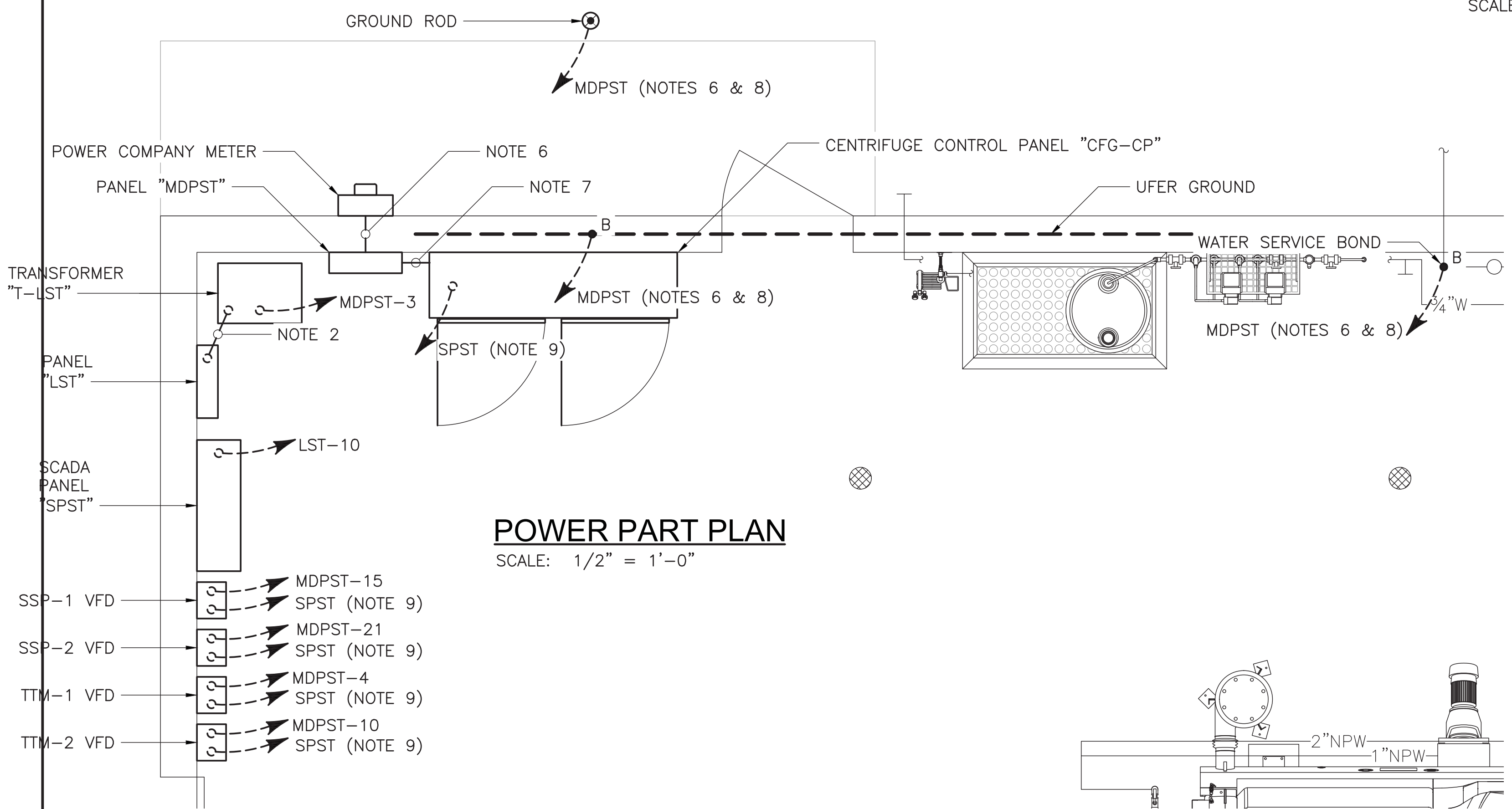
SHEET DESCRIPTION:
**SLUDGE TREATMENT
SLUDGE DEWATERING
BUILDING & DRY SLUDGE
SHELTER POWER PLAN**

E17

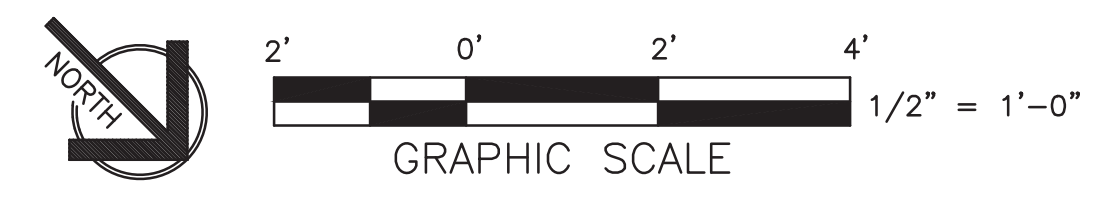


NOTES

- GENERAL**
GN1. SEE GN1, DRAWING E17.
- NUMBERED**
- 2/C #14 W / EGC - 1/2" FLEX
 - TWO, 2/C #14 W / EGC - 1" C
 - 2/C #16 TSP - 3/4" C
 - INSTALL CENTERED IN BLOCK COURSE APPROXIMATELY 12" ABOVE PUMP GRATING. INSTALL RED DOT CKMUV COVER WITH WATERTIGHT GASKET ON OUTLET BOX.
 - FIVE 2/C #16 TSP & TWO 2/C #16 - 2 1/2" C
 - FOR CONDUIT QUANTITY, TYPE, SIZE AND FILL, SEE ONE LINE DIAGRAM - SLUDGE DEWATERING BUILDING.
 - FOR CONDUIT QUANTITY, TYPE, SIZE AND FILL, SEE ASSOCIATED PANEL SCHEDULE, DRAWING E21.
 - BOND TO PANEL "MDPST" GROUND BUS.
 - EMPTY 3/4" C FOR ETHERNET CABLE
 - TWO, 2/C #16 TSP - 3/4" C
 - 10/C #16 - 3/4" C



HSI PROJECT NO. 23-04-12



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ENGINEERS & DESIGNERS
904 Lakeside Drive, Lynchburg, VA 24501
434-846-1350 Fax: 434-846-1351
660-011

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394-3277 FAX: (540) 394-3215

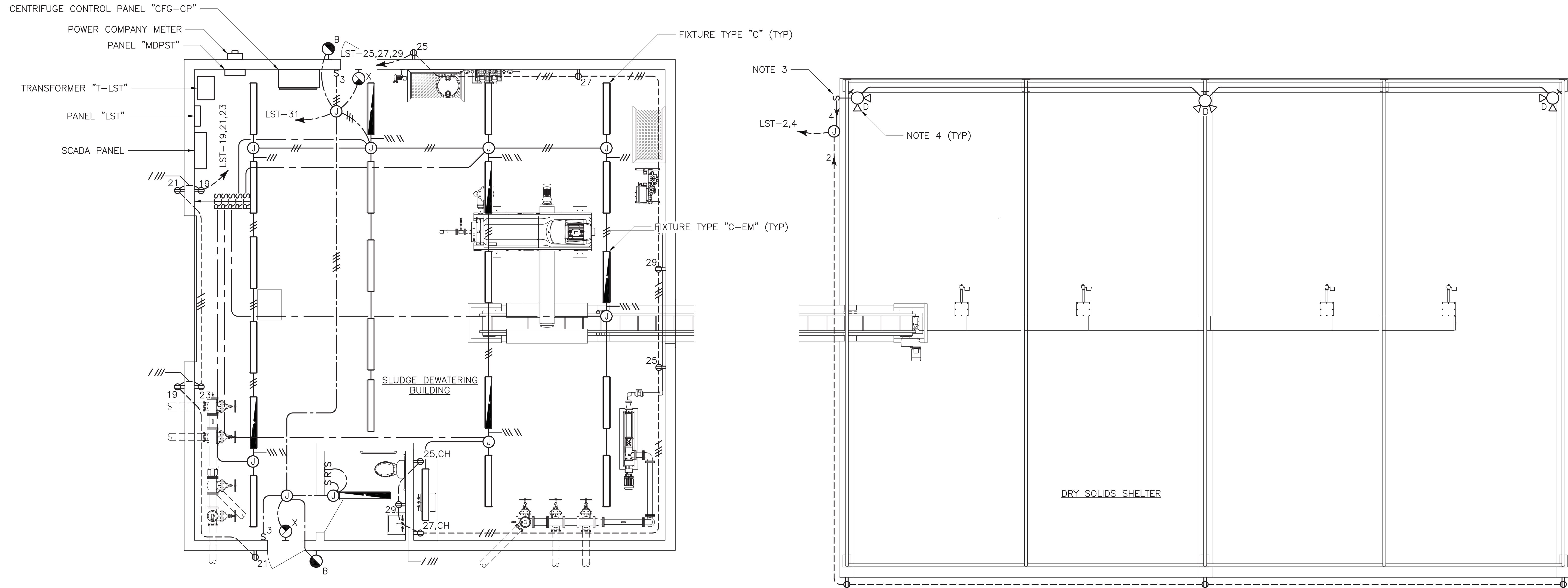
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA

SEAL
COMMONWEALTH OF VIRGINIA
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DRAWN BY:
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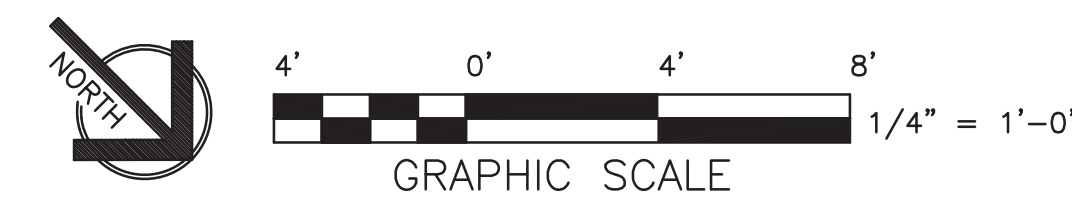
SHEET DESCRIPTION:
**SLUDGE TREATMENT
SLUDGE DEWATERING
BUILDING POWER PART
PLANS**

E18



NOTES

- 1. CONDUIT SHALL BE:
 - A. RIGID ALUMINUM WHERE EXPOSED.
 - B. RIGID STEEL WHERE CONCEALED WITHIN WALLS.
 - C. ELECTRICAL METALLIC THINWALL WHERE CONCEALED ABOVE CEILINGS.
- 2. RECEPTACLES
 - A. SHALL BE GFI TYPE.
 - B. INSTALL RED DOT CAT. NO. CKLSVU COVER WITH WATERTIGHT GASKET ON SWITCH AND RECEPTACLE OUTLET BOXES, UNLESS OTHERWISE NOTED.
- 3. LIGHT SWITCHES
 - A. WITHIN DEWATERING BUILDING
 - (1) IN PROCESS AREA
 - INSTALL FLUSH-MOUNTED, 48" AFF.
 - INSTALL STAINLESS STEEL DEVICE PLATE ON SWITCH OUTLET BOX.
 - (2) IN TOILET AREA
 - INSTALL FLUSH-MOUNTED, 48" AFF.
 - INSTALL STAINLESS STEEL DEVICE PLATE ON SWITCH OUTLET BOX.
 - B. DRY SOLIDS SHELTER: INSTALL APPROXIMATELY 48" AFG
 - (1) IN TOILET AREA
 - INSTALL FLUSH-MOUNTED, 48" AFF.
 - INSTALL STAINLESS STEEL DEVICE PLATE ON SWITCH OUTLET BOX.
- 4. INSTALL 12'-0" ABOVE SHELTER FLOOR.
 - A. WITHIN DEWATERING BUILDING
 - (1) IN PROCESS AREA
 - INSTALL FLUSH-MOUNTED, CENTERED IN BLOCK COURSE APPROXIMATELY 48" AFF.
 - INSTALL RED DOT CAT. NO. CCU COVER WITH WATERTIGHT GASKET ON SWITCH OUTLET BOX.
 - E. ON WALL OF DRY SOLIDS SHELTER, INSTALL SURFACE-MOUNTED, 6" BELOW TOP OF WALL FLOOR.

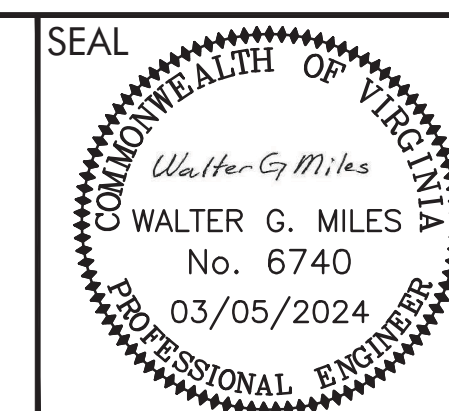


HSI PROJECT NO. 23-04-12

MASTER
ENGINEERS & DESIGNERS
904 Lakeside Drive, Lynchburg, VA 24501
434-846-1350 Fax: 434-846-1351
660-011

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3211 FAX: (540) 394 - 3215

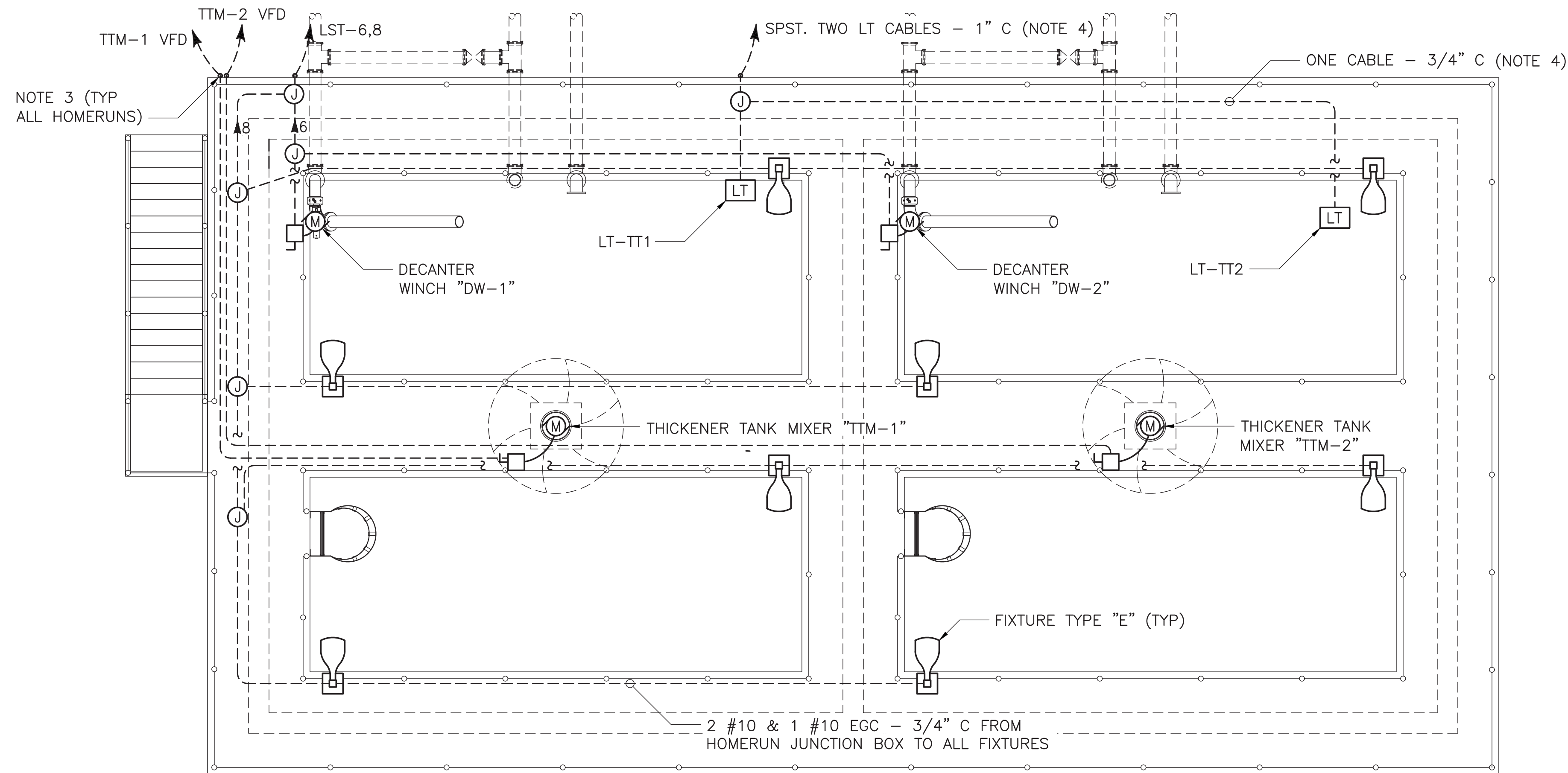
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



DRAWN BY:
REVIEW BY:
DATE:
3/5/2024
REVISION:

SHEET DESCRIPTION:
SLUDGE TREATMENT
SLUDGE DEWATERING
BUILDING & DRY SLUDGE
SHELTER LIGHTING PLAN

E19



THICKENER TANK PLAN

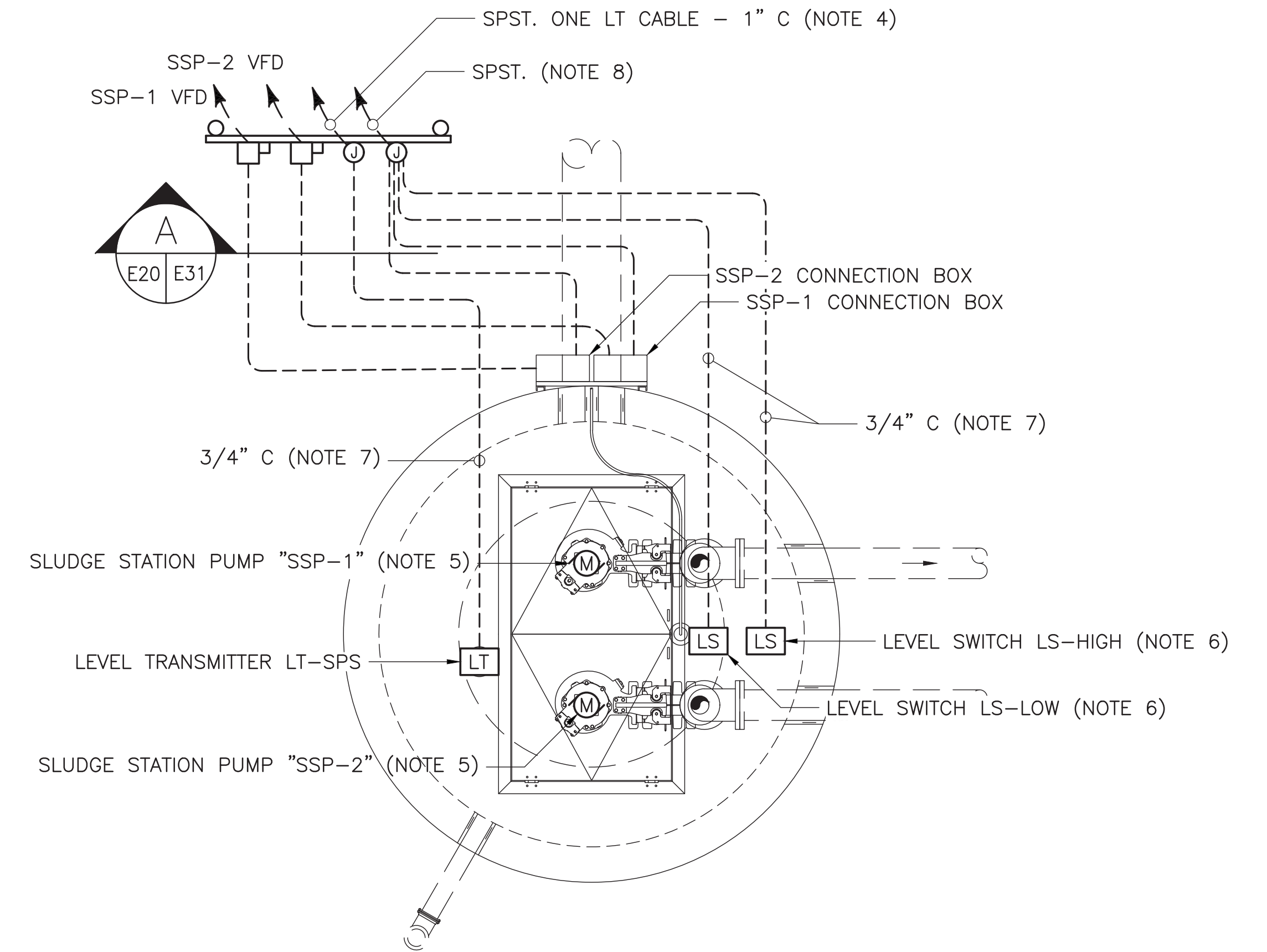
SCALE: 1/4" = 1'-0" ABOVE WATER, CONDUITS SHALL BE ALUMINUM

GENERAL NOTES

GN1. INSTALL RIGID ALUMINUM CONDUIT. INSTALL 8" BELOW TOP OF WALL. WHERE MORE THAN ONE RUN WILL BE INSTALLED, RUN ON KINDORF CHANNEL MOUNTED PERPENDICULAR TO WALL.

NOTES

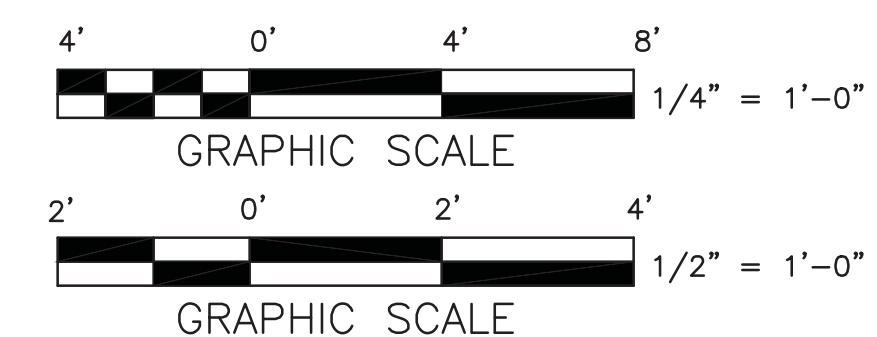
- FOR CONDUIT QUANTITY, TYPE, SIZE AND FILL, SEE ASSOCIATED PANEL SCHEDULE, DRAWING E????.
- ALL CONDUIT SHALL BE PJRSC.
- INSTALL MOGUL "C" CONDULET IN VERTICAL RUN TO FACILITATE WIRE PULLING.
- INSTALL LEVEL TRANSMITTER AND CABLE. SEE SHOP DRAWINGS OF UNIT PROVIDED FOR CABLE SIZE AND TYPE.
- PUMP POWER CORD AND OVERTEMPERATURE AND MOISTURE DETECTOR CORD ARE FACTORY WIRED TO THEIR ASSOCIATED CONNECTION BOX. VERIFY WHICH CONNECTION BOX IS FOR WHICH PUMP. VERIFY WHICH SECTION OF A BOX IS FOR POWER AND WHICH IS FOR THE OVERTEMPERATURE AND MOISTURE DETECTORS.
- INSTALL LEVEL SWITCHES.
- FACTORY CABLE.
- FOUR, 2/C #16 W / EGC - 1" C



SLUDGE PUMPING STATION PLAN

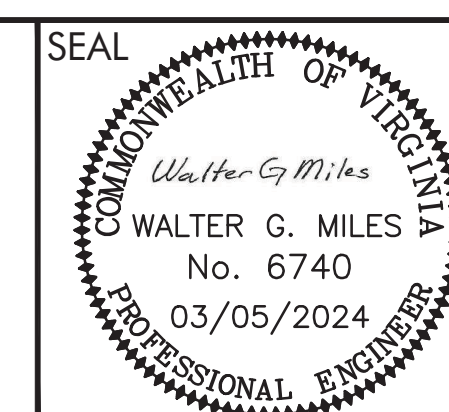
SCALE: 1/2" = 1'-0"

HSI PROJECT NO. 23-04-12



Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3211 FAX: (540) 394 - 3215

NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



DRAWN BY:
REVIEW BY:
DATE:
3/5/2024
REVISION:

SHEET DESCRIPTION:
**SLUDGE TREATMENT
THICKENER TANK &
SLUDGE PUMPING
STATION PLANS**

E20

LOAD SUMMARY

CONNECTED KVA BY LOAD TYPE								AVERAGE PHASE AMPS (CONNECTED)
LIGHTS	RECEPTACLES	SPACE HEATING	SPACE COOLING	VENTILATION	WATER HEATING	PROCESS	TOTAL KVA	
2.92	9.60	11.50		2.95	1.44	186.20	214.61	258.57

DEMAND KVA BY LOAD TYPE								AVERAGE PHASE AMPS (DEMAND)
LIGHTS	RECEPTACLES	SPACE HEATING	SPACE COOLING	VENTILATION	WATER HEATING	PROCESS	TOTAL KVA	
2.92	9.60	11.50		2.95	1.44	186.20	214.61	258.81

CENTRIFUGE CONTROL PANEL "CFG-CP" SCHEDULE

PANELBOARD CHARACTERISTICS:
 VOLTS: 277/480
 PHASES: 3
 WIRES: 4

PANEL IS PROVIDED BY CENTRIFUGE MANUFACTURER

CKT. NO.	DESCRIPTION	CONN. KVA	AMPS	NO. & WIRE SIZE			CONDUIT SIZE
				PHASE	NEUT.	EGC	
1	CENTRIFUGE BOWL MOTOR (40 HP)	41.40	499	#6	-	#6	1"
2	CENTRIFUGE SCROLL MOTOR (10 HP)	11.10	134	#12	-	#12	3/4"
3	CENTRIFUGE DISCHARGE CONVEYOR "CDC" (5 HP)	6.04	7.3	#12	-	#12	3/4"
4	SLUDGE FEED PUMP "SFP" (5 HP)	6.04	7.3	#12	-	#12	3/4"
5	DRY SOLIDS CONVEYOR "DSC" (5 HP)	6.04	7.3	#12	-	#12	3/4"
6	DRY SOLIDS DISTRIBUTION CONVEYOR "DSDC" (5 HP)	6.04	7.3	#12	-	#12	3/4"
7	CONVEYOR DISCHARGE GATES "CDG-1" thru "DG-4" (0.5 HP EACH) (ONLY ONE OPERATES AT A TIME)	0.87	1.0	#12	-	#12	3/4"
TOTALS		77.53	93.4				

PANEL "MDPST" SCHEDULE

PANELBOARD CHARACTERISTICS:
 VOLTS: 277/480
 PHASES: 3
 WIRES: 4

SOLID NEUTRAL GROUND BAR
 SHORT CIRCUIT RATING: 22,000 RMS SYM AMPS

ENCLOSURE: NEMA 12
 SURGE PROTECTIVE DEVICE

CKT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER			TRIP TYPE	NO. & WIRE SIZE			CONDUIT SIZE							
				A	B	C	P	AF	AT		PHASE	NEUT.	EGC								
MAIN BREAKER														3	400	400	LT, ST, INST, GF, EMS				
3	1	PANEL "LST" VIA TRANSFORMER "T-LST"	33.30	36.2			3	100	70	TM	#6	-	#8	1"							
	3				40.8							#6									
	5					36.5						#6									
9	7	CONVEYOR CONTROL PANEL "C-CP"	77.53	93.4			3	100	30	TM	#10	-	#12	3/4"							
	9				93.4							#10									
	11					93.4						#10									
15	13	SLUDGE STATION PUMP "SSP-1" VFD (7.5 HP)	8.75				3	100	30	TM	6/C #10 - 1"										
	15																				
	17																				
21	19	SLUDGE STATION PUMP "SSP-2" VFD (7.5 HP)					3	100	30	TM	6/C #10 - 1"										
	21																				
	23																				
	25																				
	27																				
	29																				
	31																				
	33																				
	35																				
4	2	THICKENER TANK MIXER "TTM-1" VFD (7.5 HF)	8.75				3	100	30	TM	6/C #10 - 1"										
	4																				
	6																				
10	8	THICKENER TANK MIXER "TTM-2" VFD (7.5 HF)	8.75				3	100	30	TM	6/C #10 - 1"										
	10																				
	12																				
16	14	CENTRIFUGE CONTROL PANEL "CFG-CP"	77.53	93.4			3	250	200	LT, INST, GF, EMS	#1/0	-	#6	2"							
	16				93.4							#1/0									
	18					93.4						#1/0									
	20																				
	22																				
	24																				
	26																				
	28																				
	30																				
	32																				
	34																				
	36																				
TOTALS			214.61	223.0	227.6	223.3															

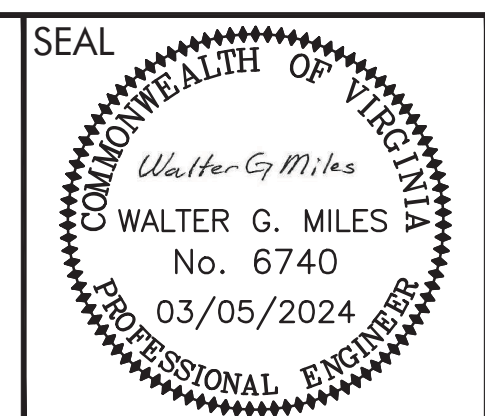
HSI PROJECT NO. 23-04-12



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 CIVIL & ENVIRONMENTAL ENGINEERS
 20 MIDWAY PLAZA DRIVE - SUITE 100
 CHRISTIANSBURG, VIRGINIA 24073
 PHONE: (540) 394 - 3214 FAX : (540) 394 - 3215

NEW RIVER REGIONAL WATER AUTHORITY WATER TREATMENT PLANT EXPANSION

AUSTINVILLE VIRGINIA



DRAWN BY:	SHEET DESCRIPTION: SLUDGE TREATMENT PANELBOARD SCHEDULES & ONE LINE DIAGRAM
REVIEW BY:	
DATE: 3/5/2024	
REVISION:	

E21

PANEL "LST" SCHEDULE

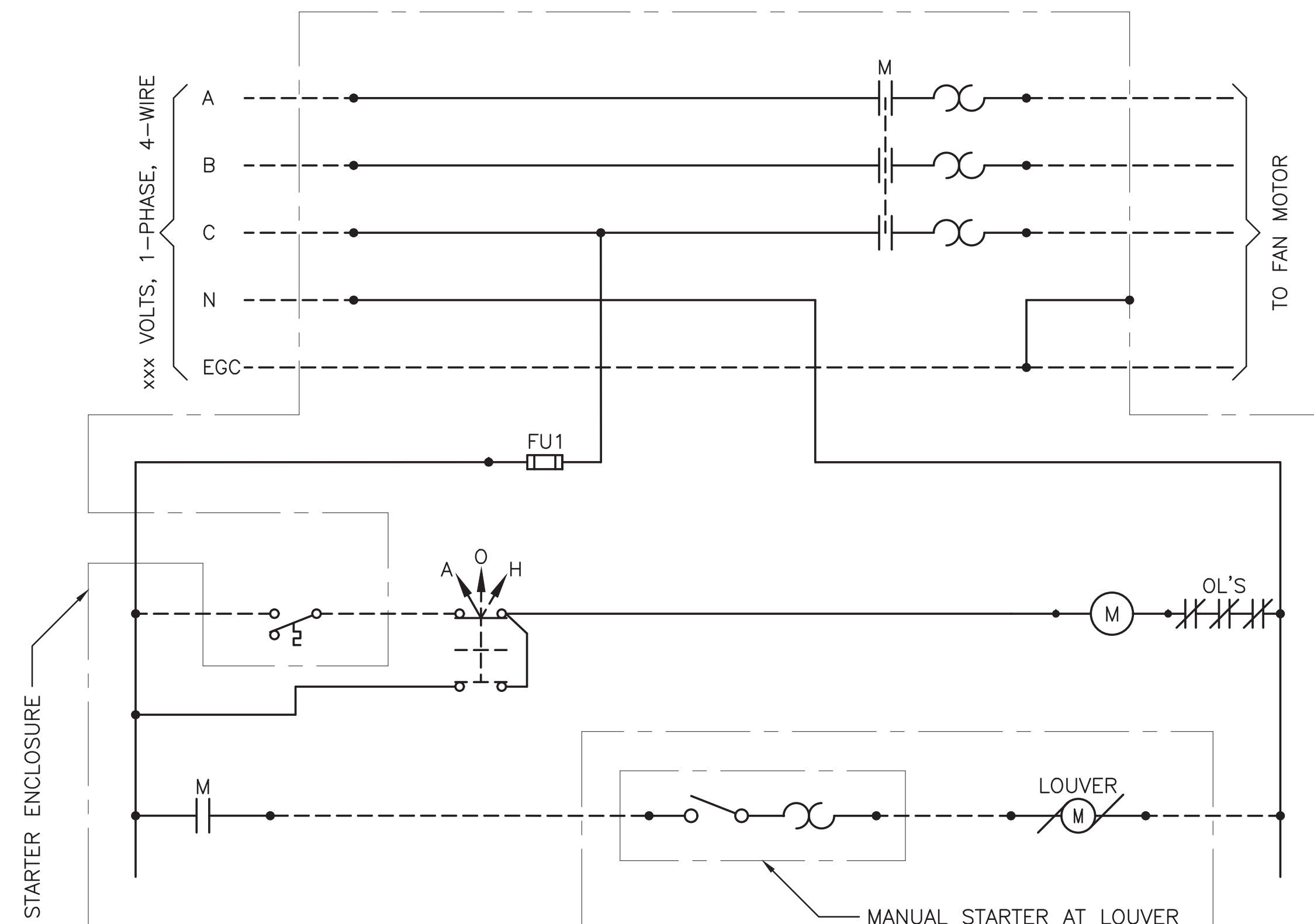
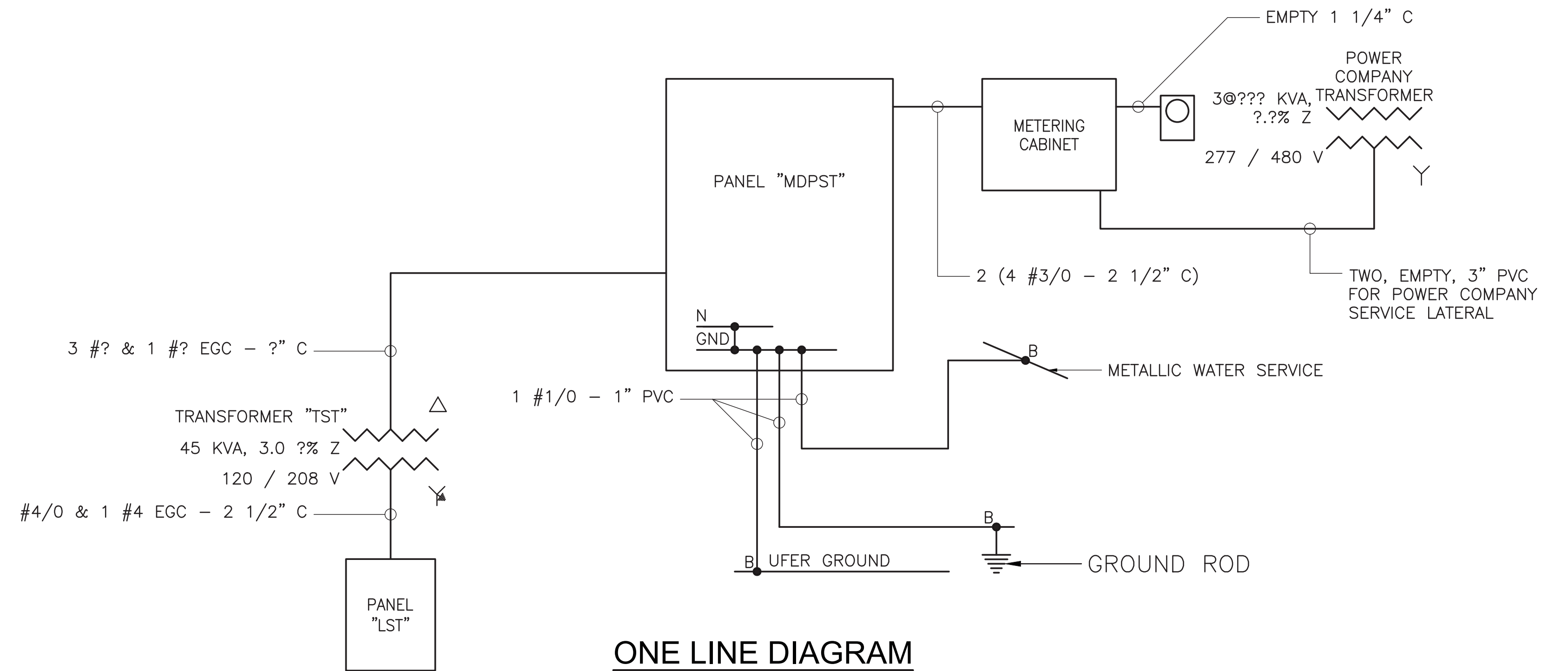
PANELBOARD CHARACTERISTICS:

VOLTS: 120/208
PHASES: 3
WIRES: 4

SOLID NEUTRAL
GROUND BAR
SHORT CIRCUIT RATING: 10,000 RMS SYM AMPS

MAIN BREAKER: 225 AF, 3P, 200 AT
INCOMING LINE: BOTTOM
ENCLOSURE: NEMA 12

CKT. NO.	POLE NO.	DESCRIPTION	CONN. KVA	CONN. AMPS			BREAKER		NO. & WIRE SIZE			CONDUIT SIZE	
				A	B	C	P	AF	AT	PHASE	NEUT.		EGC
3	1	UNIT HEATER "UH-SD1" (10 KW)	10.00	27.8			3	100	40	#8	-	#10	1"
	3				27.8					#8			
	5					27.8							
7	7	EXHAUST FAN "EF-SD1" (2 HP) & WALL LOUVER "WL-SD1"	2.70	7.5			3	100	15	#12	#12	#12	1"
	9				7.5					#12			
	11					7.5							
13	13	EXHAUST FAN "EF-SD2" (FHP)	0.25	2.1			1	100	15	#12	#12	#12	3/4"
15	15	ELECTRIC WALL HEATER "EWH-SD1"	1.50		7.2		2	100	15	#12	-	-	3/4"
19	19	REC. SLUDGE TREATMENT BUILDING	1.20	10.0			1	100	20	#12	#12	#12	3/4"
21	21	REC. SLUDGE TREATMENT BUILDING	1.20				1	100	20	#12	#12	#12	3/4"
23	23	REC. SLUDGE TREATMENT BUILDING	1.20			1.2	1	100	20	#12	#12	#12	3/4"
25	25	REC. SLUDGE TREATMENT BUILDING	1.20	10.0			1	100	20	#12	#12	#12	3/4"
27	27	REC. SLUDGE TREATMENT BUILDING	1.20				1	100	20	#12	#12	#12	3/4"
29	29	REC. SLUDGE TREATMENT BUILDING	1.20			1.2	1	100	20	#12	#12	#12	3/4"
31	31	LIGHTS: SLUDGE TREATMENT BUILDING	0.64	5.3			1	100	20	#12	#12	#12	3/4"
33	33	WATER HEATER "WH-1"	1.44		12.0		1	100	20	#12	#12	#12	3/4"
35	35	SPARE					1	100	20				
37	37	SPARE					1	100	20				
39	39	SPARE					1	100	20				
41	41	SPARE					1	100	20				
4	2	REC. DRY SOLIDS SHELTER	1.20	10.0			1	100	20	#10	#10	#10	3/4"
6	4	LIGHTS: DRY SOLIDS SHELTER	1.08		9.0		1	100	20	#12	#12	#12	3/4"
6	6	THICKENER TANK WINCHES (1/2 HP)	1.13			9.4	1	100	20	#10	#10	#10	1"
8	8	LIGHTS & REC. THICKENER TANK	1.20	10.0			1	100	20	#8	#8	#8	1"
10	10	SCADA PANEL "SPST"	1.20		10.0		1*	100	20	#12	#12	#12	3/4"
12	12	POLYMER SYSTEM CONTROL PANEL	3.58			29.8	1	100	40	#8	#8	#10	3/4"
14	14	SLUDGE PUMP STATION FLOW METER	0.10	0.8			1	100	20	#12	#12	#12	3/4"
16	16	DECHLORINATION PUMPS "DP-1" & "DP-2"	0.08		0.7		1	100	20	#12	#12	#12	3/4"
18	18	SPARE					1	100	20				
20	20	SPARE					1	100	20				
22	22	SPARE					1	100	20				
24	24	SPARE					1	100	20				
26	26	SPARE					1	100	20				
28	28	SPARE					1	100	20				
30	30	SPARE					1	100	20				
32	32	SPARE					1	100	20				
34	34	SPARE					1	100	20				
36	36	SPARE					1	100	20				
38	38	SPARE					1	100	20				
40	40	SPARE					1	100	20				
42	42	SPARE					1	100	20				
TOTALS			33.30	83.6	94.2	84.2	1*=> PROVIDE HANDLE-LOCKING DEVICE						



HSI PROJECT NO. 23-04-12

MASTER
ENGINEERS & DESIGNERS
904 Lakeside Drive, Lynchburg, VA 24501
434-846-1350 Fax: 434-846-1351

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3274 FAX: (540) 394 - 3215

NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA

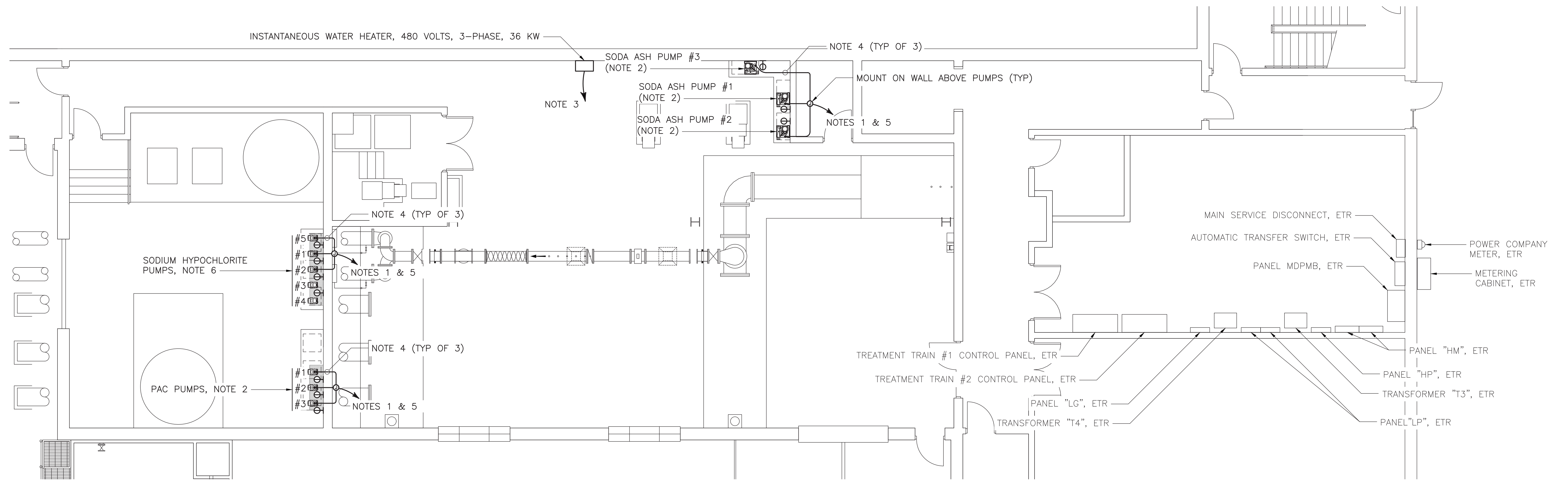
SEAL
COMMONWEALTH OF VIRGINIA
WALTER G. MILES
No. 6740
03/05/2024
PROFESSIONAL ENGINEER

DRAWN BY:
REVIEW BY:
DATE:
3/5/2024
REVISION:

SHEET DESCRIPTION:
**SLUDGE TREATMENT
PANELBOARD
SCHEDULES**

E22

JN: 22-18

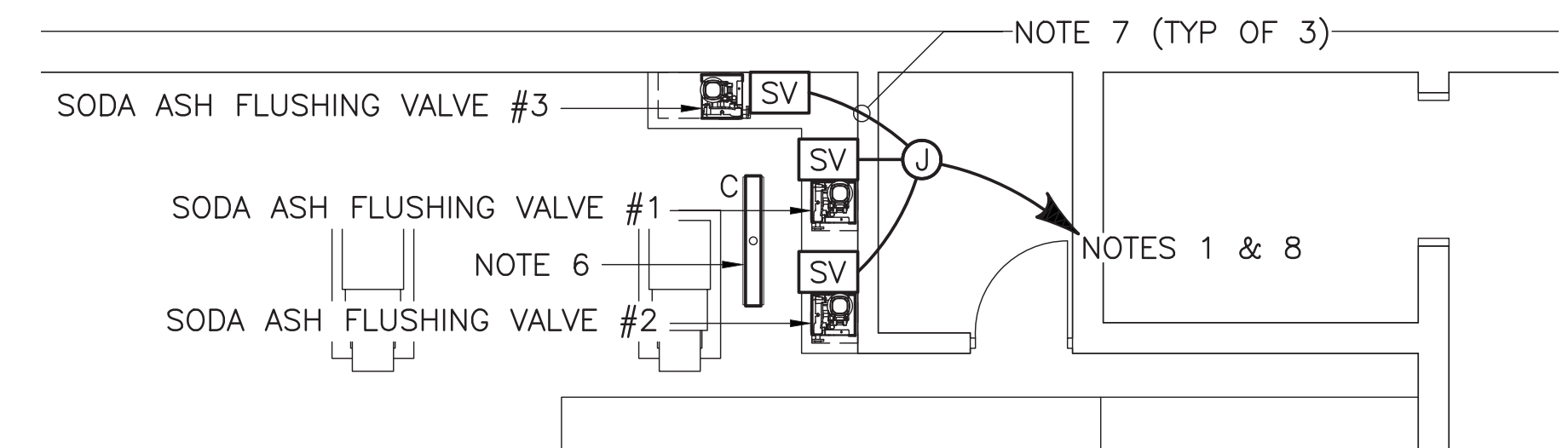


GENERAL NOTES

1. ALL CONDUIT SHALL BE RIGID ALUMINUM.

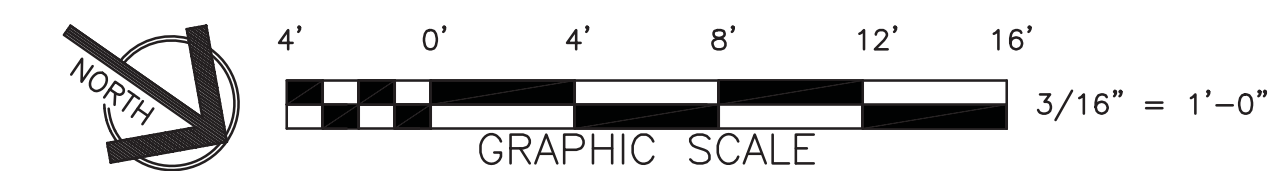
NOTES

1. TO TREATMENT TRAIN CONTROL PANELS.
2. DISCONNECT EXISTING PUMPS FROM 120 VOLT POWER. INSTALL RECEPTACLE 18" ABOVE PUMP SHELF. CONNECT RECEPTACLE TO EXISTING POWER SOURCE. OUTLET BOX SHALL BE RED DOT CAT. NO IH4-2-LM. COVER SHALL BE RED DOT CAT. NO. CKLSVU WITH WATERTIGHT GASKET.
3. 3 #6 & 1 #10 EGC - 1" C. INSTALL 3-POLE, 60 AMP BREAKER IN PANEL "HP". PANEL "HP" IS 277 / 480 VOLTS, 3-PHASE, 4-WIRE, SIEMENS CAT. NO. P3E56ML250FTS.
4. TWO, 2/C #16 TSP & ONE, 6/C #16 - 1" C
5. SIX, 2/C #16 TSP & THREE, 6/C #16 - 2" C
6. HYPOCHLORITE PUMPS.
 - A. DISCONNECT TWO, EXISTING, PUMP CONTROL PANELS FROM THEIR 120 VOLT POWER. INSTALL RECEPTACLE 18" ABOVE PUMP SHELF. CONNECT RECEPTACLE TO EXISTING POWER SOURCE.
 - B. FOR THE OTHER THREE PUMPS, INSTALL RECEPTACLE 18" ABOVE PUMP SHELF. CONNECT RECEPTACLE TO EXISTING POWER SOURCE.
 - C. RECEPTACLE OUTLET BOXES SHALL BE RED DOT CAT. NO IH4-2-LM. COVERS SHALL BE RED DOT CAT. NO. CKLSVU WITH WATERTIGHT GASKET.
6. CONNECT FIXTURE TO CIRCUIT FEEDING LIGHTING IN THE SODA ASH AREA.
7. 2/C #16 W / EGC - 3/4" C
8. THREE, 2/C #16 W / EGC - 1" C



PART PLAN - SODA ASH AREA

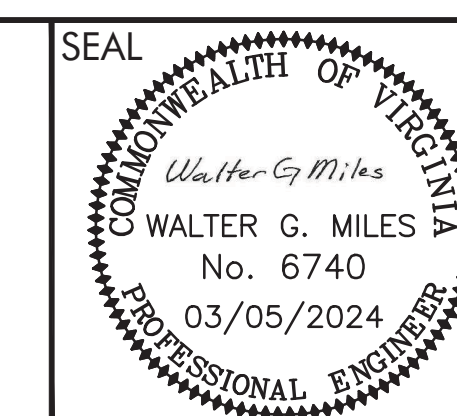
HSI PROJECT NO. 23-04-12



MASTER
ENGINEERS & DESIGNERS
904 Lakeside Drive, Lynchburg, VA 24501
434-846-1350 Fax: 434-846-1351
660-011

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3211 FAX: (540) 394 - 3215

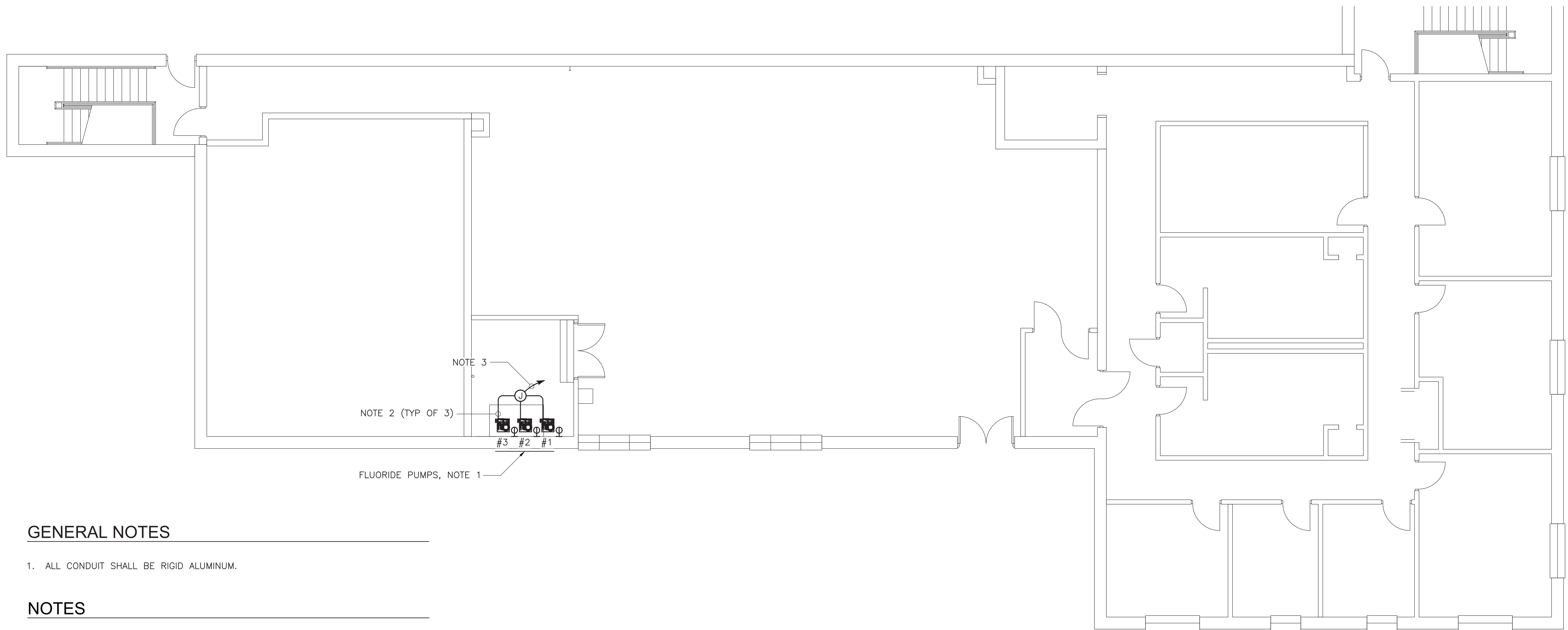
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



DRAWN BY:
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DATE:
3/5/2024
REVISION:

SHEET DESCRIPTION:
MAIN BUILDING
GROUND FLOOR

E23



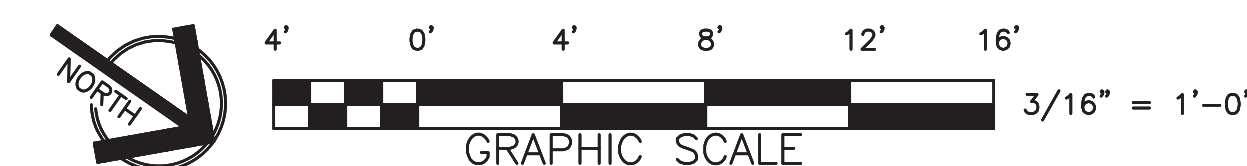
GENERAL NOTES

1. ALL CONDUIT SHALL BE RIGID ALUMINUM.

NOTES

- 1. DISCONNECT EXISTING PUMPS FROM 120 VOLT POWER. INSTALL RECEPTACLE 18" ABOVE PUMP SHELF. CONNECT RECEPTACLE TO EXISTING POWER SOURCE. OUTLET BOX SHALL BE RED DOT CAT. NO IH4-2-LM. COVER SHALL BE RED DOT CAT. NO. CKLSVU WITH WATERTIGHT GASKET. RECONNECT PACING SIGNAL WIRING.
- 2. ONE 2/C #16 TSP & TWO, 2/C #16 - 1" C
- 3. THREE 2/C #16 TSP & SIX, 2/C #16 - 1 1/2" C

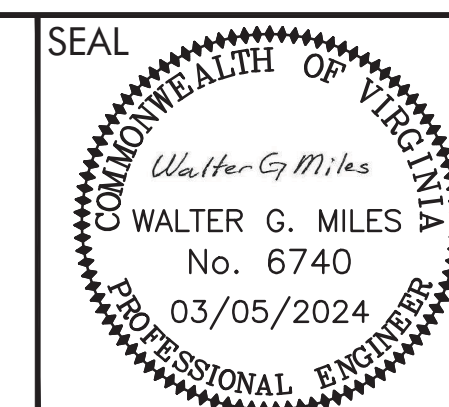
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MASTER
ENGINEERS & DESIGNERS
904 Lakeside Drive, Lynchburg, VA 24501
434-846-1350 Fax: 434-846-1351
660-011

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3215 FAX: (540) 394 - 3215

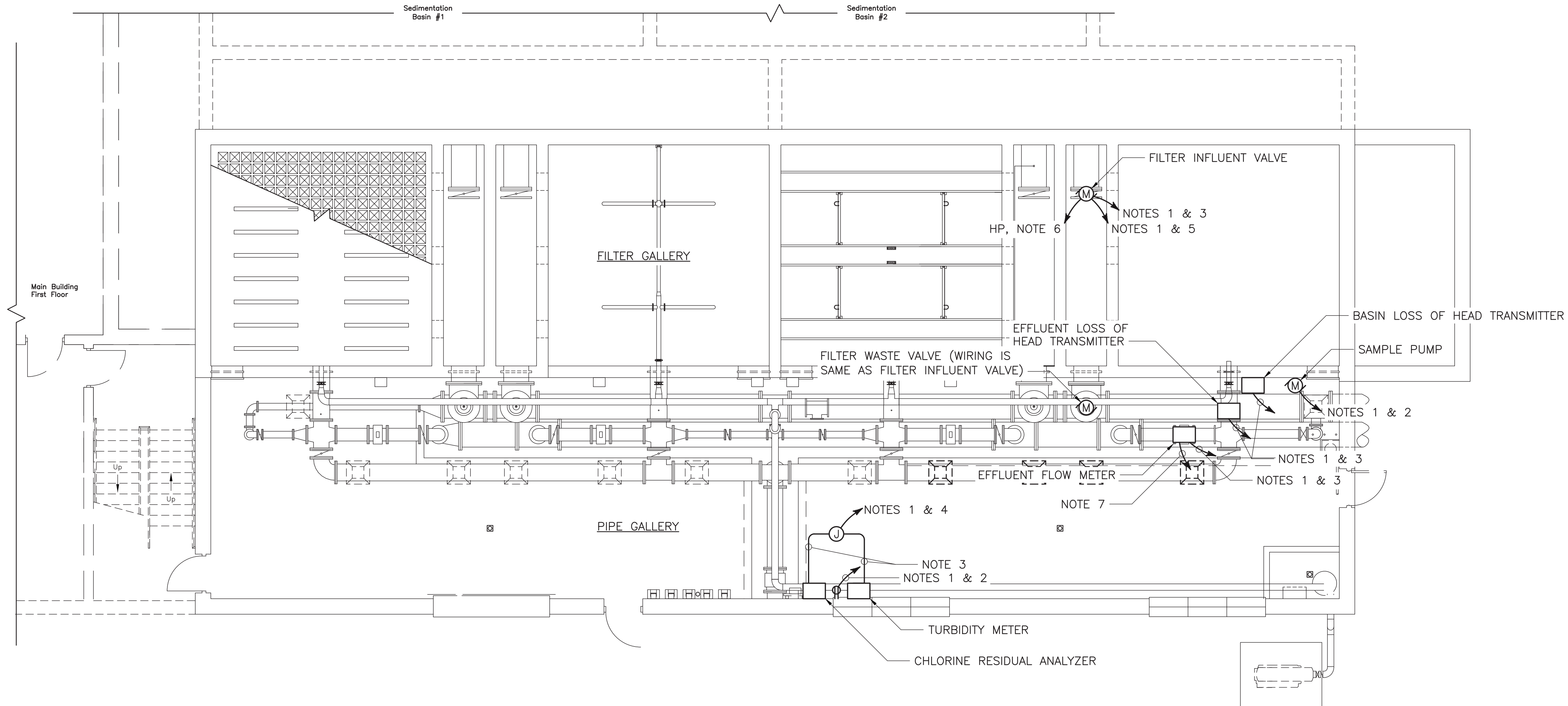
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WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



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DATE:
3/5/2024
REVISION:

SHEET DESCRIPTION:
MAIN BUILDING
SECOND FLOOR

E24



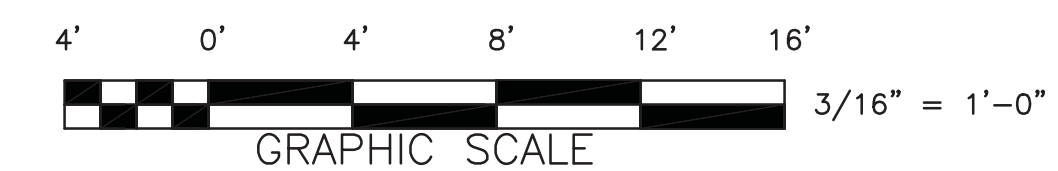
GENERAL NOTES

1. ALL CONDUIT SHALL BE RIGID ALUMINUM EXCEPT CONDUIT IN FILTER GALLERY SHALL BE PJRSC.

NOTES

1. TO FILTER #4 CONSOLE
2. 2 #12 & 1 #12 EGC - 3/4" C
3. 2/C #16 TSP - 3/4" C
4. 2/C #16 TSP & 2/C #16 - 3/4" C
5. 9/C #14 - 1" C
6. 3 #12 & 1 #12 EGC - 3/4" C. INSTALL 3-POLE, 15 AMP BREAKER IN PANEL "HP". PANEL "HP" IS 277 / 480 VOLTS, 3-PHASE, 4-WIRE, SIEMENS CAT. NO. P3E56ML250F5TS.
7. TIE INTO EXISTING FLOW METER CIRCUIT, LP2-49.

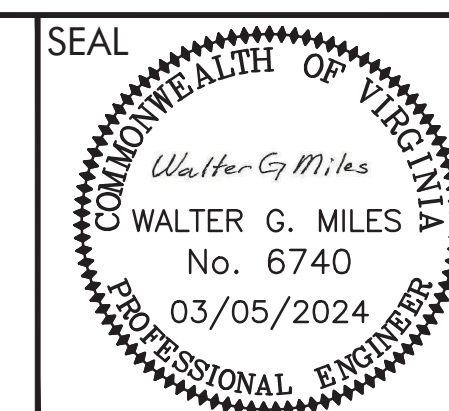
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ENGINEERS & DESIGNERS
904 Lakeside Drive, Lynchburg, VA 24501
434-846-1350 Fax: 434-846-1351
660-011

Peed & Bortz, L.L.C.
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CHRISTIANSBURG, VIRGINIA 24073
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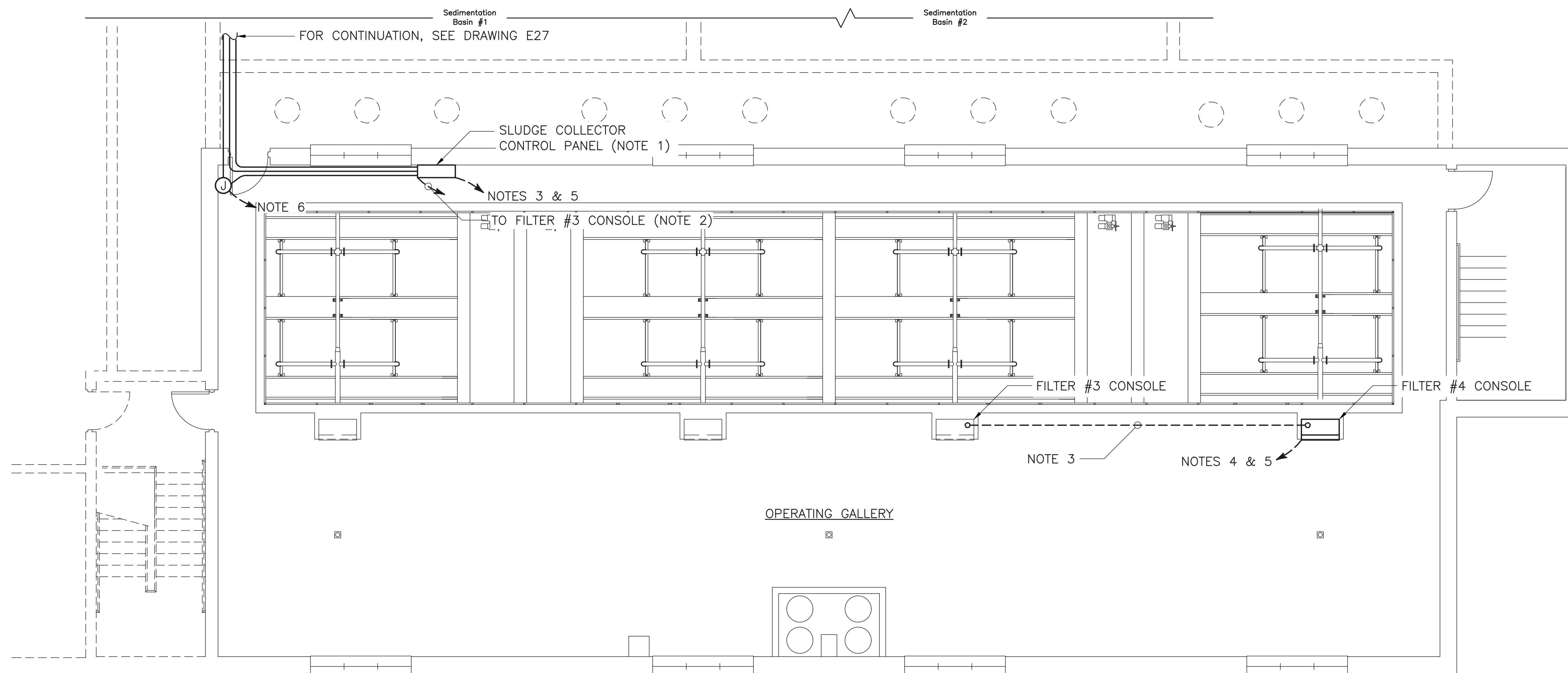
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



DRAWN BY:
REVIEW BY:
DATE:
3/5/2024
REVISION:

SHEET DESCRIPTION:
FILTER BUILDING
GROUND FLOOR

E25



GENERAL NOTES

- 1. ALL CONDUIT SHALL BE RIGID ALUMINUM.

NOTES

- 1. SEE DRAWING E27 – SLUDGE COLLECTOR CONTROL SYSTEM FOR FIELD WIRING TO SYSTEM DEVICES. SEE DRAWING C21 – SEDIMENTATION BASIN SLUDGE COLLECTOR PLAN FOR LOCATION OF SYSTEM DEVICES.
- 2. CAT 5e ETHERNET CABLE – 3/4" C
- 3. 2 #8 & 1 #8 EGC – 3/4" C TO PANEL "LP". INSTALL ONE, 1-POLE, 50 AMPERE BREAKER IN PANEL.
- 4. 2 #12 & 1 #12 EGC – 3/4" C TO PANEL "LP". INSTALL ONE, 1-POLE, 20 AMPERE BREAKER IN PANEL.
- 5. PANEL "LP" IS SIEMENS CAT. NO. P1C42FX225CTS.
- 6. 3/C #12 – TO PANEL "HM". INSTALL ONE, 3-POLE, 15 AMP BREAKER IN PANEL, PANEL "HM" IS SIEMENS CAT. NO. P3E62ML400FTS.
- 7. INSTALL THRUWALL SEALING FITTINGS.

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MASTER
ENGINEERS & DESIGNERS
904 Lakeside Drive, Lynchburg, VA 24501
434-846-1350 Fax: 434-846-1351
660-011

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3211 FAX: (540) 394 - 3215

NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA

SEAL
COMMONWEALTH OF VIRGINIA
Walter G. Miles
No. 6740
03/05/2024
PROFESSIONAL ENGINEER

DRAWN BY:
REVIEW BY:
DATE:
3/5/2024
REVISION:

SHEET DESCRIPTION:
FILTER BUILDING
SECOND FLOOR

E26

ABBREVIATIONS

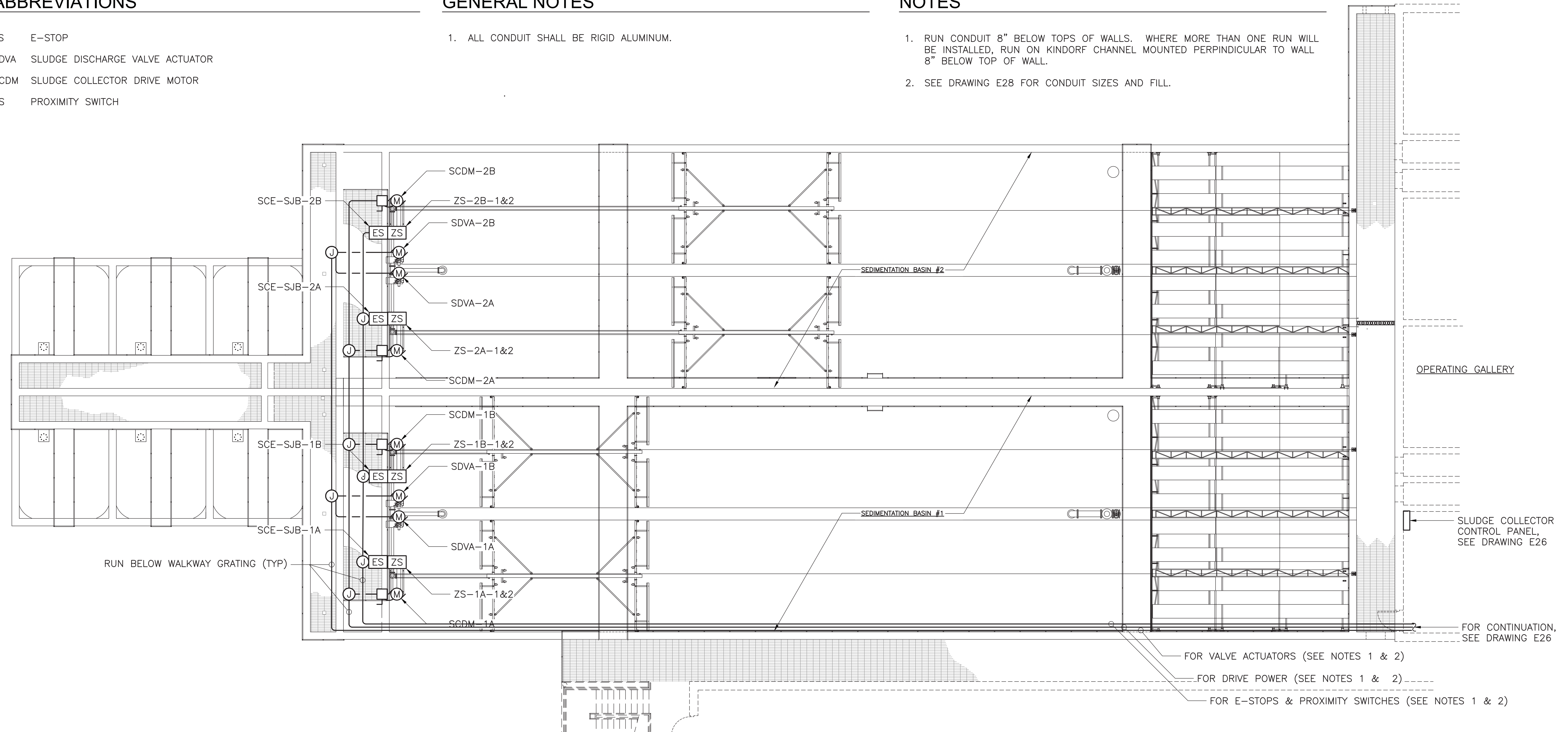
ES E-STOP
 SDVA SLUDGE DISCHARGE VALVE ACTUATOR
 SCDM SLUDGE COLLECTOR DRIVE MOTOR
 ZS PROXIMITY SWITCH

GENERAL NOTES

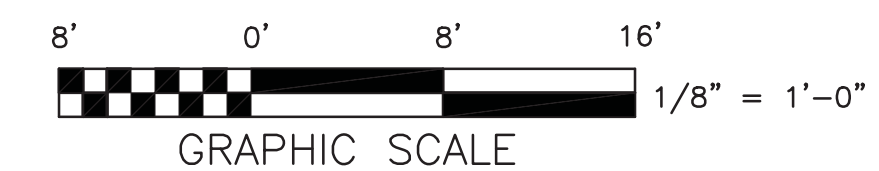
1. ALL CONDUIT SHALL BE RIGID ALUMINUM.

NOTES

1. RUN CONDUIT 8" BELOW TOPS OF WALLS. WHERE MORE THAN ONE RUN WILL BE INSTALLED, RUN ON KINDORF CHANNEL MOUNTED PERPENDICULAR TO WALL 8" BELOW TOP OF WALL.
 2. SEE DRAWING E28 FOR CONDUIT SIZES AND FILL.



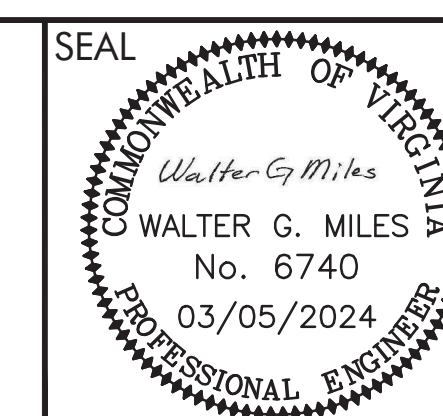
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MASTER
 ENGINEERS & DESIGNERS
 904 Lakeside Drive, Lynchburg, VA 24501
 434-846-1350 Fax: 434-846-1351
 660-011

Peed & Bortz, L.L.C.
 CIVIL & ENVIRONMENTAL ENGINEERS
 20 MIDWAY PLAZA DRIVE - SUITE 100
 CHRISTIANSBURG, VIRGINIA 24073
 PHONE: (540) 394 - 3215 FAX: (540) 394 - 3215

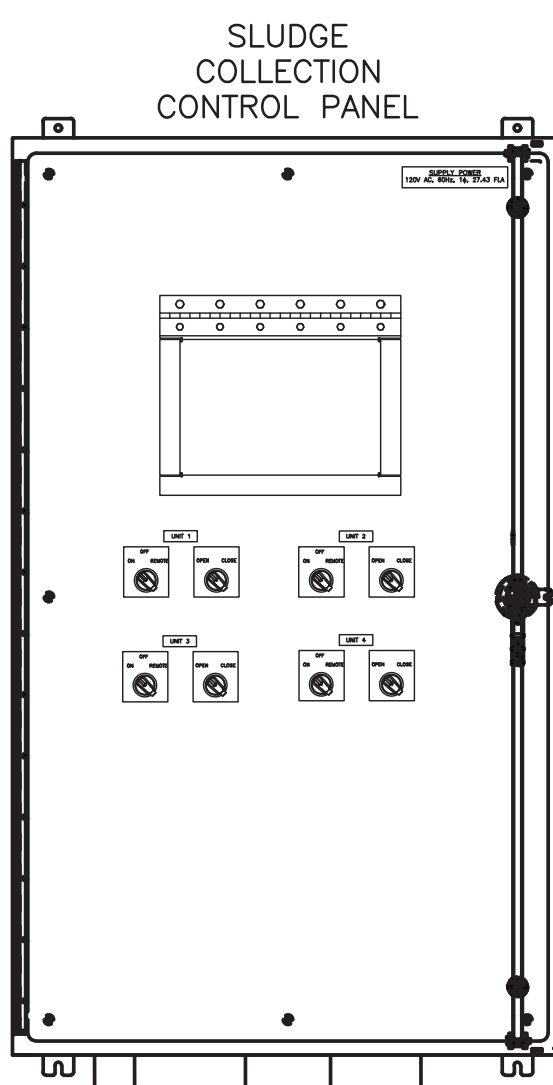
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
 AUSTINVILLE VIRGINIA



DRAWN BY:
 REVIEW BY:
 DATE:
 3/5/2024
 REVISION:

SHEET DESCRIPTION:
FILTER BUILDING
SEDIMENTATION BASIN
SLUDGE COLLECTION
SYSTEM

E27

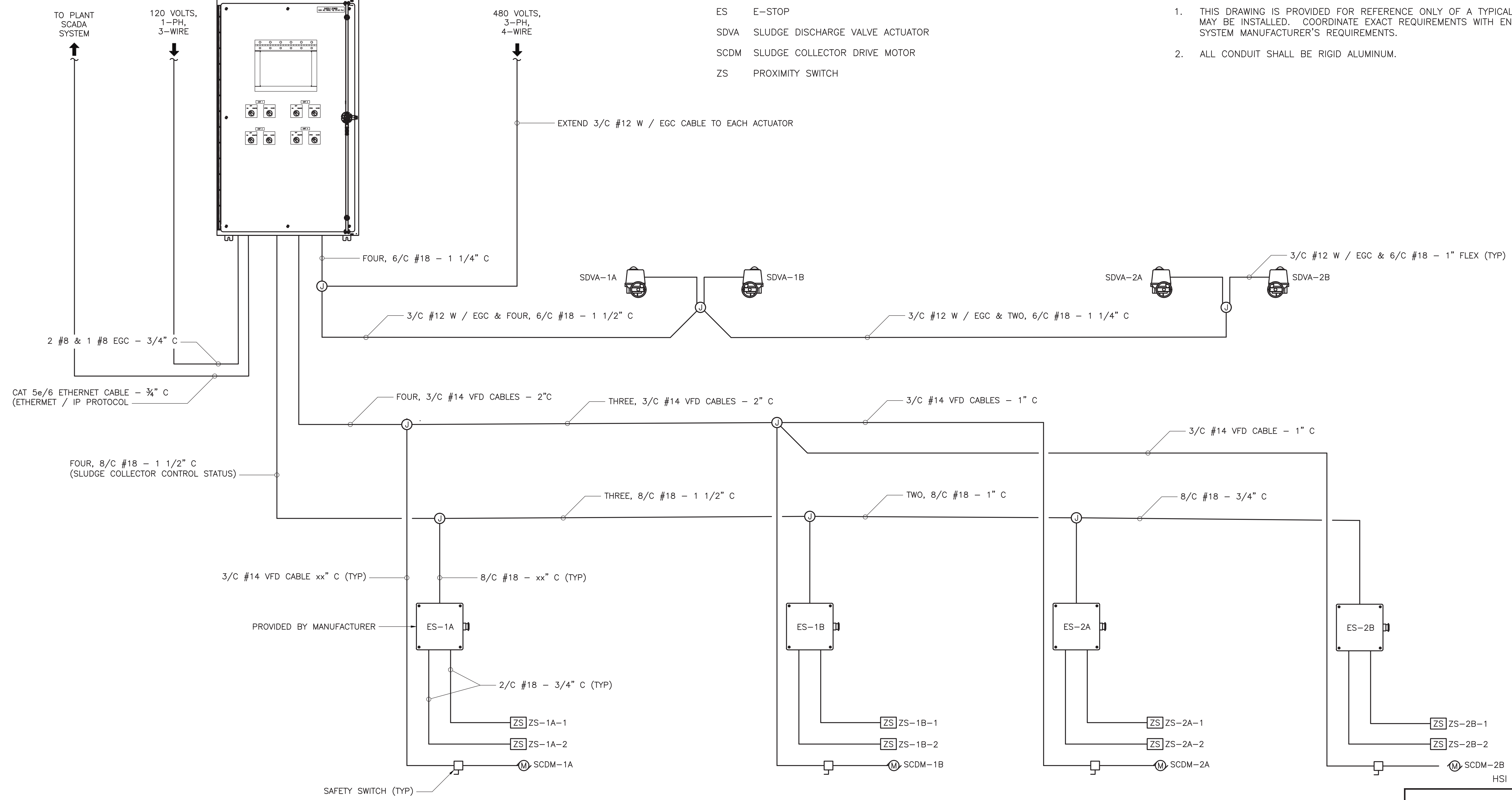


ABBREVIATIONS

- ES E-STOP
- SDVA SLUDGE DISCHARGE VALVE ACTUATOR
- SCDM SLUDGE COLLECTOR DRIVE MOTOR
- ZS PROXIMITY SWITCH

NOTES

1. THIS DRAWING IS PROVIDED FOR REFERENCE ONLY OF A TYPICAL SYSTEM WHICH MAY BE INSTALLED. COORDINATE EXACT REQUIREMENTS WITH ENGINEER & SYSTEM MANUFACTURER'S REQUIREMENTS.
2. ALL CONDUIT SHALL BE RIGID ALUMINUM.



HSI PROJECT NO. 23-04-12

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ENGINEERS & DESIGNERS
904 Lakeside Drive, Lynchburg, VA 24501
434-846-1350 Fax: 434-846-1351
660-011

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3211 FAX : (540) 394 - 3215

NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA

SEAL
COMMONWEALTH OF VIRGINIA
Walter G. Miles
No. 6740
03/05/2024
PROFESSIONAL ENGINEER

DRAWN BY:	
REVIEW BY:	
DATE:	3/5/2024
REVISION:	

SHEET DESCRIPTION:
FILTER BUILDING
SLUDGE COLLECTOR
SYSTEM WIRING
DIAGRAM

E28

LIGHT FIXTURE SCHEDULE

TYPE	MANUFACTURER	CATALOG NUMBER	VOLTAGE	VOLT-AMPERES (MAXIMUM)	LUMENS	COLOR TEMPERATURE DEG K	CRI	THD	DIMMING	IC RATED	DESCRIPTION
A	LITHONIA	TWX3 LED - P3 - 30K - MVOLT - PE - DDBXD	MVOLT	97	13,850	3,000	> 80	STANDARD	NO	N/A	LED WALL LUMINAIRE, PHOTOCELL DARK BRONZE FINISH
A-EM	LITHONIA	TWX3 LED - P3 - 30K - MVOLT - PE - DDBXD	MVOLT	97	13,850	3,000	> 80	STANDARD	NO	N/A	SIMILAR TO TYPE "A" EXCEPT EQUIP WITH REMOTE EMERGENCY BATTERY BACKUP AND REMOTE TEST SWITCH. INSTALL REMOTE EMERGENCY BATTERY ADJACENT TO FIXTURE. INSTALL REMOTE TEST SWITCH AS SHOWN ON DRAWINGS.
B	LITHONIA	TWX1 LED - P2 - 30K - MVOLT - PE - DDBXD	MVOLT	33	2,950	3,000	> 80	STANDARD	NO	N/A	LED WALL LUMINAIRE, PHOTOCELL DARK BRONZE FINISH
B-EM	LITHONIA	TWX1 LED - P2 - 30K - MVOLT - PE - DDBXD	MVOLT	33	2,950	3,000	> 80	STANDARD	NO	N/A	SIMILAR TO TYPE "B" EXCEPT EQUIP WITH REMOTE EMERGENCY BATTERY BACKUP AND REMOTE TEST SWITCH. INSTALL REMOTE EMERGENCY BATTERY ADJACENT TO FIXTURE. INSTALL REMOTE TEST SWITCH AS SHOWN ON DRAWINGS.
C	LITHONIA	FEM - L48 - 6000LM - IMAFL - MD - MVOLT - 35K - 80CRI - DPMB - STSL - WLFEND2 - CNP16WWL	MVOLT	38	6,000	3,000	80	STANDARD	NO	N/A	INDUSTRIAL, SUSPENDED, FIBERGLASS HOUSING, ACRYLIC LINEAL RIBBED DEEP FROSTED LENS, MEDIUM DISTRIBUTION, DUAL PENDANT MOUNTING BRACKET, STAINLESS STEEL LATCHES, WET LOCATION FITTING BOTH ENDS, 6WET LOCATION CORD
C-EM	LITHONIA	FEM - L48 - 6000LM - IMAFL - MD - MVOLT - 35K - 80CRI - DPMB - STSL - WLFEND2 - CNP16WWL - E10VMCP	MVOLT	38	6,000	3,000	80	STANDARD	NO	N/A	SIMILAR TO TYPE "C" EXCEPT WITH EMERGENCY BATTERY BACKUP AND SET UP FOR UNSWITCHED HOT LEG
D	LITHONIA	HGX LED 3RH ALO SWW2 120 PE	120	1750 / 2750 / 4100	36	SWITCHABLE	>80	N/A	N/A	N/A	DUAL-HEAD FLOODLIGHT, CAST ALUMINUM HOUSING WIT DARK BRONZE FINISH, SEALED LENSES, PHOTOCELL
E	LITHONIA	DSXO LED-P1 - 40K - 70CRI - TFTM-MVOLT-SPA - PER- DDBXD	120	34	4,698	4,000	70	STANDARD	N/A	N/A	POLE-MOUNTED LED AREA LIGHT, SINGLE-PIECE DIE-CAST ALUMINUM HOUSING, SEALED DRIVER HOUSING, DARK BRONZE POWDER COAT FINISH, SILICONE LENSES
E-POLE	LITHONIA	SSAH 10 4C - DM19AS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	STRAIGHT SQUARE HINGED EXTRUDED POLE OF 6063 ALUMINUM ALLOY WITH T6 TEMPER, DARK BRONZE POWDER COAT FINISH, HANDHOLE, NEMA 5-20R GFI RECEPTACLE WITH IN-USE WEATHERPROOF COVER
X	LITHONIA	LV - S - R - 120 / 277 - EL N - UM - 4X - SD	MVOLT	4	-	-	N/A	-	N/A	N/A	EXIT SIGN, STENCIL FACE, BLACK FACEPLATE ON BLACK HOUSING, RED LETTERS, NICKEL-CADMIUM ZERO MAINTENANCE BATTERY, SELF DIAGNOSTICS



TYPES "A" & "B"



TYPE "C"



TYPE "D"



TYPE "E"



TYPE "X"

HSI PROJECT NO. 23-04-12

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434-846-1350 Fax: 434-846-1351
660-011

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3214 FAX: (540) 394 - 3215

NEW RIVER REGIONAL WATER AUTHORITY WATER TREATMENT PLANT EXPANSION

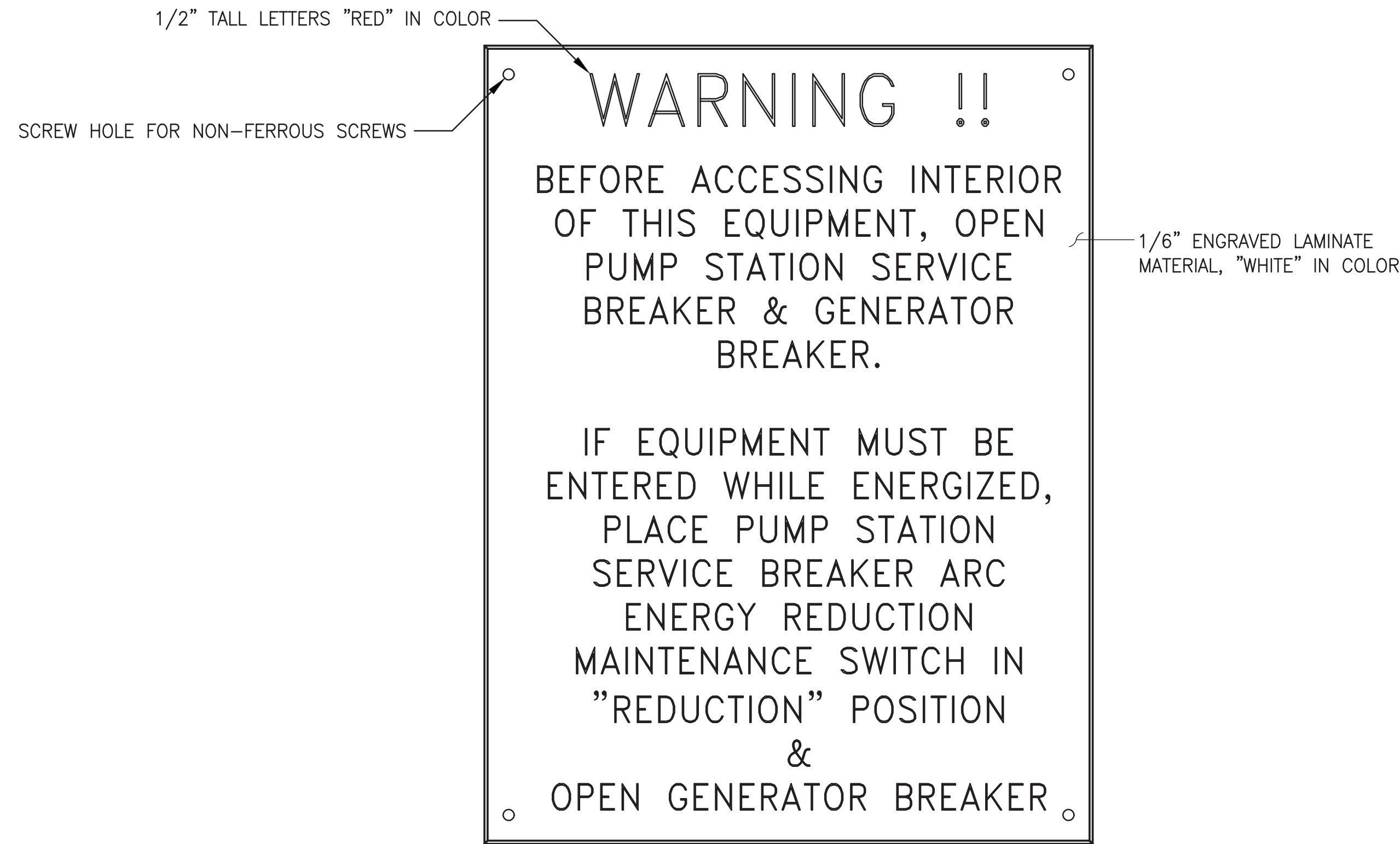
AUSTINVILLE VIRGINIA

SEAL
COMMONWEALTH OF VIRGINIA
Walter G. Miles
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DRAWN BY:
REVIEW BY:
DATE:
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REVISION:

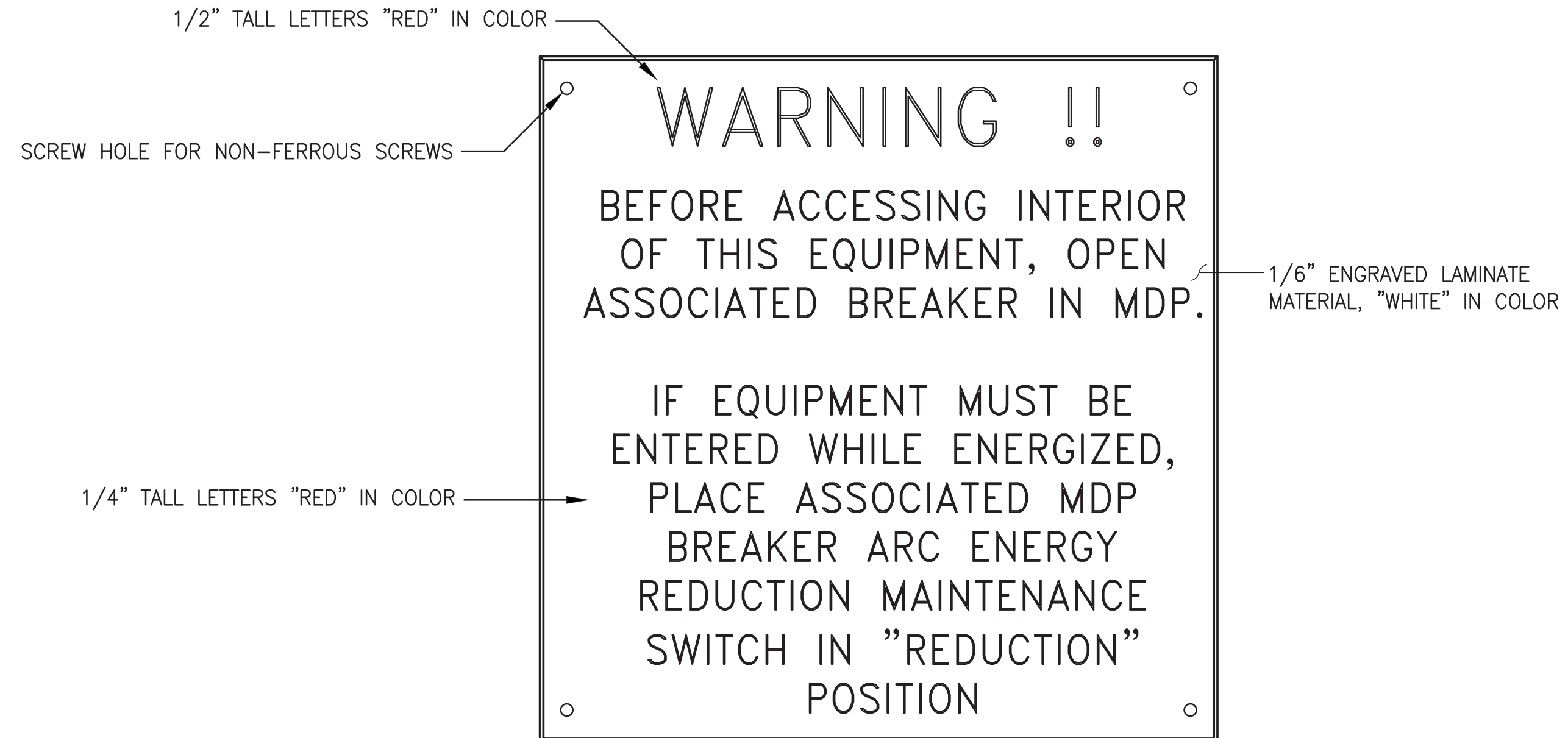
SHEET DESCRIPTION:
**MISCELLANEOUS
LIGHT FIXTURE
SCHEDULE**

E29



- NOTES:
1. FOLLOW MANUFACTURER'S MOUNTING INSTRUCTIONS.
 2. VERIFY PLATE FITS MOUNTING LOCATION BEFORE ORDERING.

WARNING NAMEPLATE #1 DETAIL
(NOTE 2)

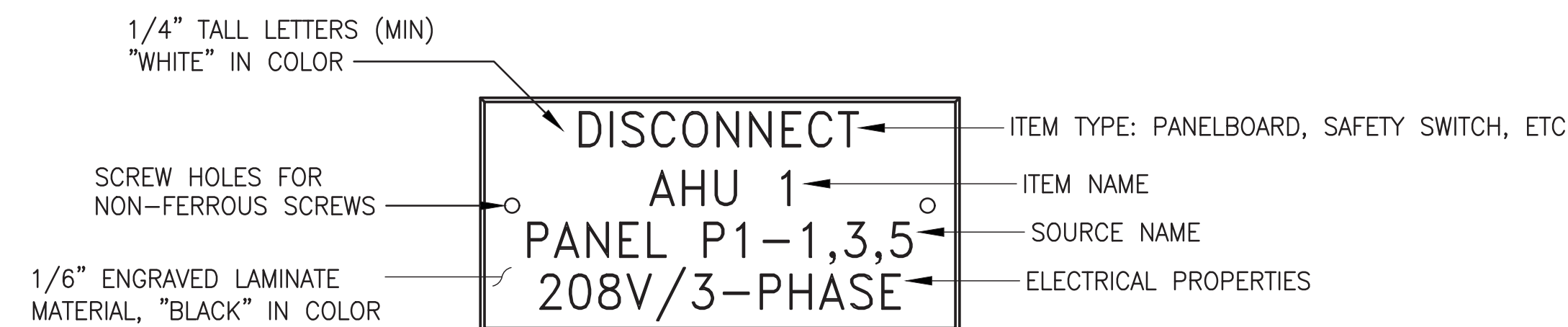


- NOTES:
1. FOLLOW MANUFACTURER'S MOUNTING INSTRUCTIONS.
 2. VERIFY PLATE FITS MOUNTING LOCATION BEFORE ORDERING.

WARNING NAMEPLATE #2 DETAIL
(NOTE 3)

NOTES

1. INSTALL ON EACH INDIVIDUALLY-ENCLOSED CIRCUIT BREAKER, SAFETY SWITCH, STARTER, VFD, AHF, PANELBOARD, ATS, EXISTING AND NEW. REMOVE EXISTING NAMEPLATES.
2. INSTALL ON EACH ATS, EXISTING AND NEW. REMOVE EXISTING NAMEPLATES.
3. INSTALL ON EACH STARTER AND VFD, EXISTING AND NEW. REMOVE EXISTING NAMEPLATES.



- NOTES:
1. FOLLOW MANUFACTURER'S MOUNTING INSTRUCTIONS.
 2. VERIFY PLATE FITS MOUNTING LOCATION BEFORE ORDERING.

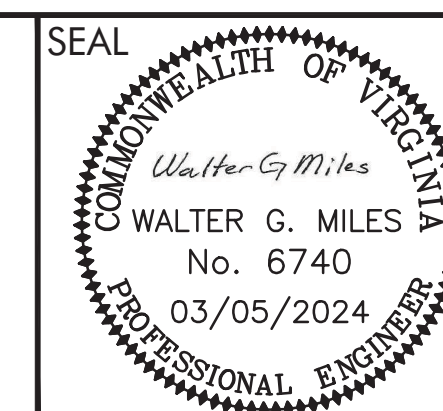
EQUIPMENT NAMEPLATE DETAIL
(NOTE 1)

HSI PROJECT NO. 23-04-12



Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3214 FAX: (540) 394 - 3215

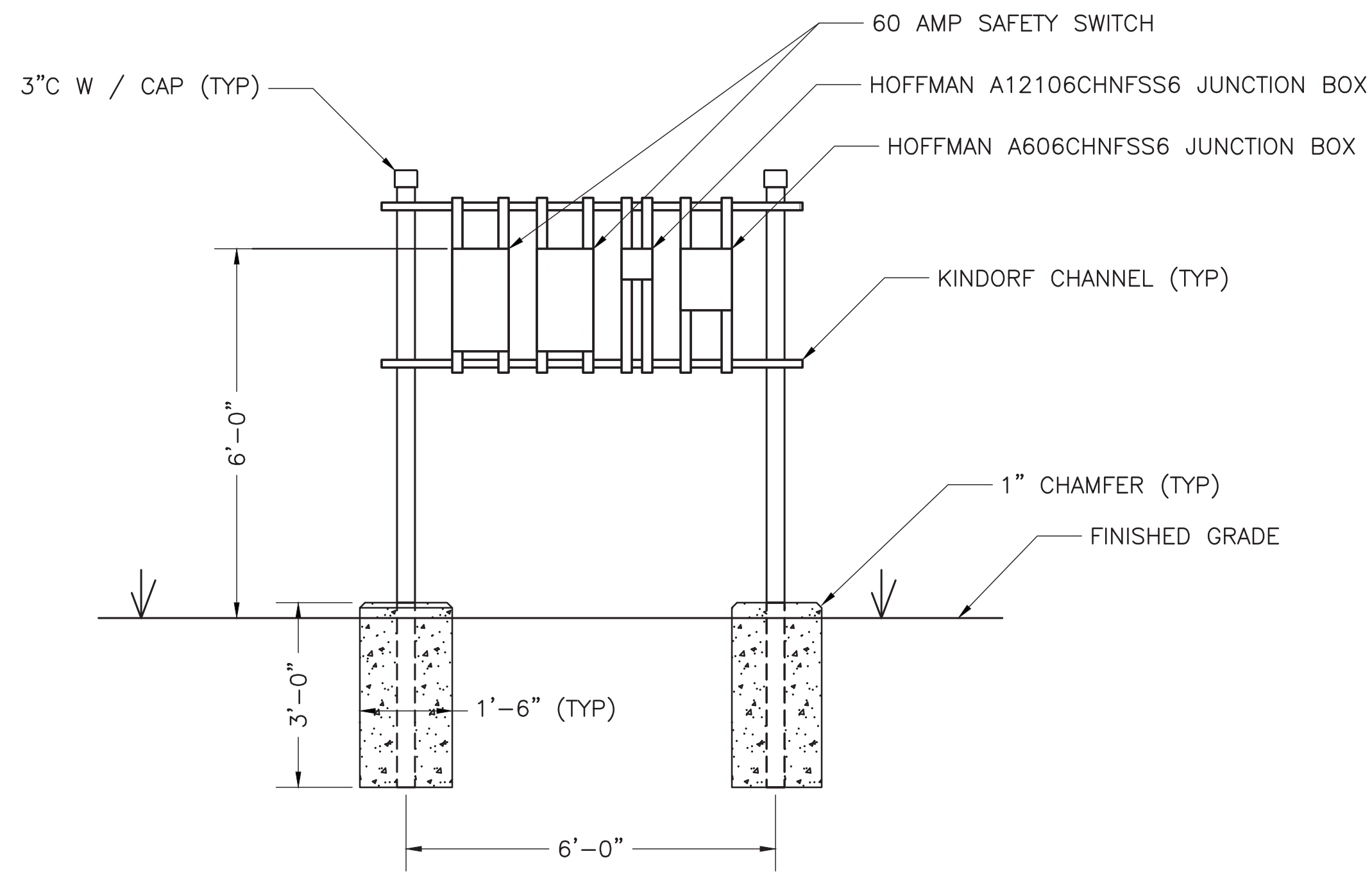
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



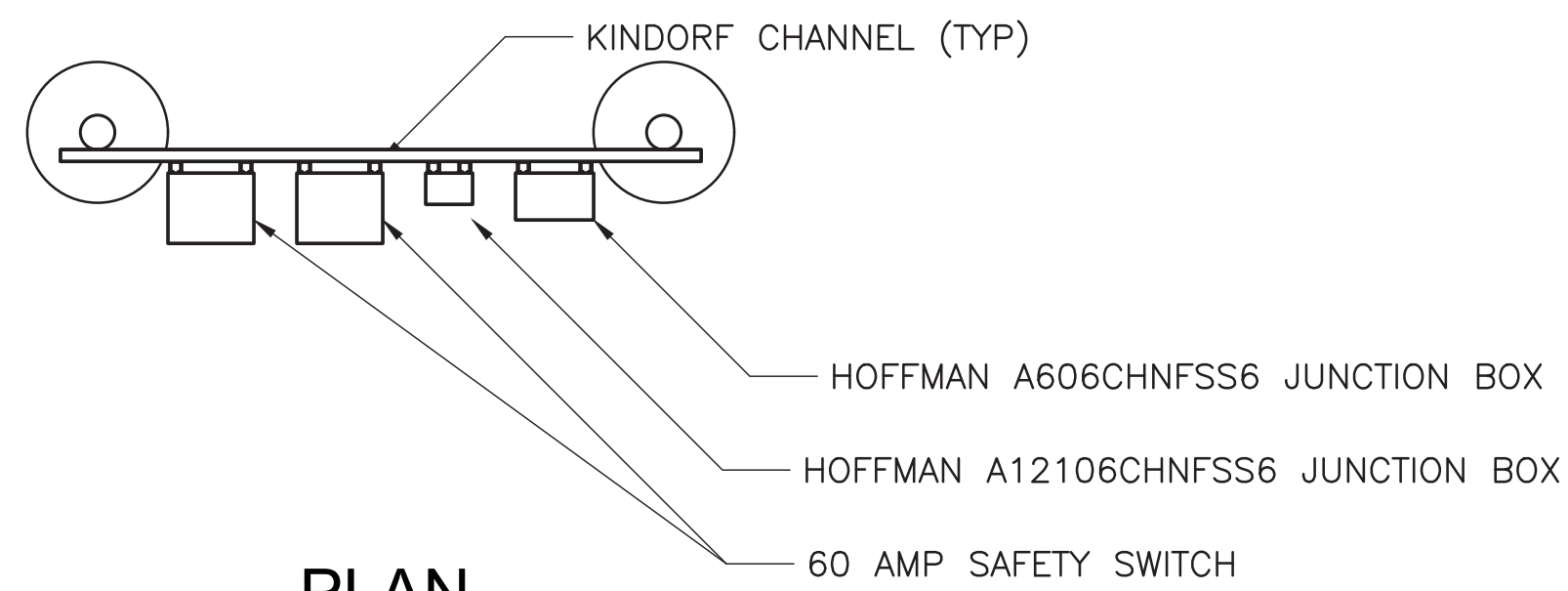
DRAWN BY:
REVIEW BY:
DATE:
3/5/2024
REVISION:

SHEET DESCRIPTION:
**MISCELLANEOUS
NAMEPLATE DETAILS**

E30



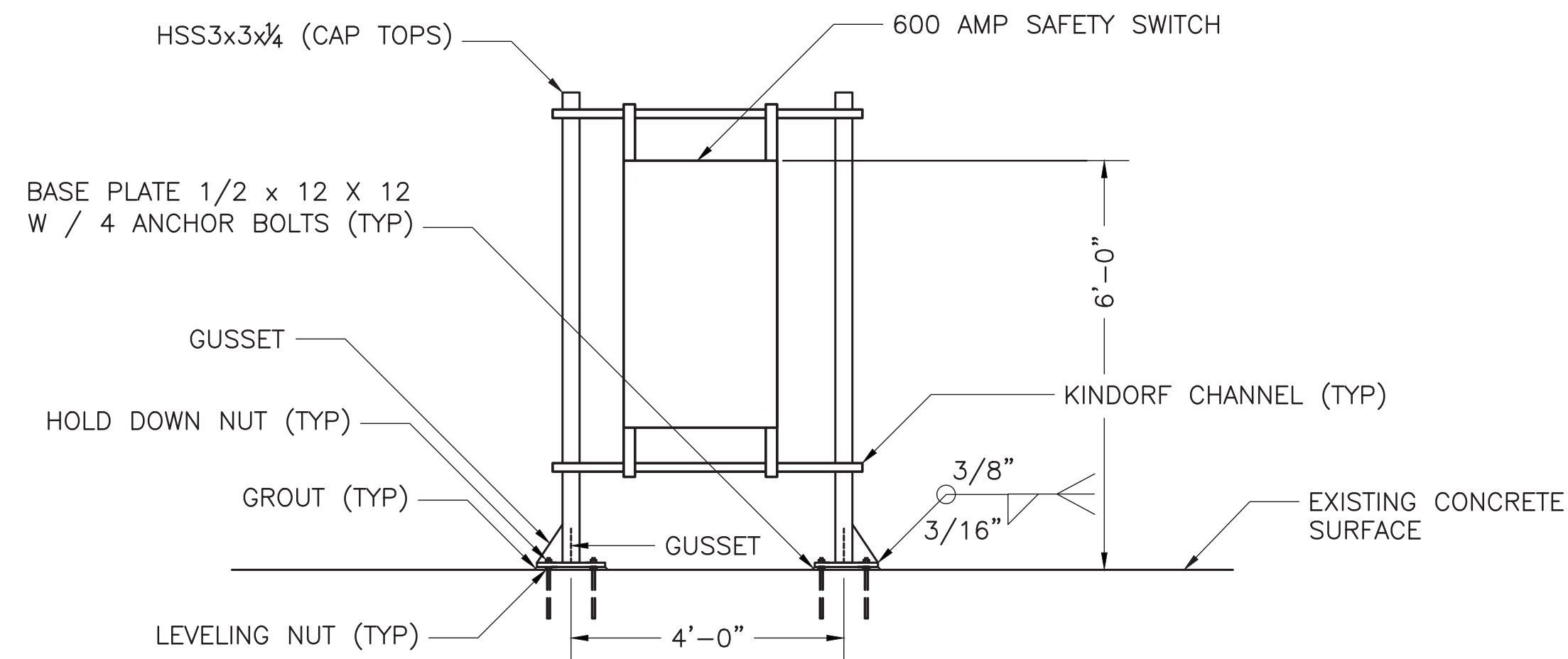
ELEVATION



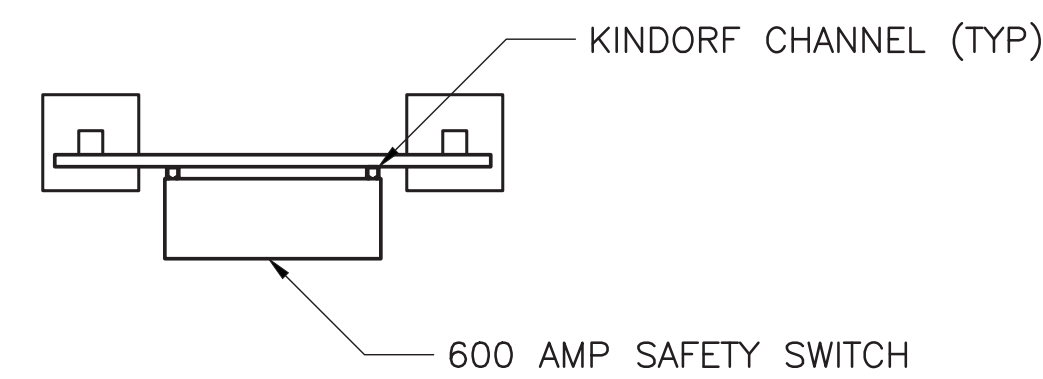
PLAN

DETAIL - SLUDGE PUMPING STATION RACK

A
E20 E31



ELEVATION



PLAN

DETAIL - HIGH SERVICE PUMP "HS-3" RACK

A
E12 E31

NOTES

1. GENERAL REQUIREMENTS
 - 1.1. THE STRUCTURES HAVE BEEN DESIGNED TO RESIST DESIGN LOADS ONLY AS A COMPLETED STRUCTURE. APPLICATION OF CONSTRUCTION LOADS TO THE PARTIALLY COMPLETED STRUCTURE SHALL BE CONSIDERED AND INCLUDED IN THE DESIGN OF SHORING, BRACING, FORMWORK, AND OTHER SUPPORTING ELEMENTS PROVIDED FOR CONSTRUCTION OF THE STRUCTURE.
2. APPLICABLE CODES AND STANDARDS
 - 2.1. "VIRGINIA CONSTRUCTION CODE" (2018 INTERNATIONAL BUILDING CODE).
 - 2.2. ACI 318, "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE".
 - 2.3. AISC, "MANUAL OF STEEL CONSTRUCTION - ALLOWABLE STRESS DESIGN".
 - 2.4. STRUCTURAL WELDING CODE, AWS D1.1.
3. DESIGN LOADS
 - 3.1. WIND LOAD

ULTIMATE WIND SPEED, V_{ult}	120 MPH
RISK CATEGORY	IV
EXPOSURE CATEGORY	C
 - 3.2. SEISMIC

RISK CATEGORY	IV
IMPORTANCE FACTOR, I_e	1.50
S_s	0.175
S_1	0.07
Site Class	D
S_{ds}	0.187
S_{d1}	0.112
DESIGN CATEGORY	B
4. SOIL BEARING CAPACITY: 2,000 PSF FOR FOOTINGS.
5. MATERIALS
 - 5.1. CONCRETE (COMPRESSIVE STRENGTH AT 28 DAYS)
3,000 PSI - AIR-ENTRAINED 6% ($\pm 1\%$)
 - 5.2. REINFORCING STEEL

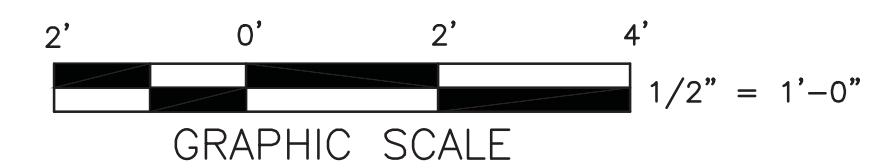
REINFORCING BARS	ASTM A615, GRADE 60
WELDED WIRE FABRIC	ASTM A1064
 - 5.3. STRUCTURAL AND MISCELLANEOUS STEEL

STEEL PLATE, ANGLE & CHANNEL	ASTM A36
TUBE STEEL	ASTM A500, GRADE C
WELDING ELECTRODES	E70XX
 - 5.4. PAINT

PRIMER: KEMBOND.
TOP COAT: INDUSTRIAL URETHANE ALKYD ENAMEL BY SHERWIN WILLIAMS OR EQUAL.
 - 5.5. ANCHOR BOLTS

REDHEAD TRUBOLT, $\frac{1}{2}$ "-13, 7" OVERALL LENGTH, 304 STAINLESS STEEL WEDGE ANCHOR, PART NO. WW-1270.
 6. WELD HORIZONTAL AND VERTICAL COMPONENTS. WELD BASE PLATE TO POST. WELD GUSSETS TO BASE PLATE AND POST.
 7. CLOSE OPEN ENDS OF TUBES. DRILL WEEP HOLES IN BOTTOM OF HORIZONTAL HSS'S.
 8. PAINT VERTICAL CONDUIT AND TUBE STEEL PRIOR TO INSTALLATION.

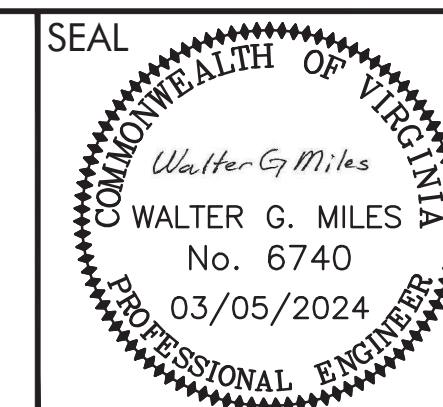
HSI PROJECT NO. 23-04-12



MASTER
ENGINEERS & DESIGNERS
904 Lakeside Drive, Lynchburg, VA 24501
434-846-1350 Fax: 434-846-1351
660-011

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394-3211 FAX: (540) 394-3215

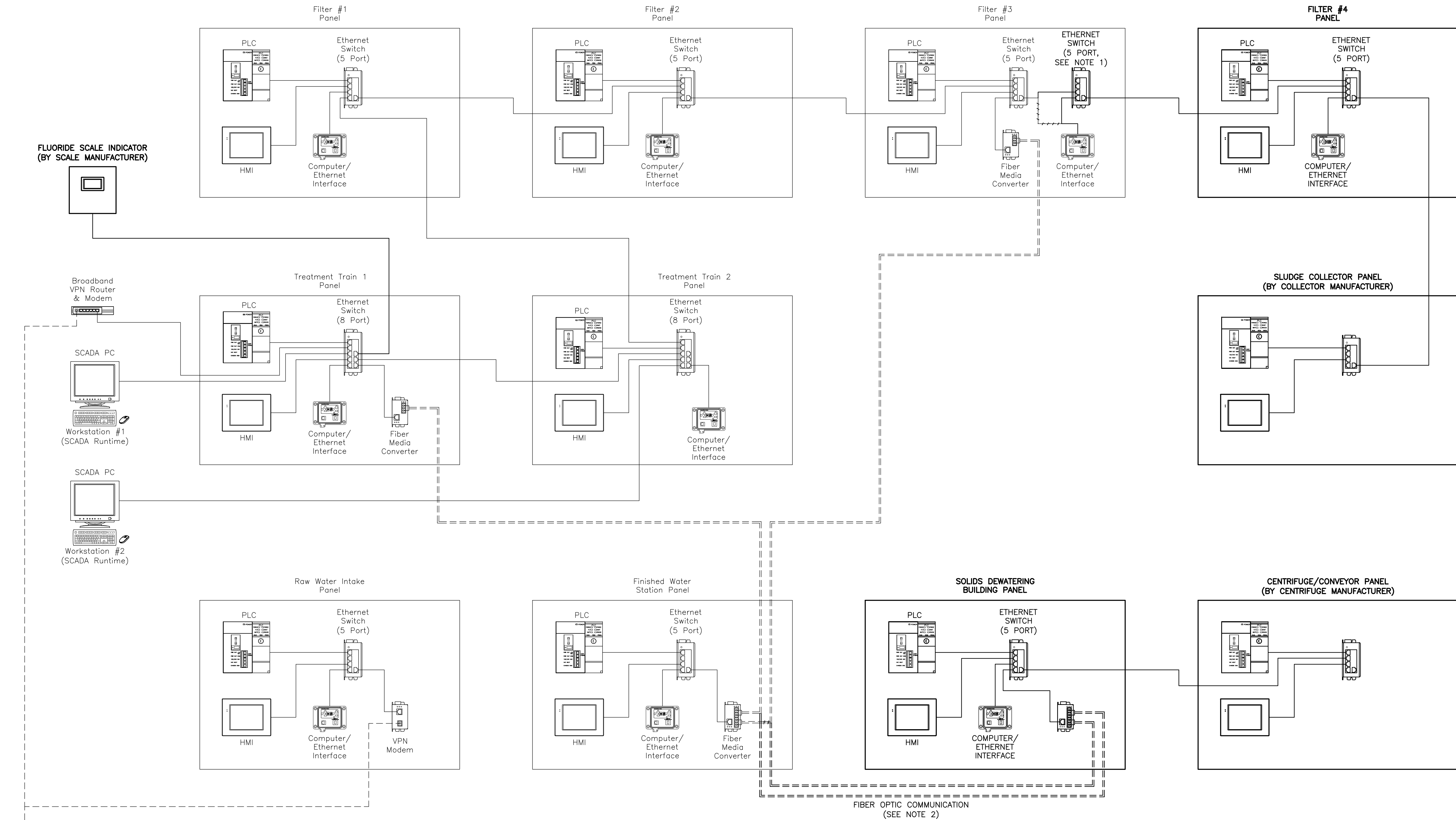
NEW RIVER REGIONAL WATER AUTHORITY
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA



DRAWN BY:
REVIEW BY:
DATE:
3/5/2024
REVISION:

SHEET DESCRIPTION:
MISCELLANEOUS RACK DETAILS

E31

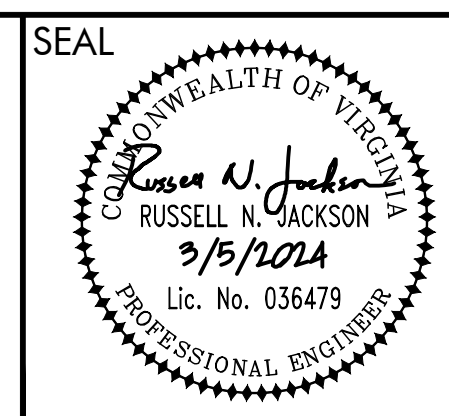


NOTES:

- CONTRACTOR SHALL INSTALL AN ADDITIONAL MINIMUM 5 PORT SWITCH IN EXISTING FILTER #3 PANEL TO EXPAND ETHERNET COMMUNICATION FROM THE EXISTING CONTROL SYSTEM TO FILTER #4 AND SLUDGE COLLECTOR PANELS. ALTERNATIVELY, CONTRACTOR MAY REPLACE EXISTING 5 PORT SWITCH IN FILTER #3 PANEL WITH A MINIMUM 8 PORT SWITCH.
- COMMUNICATION BETWEEN EXISTING CONTROL SYSTEM AND SOLIDS DEWATERING BUILDING PANEL TO BE VIA FIBER OPTIC LINES. PROVIDE DUAL FIBER OPTIC LINES FROM EXISTING FINISHED WATER STATION PANEL MEDIA CONVERTER TO NEW SOLIDS DEWATERING BUILDING PANEL CONVERTER TO EXTEND FIBER RING.

Peed & Bortz, L.L.C.
 CIVIL & ENVIRONMENTAL ENGINEERS
 20 MIDWAY PLAZA DRIVE - SUITE 100
 CHRISTIANBURG, VIRGINIA 24073
 PHONE: (540) 394 - 3214 FAX: (540) 394 - 3215

WATER TREATMENT PLANT
WATER TREATMENT PLANT EXPANSION
 AUSTINVILLE VIRGINIA



DRAWN BY: RNJ
 REVIEW BY: RNJ
 DATE: 5 MARCH 2024
 REVISION:

SHEET DESCRIPTION:
 NETWORK DIAGRAM

101

DIGITAL INPUT MODULE			
I/O STATION #	CONN #	DESCRIPTION	MODIFICATIONS
STATION #1	X1-DI-00	RAW WATER PUMP #1 - RUNNING	NOTE 2
	X1-DI-01	RAW WATER PUMP #1 - FAULT	NOTE 2
	X1-DI-02	Raw Water Pump #1 - HOA in Hand	
	X1-DI-03	Raw Water Pump #1 - HOA in Auto	
	X1-DI-04	RAW WATER PUMP #2 - RUNNING	NOTE 2
	X1-DI-05	RAW WATER PUMP #2 - FAULT	NOTE 2
	X1-DI-06	Raw Water Pump #2 - HOA in Hand	
	X1-DI-07	Raw Water Pump #2 - HOA in Auto	
	X1-DI-08	Raw Water Meter Flow Total Pulse Count	
	X1-DI-09	Permanganate Pump #1 - Running	
	X1-DI-10	Permanganate Pump #1 - Fault	
	X1-DI-11	Permanganate Pump #2 - Running	
	X1-DI-12	Permanganate Pump #2 - Fault	
	X1-DI-13	HARMONIC FILTER - ALARM	NOTE 4
	X1-DI-14		
X1-DI-15			

ANALOG INPUT MODULE			
I/O STATION #	CONN #	DESCRIPTION	MODIFICATIONS
STATION #4	X4-DI-00	Wetwell Level	
	X4-DI-01	Mag Meter Flow Rate	
	X4-DI-02	RAW WATER PUMP #1 - SPEED FEEDBACK	NOTE 2
	X4-DI-03	RAW WATER PUMP #2 - SPEED FEEDBACK	NOTE 2

ANALOG OUTPUT MODULE			
I/O STATION #	CONN #	DESCRIPTION	MODIFICATIONS
STATION #5	X5-DI-00	Permanganate Pump Speed Reference (To Both Pumps)	
	X5-DI-01	RAW WATER PUMP #1 - SPEED REFERENCE	NOTE 2
	X5-DI-02	RAW WATER PUMP #2 - SPEED REFERENCE	NOTE 2
	X5-DI-03		

DIGITAL INPUT MODULE			
I/O STATION #	CONN #	DESCRIPTION	MODIFICATIONS
STATION #2	X2-DI-00	Control Power - Normal	
	X2-DI-01	UPS Power - Normal	
	X2-DI-02	Automatic Transfer Switch - Line Power	
	X2-DI-03	Automatic Transfer Switch - Backup Power	
	X2-DI-04	Generator - Alarm	
	X2-DI-05	Door #2 - Breach Alarm	
	X2-DI-06	Door #3 - Breach Alarm	
	X2-DI-07	INTAKE SCREEN #1 VALVE ACTUATOR - OPEN LIMIT	NOTE 3
	X2-DI-08	INTAKE SCREEN #1 VALVE ACTUATOR - CLOSED LIMIT	NOTE 3
	X2-DI-09	INTAKE SCREEN #2 VALVE ACTUATOR - OPEN LIMIT	NOTE 3
	X2-DI-10	INTAKE SCREEN #2 VALVE ACTUATOR - CLOSED LIMIT	NOTE 3
	X2-DI-11	INTAKE SCREEN #3 VALVE ACTUATOR - OPEN LIMIT	NOTE 3
	X2-DI-12	INTAKE SCREEN #3 VALVE ACTUATOR - CLOSED LIMIT	NOTE 3
	X2-DI-13		
	X2-DI-14		
X2-DI-15			

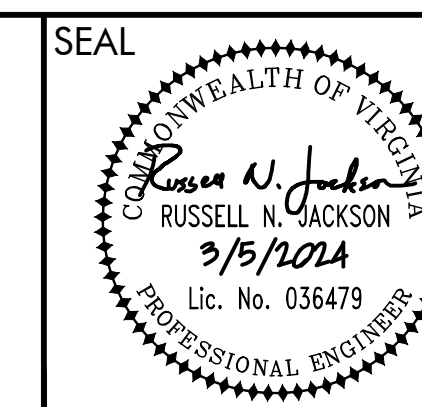
DIGITAL OUTPUT MODULE			
I/O STATION #	CONN #	DESCRIPTION	MODIFICATIONS
STATION #3	X3-DI-00	RAW WATER PUMP #1 - RUN COMMAND (cr1)	NOTE 2
	X3-DI-01	RAW WATER PUMP #2 - RUN COMMAND (cr2)	NOTE 2
	X3-DI-02	Permanganate Pump #1 - Run Command (cr3)	
	X3-DI-03	Permanganate Pump #2 - Run Command (cr4)	
	X3-DI-04	INTAKE SCREEN VALVE #1 - OPEN COMMAND (CR5)	NOTE 3
	X3-DI-05	INTAKE SCREEN VALVE #1 - CLOSE COMMAND (CR6)	NOTE 3
	X3-DI-06	INTAKE SCREEN VALVE #2 - OPEN COMMAND (CR7)	NOTE 3
	X3-DI-07	INTAKE SCREEN VALVE #2 - CLOSE COMMAND (CR8)	NOTE 3
	X3-DI-08	INTAKE SCREEN VALVE #3 - OPEN COMMAND (CR9)	NOTE 3
	X3-DI-09	INTAKE SCREEN VALVE #3 - CLOSE COMMAND (CR10)	NOTE 3
	X3-DI-10		
	X3-DI-11		
	X3-DI-12		
	X3-DI-13		
	X3-DI-14		
X3-DI-15			

NOTES:

- EXISTING AB MICROLOGIX PLC SHALL BE REPLACED WITH AB MICROLOGIX 1400, MICRO 800, OR COMPACT LOGIX SERIES. EXISTING I/O MODULES MAY BE REUSED, IF COMPATIBLE WITH NEW PLC. UNLESS OTHERWISE NOTED, ALL EXISTING I/O WIRES WITHIN PANEL SHALL BE RECONNECT TO NEW PLC. INPUT AND OUTPUT SCHEDULES MAY BE ADJUSTED IF USING A PLC WITH ONBOARD BASE I/O.
- EXISTING RAW WATER SUBMERSIBLE PUMPS WITH SOFT-START DRIVES ARE BEING REPLACED BY VERTICAL TURBINE PUMPS WITH VARIABLE FREQUENCY DRIVES. EXISTING SEAL WARNING AND OVERTEMP PROTECTION RELAY MODULES WITHIN PANEL SHALL BE REMOVED. NEW PUMP RUN COMMAND WIRES SHALL BE INSTALLED FROM EXISTING PANEL CONTROL RELAYS TO VFDS. NEW VFD FAULT DIGITAL INPUT, ANALOG SPEED REFERENCE OUTPUT, AND ANALOG SPEED FEEDBACK INPUT WIRES SHALL BE INSTALLED BETWEEN PLC AND DRIVES.
- DIGITAL I/O WIRING SHALL BE INSTALLED FROM PLC PANEL TO INTAKE SCREEN VALVE ACTUATORS FOR LIMIT SWITCH POSITION FEEDBACK AND OPEN/CLOSE COMMAND OUTPUTS. OPEN AND CLOSE COMMAND OUTPUTS SHALL BE THROUGH NEW CONTROL RELAYS TO BE INSTALLED ON CONTROL PANEL.
- WIRING TO BE INSTALLED FOR COMMON ALARM INDICATION FROM ACTIVE HARMONIC FILTER TO PLC.

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 CIVIL & ENVIRONMENTAL ENGINEERS
 20 MIDWAY PLAZA DRIVE - SUITE 100
 CHRISTIANSBURG, VIRGINIA 24073
 PHONE: (540) 394 - 3214 FAX : (540) 394 - 3215

WATER TREATMENT PLANT
WATER TREATMENT PLANT EXPANSION
 AUSTINVILLE VIRGINIA



DRAWN BY:
RNJ
 REVIEW BY:
RNJ
 DATE:
5 MARCH 2024
 REVISION:

SHEET DESCRIPTION:
RAW WATER INTAKE PLC
SCHEDULES

102

Digital Input Module			
I/O Station #	Conn #	Description	MODIFICATIONS
Station #1	X1-DI-00	Control Power Normal	
	X1-DI-01	UPS Power Normal	
	X1-DI-02	Automatic Transfer Switch Line Power	
	X1-DI-03	Automatic Transfer Switch Backup Power	
	X1-DI-04	Generator Alarm	
	X1-DI-05		
	X1-DI-06	Raw Water Flow Control Valve #1 - Open Limit Switch	
	X1-DI-07	Raw Water Flow Control Valve #1 - Closed Limit Switch	
	X1-DI-08	Flocculator #1A - Running	
	X1-DI-09	Flocculator #1B - Running	
	X1-DI-10	Flocculator #1C - Running	
	X1-DI-11	PAC Pump #1 - Running	
	X1-DI-12	PAC Pump #1 - Alarm	
	X1-DI-13	PAC Pump #1 - Selector Switch	
	X1-DI-14	PAC Pump #3 - Selector Switch	
X1-DI-15	PAC Pump #3 - Running		

Digital Output Module			
I/O Station #	Conn #	Description	MODIFICATIONS
Station #4	X4-DI-00	Influent Sample Pump (cr1)	
	X4-DI-01	Pre-Flocculation Solenoid (cr2)	
	X4-DI-02	Flocculator #1A - Run Command (cr3)	
	X4-DI-03	Flocculator #1B - Run Command (cr4)	
	X4-DI-04	Flocculator #1C - Run Command (cr5)	
	X4-DI-05	(Future) Sludge Removal Valve #1A Solenoid (cr6) HYPOCHLORITE PUMP #4 - RUN COMMAND	NOTES 2,4
	X4-DI-06	(Future) Sludge Removal Valve #5A Solenoid (cr7) SODA ASH PUMP #1 FLUSHING SOLENOID VALVE	NOTES 2,7
	X4-DI-07	(Future) Sludge Removal Valve #2A Solenoid (cr8)	NOTE 1
	X4-DI-08	(Future) Sludge Removal Valve #6A Solenoid (cr9)	NOTE 1
	X4-DI-09	(Future) Sludge Removal Valve #3A Solenoid (cr10)	NOTE 1
	X4-DI-10	(Future) Sludge Removal Valve #7A Solenoid (cr11)	NOTE 1
	X4-DI-11	(Future) Sludge Removal Valve #4A Solenoid (cr12)	NOTE 1
	X4-DI-12	(Future) Sludge Removal Valve #8A Solenoid (cr13)	NOTE 1
	X4-DI-13	Spare (cr14)	NOTE 2
	X4-DI-14	Spare (cr15)	NOTE 2
X4-DI-15	Spare (cr16)	NOTE 2	

Analog Input Module			
I/O Station #	Conn #	Description	MODIFICATIONS
Station #7	X7-DI-00	PAC Tank Level	
	X7-DI-01	Spare	NOTE 2
	X7-DI-02	Spare	NOTE 2
	X7-DI-03	Hypochlorite Tank Level	
	X7-DI-04	Spare	NOTE 2
	X7-DI-05	Spare	NOTE 2
	X7-DI-06	Chemical Waste Tank Level	
X7-DI-07	Fluoride Scale Weight	NOTE 8	

Digital Input Module			
I/O Station #	Conn #	Description	MODIFICATIONS
Station #2	X2-DI-00	PAC Pump #3 - Alarm	
	X2-DI-01	Carbon Pump #1 - Running	
	X2-DI-02	Carbon Pump #1 - Alarm	
	X2-DI-03	Carbon Pump #3 - Running	
	X2-DI-04	Carbon Pump #3 - Alarm	
	X2-DI-05	Fluoride Pump #1 - Running	
	X2-DI-06	Fluoride Pump #1 - Alarm	
	X2-DI-07	Soda Ash Pump #1 - Running	
	X2-DI-08	Soda Ash Pump #1 - Alarm	
	X2-DI-09	Soda Ash Solution Tank #1 - Low Level Alarm	
	X2-DI-10	Soda Ash Solution Tank #1 - High Level Alarm	
	X2-DI-11	Soda Ash Feeder #1 - Alarm	
	X2-DI-12	Hypochlorite Pump #1 - Running	
	X2-DI-13	Hypochlorite Pump #1 - Alarm	
	X2-DI-14	(Future) Air Tank Low Pressure	NOTE 1
X2-DI-15	Spare	NOTE 2	

Digital Output Module			
I/O Station #	Conn #	Description	MODIFICATIONS
Station #5	X5-DI-00	Sedimentation Basin #1 Sampling Pump - Run (cr17)	
	X5-DI-01	PAC Pump #1 - Run Command (cr18)	
	X5-DI-02	PAC Pump #3 - Run Command (cr19)	
	X5-DI-03	Carbon Pump #1 - Run Command (cr20)	
	X5-DI-04	Carbon Pump #3 - Run Command (cr21)	
	X5-DI-05	Carbon Feeder - Run Command (cr22)	
	X5-DI-06	Carbon Solution Tank Mixer - Run Command (cr23)	
	X5-DI-07	Carbon Suction Tank Mixer - Run Command (cr24)	
	X5-DI-08	Fluoride Pump #1 - Run Command (cr25)	
	X5-DI-09	Soda Ash Pump #1 - Run Command (cr26)	
	X5-DI-10	Soda Ash Feeder #1 - Run Command (cr27)	
	X5-DI-11	Soda Ash Tank #1 Mixer - Run Command (cr28)	
	X5-DI-12	Hypochlorite Pump #1 - Run Command (cr29)	
	X5-DI-13	Spare (cr30)	NOTE 2
	X5-DI-14	Spare (cr31)	NOTE 2
X5-DI-15	Spare (cr32)	NOTE 2	

Analog Output Module			
I/O Station #	Conn #	Description	MODIFICATIONS
Station #8	X8-DI-00	PAC Pump #1 - Speed Reference	
	X8-DI-01	PAC Pump #3 - Speed Reference	
	X8-DI-02	Carbon Pump #1 - Speed Reference	
	X8-DI-03	Carbon Pump #3 - Speed Reference	

Analog Output Module			
I/O Station #	Conn #	Description	MODIFICATIONS
Station #9	X9-DI-00	Fluoride Pump #1 - Speed Reference	
	X9-DI-01	Soda Ash Pump #1 - Speed Reference	
	X9-DI-02	Soda Ash Feeder #1 - Speed Reference	
	X9-DI-03	Hypochlorite Pump #1 - Speed Reference	

Analog Output Module			
I/O Station #	Conn #	Description	MODIFICATIONS
Station #10	X10-DI-00	Raw Water Flow Control Valve #1 - Position Reference	
	X10-DI-01	Carbon Feeder - Speed Reference	
	X10-DI-02	HYPOCHLORITE PUMP #4 - SPEED REFERENCE	NOTE 4
	X10-DI-03		

Digital Input Module			
I/O Station #	Conn #	Description	MODIFICATIONS
Station #3	X3-DI-00	Carbon Solution Mixing Tank - Low Level Alarm	
	X3-DI-01	Carbon Solution Mixing Tank - High Level Alarm	
	X3-DI-02	Soda Ash Feeder #1 - Hopper Empty Alarm	
	X3-DI-03	Spare PAC PUMP #1 - TUBE FAILURE	NOTES 2,3
	X3-DI-04	Spare PAC PUMP #3 - TUBE FAILURE	NOTES 2,3
	X3-DI-05	Spare HYPOCHLORITE PUMP #1 - TUBE FAILURE	NOTES 2,4
	X3-DI-06	Spare HYPOCHLORITE PUMP #4 - TUBE FAILURE	NOTES 2,4
	X3-DI-07	Spare SODA ASH PUMP #1 - TUBE FAILURE	NOTES 2,5
	X3-DI-08	Spare FLUORIDE PUMP #1 - TUBE FAILURE	NOTES 2,6
	X3-DI-09	Spare	NOTE 2
	X3-DI-10	Spare	NOTE 2
	X3-DI-11	Spare	NOTE 2
	X3-DI-12	Spare	NOTE 2
	X3-DI-13	Spare	NOTE 2
	X3-DI-14	Spare	NOTE 2
X3-DI-15	Spare	NOTE 2	

Analog Input Module			
I/O Station #	Conn #	Description	MODIFICATIONS
Station #6	X6-DI-00	Raw Water Flow Control Valve #1 - Position Feedback	
	X6-DI-01	Carbon Feeder - Speed Feedback	
	X6-DI-02	Soda Ash Feeder #1 - Speed Feedback	
	X6-DI-03	Carbon Solution Tank Level	
	X6-DI-04	Pre-Flocculation pH	
	X6-DI-05	Pre-Flocculation Streaming Current	
	X6-DI-06	Raw Water Mag Meter #1 Flow Rate	
X6-DI-07	Settled Water #1 Turbidity		

NOTES:

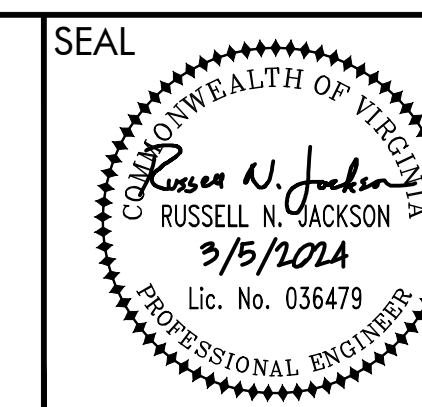
- EXISTING PLC CONTROL PANEL INCLUDED I/O AND CONTROL RELAYS FOR A FUTURE PNEUMATIC VALVE ACTUATED SLUDGE COLLECTOR SYSTEM, WHICH IS NO LONGER ANTICIPATED. I/O AND CONTROL RELAYS ORIGINALLY PROVIDED FOR THIS FUTURE SYSTEM IS TO BE ABANDONED OR REPURPOSED AS INDICATED.
- EXISTING PANEL I/O LISTED AS SPARES ARE WIRED TO EXISTING TERMINAL BLOCKS FOR FUTURE FIELD WIRE CONNECTIONS.
- EXISTING PAC PUMP SKIDS WERE ORIGINALLY PROVIDED WITH DIAPHRAGM PUMPS AND INCLUDE CONTROL PANELS ON EACH SKID. THE ORIGINAL DIAPHRAGM PUMPS WERE PREVIOUSLY REPLACED WITH PERISTALTIC PUMPS, WHICH WERE WIRED INTO THE ORIGINAL SKID CONTROL PANELS. THE SKIDS AND CONTROL PANELS ARE TO BE REMOVED WITH THE EXISTING PUMPS REMOUNTED ON A WALL SHELF. JUNCTION BOXES SHALL BE MOUNTED ON WALL FOR POWER AND CONTROL WIRING CONNECTIONS FROM PAC PUMPS. POWER, DIGITAL RUN INPUTS, DIGITAL RUN AND COMMON ALARM OUTPUTS, AND ANALOG SPEED REFERENCE INPUT WIRING SHALL BE EXTENDED FROM EXISTING WIRING AT JUNCTION BOX. NEW WIRING SHALL BE INSTALLED FROM PUMPS TO TREATMENT TRAIN PLC PANEL FOR TUBE FAILURE ALARM INDICATION.

NOTES (CONTINUED):

- THREE EXISTING HYPOCHLORITE PUMP SKIDS ARE INSTALLED AND INCLUDE CONTROL PANELS ON EACH SKID. THESE SKIDS AND PUMPS ARE BEING REMOVED AND REPLACED WITH FIVE WALL MOUNTED PERISTALTIC PUMPS. JUNCTION BOXES SHALL BE MOUNTED ON WALL FOR POWER AND CONTROL WIRING CONNECTIONS FROM NEW PUMPS. POWER, DIGITAL RUN INPUTS, DIGITAL RUN AND COMMON ALARM OUTPUTS, AND ANALOG SPEED REFERENCE INPUT WIRING SHALL BE EXTENDED FROM EXISTING WIRING AT JUNCTION BOX FOR HYPOCHLORITE PUMPS #1-#3. NEW POWER, DIGITAL RUN INPUTS, DIGITAL RUN AND COMMON ALARM OUTPUTS, AND ANALOG SPEED REFERENCE INPUT WIRING SHALL BE INSTALLED FROM TREATMENT TRAIN PLC PANEL FOR HYPOCHLORITE PUMPS #4 AND #5. NEW WIRING SHALL BE INSTALLED FROM PUMPS TO TREATMENT TRAIN PLC PANEL FOR TUBE FAILURE ALARM INDICATION OF ALL HYPOCHLORITE PUMPS.
- THREE EXISTING SODA ASH PUMP SKIDS ARE INSTALLED AND INCLUDE CONTROL PANELS ON EACH SKID. THE EXISTING DIAPHRAGM PUMPS ARE INDICATED TO BE REPLACED ON EACH SKID WITH NEW PERISTALTIC PUMPS WIRED TO EXISTING CONTROL PANELS. VFDS ARE INDICATED TO BE REPLACED WITHIN EXISTING CONTROL PANELS WITH OUTPUT POWER WIRED TO NEW PUMPS. PUMP DIGITAL RUN INPUTS, DIGITAL RUN AND COMMON ALARM OUTPUTS, AND ANALOG SPEED REFERENCE INPUT WIRING SHALL BE CONNECTED TO EXISTING CONTROL PANEL TERMINAL BLOCK WIRING. NEW WIRING SHALL BE INSTALLED FROM TREATMENT TRAIN PLC PANEL TO TERMINAL BLOCKS IN PUMP CONTROL PANEL AND EXTENDED TO PUMPS FOR TUBE FAILURE ALARM INDICATION.
- TWO EXISTING FLUORIDE PUMP SKIDS ARE INSTALLED AND INCLUDE CONTROL PANELS ON BOTH SKIDS TO OPERATE A TOTAL OF FOUR EXISTING FLUORIDE PUMPS. THESE SKIDS AND PUMPS ARE BEING REMOVED AND REPLACED WITH THREE WALL MOUNTED PERISTALTIC PUMPS. JUNCTION BOXES SHALL BE MOUNTED ON WALL FOR POWER AND CONTROL WIRING CONNECTIONS FROM NEW PUMPS. POWER, DIGITAL RUN INPUTS, DIGITAL RUN AND COMMON ALARM OUTPUTS, AND ANALOG SPEED REFERENCE INPUT WIRING SHALL BE EXTENDED FROM EXISTING WIRING AT JUNCTION BOX. NEW WIRING SHALL BE INSTALLED FROM PUMPS TO TREATMENT TRAIN PLC PANEL FOR TUBE FAILURE ALARM INDICATION.
- EXISTING TREATMENT TRAIN CONTROL PANELS PROVIDE 120 VOLT POWER TO EXISTING SAMPLE PUMPS AND SOLENOID VALVES THROUGH CONTROL RELAY TERMINALS WITH 2A FUSES ON EACH SWITCHED POWER FEED. SIMILAR SWITCHED POWER FEED SHALL BE INSTALLED FROM THE SAME 120 VOLT CONTROL PANEL POWER CIRCUIT TO NEW SODA ASH FLUSHING SOLENOID VALVES. EXISTING SPARE PLC DIGITAL RELAY OUTPUTS AND CONTROL RELAYS SHALL BE UTILIZED AS INDICATED WITH NEW 2A FUSES INSTALLED WITHIN CONTROL PANEL ON EACH SOLENOID VALVE POWER OUTPUT.
- EXISTING FLUORIDE SCALE IS BEING REPLACED. EXISTING INDICATOR WITHIN FLUORIDE ROOM IS BEING REPLACED WITH A NEW INDICATOR ON ROOM EXTERIOR WALL. EXISTING ANALOG WIRING FOR SCALE WEIGHT INDICATION SHALL BE REWIRED TO NEW INDICATOR. ETHERNET CABLE IS ALSO TO BE INSTALLED FROM NEW INDICATOR TO TREATMENT TRAIN PANEL SWITCH FOR SCADA SYSTEM MONITORING OF RECORDED USAGES.

Peed & Bortz, L.L.C.
CIVIL & ENVIRONMENTAL ENGINEERS
20 MIDWAY PLAZA DRIVE - SUITE 100
CHRISTIANSBURG, VIRGINIA 24073
PHONE: (540) 394 - 3214 FAX : (540) 394 - 3215

**WATER TREATMENT PLANT
WATER TREATMENT PLANT EXPANSION
AUSTINVILLE VIRGINIA**



DRAWN BY:
RNJ
REVIEW BY:
RNJ
DATE:
5 MARCH 2024
REVISION:

SHEET DESCRIPTION:
TREATMENT TRAIN 1 PLC
SCHEDULES

103

Digital Input Module			
I/O Station #	Conn #	Description	MODIFICATIONS
Station #1	X1-DI-00	Control Power Normal	
	X1-DI-01	UPS Power Normal	
	X1-DI-02	Hypochlorite Pump #3 - Running	
	X1-DI-03	Hypochlorite Pump #3 - Alarm	
	X1-DI-04	Hypochlorite Pump #3 - Selector Switch	
	X1-DI-05	Hypochlorite Pump #3 - Selector Switch	
	X1-DI-06	Raw Water Flow Control Valve #2 - Open Limit Switch	
	X1-DI-07	Raw Water Flow Control Valve #2 - Closed Limit Switch	
	X1-DI-08	Flocculator #2A - Running	
	X1-DI-09	Flocculator #2B - Running	
	X1-DI-10	Flocculator #2C - Running	
	X1-DI-11	PAC Pump #2 - Running	
	X1-DI-12	PAC Pump #2 - Alarm	
	X1-DI-13	Fluoride Pump #3 - Selector Switch	
	X1-DI-14	Fluoride Pump #3 - Selector Switch	
X1-DI-15	Spare	NOTE 2	

Digital Output Module			
I/O Station #	Conn #	Description	MODIFICATIONS
Station #4	X4-DI-00	Spare	NOTE 2
	X4-DI-01	Pre-Flocculation Solenoid (cr2)	
	X4-DI-02	Flocculator #2A - Run Command (cr3)	
	X4-DI-03	Flocculator #2B - Run Command (cr4)	
	X4-DI-04	Flocculator #2C - Run Command (cr5)	
	X4-DI-05	(Future) Sludge Removal Valve #1B Solenoid (cr6) HYPOCHLORITE PUMP #5 - RUN COMMAND	NOTES 1,4
	X4-DI-06	(Future) Sludge Removal Valve #5B Solenoid (cr7) SODA ASH PUMP #2 FLUSHING SOLENOID VALVE	NOTES 1,7
	X4-DI-07	(Future) Sludge Removal Valve #2B Solenoid (cr8) SODA ASH PUMP #3 FLUSHING SOLENOID VALVE	NOTES 1,7
	X4-DI-08	(Future) Sludge Removal Valve #6B Solenoid (cr9)	NOTE 1
	X4-DI-09	(Future) Sludge Removal Valve #3B Solenoid (cr10)	NOTE 1
	X4-DI-10	(Future) Sludge Removal Valve #7B Solenoid (cr11)	NOTE 1
	X4-DI-11	(Future) Sludge Removal Valve #4B Solenoid (cr12)	NOTE 1
	X4-DI-12	(Future) Sludge Removal Valve #8B Solenoid (cr13)	NOTE 1
	X4-DI-13	Spare (cr14)	NOTE 2
	X4-DI-14	Spare (cr15)	NOTE 2
X4-DI-15	Spare (cr16)	NOTE 2	

Analog Input Module			
I/O Station #	Conn #	Description	MODIFICATIONS
Station #7	X7-DI-00	Solids Holding Basin #1 Level	
	X7-DI-01	Solids Holding Basin #2 Level	
	X7-DI-02	Spare	NOTE 2
	X7-DI-03	Spare	NOTE 2
	X7-DI-04	Raw Water pH	
	X7-DI-05	Spare	NOTE 2
	X7-DI-06	Fluoride Waste Tank Level	
X7-DI-07	Spare	NOTE 2	

Digital Input Module			
I/O Station #	Conn #	Description	MODIFICATIONS
Station #2	X2-DI-00	Spare	NOTE 2
	X2-DI-01	Carbon Pump #2 - Running	
	X2-DI-02	Carbon Pump #2 - Alarm	
	X2-DI-03	Fluoride Pump #3 - Running	
	X2-DI-04	Fluoride Pump #3 - Alarm	
	X2-DI-05	Fluoride Pump #2 - Running	
	X2-DI-06	Fluoride Pump #2 - Alarm	
	X2-DI-07	Soda Ash Pump #2 - Running	
	X2-DI-08	Soda Ash Pump #2 - Alarm	
	X2-DI-09	Soda Ash Solution Tank #2 - Low Level Alarm	
	X2-DI-10	Soda Ash Solution Tank #2 - High Level Alarm	
	X2-DI-11	Soda Ash Feeder #2 - Alarm	
	X2-DI-12	Hypochlorite Pump #2 - Running	
	X2-DI-13	Hypochlorite Pump #2 - Alarm	
	X2-DI-14	(Future) Air Tank Low Pressure	NOTE 1
X2-DI-15			

Digital Output Module			
I/O Station #	Conn #	Description	MODIFICATIONS
Station #5	X5-DI-00	Sedimentation Basin #2 Sampling Pump - Run (cr17)	
	X5-DI-01	PAC Pump #2 - Run Command (cr18)	
	X5-DI-02	PAC Pump #3 - Run Command (cr19)	
	X5-DI-03	Carbon Pump #2 - Run Command (cr20)	
	X5-DI-04	Fluoride #3 - Run Command (cr21)	
	X5-DI-05	Spare	NOTE 2
	X5-DI-06	Spare	NOTE 2
	X5-DI-07	Spare	NOTE 2
	X5-DI-08	Fluoride Pump #2 - Run Command (cr25)	
	X5-DI-09	Soda Ash Pump #2 - Run Command (cr26)	
	X5-DI-10	Soda Ash Feeder #2 - Run Command (cr27)	
	X5-DI-11	Soda Ash Tank #2 Mixer - Run Command (cr28)	
	X5-DI-12	Hypochlorite Pump #2 - Run Command (cr29)	
	X5-DI-13	Soda Ash Pump #3 - Run Command (cr26)	
	X5-DI-14	Hypochlorite Pump #2 - Run Command (cr29)	
X5-DI-15	Spare (cr32)	NOTE 2	

Analog Output Module			
I/O Station #	Conn #	Description	MODIFICATIONS
Station #8	X8-DI-00	PAC Pump #2 - Speed Reference	
	X8-DI-01	Fluoride Pump #3 - Speed Reference	
	X8-DI-02	Carbon Pump #2 - Speed Reference	
	X8-DI-03	Soda Ash Pump #3 - Speed Reference	

Analog Output Module			
I/O Station #	Conn #	Description	MODIFICATIONS
Station #9	X9-DI-00	Fluoride Pump #2 - Speed Reference	
	X9-DI-01	Soda Ash Pump #2 - Speed Reference	
	X9-DI-02	Soda Ash Feeder #2 - Speed Reference	
	X9-DI-03	Hypochlorite Pump #2 - Speed Reference	

Digital Input Module			
I/O Station #	Conn #	Description	MODIFICATIONS
Station #3	X3-DI-00	Soda Ash Pump #3 - Running	
	X3-DI-01	Soda Ash Pump #3 - Alarm	
	X3-DI-02	Soda Ash Feeder #2 - Hopper Empty Alarm	
	X3-DI-03	Spare PAC PUMP #2 - TUBE FAILURE	NOTE 2,3
	X3-DI-04	Spare HYPOCHLORITE PUMP #2 - TUBE FAILURE	NOTE 2,4
	X3-DI-05	Spare HYPOCHLORITE PUMP #3 - TUBE FAILURE	NOTE 2,4
	X3-DI-06	Spare HYPOCHLORITE PUMP #5 - TUBE FAILURE	NOTE 2,4
	X3-DI-07	Spare SODA ASH PUMP #2 - TUBE FAILURE	NOTE 2,5
	X3-DI-08	Spare SODA ASH PUMP #3 - TUBE FAILURE	NOTE 2,5
	X3-DI-09	Spare FLUORIDE PUMP #2 - TUBE FAILURE	NOTE 2,6
	X3-DI-10	Spare FLUORIDE PUMP #3 - TUBE FAILURE	NOTE 2,6
	X3-DI-11	Spare	NOTE 2
	X3-DI-12	Spare	NOTE 2
	X3-DI-13	Spare	NOTE 2
	X3-DI-14	Spare	NOTE 2
X3-DI-15	Spare	NOTE 2	

Analog Input Module			
I/O Station #	Conn #	Description	MODIFICATIONS
Station #6	X6-DI-00	Raw Water Flow Control Valve #2 - Position Feedback	
	X6-DI-01	Potable Water Meter Flow Rate	
	X6-DI-02	Soda Ash Feeder #2 - Speed Feedback	
	X6-DI-03	Raw Water Turbidity	
	X6-DI-04	Pre-Flocculation pH	
	X6-DI-05	Pre-Flocculation Streaming Current	
	X6-DI-06	Raw Water Mag Meter #2 Flow Rate	
X6-DI-07	Settled Water #2 Turbidity		

NOTES (CONTINUED):

- THREE EXISTING HYPOCHLORITE PUMP SKIDS ARE INSTALLED AND INCLUDE CONTROL PANELS ON EACH SKID. THESE SKIDS AND PUMPS ARE BEING REMOVED AND REPLACED WITH FIVE WALL MOUNTED PERISTALTIC PUMPS. JUNCTION BOXES SHALL BE MOUNTED ON WALL FOR POWER AND CONTROL WIRING CONNECTIONS FROM NEW PUMPS. POWER, DIGITAL RUN INPUTS, DIGITAL RUN AND COMMON ALARM OUTPUTS, AND ANALOG SPEED REFERENCE INPUT WIRING SHALL BE EXTENDED FROM EXISTING WIRING AT JUNCTION BOX FOR HYPOCHLORITE PUMPS #1-#3. NEW POWER, DIGITAL RUN INPUTS, DIGITAL RUN AND COMMON ALARM OUTPUTS, AND ANALOG SPEED REFERENCE INPUT WIRING SHALL BE INSTALLED FROM TREATMENT TRAIN PLC PANEL FOR HYPOCHLORITE PUMPS #4 AND #5. NEW WIRING SHALL BE INSTALLED FROM PUMPS TO TREATMENT TRAIN PLC PANEL FOR TUBE FAILURE ALARM INDICATION OF ALL HYPOCHLORITE PUMPS.
- THREE EXISTING SODA ASH PUMP SKIDS ARE INSTALLED AND INCLUDE CONTROL PANELS ON EACH SKID. THE EXISTING DIAPHRAGM PUMPS ARE INDICATED TO BE REPLACED ON EACH SKID WITH NEW PERISTALTIC PUMPS WIRED TO EXISTING CONTROL PANELS. VFDS ARE INDICATED TO BE REPLACED WITHIN EXISTING CONTROL PANELS WITH OUTPUT POWER WIRED TO NEW PUMPS. PUMP DIGITAL RUN INPUTS, DIGITAL RUN AND COMMON ALARM OUTPUTS, AND ANALOG SPEED REFERENCE INPUT WIRING SHALL BE CONNECTED TO EXISTING CONTROL PANEL TERMINAL BLOCK WIRING. NEW WIRING SHALL BE INSTALLED FROM TREATMENT TRAIN PLC PANEL TO TERMINAL BLOCKS IN PUMP CONTROL PANEL AND EXTENDED TO PUMPS FOR TUBE FAILURE ALARM INDICATION.
- TWO EXISTING FLUORIDE PUMP SKIDS ARE INSTALLED AND INCLUDE CONTROL PANELS ON BOTH SKIDS TO OPERATE A TOTAL OF FOUR EXISTING FLUORIDE PUMPS. THESE SKIDS AND PUMPS ARE BEING REMOVED AND REPLACED WITH THREE WALL MOUNTED PERISTALTIC PUMPS. JUNCTION BOXES SHALL BE MOUNTED ON WALL FOR POWER AND CONTROL WIRING CONNECTIONS FROM NEW PUMPS. POWER, DIGITAL RUN INPUTS, DIGITAL RUN AND COMMON ALARM OUTPUTS, AND ANALOG SPEED REFERENCE INPUT WIRING SHALL BE EXTENDED FROM EXISTING WIRING AT JUNCTION BOX. NEW WIRING SHALL BE INSTALLED FROM PUMPS TO TREATMENT TRAIN PLC PANEL FOR TUBE FAILURE ALARM INDICATION.
- EXISTING TREATMENT TRAIN CONTROL PANELS PROVIDE 120 VOLT POWER TO EXISTING SAMPLE PUMPS AND SOLENOID VALVES THROUGH CONTROL RELAY TERMINALS WITH 2A FUSES ON EACH SWITCHED POWER FEED. SIMILAR SWITCHED POWER FEED SHALL BE INSTALLED FROM THE SAME 120 VOLT CONTROL PANEL POWER CIRCUIT TO NEW SODA ASH FLUSHING SOLENOID VALVES. EXISTING SPARE PLC DIGITAL RELAY OUTPUTS AND CONTROL RELAYS SHALL BE UTILIZED AS INDICATED WITH NEW 2A FUSES INSTALLED WITHIN CONTROL PANEL ON EACH SOLENOID VALVE POWER OUTPUT.

NOTES:

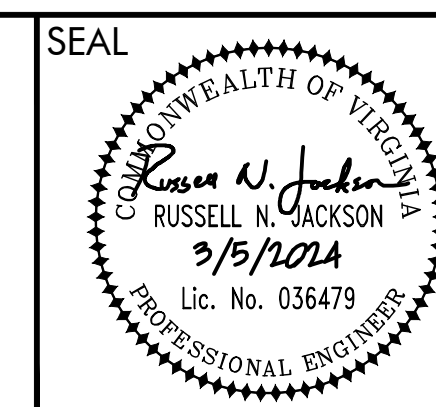
- EXISTING PLC CONTROL PANEL INCLUDED I/O AND CONTROL RELAYS FOR A FUTURE PNEUMATIC VALVE ACTUATED SLUDGE COLLECTOR SYSTEM, WHICH IS NO LONGER ANTICIPATED. I/O AND CONTROL RELAYS ORIGINALLY PROVIDED FOR THIS FUTURE SYSTEM IS TO BE ABANDONED OR REPURPOSED AS INDICATED.
- EXISTING PANEL I/O LISTED AS SPARES ARE WIRED TO EXISTING TERMINAL BLOCKS FOR FUTURE FIELD WIRE CONNECTIONS.
- EXISTING PAC PUMP SKIDS WERE ORIGINALLY PROVIDED WITH DIAPHRAGM PUMPS AND INCLUDE CONTROL PANELS ON EACH SKID. THE ORIGINAL DIAPHRAGM PUMPS WERE PREVIOUSLY REPLACED WITH PERISTALTIC PUMPS, WHICH WERE WIRED INTO THE ORIGINAL SKID CONTROL PANELS. THE SKIDS AND CONTROL PANELS ARE TO BE REMOVED WITH THE EXISTING PUMPS REMOUNTED ON A WALL SHELF. JUNCTION BOXES SHALL BE MOUNTED ON WALL FOR POWER AND CONTROL WIRING CONNECTIONS FROM PAC PUMPS. POWER, DIGITAL RUN INPUTS, DIGITAL RUN AND COMMON ALARM OUTPUTS, AND ANALOG SPEED REFERENCE INPUT WIRING SHALL BE EXTENDED FROM EXISTING WIRING AT JUNCTION BOX. NEW WIRING SHALL BE INSTALLED FROM PUMPS TO TREATMENT TRAIN PLC PANEL FOR TUBE FAILURE ALARM INDICATION.

Peed & Bortz, L.L.C.
 CIVIL & ENVIRONMENTAL ENGINEERS
 20 MIDWAY PLAZA DRIVE - SUITE 100
 CHRISTIANBURG, VIRGINIA 24073
 PHONE: (540) 394 - 3214 FAX: (540) 394 - 3215

WATER TREATMENT PLANT

WATER TREATMENT PLANT EXPANSION

AUSTINVILLE VIRGINIA



DRAWN BY:
RNJ
 REVIEW BY:
RNJ
 DATE:
5 MARCH 2024
 REVISION:

SHEET DESCRIPTION:
TREATMENT TRAIN 2 PLC SCHEDULES

104

DIGITAL INPUT MODULE			
I/O STATION #	CONN #	DESCRIPTION	NOTES
STATION #1	X1-DI-00	CONTROL POWER NORMAL	
	X1-DI-01	UPS POWER NORMAL	
	X1-DI-02	AIR SCOUR VALVE CLOSED LIMIT SWITCH	
	X1-DI-03	AIR SCOUR VALVE OPEN LIMIT SWITCH	
	X1-DI-04	AIR SCOUR VALVE - HOA SWITCH AUTO	
	X1-DI-05	BACKWASH VALVE CLOSED LIMIT SWITCH	
	X1-DI-06	BACKWASH VALVE OPEN LIMIT SWITCH	
	X1-DI-07	BACKWASH VALVE - HOA SWITCH AUTO	
	X1-DI-08	EFFLUENT VALVE CLOSED LIMIT SWITCH	
	X1-DI-09	EFFLUENT VALVE OPEN LIMIT SWITCH	
	X1-DI-10	EFFLUENT VALVE - HOA SWITCH AUTO	
	X1-DI-11	INFLUENT VALVE CLOSED LIMIT SWITCH	
	X1-DI-12	INFLUENT VALVE OPEN LIMIT SWITCH	
	X1-DI-13	INFLUENT VALVE - HOA SWITCH AUTO	
	X1-DI-14	REWASH VALVE CLOSED LIMIT SWITCH	
X1-DI-15	REWASH VALVE OPEN LIMIT SWITCH		

ANALOG INPUT MODULE			
I/O STATION #	CONN #	DESCRIPTION	NOTES
STATION #4	X4-DI-00	EFFLUENT MAG METER FLOW RATE	
	X4-DI-01	EFFLUENT TURBIDITY	
	X4-DI-02	BACKWASH VALVE POSITION FEEDBACK	
	X4-DI-03	EFFLUENT VALVE POSITION FEEDBACK	
	X4-DI-04	PRESSURE TRANSDUCER (UPSTREAM LOSS OF HEAD)	NOTE 5
	X4-DI-05	PRESSURE TRANSDUCER (DOWNSTREAM LOSS OF HEAD)	NOTE 5
	X4-DI-06	BACKWASH MAG METER FLOW RATE	NOTE 6
X4-DI-07			

ANALOG OUTPUT MODULE			
I/O STATION #	CONN #	DESCRIPTION	NOTES
STATION #5	X5-DI-00		
	X5-DI-01	EFFLUENT VALVE POSITION REFERENCE	
	X5-DI-02	BACKWASH VALVE POSITION REFERENCE	
	X5-DI-03		

DIGITAL INPUT MODULE				
I/O STATION #	CONN #	DESCRIPTION	NOTES	
STATION #2	X2-DI-00	REWASH VALVE - HOA SWITCH AUTO		
	X2-DI-01	WASTE VALVE CLOSED LIMIT SWITCH		
	X2-DI-02	WASTE VALVE OPEN LIMIT SWITCH		
	X2-DI-03	WASTE VALVE - HOA SWITCH AUTO		
	X2-DI-04	FILTER AIR SCOUR BLOWER RUNNING		
	X2-DI-05			
	X2-DI-06			
	X2-DI-07			
	X2-DI-08			
	X2-DI-09			
	X2-DI-10			
	X2-DI-11			
	X2-DI-12			
	X2-DI-13			
	X2-DI-14			
X2-DI-15				

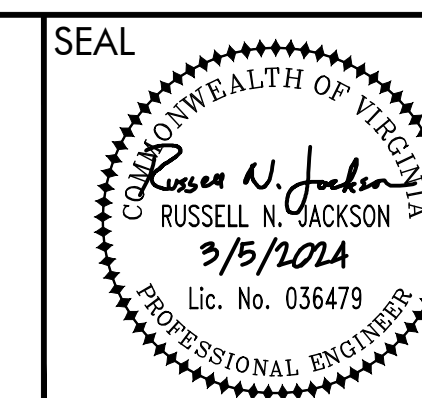
DIGITAL OUTPUT MODULE			
I/O STATION #	CONN #	DESCRIPTION	MODIFICATIONS
STATION #3	X3-DI-00	AIR SCOUR VALVE CLOSE COMMAND (CR1)	NOTE 2
	X3-DI-01	AIR SCOUR VALVE OPEN COMMAND (CR2)	NOTE 2
	X3-DI-02	INFLUENT VALVE CLOSE COMMAND (CR3)	NOTE 2
	X3-DI-03	INFLUENT VALVE OPEN COMMAND (CR4)	NOTE 2
	X3-DI-04	REWASH VALVE CLOSE COMMAND (CR 5)	NOTE 2
	X3-DI-05	REWASH VALVE OPEN COMMAND (CR6)	NOTE 2
	X3-DI-06	WASTE VALVE CLOSE COMMAND (CR7)	NOTE 2
	X3-DI-07	WASTE VALVE OPEN COMMAND (CR8)	NOTE 2
	X3-DI-08	FILTRATE SAMPLE PUMP ENERGIZED (CR9)	NOTES 2,3
	X3-DI-09	FILTER AIR SCOUR BLOWER RUN (CR10)	NOTES 2,4
	X3-DI-10	CL2 ANALYZER FILTRATE #1 SUPPLY SOLENOID (C11)	NOTES 2,3
	X3-DI-11	CL2 ANALYZER FILTRATE #2 SUPPLY SOLENOID (CR12)	NOTES 2,3
	X3-DI-12	CL2 ANALYZER FILTRATE #3 SUPPLY SOLENOID (CR13)	NOTES 2,3
	X3-DI-13	CL2 ANALYZER FILTRATE #4 SUPPLY SOLENOID (CR14)	NOTES 2,3
	X3-DI-14		
X3-DI-15			

NOTES:

- PLC INPUTS AND OUTPUTS SHOWN ARE SIMILAR TO EXISTING FILTER PLC PANELS, EXCEPT THAT OTHER FILTER PLCs INCLUDE ADDITIONAL CHEMICAL FEED PUMP CONTROL AND DO NOT INCLUDE FILTRATE SOLENOID VALVE SUPPLIES TO THE NEW FILTRATE CHLORINE RESIDUAL ANALYZER. PROGRAM FOR EXISTING FILTER #1 IS TO BE USED AS A BASE FOR NEW FILTER #4 PLC. MODIFYING THE PROGRAM FOR FILTER #4 WILL REQUIRE REMOVING CONTROL FOR POLYMER FEED PUMP #1 AND ADDING THE INDICATED FILTRATE SOLENOID VALVE CONTROL.
- ALL PLC DIGITAL RELAY OUTPUTS SHALL ENERGIZE SOLID STATE CONTROL RELAYS WITH NORMALLY OPEN CONTACTS WIRED TO TERMINAL BOCKS FOR FIELD CONNECTIONS.
- 120 VOLT POWER SUPPLY TO SAMPLE PUMP AND SOLENOID VALVES SHALL BE THROUGH CONTROL RELAY CONTACTS WITH 2 AMP FUSES INSTALLED ON EACH POWER SUPPLY OUTPUT.
- AIR SCOUR BLOWER RUN CONTACT IS WIRED IN PARALLEL THROUGH DIGITAL RELAY OUTPUT CONTACTS FROM ALL FILTER PANELS TO ALLOW ANY CONSOLE TO DIRECTLY ACTIVATE THE BLOWER. PARALLEL RUN CONTACT WIRING SHALL BE INSTALLED FROM FILTER PANEL #3 TO FILTER PANEL #4 FOR ADDITIONAL BLOWER CONTROL.
- FILTER "LOSS OF HEAD" IS CALCULATED AS THE DIFFERENCE BETWEEN AN UPSTREAM PRESSURE TRANSDUCER MEASURING FILTER WATER LEVEL ABOVE THE MEDIA AND A SECOND TRANSDUCER ON THE FILTER EFFLUENT PIPE DOWNSTREAM OF THE MEDIA AND UNDERDRAIN. THE LOSS OF HEAD CALCULATION ALSO ADJUSTS FOR THE ELEVATION DIFFERENCE BETWEEN THE TWO TRANSDUCERS WITH THE RESULT INDICATED IN UNITS OF FEET TO THE ### PRECISION. FILTER CONSOLE HMI PROGRAMMING FOR ALL FILTER PANELS SHALL ALSO BE MODIFIED TO DISPLAY THE FILTER WATER LEVEL ABOVE THE UNDERDRAIN IN THE SAME UNITS BASED ON THE UPSTREAM TRANSDUCER READING WITH SENSOR ELEVATION OFFSET.
- BACKWASH MAG METER FLOW RATE ANALOG WIRING IS LOOPED THROUGH EACH OF THE THREE EXISTING FILTER PANEL PLC ANALOG INPUT MODULES. WIRING SHALL BE INSTALLED TO EXTEND LOOP THROUGH NEW FILTER #4 ANALOG INPUT.

Peed & Bortz, L.L.C.
 CIVIL & ENVIRONMENTAL ENGINEERS
 20 MIDWAY PLAZA DRIVE - SUITE 100
 CHRISTIANBURG, VIRGINIA 24073
 PHONE: (540) 394 - 3214 FAX : (540) 394 - 3215

WATER TREATMENT PLANT
WATER TREATMENT PLANT EXPANSION
 AUSTINVILLE VIRGINIA



SEAL
 DRAWN BY:
 RNJ
 REVIEW BY:
 RNJ
 DATE:
 5 MARCH 2024
 REVISION:

SHEET DESCRIPTION:
 FILTER 4 PLC SCHEDULES

105

DIGITAL INPUT MODULE			
I/O STATION #	CONN #	DESCRIPTION	MODIFICATIONS
STATION #1	X1-DI-00	Finished Water Pump #1 - HOA in Hand	
	X1-DI-01	Finished Water Pump #1 - HOA in Auto	
	X1-DI-02	Finished Water Pump #1 - Running	
	X1-DI-03	Finished Water Pump #2 - HOA in Hand	
	X1-DI-04	Finished Water Pump #2 - HOA in Auto	
	X1-DI-05	Finished Water Pump #2 - Running	
	X1-DI-06	Finished Water Pump #3 - HOA in Hand	NOTE 2
	X1-DI-07	Finished Water Pump #3 - HOA in Auto	NOTE 2
	X1-DI-08	Finished Water Pump #3 - Running	NOTE 2
	X1-DI-09	Spare	NOTE 5
	X1-DI-10		
	X1-DI-11		
	X1-DI-12		
	X1-DI-13		
	X1-DI-14		
X1-DI-15			

ANALOG INPUT MODULE			
I/O STATION #	CONN #	DESCRIPTION	MODIFICATIONS
STATION #4	X4-DI-00	Finished Water Chlorine Residual Analyzer	
	X4-DI-01	Finished Water pH	
	X4-DI-02	Finished Water Mag Meter Flow Rate	
	X4-DI-03	Finished Water Turbidity	

ANALOG INPUT MODULE			
I/O STATION #	CONN #	DESCRIPTION	MODIFICATIONS
STATION #5	X5-DI-00	Clearwell Level	
	X5-DI-01	Chlorine Contact Tank Level	
	X5-DI-02	Spare	
	X5-DI-03	Spare	

DIGITAL INPUT MODULE			
I/O STATION #	CONN #	DESCRIPTION	MODIFICATIONS
STATION #2	X2-DI-00	Finished Water Mag Meter - Flow Total Pule Contact	
	X2-DI-01	Backwash Pump #1 - HOA in Hand	
	X2-DI-02	Backwash Pump #1 - HOA in Auto	
	X2-DI-03	Backwash Pump #1 - Running	
	X2-DI-04	Backwash Pump #2 - HOA in Hand	
	X2-DI-05	Backwash Pump #2 - HOA in Auto	
	X2-DI-06	Backwash Pump #2 - Running	
	X2-DI-07	Spare	NOTE 5
	X2-DI-08	Automatic Transfer Switch - Line Power	
	X2-DI-09	Automatic Transfer Switch - Backup Power	
	X2-DI-10	Control Power Normal	
	X2-DI-11	UPS Power Normal	
	X2-DI-12	Generator Alarm	
	X2-DI-13	Spare	NOTE 5
	X2-DI-14	Spare	NOTE 5
X2-DI-15	Spare	NOTE 5	

ANALOG INPUT MODULE			
I/O STATION #	CONN #	DESCRIPTION	MODIFICATIONS
STATION #6	X6-DI-00	FINISHED WATER PUMP #1 - SPEED FEEDBACK	NOTE 3
	X6-DI-01	FINISHED WATER PUMP #2 - SPEED FEEDBACK	NOTE 3
	X6-DI-02	FINISHED WATER PUMP #3 - SPEED FEEDBACK	NOTE 3
	X6-DI-03		

ANALOG OUTPUT MODULE			
I/O STATION #	CONN #	DESCRIPTION	MODIFICATIONS
STATION #7	X7-DI-00	FINISHED WATER PUMP #1 - SPEED REFERENCE	NOTE 3
	X7-DI-01	FINISHED WATER PUMP #2 - SPEED REFERENCE	NOTE 3
	X7-DI-02	FINISHED WATER PUMP #3 - SPEED REFERENCE	NOTE 3
	X7-DI-03		

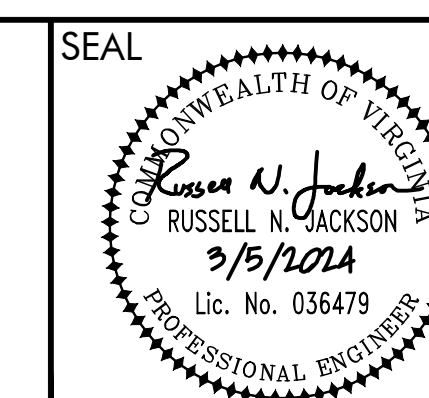
DIGITAL OUTPUT MODULE			
I/O STATION #	CONN #	DESCRIPTION	MODIFICATIONS
STATION #3	X3-DI-00	Finished Water Pump #1 - Run Command (cr1)	
	X3-DI-01	Finished Water Pump #2 - Run Command (cr2)	
	X3-DI-02	Finished Water Pump #3 - Run Command (cr3)	NOTE 2
	X3-DI-03	Backwash Pump #1 - Run Command (cr4)	
	X3-DI-04	Backwash Pump #2 - Run Command (cr5)	
	X3-DI-05	Sample Solenoid Valve (cr6)	
	X3-DI-06	HARMONIC FILTER ALARM	NOTE 6
X3-DI-07			

NOTES:

- EXISTING AB MICROLOGIX PLC SHALL BE REPLACED WITH AB MICROLOGIX 1400, MICRO 800, OR COMPACT LOGIX SERIES. EXISTING I/O MODULES MAY BE REUSED, IF COMPATIBLE WITH NEW PLC. UNLESS OTHERWISE NOTED, ALL EXISTING I/O WIRES WITHIN PANEL SHALL BE RECONNECT TO NEW PLC. INPUT AND OUTPUT SCHEDULES MAY BE ADJUSTED IF USING A PLC WITH ONBOARD BASE I/O.
- EXISTING PANEL INCLUDED DIGITAL INPUTS, DIGITAL OUTPUTS, AND CONTROL RELAYS FOR FUTURE FINISHED WATER PUMP #3, WHICH SHALL BE WIRED TO ADDITIONAL THIRD PUMP BEING INSTALLED.
- ANALOG FINISHED WATER PUMP VFD SPEED REFERENCE AND FEEDBACK I/O AND WIRING IS BEING ADDED FOR ALL THREE FINISHED WATER PUMPS. WIRING SHALL BE RUN FROM PANEL TERMINAL BLOCKS TO EXISTING AND NEW FINISHED WATER PUMP VFDs.
- FINISHED WATER PUMP #2 RUN FEEDBACK SIGNAL WAS ORIGINALLY WIRED FROM VFD OUTPUT TO INDICATED PLC INPUT. A SUBSEQUENT DRIVE PROGRAMMING MODIFICATION DISABLED THE DRIVE CONTACT, SO THE PLC NO LONGER RECEIVED THE RUN CONFIRMATION FEEDBACK AND MAINTAINED THE PUMP RUN COMMAND. JUMPER WIRING WAS INSTALLED FROM THE PLC RUN OUTPUT TO THE RUN FEEDBACK INPUT TO PATCH THIS ISSUE AND MAINTAIN PUMP CONTROL. EXISTING VFDs ARE TO BE RECONFIGURED FOR REMOTE ANALOG SPEED CONTROL. DRIVE RUN CONFIRMATION CONTACT OPERATION SHALL BE VERIFIED AT THE SAME TIME, WITH THE FEEDBACK INPUT TO THE PLC RESTORED IF OPERATIONAL.
- WIRING FROM EXISTING "SPARE" PLC INPUTS AND OUTPUTS TO TERMINAL BLOCKS SHALL BE RECONNECTED FOR FUTURE USE.
- WIRING TO BE INSTALLED FOR COMMON ALARM INDICATION FROM ACTIVE HARMONIC FILTER TO PLC.

Peed & Bortz, L.L.C.
 CIVIL & ENVIRONMENTAL ENGINEERS
 20 MIDWAY PLAZA DRIVE - SUITE 100
 CHRISTIANBURG, VIRGINIA 24073
 PHONE: (540) 394 - 3214 FAX: (540) 394 - 3215

WATER TREATMENT PLANT
WATER TREATMENT PLANT EXPANSION
 AUSTINVILLE VIRGINIA



DRAWN BY:
RNJ
 REVIEW BY:
RNJ
 DATE:
5 MARCH 2024
 REVISION:

SHEET DESCRIPTION:
 FINISHED WATER STATION
 PLC SCHEDULES

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DIGITAL INPUT MODULE			
I/O STATION #	CONN #	DESCRIPTION	NOTES
STATION #1	X1-DI-00	SLUDGE STATION PUMP #1 - RUNNING	
	X1-DI-01	SLUDGE STATION PUMP #1 - DRIVE FAULT	
	X1-DI-02	SLUDGE STATION PUMP #1 - OVERTEMP	NOTE 4
	X1-DI-03	SLUDGE STATION PUMP #1 - OVERTEMP	NOTE 4
	X1-DI-04	SLUDGE STATION PUMP #2 - RUNNING	
	X1-DI-05	SLUDGE STATION PUMP #2 - FAULT	
	X1-DI-06	SLUDGE STATION PUMP #2 - SEAL WARNING	NOTE 4
	X1-DI-07	SLUDGE STATION PUMP #2 - OVERTEMP	NOTE 4
	X1-DI-08	SLUDGE STATION DISCHARGE MAG METER FLOW TOTAL	
	X1-DI-09	THICKENER MIXER #1 - RUNNING	
	X1-DI-10	THICKENER MIXER #1 - FAULT	
	X1-DI-11	THICKENER MIXER #2 - RUNNING	
	X1-DI-12	THICKENER MIXER #2 - FAULT	
	X1-DI-13		
	X1-DI-14		
X1-DI-15			

ANALOG INPUT MODULE			
I/O STATION #	CONN #	DESCRIPTION	NOTES
STATION #4	X4-DI-00	SLUDGE STATION WETWELL LEVEL	NOTE 2
	X4-DI-01	SLUDGE STATION MAG METER FLOW RATE	
	X4-DI-02	SLUDGE PUMP #1 - SPEED FEEDBACK	
	X4-DI-03	SLUDGE PUMP #2 - SPEED FEEDBACK	
	X4-DI-04		
	X4-DI-05		
	X4-DI-06		
X4-DI-07			

DIGITAL INPUT MODULE			
I/O STATION #	CONN #	DESCRIPTION	NOTES
STATION #2	X2-DI-00	DECHLORINATION PUMP #1 - RUNNING	
	X2-DI-01	DECHLORINATION PUMP #1 - FAULT	
	X2-DI-02	DECHLORINATION PUMP #1 - TUBE FAILURE	
	X2-DI-03	DECHLORINATION PUMP #2 - RUNNING	
	X2-DI-04	DECHLORINATION PUMP #2 - FAULT	
	X2-DI-05	DECHLORINATION PUMP #2 - TUBE FAILURE	
	X2-DI-06		
	X2-DI-07		
	X2-DI-08		
	X2-DI-09		
	X2-DI-10		
	X2-DI-11		
	X2-DI-12		
	X2-DI-13		
	X2-DI-14		
X2-DI-15			

ANALOG INPUT MODULE			
I/O STATION #	CONN #	DESCRIPTION	NOTES
STATION #5	X5-DI-00	THICKENER TANK #1 LEVEL	NOTE 2
	X5-DI-01	THICKENER TANK #2 LEVEL	NOTE 2
	X5-DI-02	THICKENER MIXER #1 - SPEED FEEDBACK	
	X5-DI-03	THICKENER MIXER #2 - SPEED FEEDBACK	
	X5-DI-04	DECHLORINATION PUMP #1 - FLOW FEEDBACK	
	X5-DI-05	DECHLORINATION PUMP #2 - FLOW FEEDBACK	
	X5-DI-06		
X5-DI-07			

ANALOG OUTPUT MODULE			
I/O STATION #	CONN #	DESCRIPTION	NOTES
STATION #6	X6-DO-00	SLUDGE PUMP #1 - SPEED REFERENCE	
	X6-DO-01	SLUDGE PUMP #2 - SPEED REFERENCE	
	X6-DO-02	THICKENER MIXER #1 - SPEED REFERENCE	
	X6-DO-03	THICKENER MIXER #2 - SPEED REFERENCE	

DIGITAL OUTPUT MODULE			
I/O STATION #	CONN #	DESCRIPTION	MODIFICATIONS
STATION #3	X3-DO-00	SLUDGE STATION PUMP #1 - RUN COMMAND (CR1)	NOTE 1
	X3-DO-01	SLUDGE STATION PUMP #2 - RUN COMMAND (CR2)	NOTE 1
	X3-DO-02	THICKENER MIXER #1 - RUN COMMAND (CR3)	NOTE 1
	X3-DO-03	THICKENER MIXER #2 - RUN COMMAND (CR4)	NOTE 1
	X3-DO-04	DECHLORINATION PUMP #1 - RUN COMMAND (CR5)	NOTE 1
	X3-DO-05	DECHLORINATION PUMP #2 - RUN COMMAND (CR6)	NOTE 1
	X3-DO-06		
	X3-DO-07		
	X3-DO-08		
	X3-DO-09		
	X3-DO-10		
	X3-DO-11		
	X3-DO-12		
	X3-DO-13		
	X3-DO-14		
X3-DO-15			

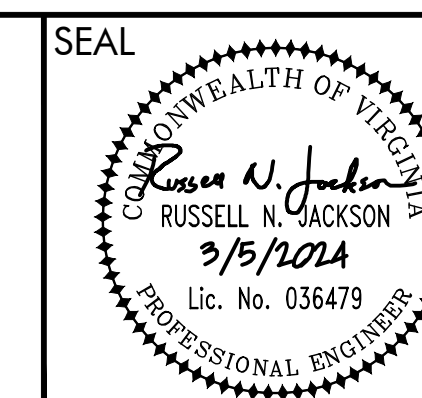
ANALOG OUTPUT MODULE			
I/O STATION #	CONN #	DESCRIPTION	NOTES
STATION #7	X7-DO-00	DECHLORINATION PUMP #1 - FLOW REFERENCE	
	X7-DO-01	DECHLORINATION PUMP #2 - FLOW REFERENCE	
	X7-DO-02		
	X7-DO-03		

NOTES:

- ALL DIGITAL RELAY OUTPUTS SHALL BE WIRED TO INDIVIDUAL SOLID STATE CONTROL RELAYS WITHIN PANEL WITH NORMALLY OPEN CONTACTS WIRED TO TERMINAL BLOCKS FOR FIELD WIRE CONNECTIONS.
- ANALOG ISOLATORS/ REPEATERS SHALL BE INSTALLED WITHIN PANEL TO PROVIDE SURGE PROTECTION FOR PLC ANALOG INPUTS FROM LEVEL TRANSDUCER SIGNALS FROM SLUDGE STATION WETWELL AND THICKENER TANKS.
- DEWATERING BUILDING PLC PANEL SHALL INCLUDE ETHERNET SWITCH WITH NETWORKED COMMUNICATION TO CENTRIFUGE AND CONVEYOR PANEL PLC FOR STATUS MONITORING AND REMOTE CONTROL OF CENTRIFUGE RUN/STOP OPERATION, CONVEYOR AND DISCHARGE GATE OPERATION, AND SYSTEM MONITORING.
- PUMP PROTECTION RELAY MODULES SHALL BE OBTAINED FROM PUMP SUPPLIER (OR PER PUMP SUPPLIERS RECOMMENDATIONS) AND MOUNTED IN CONTROL PANEL FOR MONITORING OF PUMP MOTOR OVER-TEMPERATURE AND SEAL FAILURE WARNING.

Peed & Bortz, L.L.C.
 CIVIL & ENVIRONMENTAL ENGINEERS
 20 MIDWAY PLAZA DRIVE - SUITE 100
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 PHONE: (540) 394 - 3214 FAX : (540) 394 - 3215

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DRAWN BY:
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SHEET DESCRIPTION:
DEWATERING BUILDING
PLC SCHEDULES

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