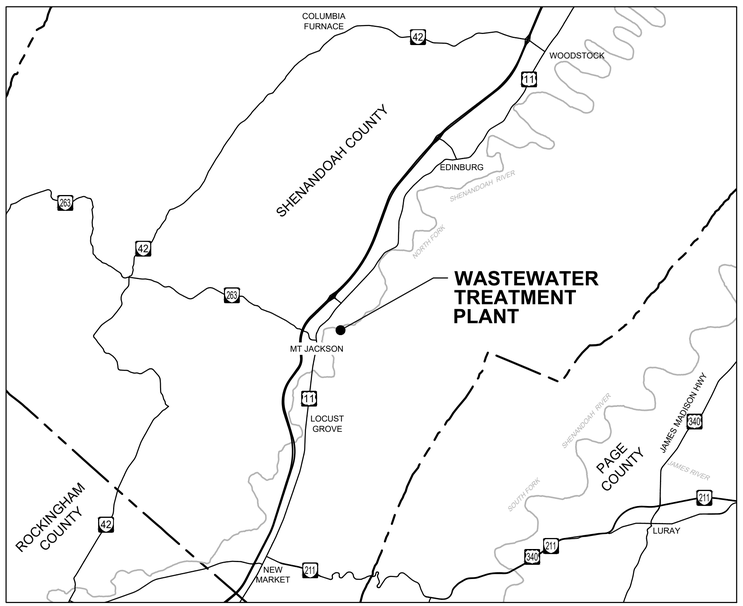
MOUNT JACKSON WWTP
EQUALIZATION PROJECT

MOUNT JACKSON, VIRGINIA
FOR CONSTRUCTION



PROJECT VICINITY MAP
NOT TO SCALE

INDEX OF DRAWINGS

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C-102	CIVIL SITE PLAN
C-103	CIVIL DEMOLITION PLAN
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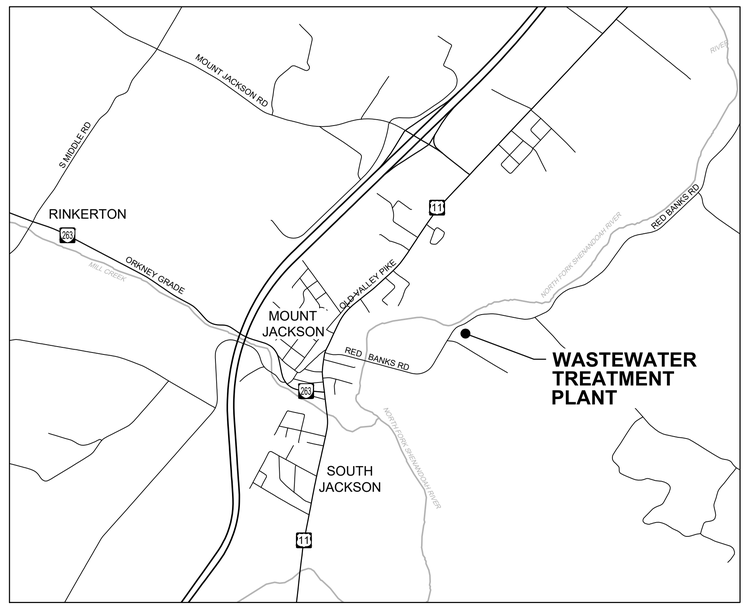

PROJECT LOCATION MAP
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N

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MOUNT JACKSON WWTP
EQUALIZATION PROJECT

OWNER:
TOWN OF MOUNT JACKSON
MOUNT JACKSON, VIRGINIA

MARK	DATE	DESCRIPTION
0	10/24/2022	BID SET

PROJECT NO:	TCS2241
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CHECKED BY:	CRLM
SHEET TITLE	

COVER SHEET

G-001

SHEET 1 OF 20

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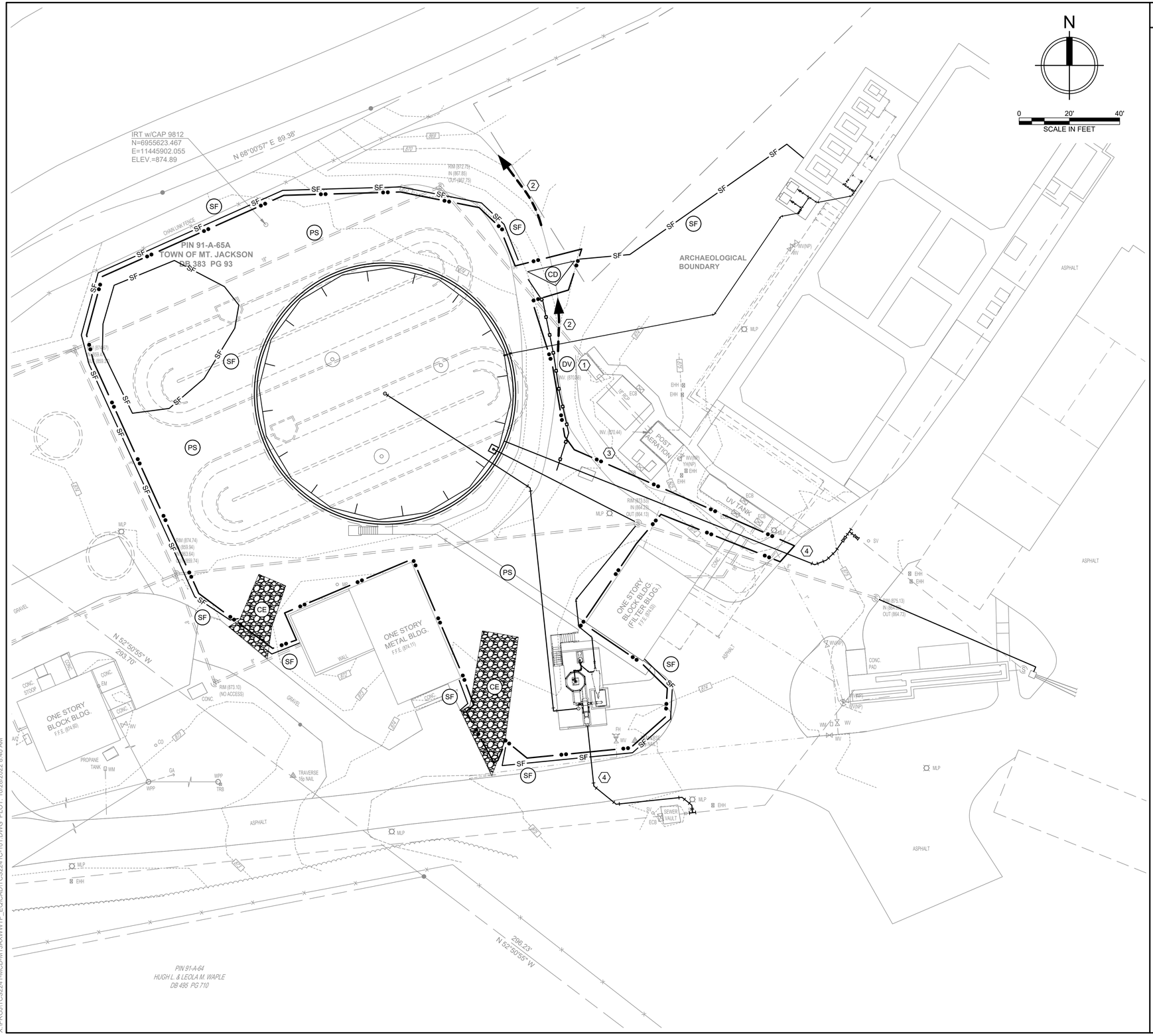

KEY NOTES:

1. PROVIDE TEMP. DIV. BARRIER WITH SUPER SILT FENCE AND 60 MIL POLYETHYLENE SHEETING TO KEEP SITE WATER FROM ENTERING EXCAVATION AREA. ALL EXCAVATED AREA DEWATERING SHALL BE PUMPED TO AN APPROVED SEDIMENT REMOVAL DEVICE (DIRTBAG OR APPROVED EQUAL IAW VA ESC STANDARDS).
2. EXISTING GRASS SWALE TO REMAIN.
3. STOCKPILE TRENCH MATERIAL ON UPSLOPE SIDE OF TRENCH, STABILIZE TRENCH ACROSS SWALE AREA WITH SOD UPON COMPLETION OF PIPE INSTALLATION.
4. PROVIDE SAME DAY STABILIZATION OF UTILITY TRENCH IN PAVEMENT WITH #57 STONE PATCH UNTIL PAVEMENT CAN BE RESTORED.

EROSION AND SEDIMENT CONTROL LEGEND:

LIMITS OF CONSTRUCTION		
SF	SF	SILT FENCE PER VESCH STD. & SPEC 3.05
	CE	CONSTRUCTION ENTRANCE PER VESCH STD. & SPEC 3.02
	DV	DIVERSION PER VESCH STD. & SPEC 3.12
	CD	ROCK CHECK DAM PER VESCH STD. & SPEC 3.20
	PS	PERMANENT SEEDING PER VESCH STD. & SPEC. 3.32 (NOTE: ALL DISTURBED AREAS TO RECEIVE PERMANENT SEEDING)

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E&S PLAN

C-101

SHEET 2 OF 20

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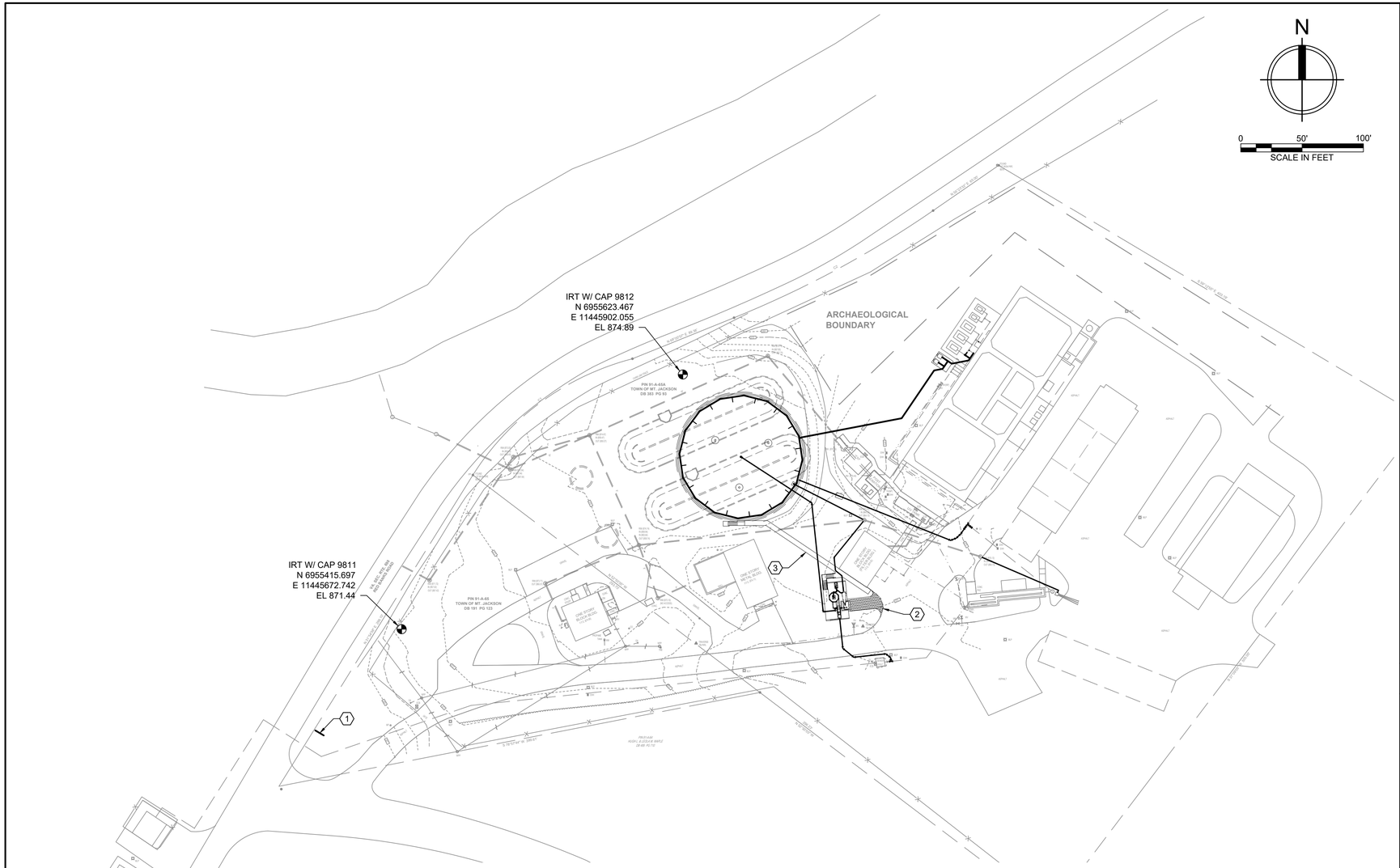


GENERAL NOTES:

A. SEE DEMOLITION DRAWING SHEET C-103 FOR OVER EXCAVATION REQUIREMENTS, ENGINEERED BACKFILL AND REQUIRED BEARING CAPACITY FOR NEW EQ STRUCTURE.

B. TOPOGRAPHIC INFORMATION SHOWN HEREON IS BASED ON AN ACTUAL FIELD SURVEY COMPLETED JULY 7, 2022. BOUNDARY INFORMATION IS BASED ON AVAILABLE DEEDS AND PLATS OF RECORD AND ORIENTED TO THE SURVEY BASED ON PROPERTY CORNERS FOUND. NO FIELD RUN BOUNDARY SURVEY IS IMPLIED.

C. NO TITLE REPORT FURNISHED. THEREFORE, EASEMENTS OR ENCUMBRANCES MAY EXIST THAT ARE NOT SHOWN.

D. ANY UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE.

E. HORIZONTAL ORIENTATION IS BASED ON VA. NAD 83 NORTH ZONE STATE GRID; VERTICAL DATUM IS BASED ON NAVD 88 ELEVATIONS ESTABLISHED USING GPS METHODS.

LEGEND:

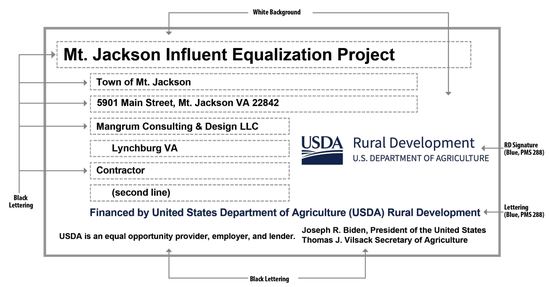
ABBREVIATION	DEFINITION
◔	BENCHMARK
CO	SANITARY CLEAN OUT
ECB	ELECTRIC CONTROL BOX
EHH	ELECTRIC HANDHOLE
EM	ELECTRIC METER
F.F.E.	FINISHED FLOOR ELEVATION
FH	FIRE HYDRANT
GA	GUY ANCHOR
INV.	INVERT
IPF	IRON PIPE FOUND
MLP	METAL LIGHT POLE
MP	METAL POST
NP	NON POTABLE
RCP	REINFORCED CONCRETE PIPE
(S)	SANITARY MANHOLE
SV	SEWER VALVE
TRB	TELEPHONE RISER BOX
WM	WATER METER
WPP	WOOD POWER POLE
WV	WATER VALVE
-X-	FENCE
----------	U/G WATER LINE

KEY NOTES:

1. LOCATION OF PROJECT SIGN. SEE DETAIL D1 THIS SHEET.
2. NEW PAVEMENT, SEE DETAIL D2 THIS SHEET.
3. 4' SIDEWALK, SEE DETAIL D2/S-501.

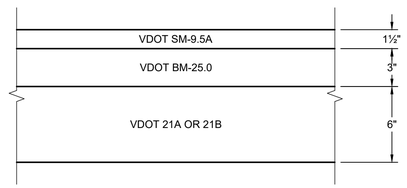
TEMPORARY CONSTRUCTION SIGN FOR RURAL DEVELOPMENT PROJECTS

Recommended Fonts: Helvetica or Arial



SIGN DIMENSIONS : 1200 mm x 2400 mm x 19 mm (approx. 4' x 8' x ¾")
PLYWOOD PANEL (APA RATED A-B GRADE–EXTERIOR)

D1 PROJECT SIGN
NOT TO SCALE



D2 TYPICAL PAVEMENT SECTION
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MOUNT JACKSON WWTP
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CIVIL SITE PLAN

C-102

SHEET 3 OF 20

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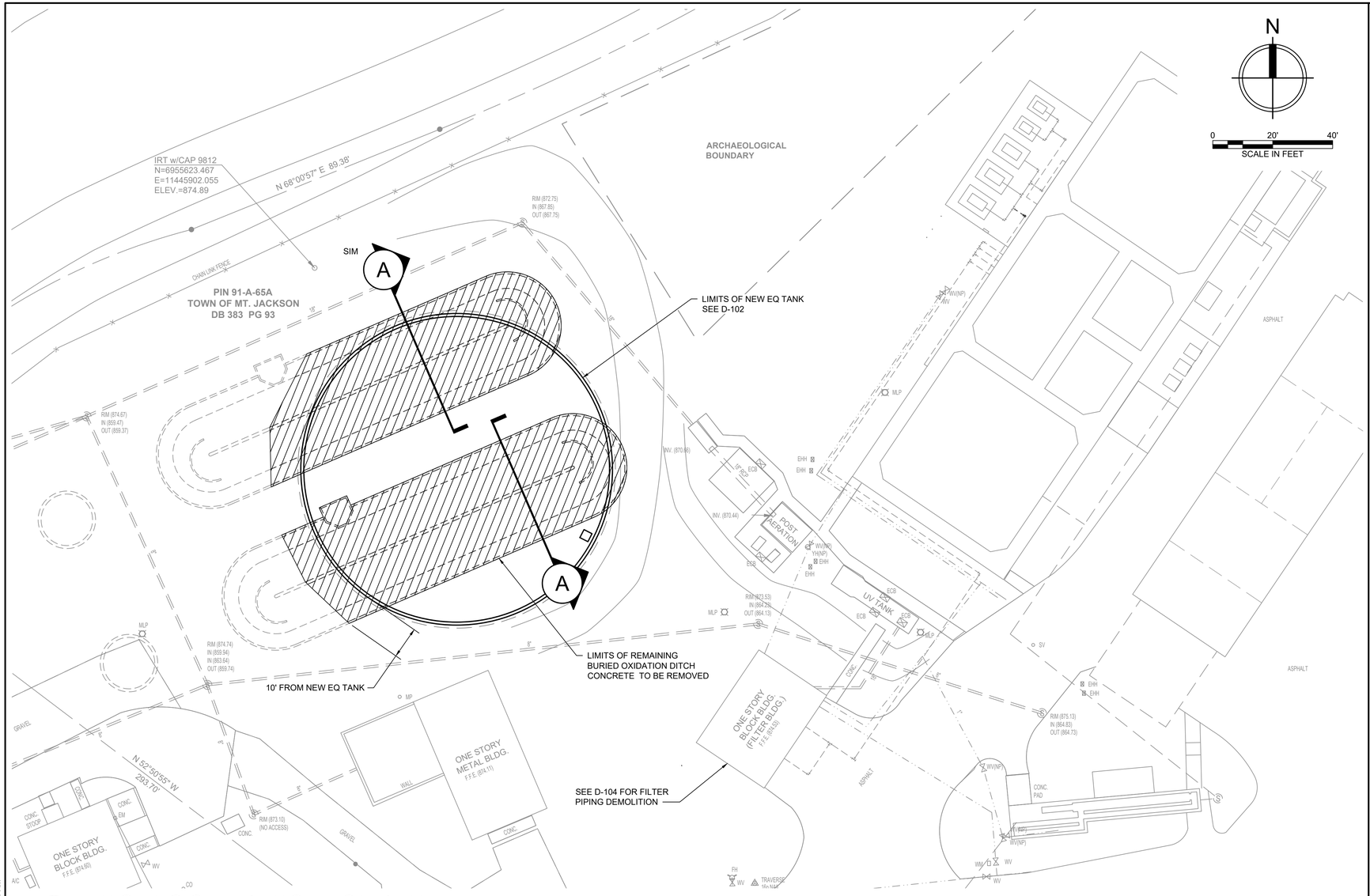
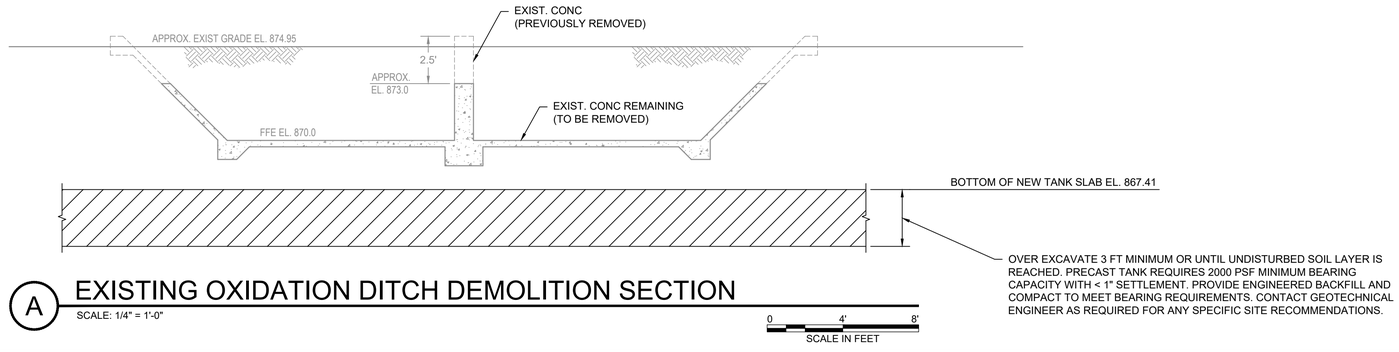


1 EXISTING SITE DEMOLITION PLAN

SCALE: 1" = 20'-0"



A EXISTING OXIDATION DITCH DEMOLITION SECTION

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

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CIVIL
DEMOLITION
PLAN

C-103

SHEET 4 OF 20

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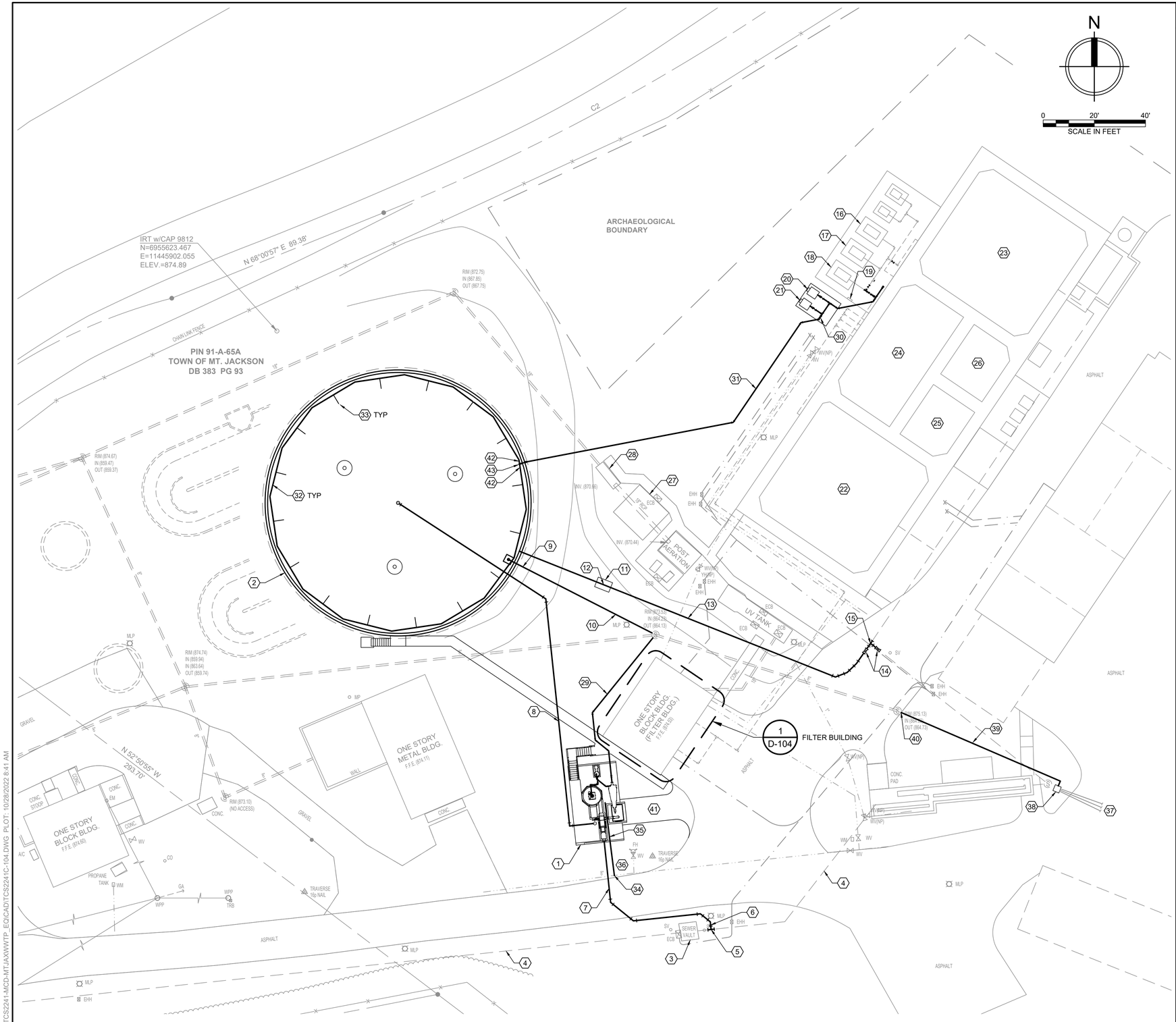

KEY NOTES:

1. NEW PACKAGED FINE SCREEN AND GRIT REMOVAL SYSTEM, SEE SECTION 110002.
2. EQUALIZATION TANK. SIZE: 102' I.D., 13.6' WATER DEPTH, 15.6' WALL HEIGHT. SEE D-002.
3. EXISTING FLOWMETER VAULT.
4. EXISTING 12" DIP INFLUENT FORCEMAIN.
5. CUT IN NEW 12" DIP TEE WITH SLEEVE. BYPASS PUMPING SHALL BE EMPLOYED SO THAT PLANT INFLUENT FORCEMAIN REMAINS FULLY FUNCTIONAL AT ALL TIMES.
6. 12" PV.
7. 12" INFLUENT FORCEMAIN TO NEW HEADWORKS.
8. 18" PRO EQ INFLUENT.
9. 8" PV
10. 8" TANK DRAIN.
11. CONTROL VALVE VAULT
12. 18" MOTOR ACTUATED PV.
13. 18" PRO EQ EFFLUENT.
14. 18" PV.
15. REPLACE EXISTING 18" 90° BEND WITH 18" TEE.
16. EXISTING SBR BLOWER 1.
17. EXISTING SBR BLOWER 2.
18. EXISTING SBR BLOWER 3.
19. EXISTING ELECTRICAL JUNCTION BOXES MOUNTED ON UNISTRUT.
20. SBR BLOWER 4.
21. SBR BLOWER 5.
22. EXISTING SBR No. 1.
23. EXISTING SBR No. 2.
24. EXISTING POST EQ.
25. EXISTING AEROBIC SLUDGE HOLDING TANK No. 1.
26. EXISTING AEROBIC SLUDGE HOLDING TANK No. 2.
27. EXISTING NPW STATION.
28. EXISTING FLUME.
29. 8" DRAIN FROM NEW HEADWORKS TO EXISTING PLANT DRAIN MH.
30. TRANSITION FROM ABOVE GRADE TO BELOW GRADE. 8" UNLINED DIP.
31. BURIED AIR LINE, 8" UNLINED DIP.
32. 6" SS SCH. 10 AIR LINE.
33. 24" SS COARSE BUBBLE DIFFUSER.
34. 2" SADDLE TAP CONNECT.
35. 2" WATER LINE TO HEADWORKS.
36. 2" DUAL ZONE RPZ WITH HOT BOX INSTALLED ON CONCRETE SLAB.
37. EXISTING (3) 1" HDPE LINES.
38. INTERCEPT (3) EXISTING HDPE PIPES PRIOR TO DISCHARGING INTO MANHOLE AND RE-ROUTE AS SHOWN. REMOVE PENETRATIONS EXTENDING INTO EXISTING MANHOLE AND GOUT CLOSED TO ACHIEVE WATER TIGHTNESS. CONNECTIONS SHALL BE WITH A NEW 30" SQUARE PRECAST CONCRETE BOX WITH GRAVEL FLOOR. CONCRETE LID TO BE 6 INCHES ABOVE FINISHED GRADE.
39. THREE (3) NEW 1" HDPE PIPES.
40. CORE DRILL EXISTING MANHOLE 18 INCHES BELOW GRADE AND GROUT IN (3) 1" HDPE PIPE PENETRATIONS. EACH PIPE TO HAVE IT'S OWN DEDICATED TURN DOWN ELBOW TO DIRECT DISCHARGE DOWN.
41. NEW PAVEMENT, SEE DETAIL D1, SHEET C-102.
42. 8"x6" REDUCER SS SCH. 10.
43. 8" TEE SS SCH. 10.

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CIVIL YARD PIPING PLAN

C-104

SHEET 5 OF 20

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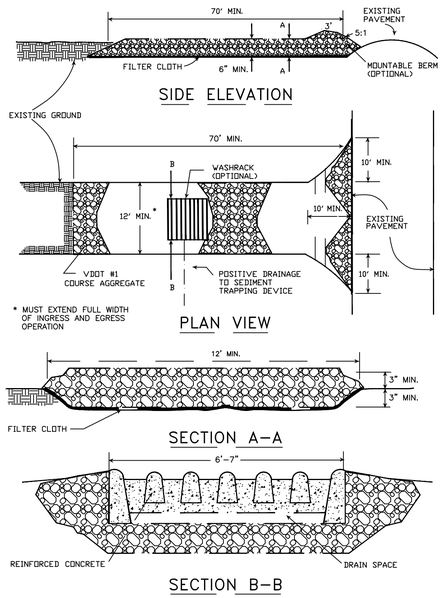
STONE CONSTRUCTION ENTRANCE



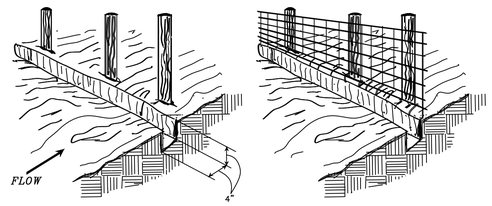
SOURCE: ADAPTED from 1983 Maryland Standards for Soil erosion and Sediment Control, and Va. DSWC — Plate 3.02-1

CE CONSTRUCTION ENTRANCE

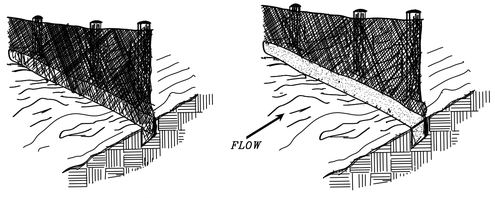
NOT TO SCALE

CONSTRUCTION OF A SILT FENCE (WITH WIRE SUPPORT)

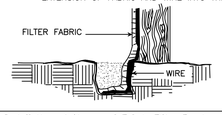
1. SET POSTS AND EXCAVATE A 4"X4" TRENCH UPSLOPE ALONG THE LINE OF POSTS.
2. STAPLE WIRE FENCING TO THE POSTS.



3. ATTACH THE FILTER FABRIC TO THE WIRE FENCE AND EXTEND IT INTO THE TRENCH.
4. BACKFILL AND COMPACT THE EXCAVATED SOIL.



EXTENSION OF FABRIC AND WIRE INTO THE TRENCH.



SOURCE: Adapted from Installation of Straw and Fabric Filter Barriers for Sediment Control, Sherwood & Wyant — PLATE 3.05-1

SF SILT FENCE

NOT TO SCALE

STD & SPEC 3.05 - SILT FENCE

DEFINITION:

A TEMPORARY SEDIMENT BARRIER CONSISTING OF A SYNTHETIC FILTER FABRIC STRETCHED ACROSS AND ATTACHED TO SUPPORTING POSTS AND ENTRENCHED.

CONDITIONS WHERE PRACTICE APPLIES:

1. BELOW DISTURBED AREAS WHERE EROSION WOULD OCCUR IN THE FORM OF SHEET AND RILL EROSION.
2. WHERE THE SIZE OF THE DRAINAGE AREA IS NO MORE THAN ONE QUARTER ACRE PER 100 FEET OF SILT FENCE LENGTH; THE MAXIMUM SLOPE LENGTH BEHIND THE BARRIER IS 100 FEET; AND THE MAXIMUM GRADIENT BEHIND THE BARRIER IS 50 PERCENT (2:1).
3. IN MINOR SWALES OR DITCH LINES WHERE THE MAXIMUM CONTRIBUTING DRAINAGE AREA IS NO GREATER THAN 1 ACRE AND FLOW IS NO GREATER THAN 1 CFS.
4. SILT FENCE WILL NOT BE USED IN AREAS WHERE ROCK OR SOME OTHER HARD SURFACE PREVENTS THE FULL AND UNIFORM DEPTH ANCHORING OF THE BARRIER.

PLANNING CONSIDERATIONS:

LABORATORY WORK AT THE VIRGINIA HIGHWAY AND TRANSPORTATION RESEARCH COUNCIL (VHTRC) HAS SHOWN THAT SILT FENCES CAN TRAP A MUCH HIGHER PERCENTAGE OF SUSPENDED SEDIMENTS THAN STRAW BALES, THOUGH SILT FENCE PASSES THE SEDIMENT-LADEN WATER SLOWER. SILT FENCES ARE PREFERABLE TO STRAW BARRIERS IN MANY CASES BECAUSE OF THEIR DURABILITY AND POTENTIAL COST SAVINGS. WHILE THE FAILURE RATE OF SILT FENCES IS LOWER THAN THAT OF STRAW BARRIERS, MANY INSTANCES HAVE BEEN OBSERVED WHERE SILT FENCES ARE IMPROPERLY INSTALLED, INVITING FAILURE AND SEDIMENT LOSS. THE INSTALLATION METHODS OUTLINED HERE CAN IMPROVE PERFORMANCE AND REDUCE FAILURES.

AS NOTED, FLOW RATE THROUGH SILT FENCE IS SIGNIFICANTLY LOWER THAN THE FLOW RATE FOR STRAW BALE BARRIERS. THIS CREATES MORE PONDING AND HENCE MORE TIME FOR SEDIMENT .TO FALL OUT. TABLE 3.05-A DEMONSTRATES THESE RELATIONSHIPS.

BOTH WOVEN AND NON-WOVEN SYNTHETIC FABRICS ARE COMMERCIALLY AVAILABLE. THE WOVEN FABRICS GENERALLY DISPLAY HIGHER STRENGTH THAN THE NON-WOVEN FABRICS AND, IN MOST CASES, DO NOT REQUIRE ANY ADDITIONAL REINFORCEMENT. WHEN TESTED UNDER ACID AND ALKALINE WATER CONDITIONS, MOST OF THE WOVEN FABRICS INCREASE IN STRENGTH, WHILE THE REACTIONS OF NON-WOVEN FABRICS TO THESE CONDITIONS ARE VARIABLE. THE SAME IS TRUE OF TESTING UNDER EXTENSIVE ULTRAVIOLET RADIATION. PERMEABILITY RATES VARY REGARDLESS OF FABRIC TYPE. WHILE ALL OF THE FABRICS DEMONSTRATE VERY HIGH FILTERING EFFICIENCIES FOR SANDY SEDIMENTS, THERE IS CONSIDERABLE VARIATION AMONG BOTH WOVEN AND NON-WOVEN FABRICS WHEN FILTERING THE FINER SILT AND CLAY PARTICLES.

DESIGN CRITERIA:

1. NO FORMAL DESIGN IS REQUIRED. AS WITH STRAW BALE BARRIERS, AN EFFORT SHOULD BE MADE TO LOCATE SILT FENCE AT LEAST 5 FEET TO 7 FEET BEYOND THE BASE OF DISTURBED SLOPES WITH GRADES GREATER THAN 7%.

CONSTRUCTION SPECIFICATIONS:

MATERIALS

1. SYNTHETIC FILTER FABRIC SHALL BE A PERVIOUS SHEET OF PROPYLENE, NYLON, POLYESTER OR ETHYLENE YARN AND SHALL BE CERTIFIED BY THE MANUFACTURER OR SUPPLIER AS CONFORMING TO THE REQUIREMENTS NOTED IN TABLE 3.05-B.
2. SYNTHETIC FILTER FABRIC SHALL CONTAIN ULTRAVIOLET RAY INHIBITORS AND STABILIZERS TO PROVIDE A MINIMUM OF SIX MONTHS OF EXPECTED USABLE CONSTRUCTION LIFE AT A TEMPERATURE RANGE OF 0° F TO 120° F.
3. IF WOODEN STAKES ARE UTILIZED FOR SILT FENCE CONSTRUCTION, THEY MUST HAVE A DIAMETER OF 2 INCHES WHEN OAK IS USED AND 4 INCHES WHEN PINE IS USED. WOODEN STAKES MUST HAVE A MINIMUM LENGTH OF 5 FEET.
4. IF STEEL POSTS (STANDARD "U" OR "T" SECTION) ARE UTILIZED FOR SILT FENCE CONSTRUCTION, THEY MUST HAVE A MINIMUM WEIGHT OF 1.33 POUNDS PER LINEAR FOOT AND SHALL HAVE A MINIMUM LENGTH OF 5 FEET.
5. WIRE FENCE REINFORCEMENT FOR SILT FENCES USING STANDARD-STRENGTH FILTER CLOTH SHALL BE A MINIMUM OF 14 GAUGE AND SHALL HAVE A MAXIMUM MESH SPACING OF 6 INCHES.

INSTALLATION:

1. THE HEIGHT OF A SILT FENCE SHALL BE A MINIMUM OF 16 INCHES ABOVE THE ORIGINAL GROUND SURFACE AND SHALL NOT EXCEED 34 INCHES ABOVE GROUND ELEVATION.
2. THE FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID THE USE OF JOINTS. WHEN JOINTS ARE UNAVOIDABLE, FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6-INCH OVERLAP, AND SECURELY SEALED.
3. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 4-INCHES WIDE AND 4-INCHES DEEP ON THE UPSLOPE SIDE OF THE PROPOSED LOCATION OF THE MEASURE.
4. WHEN WIRE SUPPORT IS USED, STANDARD-STRENGTH FILTER CLOTH MAY BE USED. POSTS FOR THIS TYPE OF INSTALLATION SHALL BE PLACED A MAXIMUM OF 10-FEET APART (SEE PLATE 3.05-1). THE WIRE MESH FENCE MUST BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY DUTY WIRE STAPLES AT LEAST ONE INCH LONG, TIE WIRES OR HOG RINGS. THE WIRE SHALL EXTEND INTO THE TRENCH A MINIMUM OF TWO INCHES AND SHALL NOT EXTEND MORE THAN 34 INCHES ABOVE THE ORIGINAL GROUND SURFACE. THE STANDARD-STRENGTH FABRIC SHALL BE STAPLED OR WIRED TO THE WIRE FENCE, AND 8 INCHES OF THE FABRIC SHALL BE EXTENDED INTO THE TRENCH. THE FABRIC SHALL NOT BE STAPLED TO EXISTING TREES.
5. WHEN WIRE SUPPORT IS NOT USED, EXTRA-STRENGTH FILTER CLOTH SHALL BE USED. POSTS FOR THIS TYPE OF FABRIC SHALL BE PLACED A MAXIMUM OF 6-FEET APART (SEE PLATE 3.05-2). THE FILTER FABRIC SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING ONE INCH LONG (MINIMUM) HEAVY-DUTY WIRE STAPLES OR TIE WIRES AND EIGHT INCHES OF THE FABRIC SHALL BE EXTENDED INTO THE TRENCH. THE FABRIC SHALL NOT BE STAPLED TO EXISTING TREES. THIS METHOD OF INSTALLATION HAS BEEN FOUND TO BE MORE COMMONPLACE THAN #4.
6. IF A SILT FENCE IS TO BE CONSTRUCTED ACROSS A DITCH LINE OR SWALE, THE MEASURE MUST BE OF SUFFICIENT LENGTH TO ELIMINATE ENDFLOW, AND THE PLAN CONFIGURATION SHALL RESEMBLE AN ARC OR HORSESHOE WITH THE ENDS ORIENTED UPSLOPE (SEE PLATE 3.05-2). EXTRA-STRENGTH

   FILTER FABRIC SHALL BE USED FOR THIS APPLICATION WITH A MAXIMUM 3-FOOT SPACING OF POSTS.

   ALL OTHER INSTALLATION REQUIREMENTS NOTED IN #5 APPLY.
7. THE 4-INCH BY 4-INCH TRENCH SHALL BE BACKFILLED AND THE SOIL COMPACTED OVER THE FILTER FABRIC.
8. SILT FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.

TABLE 3.05-B

PHYSICAL PROPERTIES OF FILTER FABRIC IN SILT FENCE

PHYSICAL PROPERTY	TEST	REQUIREMENTS
FILTERING EFFICIENCY	ASTM 5141	75% (MINIMUM)
TENSILE STRENGTH AT 20% (MAX.) ELONGATION*	VTM-52	EXTRA STRENGTH - 50 LBS./LINEAR INCH (MINIMUM) STANDARD STRENGTH - 30 LBS./LINEAR INCH (MINIMUM)
FLOW RATE	ASTM 5141	0.2 GAL./SQ FT./MINUTE (MINIMIM)
ULTRAVIOLET RADIATION STABILITY %	ASTM-G-26	90% (MINIMUM)

* REQUIREMENTS REDUCED TO 50% AFTER SIX MONTHS OF INSTALLATION.

SOURCE: VHTRC

GENERAL REQUIREMENTS:

NO PERSON MAY ENGAGE IN ANY LAND-DISTURBING ACTIVITY UNTIL HE OR SHE HAS SUBMITTED TO THE OFFICE OF BUILDING AND ZONING FOR ORANGE COUNTY AN EROSION AND SEDIMENT CONTROL PLAN FOR THE LAND-DISTURBING ACTIVITY AND SUCH PLAN HAS BEEN APPROVED BY THE PLAN-APPROVING AUTHORITY.

PROJECT WORK WILL COMPLY WITH THE STANDARDS CONTAINED WITHIN THE "VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS," AND THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESC) AS AMENDED AND THE CHESAPEAKE BAY PRESERVATION AREA DESIGNATION AND MANAGEMENT REGULATIONS (CBPA) AS CODIFIED (9VAC25-830).

THIS PROJECT DOES NOT INCLUDE ANY IMPACTS OR WORK WITHIN RESOURCE PROTECTION AREAS (RPAS) AS DESIGNATED BY THE CBPA/ ORANGE COUNTY.

AS THIS PROJECT RESULTS IN OVER 10,000 SQUARE FEET OF LAND DISTURBANCE AN E&S PERMIT IS REQUIRED FROM THE COUNTY FOR THIS WORKCOPIES OF THIS PERMIT ARE INCLUDED IN THE PROJECT MANUAL FOR REFERENCE AND THIS PLAN INCLUDES ALL REQUIRED E&S CONTROL MEASURES REFERENCED IN THAT PERMIT.

9VAC25-840-40. MINIMUM STANDARDS. CONTRACTOR SHALL EXECUTE WORK CONSISTENT WITH THE FOLLOWING CRITERIA, TECHNIQUES AND METHODS:

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 OTHENVISE PERMANENTLY STABILIZED. PERMANENT VEGETATION SHALL NOT BE CONSIDERED ESTABLISHED UNTIL A GROUND COVAR 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. (NOT APPLICABLE TO THIS PROJECT SCOPE)
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. (NOT APPLICABLE TO THIS PROJECT SCOPE)
   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. (NOT APPLICABLE TO HIS PROJECT SCOPE)
   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 BASIM THE MINIMUM STORAGE CAPACITY OT 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 EATTH CONDITION OR THOSE CONDITIONS EXPECTED TO EXIST WHILE THE SEDIMENT BASIN IS UTILIZED- (NOT APPLICABLE TO THIS PROJECT SCOPE)
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. (NOT APPLICABLE TO THIS PROJECT SCOPE)
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- (NOT APPLICABLE TO THIS PROJECT SCOPE)
9. WHENEVER WATER SEEPS FROM A SLOPE FACE, ADEQUATE DRAINAGE OR OTHER PROTECTION SHALL BE PROVIDED. (NOT APPLICABLE TO THIS PROJECT SCOPE)
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 OTHENVISE TREATED TO REMOVE SEDIMENT. (NOT APPLICABLE TO THIS PROJECT SCOPE)
11. BEFORE NEWLY CONSTRUCTED STORMWATER CONVEYANCE CHANNELS CR 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. (NOT APPLICABLE TO THIS PROJECT SCOPE)
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. (NOT APPLICABLE TO THIS PROJECT SCOPE)
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- (NOT APPLICABLE TO THIS PROJECT SCOPE)
14. ALL APPLICABLE FEDERAL, STATE AND LOCAL REQUIREMENTS PERTAINING TO WORKING IN OR CROSSING LIVE WATERCOURSES SHALL BE MET (NOT APPLICABLE TO THIS PROJECT SCOPE)
15. THE BED AND BANKS OF A WATERCOURSE SHALL BE STABILIZED IMMEDIATELY AFTER WORK IN THE WATERCOURSE IS COMPLETED. (NOT APPLICABLE TO THIS PROJECT SCOPE)
16. UNDERGROUND UTILITY LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING STANDARDS IN ADDITION TO OTHER APPLICABLE CRITERIA:
   a. NO MORE THAN 500 LINEAR FEET OF TRENCH MAY BE OPENED AT ONE TIME
   b. EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES.
   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 PROPENY.
   d. MATERIAL USED FOR BACKFILLING TRENCHES SHALL BE PROPERLY COMPACTED IN ORDER TO MINIMIZE EROSION AND PROMOTE STABILIZATION.
   e. RESTABILIZATION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THIS CHAPTER
   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. (NOT APPLICABLE TO THIS PROJECT SCOPE)
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 WATENVAYS 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 TOR NATURAL OR MAN-MADE CHANNELS: (NOT APPLICABLE TO THIS PROJECT SCOPE, LESS THAN ____ SQUARE FEET OF NEW IMPERVIOUS COVER CREATED ON PROJECT; NET REDUCTION OF _____ STT-)

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COMMONWEALTH OF VIRGINIA
CARL ROBERT LAWRENCE MANGRUM
Lic. No. 33450
10/24/2022
REGISTERED PROFESSIONAL ENGINEER

MOUNT JACKSON WWTP
EQUALIZATION PROJECT

OWNER:
TOWN OF MOUNT JACKSON
MOUNT JACKSON, VIRGINIA

MARK	DATE	DESCRIPTION
0	10/24/2022	BID SET

PROJECT NO:	TCS2241
DATE:	OCTOBER 24, 2022
DRAWN BY:	MCT
CHECKED BY:	CRLM
SHEET TITLE	

E&S NARRATIVE

C-501

SHEET 6 OF 20

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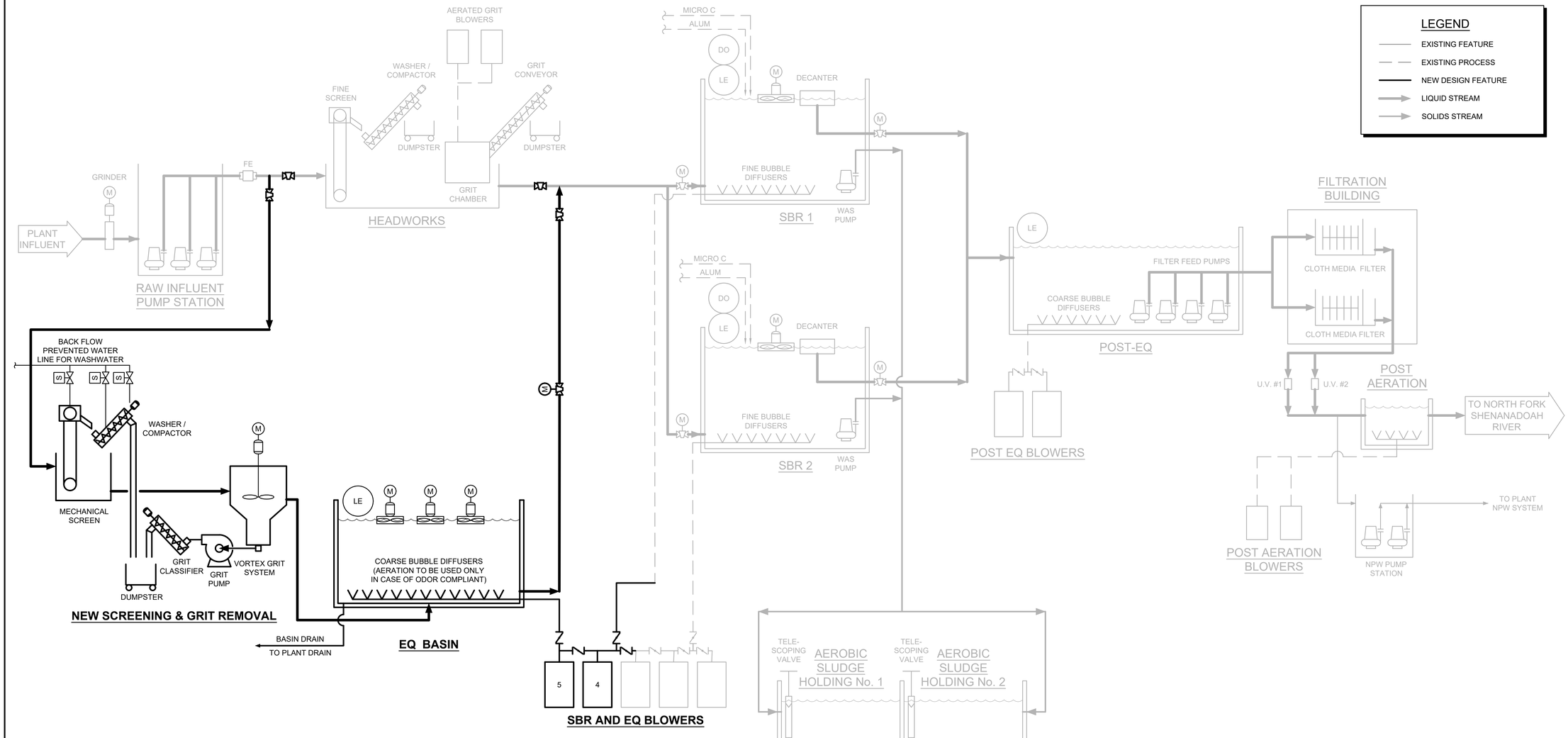

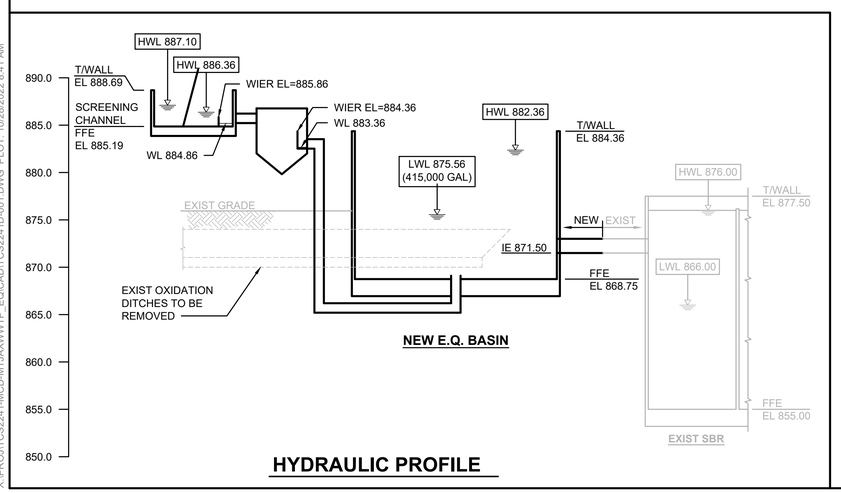

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MOUNT JACKSON WWTP
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OWNER:
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MARK	DATE	DESCRIPTION
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PROJECT NO:	TCS2241
DATE:	OCTOBER 24, 2022
DRAWN BY:	MCT
CHECKED BY:	CRLM
SHEET TITLE	

PROCESS FLOW SCHEMATIC & HYDRAULIC PROFILE

D-001

SHEET 7 OF 20

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GENERAL NOTES:

A. EQ TANK:

1. DUTCHLAND INC. PRECAST POST-TENSIONED CIRCULAR CONCRETE TANK WITH THE FOLLOWING FEATURES:
   a. BASE OUTSIDE DIAMETER: 106'-0"
   b. TANK INSIDE DIAMETER: 102'-0"
   c. TANK WALL HEIGHT: 15'-7"
   d. MAXIMUM WATER LEVEL: 13'-7"
   e. TANK FREEBOARD: 2'-0".
   f. TOTAL VOLUME TO MAXIMUM WATER LEVEL: 831,900 GALLONS MIN.
   g. CAST-IN-PLACE REINFORCED CONCRETE BASE SLAB CONSISTING OF A 16" THICKNESS X 48" WIDTH UNDER THE WALL PANELS, REDUCING TO A 12" THICKNESS FOR THE REMAINDER OF THE BASE SLAB.
   h. THREE (3) 1" WIDE BY 1" DEEP DRAINAGE CHANNELS SHALL BE FORMED INTO THE BASE SLAB (EQUALLY SPACED RADIALLY ACROSS BASE SLAB) TO FACILITATE COMPLETE TANK DRAINAGE TO THE SUMP.
   i. CAST-IN-PLACE SUMP TO BE 3' BY 3' BY 1.5' DEEP.
   j. 4" CAST IN PLACE FLANGE AND 36" CIRCULAR MANWAY AS SHOWN ON D-102.
   k. BACKFILL DEPTH APPROXIMATELY 7.25' AGAINST TANK WALLS.
2. TANK STRUCTURE SHALL BE DELEGATED DESIGNED BASED ON THE LATEST ACI 350 CODE INCLUDING REQUIREMENTS FOR POST-TENSIONED TANKS:
   a. SECTION 033100: CAST-IN-PLACE CONCRETE FOR PRECAST, POST-TENSIONED, CONCRETE TANK BASE SLABS.
   b. SECTION 034210: PRECAST, POST-TENSIONED, CONCRETE TANKS - CIRCULAR (ACI 350).
3. TANK MANUFACTURER SHALL BE RESPONSIBLE FOR COMPLETE TANK ERECTION AND FABRICATION.
4. TANK MANUFACTURER SHALL BE RESPONSIBLE FOR DESIGN AND INSTALLATION OF THE BASE SLAB.
5. 5-YEAR STRUCTURAL WARRANTY SHALL BE PROVIDED BY THE TANK MANUFACTURER. REFERENCES SHALL BE PROVIDED AS TO SIMILAR TANKS PREVIOUSLY INSTALLED WITH A 10-YEAR WARRANTY. DEMONSTRATED PRIOR EXPERIENCE IN SIMILAR APPLICATIONS WITH 10-YEAR STRUCTURAL WARRANTY SHALL BE REQUIRED FOR THE PROPOSED TANK MANUFACTURER.
6. TANK DESIGN SHALL ACCOMMODATE A GROUND WATER ELEVATION UP TO FINISHED GRADE.
7. TANK DESIGN SHALL INCORPORATE ALL NECESSARY APPURTENANCES CONSTRUCTION COORDINATION TO FACILITATE TANK STAIRS, SUBMERSIBLE PUMP PLATFORM, EQUIPMENT SUPPORTS, AND WALL PENETRATIONS AS DESCRIBED AND SHOWN HEREIN.
8. DELEGATED DESIGN ITEM FOR TANK AND FOUNDATION DESIGN: SIGNED AND SEALED DRAWINGS AND DESIGN CALCULATIONS BY A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF VIRGINIA SHALL BE SUBMITTED AS PART OF OWNER REVIEW PROCESS.

B. EQ MIXERS:

1. THREE (3) FLOATING ANOXIC MIXERS SHALL BE FURNISHED AND SUPPLIED COMPLETE WITH MOUNTING EQUIPMENT THAT FACILITATES 0 - 15.6 FT FLUCTUATING LEVEL IN THE EQ TANK. PERMANENT POSTS FOR EACH MIXER SHALL BE PROVIDED EACH MIXER POST SHALL HAVE STOPS THAT PREVENT MIXERS FROM RESTING ON THE TANK FLOOR WHEN TANK IS EMPTY BUT ALLOW MIXER MAINTENANCE TO BE PERFORMED WHEN STANDING ON THE TANK FINISHED FLOOR.
2. EACH MIXER SHALL BE A 5 HP 480V 3 PHASE 60 HZ FSS ENDURA SERIES AQUADDM MIXER BY AQUA AEROBIC. MIXERS SHALL BE RADIALLY SPACED BY 120 DEGREES, 25 FT FROM TANK CENTER.

C. MAGNETIC FLOWMETERS:

MAGNETIC FLOW METER SYSTEMS SHALL INCLUDE A MAGNETIC FLOW TUBE AND A MICROPROCESSOR-BASED "SMART" TRANSMITTER AND SHALL UTILIZE THE CHARACTERIZED FIELD PRINCIPLE OF ELECTROMAGNETIC INDUCTION, AND SHALL PRODUCE DC SIGNALS DIRECTLY PROPORTIONAL TO THE LIQUID FLOW RATE:

1. SENSING HEAD:
   a. END CONNECTIONS: CLASS 150 RAISED FACE FORGED STEEL FLANGES.
   b. PIPE MATERIAL: 304 STAINLESS STEEL.
   c. LINER MATERIAL AND ASSOCIATED MAXIMUM OPERATING TEMPERATURE: URETHANE
   d. ELECTRODE MATERIAL: STAINLESS STEEL.
   e. GROUNDING RING: STAINLESS STEEL.
   f. NEMA 6P RATED.
2. PROGRAMMABLE MICROPROCESSOR BASED INDICATING TRANSMITTER:
   a. POWER SUPPLY: 120 VOLTS AC.
   b. THE TRANSMITTER SHALL UTILIZE "SMART" ELECTRONICS AND SHALL CONTAIN AUTOMATIC, CONTINUOUS ZERO CORRECTION.
   c. LOCAL OPERATOR INTERFACE CAPABLE OF DISPLAYING FLOW RATE AND TOTALIZED FLOW, MOUNTED ON UNISTRUT 5FT ABOVE GRADE ADJACENT TO FLOW METER.
   d. THE TRANSMITTER SHALL FEATURE CONTINUOUS, ON-DEMAND CALIBRATION VERIFICATION WITHOUT USE OF ANY EXTERNAL DEVICES.
   e. OUTPUT: 4-20 M AMP OUTPUT PROPORTIONAL TO FLOW RATE.
   f. NEMA 4X RATED.
3. SYSTEM PERFORMANCE:
   a. ACCURACY: PLUS OR MINUS 0.5 PERCENT OF READING AT FLOW VELOCITIES BETWEEN 0.5 AND 10 FEET PER SECOND;
   b. REPEATABILITY: PLUS OR MINUS 0.1 PERCENT OF READING.

D. SUPPLEMENTAL AERATION BLOWERS:

1. EACH PD BLOWER SHALL BE ATLAS COPCO TRILOBE BLOWER IN A PIGGYBACK CONFIGURATION AND SHALL HAVE A 75 HP PREMIUM EFFICIENCY MOTOR. THE BLOWER SHALL DELIVER AT LEAST 963 SCFM AT THE PROJECT SITE (875 FT MSL) UNDER 100 F AND 100% RH CONDITIONS WITH A DISCHARGE PRESSURE OF 10.7 PSI AND A MAXIMUM RPM OF 3,560. BELT AND PULLEY SYSTEM SHALL BE SET UP TO ACHIEVE A CONSTANT 3,560 RPM BLOWER SPEED. EACH BLOWER SHALL BE A PART OF A PACKAGE SYSTEM THAT IS CONTROLLED BY A MANUFACTURER SUPPLIED STAINLESS STEEL NEMA 4X CONTROL PANEL. THE CONTROL PANEL SHALL INCLUDE A WYE-DELTA REDUCED VOLTAGE MOTOR STARTER AND SHALL AT MINIMUM PROVIDE THE FOLLOWING I/O FOR HARD WIRING TO THE MAIN PLANT SCADA: REMOTE START/STOP; STATUS INDICATION; GENERAL ALARM RELAY.
2. THE BLOWER SYSTEM SHALL BE FURNISHED AS A PACKAGE SYSTEM FROM A SINGLE SUPPLIER TO INCLUDE: BLOWER, REDUCED VOLTAGE STARTER, FRAME/STAND, PULLEY/BELTS/SHEAVES, CONTROL PANEL, OUTDOOR RATED ACOUSTICAL ENCLOSURE TO ACHIEVE 75 DB AT 1 METER, INTAKE/DISCHARGE SILENCERS, INTAKE FILTER, CHECK VALVE, COMBINED MECHANICAL PRESSURE RELIEF VALVE AND UNLOADING VALVE (SET AT 11.0 PSI), AND AS REQUIRED TO ACHIEVE A COMPLETE FUNCTIONAL SYSTEM MEETING PERFORMANCE REQUIREMENTS, A PRESSURE SWITCH WHICH AUTOMATICALLY SHUT DOWN THE BLOWER WHEN DISCHARGE PRESSURE REACHES 11.5 PSI, AND FLEXIBLE COUPLINGS RATED FOR 350 F. ISOLATION VALVES SHALL BE IN ACCORDANCE WITH D-002. THE CONTROL PANEL SHALL HAVE AN HMI WITH SUNSHIELD. THE CONTROL PANEL SHALL HAVE A SINGLE POINT ELECTRICAL CONNECTION (480-VOLT 3 PHASE) WHICH PROVIDES POWER TO THE ENTIRE BLOWER PACKAGE, CONTROLS AND INSTRUMENTS. EACH BLOWER SHALL AUTOMATICALLY HAVE AN INTERNAL MOTOR HEATER ENGAGED WHEN THE BLOWER IS NOT RUNNING. THE ACOUSTICAL ENCLOSURE SHALL HAVE REMOVABLE PANELS TO FACILITATE COMPLETE BLOWER MAINTENANCE ACTIVITIES. ALL BLOWER INTAKE AIR SHALL BE COMPLETELY AND DIRECTLY PIPED INTO THE BLOWER FROM OUTSIDE OF THE ACOUSTICAL ENCLOSURE. THE ACOUSTICAL ENCLOSURE SHALL HAVE A DEDICATED VENTILATION FAN. UNLOADING VALVE SHALL BE DIRECTLY PIPED TO DISCHARGE OUTSIDE OF ACCOUSTICAL ENCLOSURE.

E. CHECK VALVE FOR AIR SERVICE:

1. WAFER-STYLE, DUAL PLATE CHECK VALVE WITH SPRING.
2. MATERIAL OF CONSTRUCTION: 316 SST BODY, 316 SST INTERNALS AND DISC, 316 SST SPRING AND SILICONE SEAL.
3. TEMPERATURE RATING: 500 DEGREES F.
4. MANUFACTURERS AND PRODUCTS:
   a. FLEXI-HINGE SERIES 504.

F. LUG BUTTERFLY VALVE AIR SERVICE:

1. LUG STYLE, TWO-PIECE ASTM A 126 CLASS B ANSI B16.1.
2. MATERIALS OF CONSTRUCTION: DUCTILE IRON ASTM A 536 OR CAST IRON BODY, ONE PIECE TYPE 316 SST THIN-PROFILE DISC AND STEM, HEAVY-DUTY STEM BUSHING, NBR STEM SEAL, FKM (VITON) REPLACEABLE RESILIENT SEAT.
3. PRESSURE RATING: 75 PSI PRESSURE BI-DIRECTIONAL BUBBLE-TIGHT.
4. TEMPERATURE RATING: 500 DEGREES F.
5. PROCESS CONNECTIONS: ANSI B16.1 CLASS 125 FLANGES.
6. SUPPLY REDUCED DISC DIAMETER, IF AVAILABLE.
7. HAND ACTUATORS SHALL BE 10 POSITION LOCKING TYPE.
8. MANUFACTURERS AND PRODUCTS:
   a. BRAY CONTROLS SERIES 21.
   b. DEZURIK STYLE BOS.

G. AIR PIPING:

1. PIPING - AIR SERVICE:
   - 304 L STAINLESS STEEL MINIMUM 10 GAUGE - ABOVE GRADE.
   - CONNECTIONS TO VALVES SHALL BE WELD ON FLANGED CONNECTIONS, 150 # - ABOVE GRADE
   - BELOW GRADE AIR PIPE SHALL BE UNLINED DIP WITH MJ JOINTS AND FITTINGS.

H. COARSE BUBBLE DIFFUSER SYSTEM:

STAINLESS STEEL 24-INCH COARSE BUBBLE DIFFUSERS WITH ¾-INCH THREADED CONNECTION. PERIPHERAL HEADER TO BE 6" DIA. SCH. 10 SS. PERIPHERAL HEADER TO BE SUPPORTED 1' ABOVE TANK FINISHED FLOOR WITH STAINLESS STEEL SUPPORTS AND HARDWARE SPACED EVERY 6 FT. DROP LEG TO BE 8" DIA. SCH. 10 SS. TOTAL OF 25 DIFFUSERS INSTALLED EQUALLY SPACED AROUND TANK PERIMETER.

I. LEVEL ELEMENT:

KPSI MODEL 700 SUBMERSIBLE PRESSURE TRANSDUCER UNIT CONSTRUCTED OF STAINLESS STEEL. TRANSDUCER SHALL UTILIZE A DIFFUSED SILICONE SEMICONDUCTOR SENSOR PROTECTED BY AN INTEGRAL STAINLESS STEEL DIAPHRAGM WITH SEAL FLUID. TRANSDUCER OUTPUT SHALL BE A 4-20 MA SIGNAL. ELECTRICAL CONNECTION SHALL BE 2-WIRE, LOOP POWERED THROUGH A SHIELDED INTEGRAL CABLE COMPRISED OF 22 AWG CONDUCTORS AND SEPARATE DRAIN WIRE. TRANSDUCERS SHALL BE CONNECTED TO TANK FLAGE LOCATED NEAR BOTTOM OF THE TAN. A MOISTURE EXCLUDING ANEROID BELLOWS SHALL BE SUPPLIED LOOSE FOR INSTALLATION IN THE JUNCTION BOX/ DISCONNECT. ATTACHMENT AND SUPPLY OF THE JUNCTION BOX/DISCONNECT AT THE BASIN WALL SHALL BE THE RESPONSIBILITY OF THE INSTALLING CONTRACTOR. ADHESIVE ANCHORS OF 304 STAINLESS STEEL SHALL BE PROVIDED FOR ANCHORING.EACH LEVEL ELEMENT SHALL BE A KPSI MODEL 700 SUBMERSIBLE PRESSURE TRANSDUCER UNIT CONSTRUCTED OF STAINLESS STEEL. TRANSDUCER SHALL UTILIZE A DIFFUSED SILICONE SEMICONDUCTOR SENSOR PROTECTED BY AN INTEGRAL STAINLESS STEEL DIAPHRAGM WITH SEAL FLUID. TRANSDUCER OUTPUT SHALL BE A 4-20 MA SIGNAL. ELECTRICAL CONNECTION SHALL BE 2-WIRE, LOOP POWERED THROUGH A SHIELDED INTEGRAL CABLE COMPRISED OF 22 AWG CONDUCTORS AND SEPARATE DRAIN WIRE.

J. STAIRS, LANDING AND PLATFORMS: (SEE S-001 FOR ADDITIONAL REQUIREMENTS)

1. MATERIALS OF CONSTRUCTION SHALL BE ALUMINUM.
2. STAIR TREAD SHALL BE FRP NON-SLIP TYPE.
3. STAIR WIDTH SHALL BE 36" AND LANDING SHALL BE 48"x48".
4. STAIR RISER SHALL BE 7 INCHES MINIMUM.
5. STAIR TREAD DEPTH SHALL BE 10 INCHES MAXIMUM.
6. HANDRAILS AND TOE PLATE AS REQUIRED BY OSHA GENERAL INDUSTRY STANDARDS.
7. DELEGATED DESIGN ITEM FOR STAIRS AND LANDING.
8. SIGNED AND SEALED DRAWINGS AND DESIGN CALCULATIONS BY A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF VIRGINIA SHALL BE SUBMITTED AS PART OF SHOP DRAWING SUBMITTAL PROCESS.

K. DIP YARD PIPING:

1. ALL DIP PIPE, FITTINGS AND SLEEVES EXCEPT WITHIN THE EQ TANK SHALL HAVE AN INTERIOR COATING OF PROTECTO 401. EXTERIOR OF ALL PIPES, FITTINGS AND SLEEVES SHALL HAVE ASPHALTIC EXTERIOR COATING CONFORMING TO ANSI/AWWA 151/A21.51 SUITABLE FOR BURIED APPLICATIONS. ALL PIPE SHALL BE SUPPLIED BY PIPE MANUFACTURER TO THE PROJECT SITE WITH THE INTERIOR AND EXTERIOR COATINGS ALREADY APPLIED AND FULLY WARRANTED BY PIPE SUPPLIER. ALL DIP PIPE SHALL BECLASS 53 THICKNESS CLASS TO INCLUDE MJ PIPE. PRESSURE CLASS DIP PIPE SHALL NOT BE USED.
2. ALL DIP PIPING WITHIN THE EQ TANK SHALL HAVE AN INDURON CERAMAPURE™ INTERIOR COATING OF CERAMIC MODIFIED NOVALAC EPOXY AND SHALL HAVE A CERAMAWRAP™ EPOXY EXTERIOR COATING. THE EXTERIOR COATING SHALL BE A HIGH SOLIDS, SOLVENT FREE, FAST CURING TWO COMPONENT EPOXY FORMULATED ESPECIALLY TO COAT THE EXTERIOR OF DUCTILE IRON PIPE FOR AGGRESSIVE ATMOSPHERES OR LIQUIDS. CERAMAWRAP™ IS A CHEMICAL RESISTANT PRODUCT THAT WILL PROTECT DUCTILE IRON PIPE IN SALT WATER, HIGH PH, LOW PH, AND AGGRESSIVE LIQUIDS AND ATMOSPHERES. APPLICATION SHALL BE 20-25 MILS. ALL PIPE SHALL BE SUPPLIED BY PIPE MANUFACTURER TO THE PROJECT SITE WITH THE INTERIOR AND EXTERIOR COATINGS ALREADY APPLIED AND FULLY WARRANTED BY PIPE SUPPLIER.
3. ALL DIP PIPE, FITTINGS AND VALVES SHALL BE MJ OR FLANGED CONNECTIONS. ALL MJ CONNECTIONS SHALL BE OF THE RESTRAINED TYPE USING MEGALUG PURSUANT TO BELOW.
4. ALL DIP MJ PIPE, FITTINGS, VALVES AND MECHANICAL SLEEVES SHALL BE RESTRAINED WITH SERIES 1100 EPOXY COATED MEGALUG FITTINGS FURNISHED AS PACKAGED ACCESSORIES COMPLETE WITH RESTRAINT, GASKET, LUBRICATION, AND STAINLESS-STEEL BOLTING HARDWARE FROM MANUFACTURER.
5. MJ DUCTILE-IRON PIPE SHALL CONFORM TO THE REQUIREMENTS OF ANSI/AWWA C151/A21.51 AND ACCESSORIES CONFORMING TO ANSI/AWWA C111/A21.11. MJ DUCTILE-IRON FITTINGS SHALL CONFORM TO ANSI/AWWA C153/A21.53. GASKETS SHALL CONFORM TO ANSI//AWWA C111/A21.11 AND SHALL BE SBR MATERIAL. GASKETS SHALL MEET THE REQUIREMENTS ANSI/NSF-61.
6. FLANGED DUCTILE-IRON PIPE SHALL CONFORM TO THE REQUIREMENTS OF ANSI/AWWA C115/A21.15 AND ANSI//AWWA C151/A21.51 DUCTILE IRON PIPE. GRAY-IRON WILL NOT BE ACCEPTED. PIPE BARRELS AND FLANGES SHALL HAVE A TAPER PIPE THREAD (NPT) IN ACCORDANCE WITH ANSI B1.20.1. FULL FACE GASKETS SHALL ONLY BE UTILIZED. HEX-HEAD HIGH STRENGTH HEAVY-DUTY CORROSION RESISTANT BOLTS AND NUTS SHALL BE UTILIZED FOR ALL FLANGED CONNECTIONS.
7. SEE D-501 FOR PIPE BEDDING REQUIREMENT.

L. PLUG VALVES:

1. PLUG VALVE SHALL BE ECCENTRIC TYPE WITH CAST IRON PLUG COATED WITH CHLOROPRENE (CR). SEALS TO BE NITRILE. PORT SHALL BE 100 PERCENT OPENING TYPE. BEARINGS SHALL BE SLEEVE TYPE AND MADE OF SINTERED, OIL IMPREGNATED PERMANENTLY LUBRICATED TYPE 316 STAINLESS STEEL FOR SIZES 4-18" AND ASTM A743 GRADE CF8M FOR SIZES 20-36". PRESSURE RATINGS SHALL BE 150 PSI.
2. SEATS ON SHALL BE 1/8" THICK WELDED OVERLAY OF NOT LESS THAN 95% PURE NICKEL. SEAT SHALL BE AT LEAST 1/2" WIDE, 1/8" THICK THROUGH ENTIRE WIDTH AND RAISED. THE RAISED SURFACE SHALL BE COMPLETELY COVERED WITH NICKEL TO INSURE THAT THE RESILIENT PLUG FACE CONTACTS ONLY THE NICKEL SEAT.
3. ADJUSTABLE PACKING SHALL BE ACRYLONITRILE-BUTADIENE (NBR) MULTIPLE V-RING TYPE, WITH A PACKING GLAND FOLLOWER. PACKING GLAND SHALL PERMIT INSPECTION, ADJUSTMENT OR COMPLETE REPLACEMENT OF PACKING WITHOUT DISTURBING ANY PART OF THE VALVE OR ACTUATOR ASSEMBLY, EXCEPT THE GLAND FOLLOWER.
4. ALL VALVES LARGER THAN 6" SHALL BE INSTALLED WITH WORM GEAR ACTUATORS. ALL GEARING SHALL BE ENCLOSED IN A CAST IRON HOUSING, WITH OUTBOARD SEALS TO PROTECT THE BEARINGS AND OTHER INTERNAL COMPONENTS. THE ACTUATOR SHAFT AND GEAR QUADRANT SHALL BE SUPPORTED ON PERMANENTLY LUBRICATED BRONZE BEARINGS.
5. BURIED ACTUATORS SHALL BE 90% GREASE FILLED. INPUT SHAFT AND FASTENERS SHALL BE STAINLESS STEEL. ACTUATOR MOUNTING BRACKETS SHALL BE TOTALLY ENCLOSED.
6. VALVE SHALL BE DEZURIK PEF 100% PORT ECCENTRIC PLUG VALVE.
7. BURIED VALVES 6 INCHES AND SMALLER TO HAVE A 2 INCH OPERATING NUT WITH VALVE BOX EXTENSION WITH COVER MOUNTED FLUSH WITH FINISHED GRADE.

M. VALVE OPERATOR - MANUAL:

1. EXPOSED OPERATOR:
   a. PROVIDE GALVANIZED OR PAINTED HANDWHEELS FOR ALL EXPOSED OPERATORS.
   b. LEVER OPERATORS ALLOWED ON QUARTER-TURN VALVES LESS THAN 8 INCH.
   c. PROVIDE CRANKS ON GEAR TYPE OPERATORS.
   d. IN APPLICATIONS WHERE VALVE IS SIX AND ONE-HALF (6 FT 6 IN.) FEET ABOVE THE ACCESSIBLE FINISHED FLOOR AREA, PROVIDE A CHAIN WHEEL OPERATOR TO PERMIT OPERATION FROM NORMAL OPERATION LEVEL.
   e. VALVE HANDLES SHALL TAKE A PADLOCK, AND WHEELS A CHAIN AND PADLOCK.
2. BURIED OPERATOR:
   a. BURIED SERVICE OPERATORS ON VALVES LARGER THAN 2-1/2 INCHES SHALL HAVE A 2-INCH AWWA OPERATING NUT. BURIED OPERATORS ON VALVES 2 INCHES AND SMALLER SHALL HAVE CROSS HANDLE FOR OPERATION BY FORKED KEY. ENCLOSE MOVING PARTS OF VALVE AND OPERATOR IN HOUSING TO PREVENT CONTACT WITH THE SOIL.
   b. DESIGN BURIED SERVICE OPERATORS FOR QUARTER-TURN VALVES TO WITHSTAND 450 FOOT-POUNDS OF INPUT TORQUE AT THE FULLY OPEN OR FULLY CLOSED POSITIONS, GREASE PACKED AND GASKETED TO WITHSTAND A SUBMERSION IN WATER TO 10 PSI.
   c. VALVES LOCATED IN VALVE VAULTS SHALL BE CONSIDERED BURIED SERVICE AND SHALL HAVE EITHER OPERATOR NUTS OR CROSS-HANDLES THAT ARE ACCESSIBLE FROM OUTSIDE THE VALVE VAULT USING A T-HANDLE OPERATING WRENCH, A PERMANENTLY INSTALLED T-HANDLE, AN EXTENSION STEM (ENCLOSED) AND FLOOR STAND, OR AN EXTENSION STEM (NON-ENCLOSED) AND FLOOR STAND. WHERE MANUAL OPERATOR IS SHOWN EXTENDING THROUGH GRATING, OPERATOR HANDLE SHALL EXTEND 3.5 FEET ABOVE TOP OF GRATING. IF NO OPERATOR TYPE IS SHOWN, PROVIDE OPERATOR NUTS OR CROSS-HANDLES THAT ARE ACCESSIBLE FROM OUTSIDE THE VALVE VAULT USING A T-HANDLE OPERATING WRENCH.
   d. BURIED VALVES SHALL HAVE AN EXTENDED BONNET WITH 304 SS BONNET AND 304 SS EXTENSION STEM AND VALVE BOX.

N. VALVE OPERATOR - ELECTRIC:

1. GENERAL:
   a. COMPLY WITH AWWA C540.
   b. SIZE TO 1-1/2 TIMES REQUIRED OPERATING TORQUE. MOTOR STALL TORQUE NOT TO EXCEED TORQUE CAPACITY OF VALVE.
   c. CONTROLS INTEGRAL WITH THE ACTUATOR AND FULLY EQUIPPED AS SPECIFIED IN AWWA 540.
   d. FOR BELOW GRADE APPLICATIONS, AN EXTENDED BONNET WITH 304 SS BONNET AND 304 SS EXTENSION STEM SHALL BE PROVIDED TO EXTEND ELECTRIC ACTUATOR 3'-6" ABOVE GRADE LINE WITH EXTERIOR COATING TO MATCH VALVE.
   e. ALL OPERATORS AND VALVES THAT INCLUDE EXTENSIONS, FLOOR STANDS OR OTHER ACCESSORIES SHALL BE PRE-ASSEMBLED AND TESTED AND SHALL BE PROVIDED BY THE MANUFACTURER AS A PRE-ASSEMBLED SYSTEM.
   f. STEM PROTECTION FOR RISING STEM VALVES.
2. ACTUATOR OPERATION-GENERAL:
   a. SUITABLE FOR FULL 90-DEGREE ROTATION OF QUARTER-TURN VALVES OR FOR USE ON MULTI TURN VALVES.
   b. MANUALLY OVERRIDE HANDWHEEL.
   c. VALVE POSITION INDICATION.
   d. OPERATE FROM FULL CLOSED TO FULL OPEN POSITIONS OR THE REVERSE IN THE NUMBER OF SECONDS GIVEN IN THE ELECTRIC OPERATOR SCHEDULE.
3. OPEN-CLOSE SERVICE:
   a. SIZE MOTORS FOR ONE COMPLETE OPEN-CLOSE-OPEN CYCLE NO LESS THAN ONCE EVERY 10 MINUTES.
   b. ACTUATOR SUITABLE FOR THROTTLING OPERATION OF VALVE AT INTERMEDIATE POSITIONS.
   c. INTEGRAL OPEN-STOP-CLOSE PUSHBUTTON CONTROLS.
   d. OPEN AND CLOSED INDICATING LIGHTS
   e. REVERSING MOTOR STARTER WITH BUILT-IN OVERLOAD PROTECTION.
4. ACTUATOR POWER SUPPLY:
   a. 460-VOLT, THREE-PHASE UNLESS OTHERWISE INDICATED.
   b. CONTROL POWER TRANSFORMER, 120-VOLT SECONDARY.
   c. EXTERNALLY OPERABLE POWER DISCONNECT SWITCH.
5. ENCLOSURE:
   a. AS DEFINED IN NEMA 250, TYPE 4X.
   b. PROTECTION FROM INGRESS OF DUST AND MOISTURE:
      1) MINIMUM OF TWO O-RING SEALS:
         a) OUTER SEAL BETWEEN TERMINAL COVER AND TERMINAL COMPARTMENT.
         b) INNER SEAL: PROTECTS MOTOR AND OTHER INTERNAL ELECTRICAL ELEMENTS FROM DUST/MOISTURE INGRESS WHEN TERMINAL COVER REMOVED.
         c) NONINTRUSIVE PARAMETER ADJUSTMENTS: PROVIDE NONINTRUSIVE ADJUSTMENT OF PARAMETER SETTINGS. NONINTRUSIVE MEANS VARIOUS PARAMETERS ARE ADJUSTABLE WITHOUT OPENING ANY ENCLOSURE COVERS. AS A MINIMUM, PROVIDE NON-INTRUSIVE ADJUSTMENT FOR THE FOLLOWING PARAMETERS: TORQUE SWITCH SETTINGS, POSITION SWITCH LIMITS, INDICATION SWITCH CONTACTS, POSITIONER FUNCTIONALITY, AND POSITION TRANSMITTER.
6. MANUFACTURERS AND PRODUCTS:
   a. ROTORK.
   b. LIMITORQUE.

O. OHEMSCAN UV-4200 E PARAMETER ANALYZER:

1. WALL-MOUNTED CHEMSCAN MODEL UV-4200 PROCESS ANALYZER INCLUDING, MAIN POWER CONNECTION, CONTROL CIRCUIT BOARD, NETWORK COMMUNICATIONS BOARD AND ASSOCIATED SOFTWARE FOR INSTRUMENT CONTROL, INTERNAL MEMORY WITH LITHIUM BATTERY BACKUP, LIGHT SOURCE MODULE, SPECTROGRAPH MODULE WITH 256 ELEMENT ARRAY DETECTOR AND CABINET MOUNTED TOUCHSCREEN GRAPHICAL HM AND USB PORT. FLOW-CELL MODULE CONSISTING OF EXTENDED PATH-LENGTH, INJECTION-TYPE FLOW-CELL, REAGENT INJECTORS, INTERNAL MANIFOLD INCLUDING AUTO ZERO AND CLEAN FUNCTIONS, WITH THE CAPABILITY OF ANALYZING UP TO ONE (1) SAMPLE STREAM, ADDITIONAL CALIBRATION (GRAB-SAMPLE) PORT, PERISTALTIC ANALYZER PUMP FOR ZEROING AND CLEANING SOLUTIONS PLUS GRAB SAMPLES AND NEMA-3R ENCLOSURE.
2. NEMA-4 ELECTRONICS MODULE ENCLOSURE AND NEMA-3R LOWER ENCLOSURE FOR REAGENTS AND PUMPING ARRAY.
3. 120 VAC INPUT REQUIRED - ANALYZER WILL PROVIDE 24VDC TO EXTERNAL EIE COMMUNICATION MODULE.
4. WALL MOUNTED CHEMSCAN ELECTRICAL INTERFACE ENCLOSURE (EIE) INCLUDING NEMA-4X FRP ENCLOSURE, SYSTEMS COMMUNICATION MODULE (ETHERNET IP) AND 8 ANALOG (4-20mA) OUTPUTS.
5. FLOWCELL - 13 mm X 10mL
6. CHEMSCAN UV SERIES PARAMETER AMMONIA (NH3-N) (0.2-20 mg/L)
7. CHEMSCAN UV SERIES PARAMETER NITRATE (NO3-N (0.1-30.0 mg/L)
8. CHEMSCAN UV SERIES PARAMETER ORTHOPHOSPHATE (PO4-P) (0.05-5.00 mg/L)
9. SAMPLE LINE - 1
10. SAMPLE TUBING, 50FT, 3/8" O.D.
11. REAGENT KIT, STARTUP, UV-SERIES WASTEWATER, PHOSPHATE, NITRATE, AND AMMONIA.
12. FIELD SERVICE: ON-SITE COMMISIONING, START-UP AND CALIBRATION OF THE SYSTEM, OPERATION AND MAINTENANCE TRAINING, AND RECIPE INSTRUCTIONS TO ALLOW ON-SITE PREPARATION OF REAGENTS.

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10/24/2022
PROFESSIONAL ENGINEER

MOUNT JACKSON WWTP
EQUALIZATION PROJECT

OWNER:
TOWN OF MOUNT JACKSON
MOUNT JACKSON, VIRGINIA

MARK	DATE	DESCRIPTION
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PROJECT NO: TCS2241
DATE: OCTOBER 24, 2022
DRAWN BY: MCT
CHECKED BY: CRLM
SHEET TITLE

PROCESS - MECHANICAL NOTES

D-002

SHEET 8 OF 20

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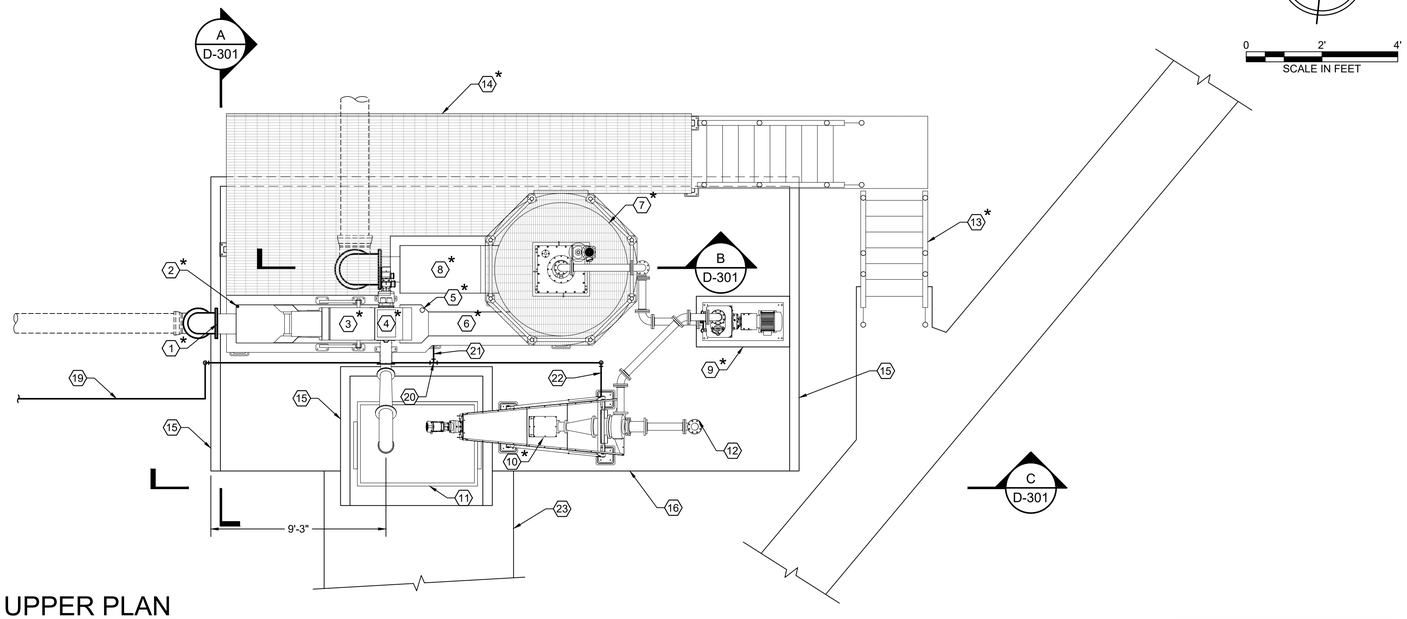
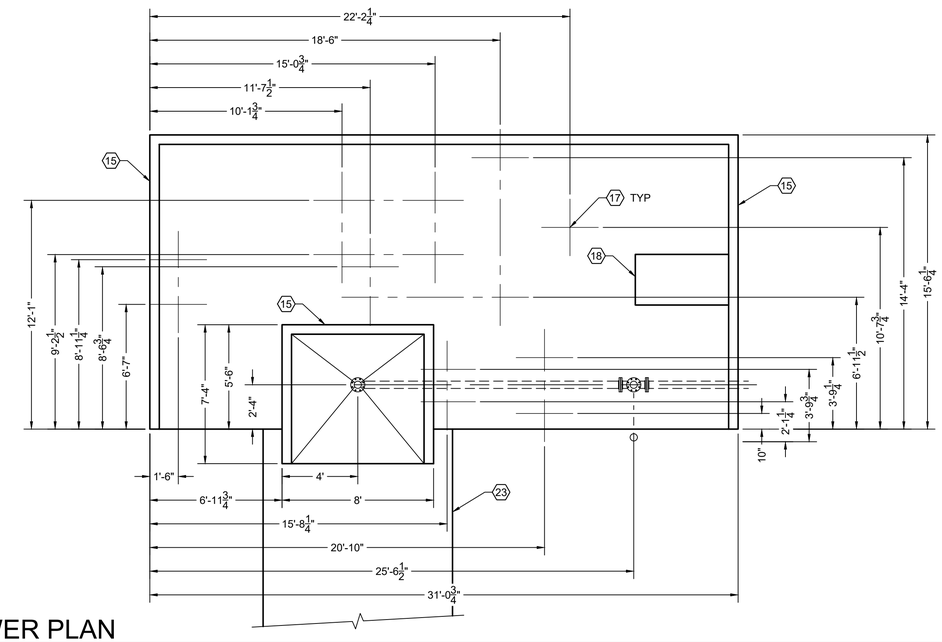


1 HEADWORKS UPPER PLAN

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



2 HEADWORKS LOWER PLAN

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

GENERAL NOTES:

A. SEE D-002 FOR MATERIAL AND EQUIPMENT SPECIFICATIONS NOT CONTAINED IN REFERENCED SPECIFICATIONS.

B. * DENOTES DEVICES, INSTRUMENTS OR EQUIPMENT THAT ARE PART OF A PACKAGE SYSTEM DESCRIBED IN THE SPECIFICATIONS FOR THE ASSOCIATED UNIT PROCESS WHICH CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF AND FURNISHING FIELD WIRING AND ANCILLARY MECHANICAL ITEMS TO ACHIEVE FUNCTIONALITY SHOWN.

C. SEE SPECIFICATION 150002 FOR PACKAGE HEADWORKS SYSTEM REQUIREMENTS.

KEY NOTES:

1. 18" INLET FLANGE.
2. UPSTREAM EMERGENCY HIGH-HIGH LEVEL FLOAT.
3. MECHANICAL SCREENING.
4. SCREENINGS WASHER AND COMPACTOR.
5. 4" PVC STILLING WELL W/ SS WALL CLAMPS.
6. 15" CHANNEL.
7. GRIT TANK.
8. 30" CHANNEL.
9. GRIT PUMP.
10. GRIT WASHER AND COMPACTOR.
11. DUMPSTER, OWNER FINISHED.
12. GRIT SCREENINGS DISCHARGE.
13. ACCESS STAIRS.
14. ACCESS PLATFORM.
15. 6" CONCRETE CURBING.
16. 12" TURN DOWN CONCRETE SLAB. SEE D1 ON S-501.
17. APPROXIMATE CENTER LINE OF PACKAGE SYSTEM SUPPORT COLUMNS. COLUMNS WILL BE SUPPORTED BY 12" BASE SLAB. CONTRACTOR TO GROUT IN COLUMNS AS REQUIRED.
18. 4'-11"x2'-8" GRIT PUMP CONCRETE PAD. SEE D1 ON S-501.
19. 2" WATER LINE.
20. 2x2x1½" TEE.
21. 1½" WATER TO CONNECT TO SCREENINGS WASHER. TO BE HEAT TRACED AND INSULATED.
22. 1½" WATER TO CONNECT TO GRIT WASHER. TO BE HEAT TRACED AND INSULATED.
23. NEW PAVEMENT, SEE DETAIL D1, SHEET C-102.

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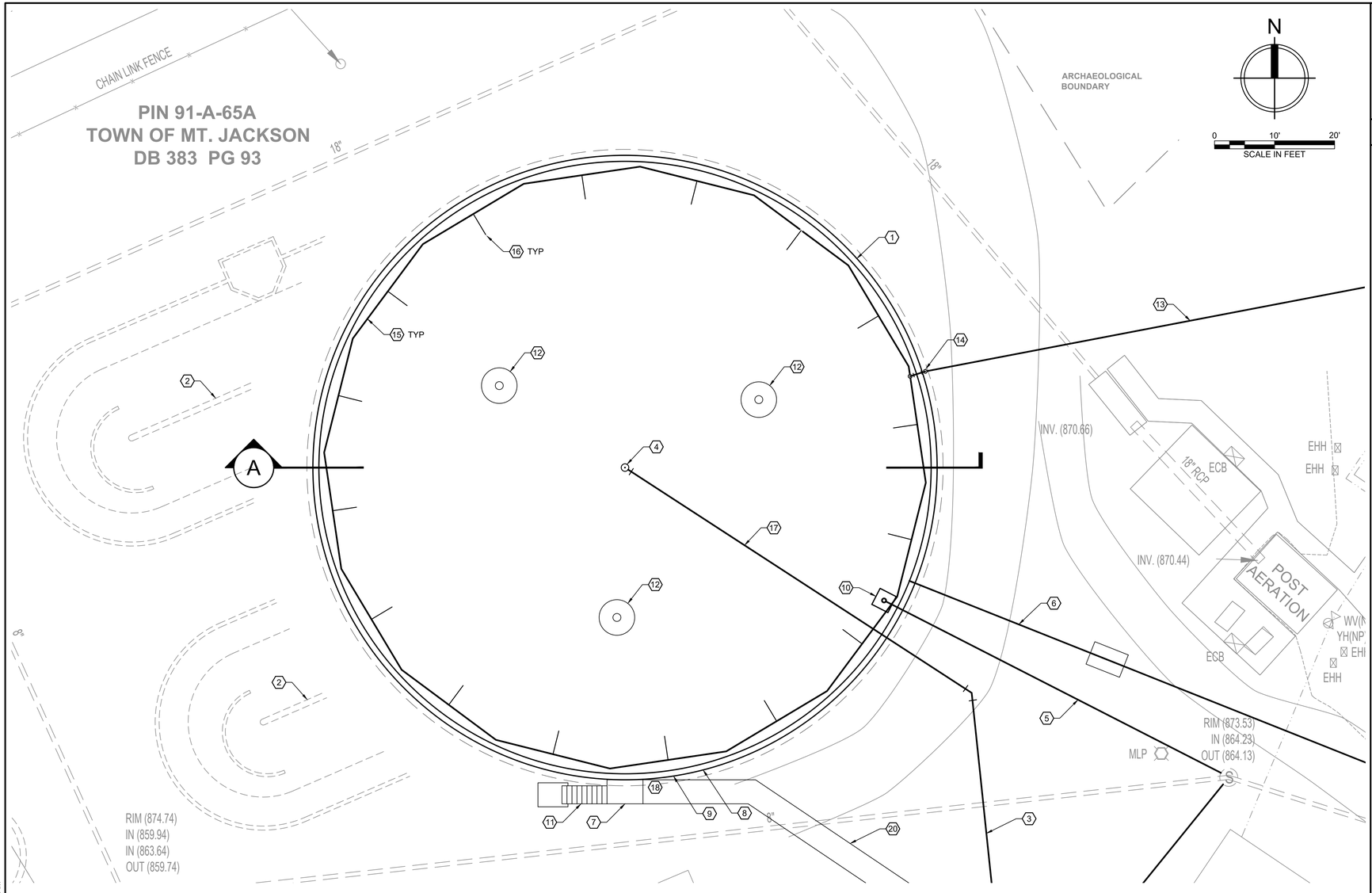
HEADWORKS PLAN

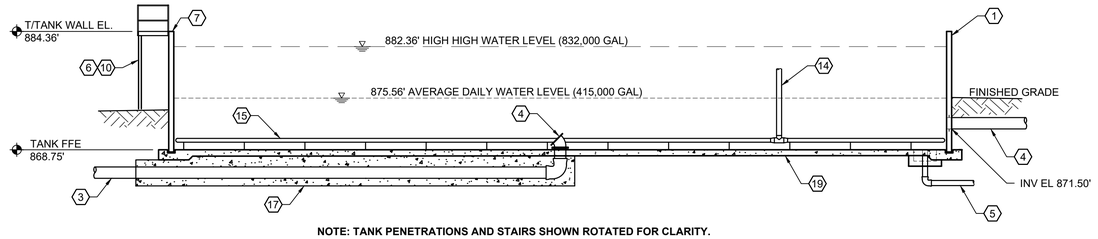
D-101

SHEET 9 OF 20



1 EQUALIZATION TANK - PLAN

SCALE: 1" = 1'-0"



NOTE: TANK PENETRATIONS AND STAIRS SHOWN ROTATED FOR CLARITY.

A EQUALIZATION TANK - SECTION

SCALE: 1" = 1'-0"

GENERAL NOTES:

A. SEE D-002 FOR MATERIAL AND EQUIPMENT SPECIFICATIONS NOT CONTAINED IN REFERENCED SPECIFICATIONS.

B. PRECAST TANK REQUIRES 2000 PSF BEARING CAPACITY WITH < 1" SETTLEMENT. PROVIDE ENGINEERING BACKFILL AND COMPACT TO MEET BEARING REQUIREMENTS. CONTACT GEOTECHNICAL ENGINEER AS REQUIRED FOR ANY SPECIFIC SITE RECOMMENDATIONS.

KEY NOTES:

1. PRECAST POST-TENSIONED CONCRETE TANK. SEE D-002.
2. EXISTING BURIED OXIDATION DITCH CONCRETE TO REMAIN.
3. 18" DIP EQ INFLUENT FROM HEADWORKS.
4. 18" DIP 90° BEND, UP WITH 45° FITTING ALIGNED AT 310° IN THE HORIZONTAL PLANE.
5. 18" DIP EQ EFFLUENT TO SBR TANKS.
6. 8" DIP EQ TANK DRAIN. PLAIN END OF PIPE TO BE FLUSH WITH TANK FINISHED FLOOR.
7. 4'x6' PLATFORM AND RAILING AT TOP OF TANK. SEE D-002.
8. BOLTED 36" CIRCULAR MANWAY ENTRY. BOTTOM OF MANWAY TO BE 2 FT ABOVE FINISHED GRADE.
9. 4" CAST IN FLANGE FOR PRESSURE TRANSDUCER MOUNTING. 1 FT ABOVE FINISHED GRADE.
10. 3'x3'x1'-6" DEEP SUMP AT DRAIN LINE.
11. EQ TANK ACCESS STAIRS. SEE D-002.
12. THREE (3) 5 HP ANOXIC FLOATING MIXERS. SEE D-002.
13. BURIED AIR LINE, 8" UNLINED DIP.
14. TRANSITION BURIED 8" UNLINED DIP TO 8" SCH. 10 SS AT GRADE. ROUTE 8" SCH 10. SS OVER TANK WALL. SUPPORT 8" SCH. 10 SS ALONG INSIDE AND OUTSIDE TANK WALL. SS 8" TEE WITH TWO (2) 8"x6" REDUCERS TO CONNECT TO 6" PERIPHERAL HEADER. SEE SHEET D-002.
15. 6" SCH. 10 SS PERIPHERAL HEADER WITH SS SUPPORTS MOUNTED TO TANK FLOOR.
16. 24" SS COARSE BUBBLE DIFFUSER MOUNTED 1' ABOVE FLOOR. TYPICAL OF 25.
17. 18" EQ INFLUENT ENCASED IN CONCRETE.
18. OWNER FURNISHED COMPOSITE SAMPLER.
19. SEE C-103 (EXISTING OXIDATION DITCH DEMOLITION SECTION): OVER EXCAVATE BELOW BOTTOM OF NEW EQ TANK FOUNDATION 3 FT MINIMUM OR UNTIL UNDISTURBED SOIL LAYER IS REACHED. PRECAST CONCRETE EQ TANK REQUIRES 2000 PSF MINIMUM BEARING CAPACITY WITH < 1" SETTLEMENT. PROVIDE ENGINEERED BACKFILL AND COMPACT TO MEET BEARING REQUIREMENTS. CONTACT GEOTECHNICAL ENGINEER AS REQUIRED FOR ANY SPECIFIC SITE RECOMMENDATIONS.
20. 4' SIDEWALK, SEE DETAIL D2/S-501.

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SHEET TITLE	

EQ TANK PLAN AND ELEVATION

D-102

SHEET 10 OF 20

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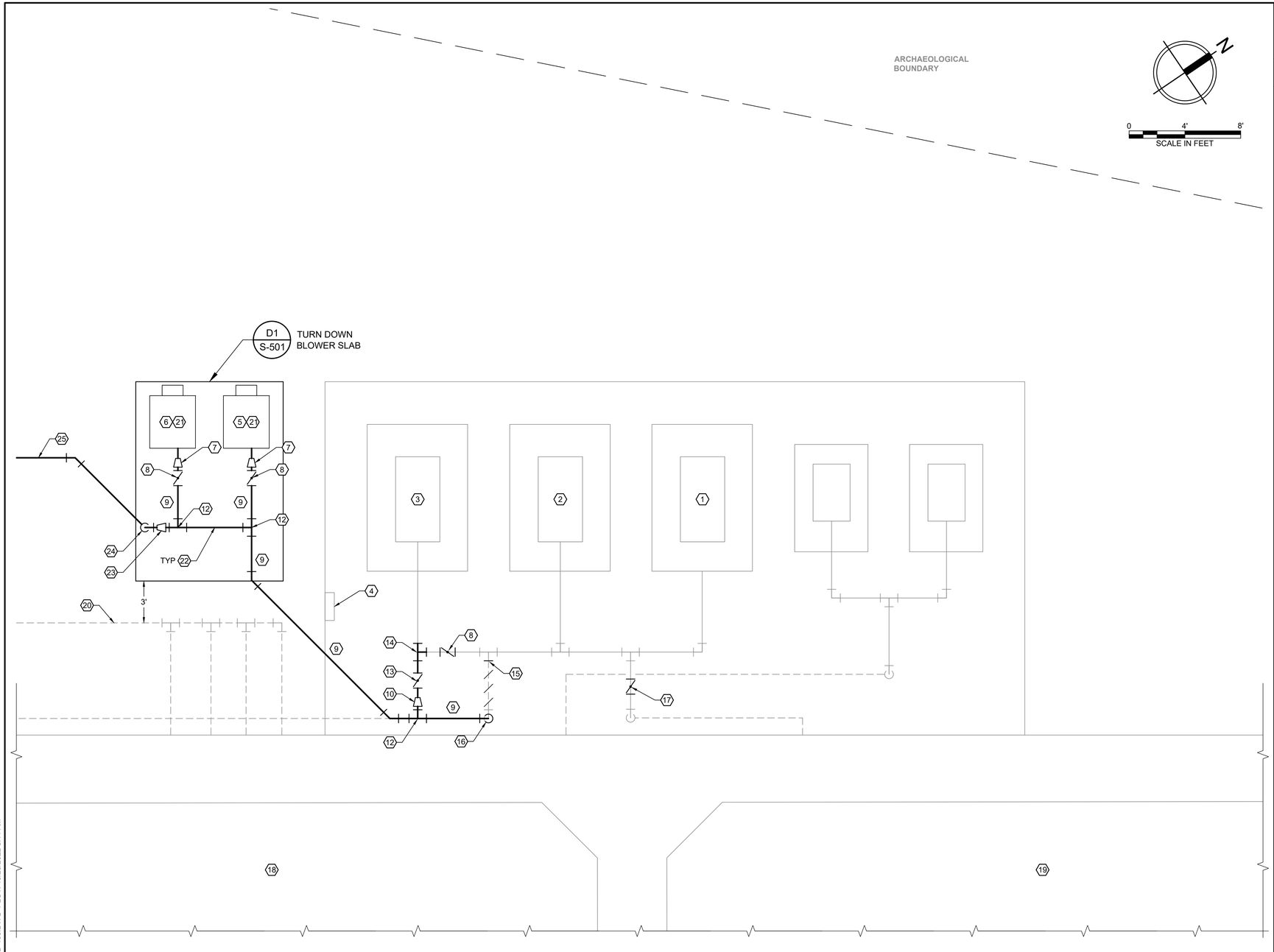

1 SBR BLOWERS - PLAN

SCALE: 1" = 1'-0"

GENERAL NOTES:

A. SEE D-002 FOR MATERIAL AND EQUIPMENT SPECIFICATIONS NOT CONTAINED IN REFERENCED SPECIFICATIONS.

KEY NOTES:

1. EXISTING SBR BLOWER 1.
2. EXISTING SBR BLOWER 2.
3. EXISTING SBR BLOWER 3.
4. EXISTING ELECTRICAL JUNCTION BOXES MOUNTED ON UNISTRUT.
5. SBR BLOWER 4. SEE D-002.
6. SBR BLOWER 5. SEE D-002.
7. 12"x8" REDUCER.
8. 12" BFV (AIR SERVICE).
9. 12" ABOVE GRADE LPA PIPE.
10. 12"x10" REDUCER.
11. 12" 90° HORIZ BEND.
12. 12" TEE.
13. 10" BFV (AIR SERVICE).
14. 10" TEE.
15. BLIND FLANGE EXIST TEE, REMOVE PORTION OF EXISTING 10" LPA PIPE AS SHOWN.
16. ROTATE EXISTING 12" 90° BEND TO CONNECT TO NEW 12" LPA.
17. REPLACE EXISTING 10" ELECTRICALLY ACTUATED BFV WITH NEW 10" MANUAL BFV (AIR SERVICE).
18. EXISTING POST EQ.
19. EXISTING SBR No. 2.
20. EXISTING POST EQ FORCEMAIN TO FILTER BUILDING.
21. EACH BLOWER WILL CONTAIN THE FOLLOWING ACCESSORIES SUPPLIED AS PART OF EACH BLOWER PACKAGE AND CONTAINED WITHIN THE ACOUSTICAL HOUSING: INTAKE FILTER AND SILENCER, DISCHARGE SILENCER, PRESSURE RELIEF VALVE, UNLOADING VALVE, AND ISOLATION VALVE. SEE D-002.
22. 304 STAINLESS STEEL PIPE SUPPORT WITH 360 DEGREE AXIAL MOVEMENT GUIDES. LOWEST POINT OF PIPING ACCESSORIES SHALL NOT BE LESS THAN 18 INCHES ABOVE FINISHED GRADE.
23. 10"x8" REDUCER.
24. 8" 90° BEND, DOWN.
25. BURIED 8" UNLINED DIP TO EQ TANK.

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SBR BLOWER PLAN

D-103

SHEET 11 OF 20

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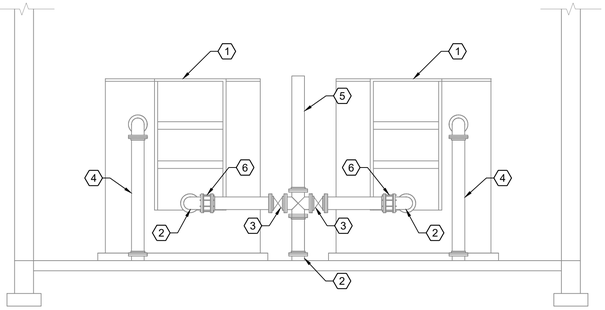
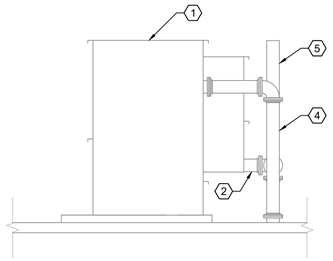


A EXISTING FILTERS PIPING - SECTION

SCALE: 1" = 5'-0"



B EXISTING FILTERS PIPING - SECTION

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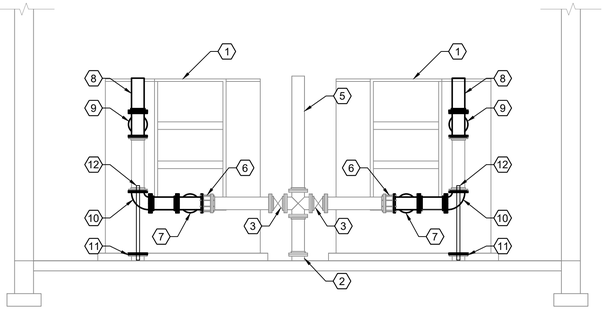

C MODIFIED FILTERS PIPING - SECTION

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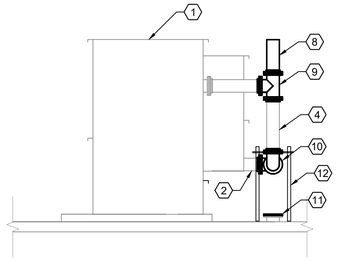

D MODIFIED FILTERS PIPING - SECTION

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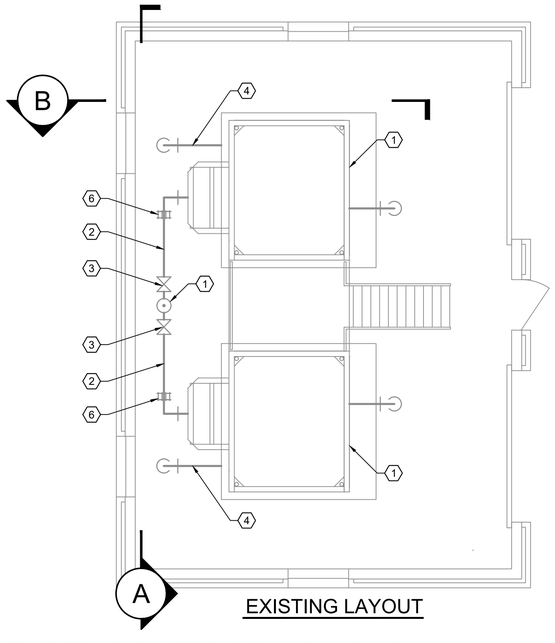

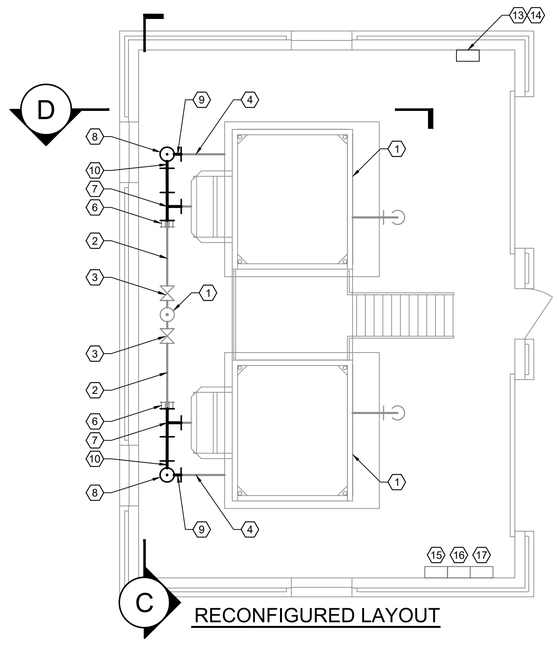

1 EXISTING FILTERS BULDING - PLAN

SCALE: 1" = 5'-0"

0 5' 10'
SCALE IN FEET

N

GENERAL NOTES:

A. SEE D-002 FOR MATERIAL AND EQUIPMENT SPECIFICATIONS NOT CONTAINED IN REFERENCED SPECIFICATIONS.

KEY NOTES:

1. EXISTING MEDIA DISK FILTER.
2. EXISTING 10" DIP FILTER EFFLUENT.
3. EXISTING 10" DIP BFV.
4. EXISTING 10" DIP FILTER OVERFLOW.
5. EXISTING 10" DIP VENT LINE.
6. EXISTING 10" DISMANTLING JOINT.
7. 10" DIP FILTER EFFLUENT TEE.
8. 10" DIP FLxPL SPOOL, VENT LINE.
9. 10" DIP FILTER OVERFLOW/VENT TEE.
10. 10" DIP 90° BEND.
11. 10" DIP BLIND FLANGE.
12. BASE FLANGE MOUNTED PIPE SUPPORT FOR ELBOW. STANDARD MODEL S89 FLANGED ADJUSTABLE PIPE SUPPORT.
13. CHEM SCAN UV-4200, 3 PARAMETER UNIT (ORTHO-P, NITRATE, AMMONIA). SEE D-002 FOR SPECIFICATIONS.
14. ROUTE 1.5" SCH. 80 PVC DRAIN LINE FOR CHEM SCAN TO NEAREST FLOOR DRAIN. SECURE PIPE TO CONCRETE FLOOR EVERY 5 LINEAR FEET.
15. EXISTING PANEL L3.
16. EXISTING PANEL T3.
17. EXISTING PANEL H3.

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COMMONWEALTH OF VIRGINIA
CARL ROBERT LAWRENCE MANGRUM
Lic. No. 33450
PROFESSIONAL ENGINEER
10/24/2022

MOUNT JACKSON WWTP
EQUALIZATION PROJECT

OWNER:
TOWN OF MOUNT JACKSON
MOUNT JACKSON, VIRGINIA

MARK	DATE	DESCRIPTION
0	10/24/2022	BID SET

PROJECT NO: TCS2241
DATE: OCTOBER 24, 2022
DRAWN BY: MCT
CHECKED BY: CRLM
SHEET TITLE

FILTER PIPING PLAN & SECTIONS

D-104

SHEET 12 OF 20

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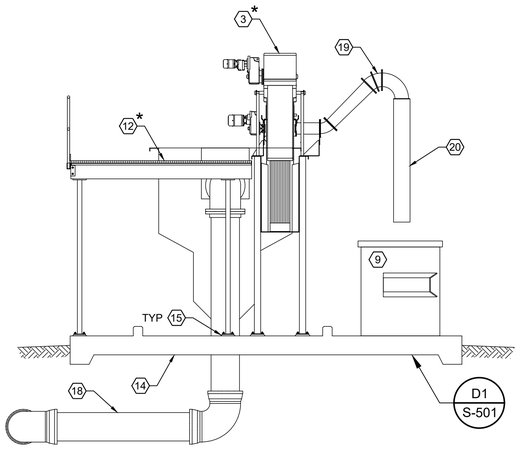
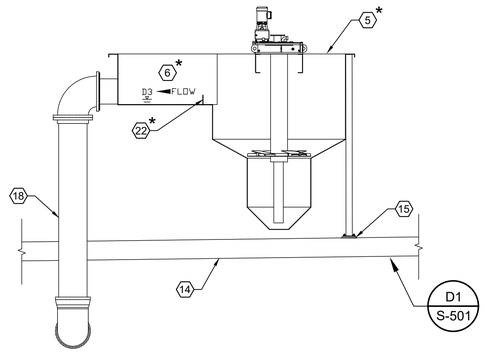


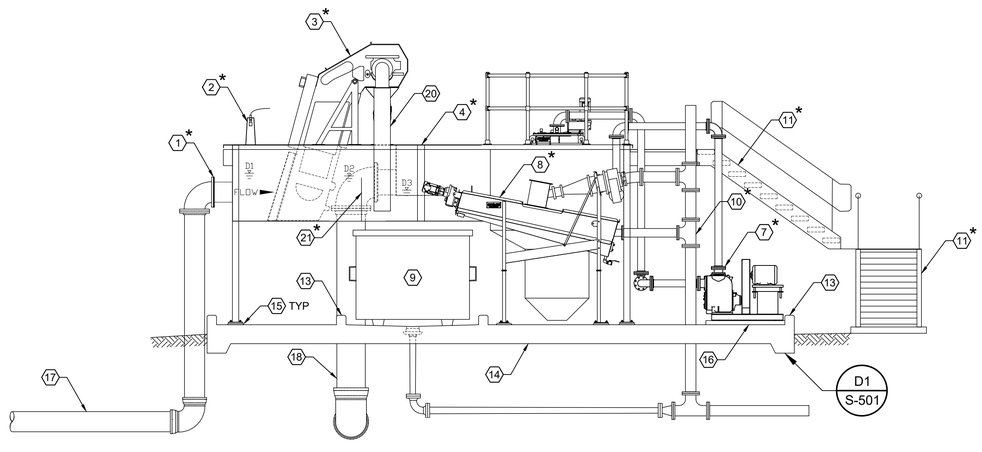
A HEADWORKS - SECTION

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



B HEADWORKS - SECTION

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



C HEADWORKS - SECTION

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

GENERAL NOTES:

A. SEE D-002 FOR MATERIAL AND EQUIPMENT SPECIFICATIONS NOT CONTAINED IN REFERENCED SPECIFICATIONS.

B. * DENOTES DEVICES, INSTRUMENTS OR EQUIPMENT THAT ARE PART OF A PACKAGE SYSTEM DESCRIBED IN THE SPECIFICATIONS FOR THE ASSOCIATED UNIT PROCESS WHICH CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF AND FURNISHING FIELD WIRING AND ANCILLARY MECHANICAL ITEMS TO ACHIEVE FUNCTIONALITY SHOWN.

C. SEE SPECIFICATION 150002 FOR PACKAGE HEADWORKS SYSTEM REQUIREMENTS.

KEY NOTES:

1. 12" INLET FLANGE.
2. UPSTREAM EMERGENCY HIGH-HIGH LEVEL FLOAT.
3. MECHANICAL SCREENING.
4. 4" PVC STILLING WELL W/ SS WALL CLAMPS.
5. GRIT TANK.
6. 30" CHANNEL WIDTH.
7. GRIT PUMP.
8. GRIT SCREENINGS WASH AND COMPACTOR.
9. DUMPSTER, OWNER SUPPLIED.
10. GRIT SCREENINGS DISCHARGE.
11. ACCESS STAIRS.
12. ACCESS PLATFORM.
13. 6" CONCRETE CURBING.
14. 12" CONCRETE SLAB. SEE DETAIL D1, SHEET S-501.
15. APPROXIMATE CENTER LINE OF PACKAGE SYSTEM SUPPORT COLUMNS. COLUMNS WILL BE SUPPORTED BY 12" BASE SLAB. CONTRACTOR TO GROUT IN COLUMNS AS REQUIRED.
16. 4'-11"x2'-8" 4" GRIT PUMP CONCRETE PAD.
17. 12" PRO SCREEN INFLUENT.
18. 18" PRO GRIT EFFLUENT.
19. 22.5° SS BEND. NOT PART OF SCREENING PACKAGE.
20. FLEXIBLE TREMIE CHUTE. NOT PART OF SCREENING PACKAGE.
21. SCREEN EFFLUENT OVERFLOW WEIR. TOP EL = 885.86'
22. GRIT EFFLUENT OVER FLOW WEIR. TOP EL = 884.36'

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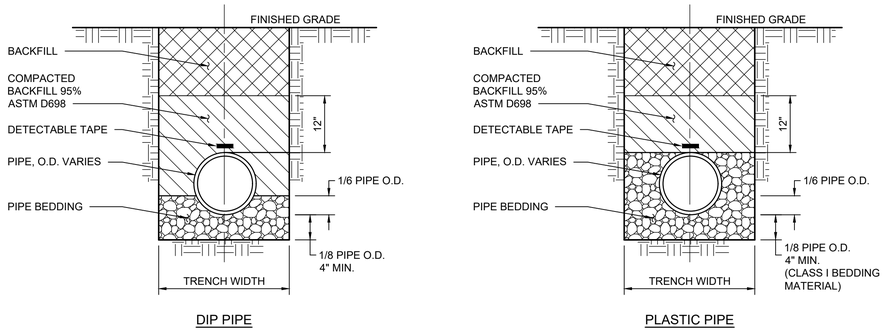
HEADWORKS SECTIONS

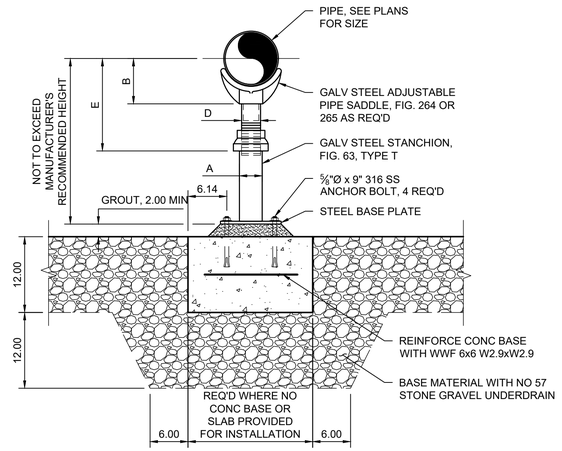
D-301

SHEET 13 OF 20



D1 PIPE BEDDING DETAIL

NOT TO SCALE



NOMINAL PIPE SIZE	A	B	D	E	
				MIN	MAX
2½	2½	3½	1½	8	13
3		3¾		8¼	13¼
3½		4		8½	13½
4"	3	4¼	2½	9¼	14
5"		4⅞		10	14¾
6"		5½		10½	15¼
8"		6⅞		11¾	16½
10"		8½		13½	18¼
12"		9 15/16		15	19¾

D2 ADJUSTABLE PIPE SADDLE SUPPORT AT GRADE

NOT TO SCALE

SEPARATION OF WATER AND SEWER LINES:

A. PARALLEL INSTALLATION:

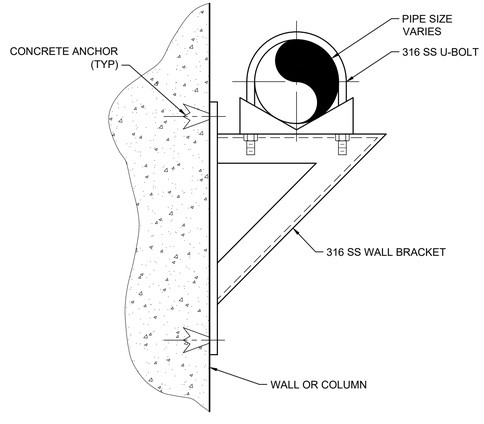
1. NORMAL CONDITIONS: WATER LINES SHALL BE AT LEAST 10 FEET HORIZONTALLY FROM A SEWER OR SEWER MANHOLE WHENEVER POSSIBLE, AND THE DISTANCE SHALL BE MEASURED EDGE TO EDGE.
2. UNUSUAL CONDITIONS: WHEN LOCAL CONDITIONS PREVENT A HORIZONTAL SEPARATION OF AT LEAST 10 FEET, THE WATER LINE MAY BE CLOSER TO A SEWER OR SEWER MANHOLE PROVIDED THAT:
   a. THE BOTTOM OF THE WATER LINE IS AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER.
   b. WHERE THIS VERTICAL SEPARATION CANNOT BE OBTAINED, THE SEWER SHALL BE CONSTRUCTED OF AWWA APPROVED WATER PIPE PRESSURE-TESTED IN PLACE TO 50 PSI WITHOUT LEAKAGE PRIOR TO BACKFILLING. THE SEWER MANHOLE SHALL BE OF WATERTIGHT CONSTRUCTION AND TESTED IN PLACE.

B. CROSSINGS:

1. NORMAL CONDITIONS: WATER LINES CROSSING OVER SEWERS SHALL BE AT LEAST 18 INCHES BETWEEN THE BOTTOM OF THE WATER LINE AND THE TOP OF THE SEWER.
2. UNUSUAL CONDITIONS: WHEN LOCAL CONDITIONS PREVENT A VERTICAL SEPARATION DESCRIBED IN CROSSING, NORMAL CONDITIONS, PARAGRAPH ABOVE, THE FOLLOWING CONSTRUCTION SHALL BE USED:
   a. SEWERS PASSING OVER OR UNDER WATER LINES SHALL BE CONSTRUCTED OF THE MATERIALS DESCRIBED IN PARALLEL INSTALLATION, UNUSUAL CONDITIONS, PARAGRAPH ABOVE.
   b. WATER LINES PASSING UNDER SEWERS SHALL, IN ADDITION, BE PROTECTED BY PROVIDING:
      i) A VERTICAL SEPARATION OF AT LEAST 18 INCHES BETWEEN THE BOTTOM OF THE SEWER AND THE TOP OF THE WATER LINE.
      ii) ADEQUATE STRUCTURE SUPPORT FOR THE SEWERS TO PREVENT EXCESSIVE DEFLECTION OF THE JOINTS AND SETTLING ON THE WATER LINE.
      ii) THAT THE LENGTH OF THE WATER LINE BE CENTERED AT THE POINT OF THE CROSSING SO THAT JOINTS SHALL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE SEWER.
      iv) WATER LINES SHALL NOT BE INSTALLED TO PASS THROUGH SEWER MANHOLES.

D3 SEPARATION OF WATER AND SEWER LINES

NOT TO SCALE



NOTES:

1. WALL BRACKET SHALL BE DESIGNED BY FABRICATOR FOR SPECIFIC PIPE AND APPLICATION.
2. PIPE SUPPORT SHALL ALLOW HORIZONTAL MOVEMENT FOR AIR PIPE APPLICATIONS UNLESS NOTED OTHERWISE.

D4 WALL MOUNTED PIPE SUPPORT DETAIL

NOT TO SCALE

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CIVIL DETAILS

D-501

SHEET 14 OF 20

1. STRUCTURAL GENERAL NOTES

STRUCTURAL GENERAL NOTES ARE INTENDED TO HIGHLIGHT OR IN SOME CASES SUPPLEMENT PROJECT SPECIFICATIONS. REFER TO THE PROJECT SPECIFICATIONS FOR COMPLETE WORK COVERAGE.

A. GOVERNING CODES

1. INTERNATIONAL BUILDING CODE (IBC, 2015 EDITION)
2. VIRGINIA UNIFORM STATEWIDE BUILDING CODE (VUSBC, 2015)
3. BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI, 318)
4. BUILDING CODE REQUIREMENTS AND SPECIFICATIONS FOR MASONRY STRUCTURES (ACI, 530)
5. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC, 14TH EDITION)
6. NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION (NDS)

B. DESIGN LOADS AND CRITERIA (SEE SECTION F FOR ADDITIONAL DELEGATED DESIGN CRITERIA)

1. GRAVITY LOADS (PSF):

ROOF	SNOW LOAD 30

2. WIND CRITERIA: ULTIMATE DESIGN WIND SPEED = 100 MPH, SUSTAINED
3. SEISMIC CRITERIA: SEISMIC DESIGN CATEGORY A
4. FROST DEPTH: 24"
5. FOOTING BEARING PRESSURE 2,000 PSF ON APPROVED SUBGRADE, ASSUMED.

C. MATERIALS

1. CLASS A CONCRETE: (USE U.N.O.) PORTLAND CEMENT ASTM C150 TYPE I/II
   FLY ASH ASTM C618, 10% – 25% BY WEIGHT
   WATER / CEMENT + FLY ASH = 0.45 MAXIMUM
   28 DAY f'c = 4000 PSI
   AIR CONTENT 4.5% – 7.0%
   ¾" MAX. NORMAL WEIGHT AGGREGATE

   CLASS B CONCRETE: (FOOTINGS) PORTLAND CEMENT ASTM C150 TYPE I/II
   FLY ASH ASTM C618, 10% – 25% BY WEIGHT
   WATER / CEMENT + FLY ASH = 0.45 MAXIMUM
   28 DAY f'c = 3000 PSI
   AIR CONTENT 4.5% – 7.0%
   ¾" MAX. NORMAL WEIGHT AGGREGATE

   CLASS C CONCRETE: (DUMPSTER PAD) PORTLAND CEMENT ASTM C150 TYPE I/II
   FLY ASH ASTM C618, 10% – 25% BY WEIGHT
   WATER / CEMENT + FLY ASH = 0.45 MAXIMUM
   28 DAY f'c = 5000 PSI
   AIR CONTENT 4.5% – 7.0%
   1" MAX. NORMAL WEIGHT AGGREGATE

2. REINFORCING BARS: ASTM A615, GRADE 60
3. DEFORMED BARS: ASTM A706, GRADE 60 (WHERE INDICATED TO BE WELDED)
4. MECHANICAL SPLICES: LENTON TAPERED, THREADED COUPLERS AS MFG BY ERICO
5. WELDED WIRE FABRIC: ASTM A185, FLAT SHEET MATERIAL
6. ANCHOR RODS: ASTM F1554 GRADE 36 OR 55
7. GROUT: ASTM C1107, NON-METALLIC NON-SHRINK, 3 DAY f'c = 4000 PSI
8. MASONRY UNITS: ASTM C90, GRADE N, f'c = 1900 PS
9. MORTAR: ASTM C270, TYPE S
10. MASONRY GROUT: ASTM C476 FINE, f'c = 2000 PSI WITH 10" SLUMP
11. CMU ASSEMBLIES: 28 DAY f'm = 1500 PSI, UNIT STRENGTH METHOD
12. STRUCTURAL STEEL:
    W SHAPES ASTM A992, Fy = 50 KSI
    OTHER ROLLED SHAPES ASTM A36, Fy = 36 KSI
    PLATES ASTM A36, Fy = 36 KSI
    PIPE ASTM A53 GRADE B, TYPE E OR S, Fy = 35 KSI
    HSS –SQUARE OR RECT ASTM A500 GRADE B, Fy = 46 KSI
    HSS –ROUND ASTM A500 GRADE B, Fy = 42 KSI13.
13. HIGH STRENGTH BOLTS: ASTM A325 TYPE 1 UNCOATED; STEEL TO STEEL CONNECTIONS
14. BOLTS: ONLY ASTM A307; WOOD OR WOOD TO STEEL CONNECTIONS OR ERECTION
15. HEADED ANCHOR STUDS: ASTM A108 GRADE 1010 – 1020, TYPE B, Fu = 60 KSI (AWS D1.1 TABLE 7.1, TYPE B)
16. WELD METAL: F7X-EXXX OR E70XX
17. STEEL DECK: ASTM A446 GRADE A OR A653, Fy = 33 KSI.
18. EXPANSION ANCHORS: STUD TYPE EXPANSION ANCHOR WITH SINGLE PIECE WEDGE HILTI KWIK BOLT III EXPANSION ANCHOR OR EQUAL W/ COMPRESSION RING, EXPANSION CONE AND EXPANSION SLEEVE
19. ADHESIVE ANCHORS: ADHESIVE ASTM A36 SHANK – ALL THREAD TYPE, 'SIMPSON' SET-XP INJECTABLE OR ALTERNATIVE AS APPROVED BY THE ENGINEER
20. GLUE LAMINATED TIMBER: ANSI/AITC A190.1, COMBINATION SYMBOL 24F-V8-DF/DF
21. DIMENSION LUMBER: GRADED BY WESTERN WOOD PRODUCTS ASSOCIATION (WWPA) OR WEST COAST LUMBER INSPECTION BUREAU (WCLIB). DOUG-FIR #2 UNLESS NOTED OTHERWISE
22. WOOD SHEATHING/PANELS: AMERICAN PLYWOOD ASSOCIATION (APA) RATED STRUCTURAL I" OR "SHEATHING" SUITED FOR SPAN & USE

D. FOUNDATIONS

1. FOUNDATIONS HAVE BEEN DESIGNED BASED ON ASSUMED VALUES FROM PREVIOUS PROJECTS ON SITE, 2,000 PSF MAXIMUM ALLOWABLE BEARING PRESSURE. NO SOILS REPORT HAS BEEN PROVIDED.
2. PLACE FOOTINGS ON COMPACTED NATURAL SOILS OR ENGINEERED FILL PLACED OVER UNDISTURBED NATURAL SOILS. ENGINEERED FILL MATERIAL SHALL BE MINUS 3" GRANULAR, APPROVED BY A GEOTECHNICAL ENGINEER. PLACE ENGINEERED FILL IN UNIFORM LIFTS AND COMPACT TO 98% STANDARD PROCTOR ACCORDING TO ASTM D698. PLAN LIMITS OF ENGINEERED FILL MUST EXTEND AT LEAST 2'-0" BEYOND ALL FOOTING EDGES. IF ENCOUNTERED, EXISTING FILL SHALL BE REMOVED TO AN APPROVED DEPTH AND REPLACED WITH ENGINEERED FILL AS DESCRIBED ABOVE, PLACED AND COMPACTED AS DESCRIBED ABOVE.
3. PLACE INTERIOR SLABS ON GRADE ON 4" OF MINUS ¾" DRAINAGE COURSE, GRADED FOR COMPACTION WITH LESS THAN 12% PASSING THE #200 SIEVE. PLACE DRAINAGE COURSE OVER A VAPOR RETARDER ON NATURAL SOILS OR ENGINEERED FILL PLACED OVER UNDISTURBED NATURAL SOILS. COMPACT SOILS UNDER SLABS (ABOVE FOOTINGS) TO 95% STANDARD PROCTOR ACCORDING TO ASTM D698.
4. DO NOT BACKFILL WALLS WITH UNBALANCED SOIL LEVELS UNLESS ADEQUATELY SHORED OR PERMANENT FLOOR PLATES ARE INSTALLED AND CONNECTIONS ARE COMPLETE – THIS DOES NOT INCLUDE RETAINING WALLS. THE CONTRACTOR IS RESPONSIBLE FOR TEMPORARY SHORING DESIGN AND INSTALLATION.
5. BACKFILL AND COMPACT BURIED WALLS OR GRADE BEAMS EVENLY ON EACH SIDE TO AVOID UNBALANCED LOADS. COMPACT LAYERS TO 95% STANDARD PROCTOR ACCORDING TO ASTM D698 EXCEPT 92% UNDER NON-PAVED AREAS.
6. ALWAYS PROVIDE POSITIVE SURFACE WATER DRAINAGE AWAY FROM THE STRUCTURE.

E. CONCRETE

1. PERFORM CONCRETE WORK IN ACCORDANCE WITH "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE" (ACI 318) UNLESS MORE STRINGENT REQUIREMENTS ARE INDICATED.
2. MINIMUM REINFORCING BAR COVER:
   3" AT UNFORMED SURFACES EXPOSED TO EARTH
   2" AT FORMED SURFACES EXPOSED TO EARTH OR WEATHER FOR #6 AND LARGER
   1½" AT FORMED SURFACES EXPOSED TO EARTH OR WEATHER FOR #3–#5
   1" AT SLABS AND WALLS NOT EXPOSED TO EARTH OR WEATHER
3. SPLICE REINFORCING BARS BY LAPPING ACCORDING TO THE SCHEDULE ON THE DRAWINGS. PLACE MECHANICAL CONNECTORS WHERE SHOWN. SPLICE WWF SHEETS BY LAPPING AT LEAST ONE PANEL WIDTH (TWO LONGITUDINAL BARS IN CONTACT) OR 6 INCHES MINIMUM.
4. ADD #4x2'-6" DIAGONAL EACH FACE AT ALL OPENING CORNERS AND #5x5'-0" DIAGONAL MID-DEPTH AT ALL RE-ENTRANT SLAB CORNERS UNLESS SHOWN OTHERWISE.
5. SECURE ALL REINFORCING, INCLUDING WWF, IN POSITION WITH CHAIRS BEFORE CONCRETE PLACEMENT. CONCRETE DOBIES MAY BE USED TO POSITION SLAB ON GRADE REINFORCEMENT.
6. TIE DOWELS IN PLACE BEFORE PLACING CONCRETE. DO NOT STAB OR "WET-SET" DOWELS.
7. INSTALL AND SECURE EMBEDMENTS SUCH AS ANCHOR BOLTS AND EMBEDMENT PLATES WITHIN SPECIFIED TOLERANCES BEFORE CONCRETE PLACEMENT.
8. ROUND ISOLATION JOINTS SHOWN AT COLUMN LOCATIONS MAY BE SIMILAR SIZE DIAMOND SHAPED JOINTS AT THE CONTRACTOR'S DISCRETION.
9. WHERE TOP SURFACES OF CONCRETE SLABS ARE SHOWN TO BE RECESSED MORE THAN ½", THICKEN SLAB TO MAINTAIN INDICATED SLAB THICKNESS.
10. MECHANICALLY VIBRATE ALL CONCRETE PLACEMENTS EXCEPT SLABS LESS THAN 5" THICK.
11. WHERE SLAB CONTRACTION JOINTS ARE SHOWN ON THE DRAWINGS, CONSTRUCTION JOINTS MAY BE SUBSTITUTED TO ACCOMMODATE THE CONTRACTOR'S PLACEMENT STRATEGY.
12. FREE WATER ON THE SLAB SURFACE DURING FINISHING OPERATIONS IS PROHIBITED. SOFT CUT CONTRACTION JOINTS AS SOON AS POSSIBLE – GENERALLY WITHIN 6 HOURS AFTER FINISHING.
13. PROTECT AND CURE ALL CONCRETE SURFACES. BEGIN CURING WALLS IMMEDIATELY AFTER STRIPPING FORMS AND FLATWORK IMMEDIATELY AFTER FINISHING.
14. CONCRETE SURFACES TO RECEIVE GROUT UNDER COLUMN BASE PLATES MUST BE PREPARED BY LIGHT BUSH HAMMERING (¼" AMPLITUDE) THE GROUTED AREA AND PRE-SOAKING.

F. DELEGATED DESIGN OF STAIRS, RAILS, EQUIPMENT PLATFORMS, EQUIPMENT SUPPORTS, AND PRE-CAST POST TENSIONED CONCRETE TANK.
(SEE D-001 FOR ADDITIONAL REQUIREMENTS)

1. DESIGN REQUIREMENTS:
   1.1. STAIRS TO BE PER IBC-2015 SECTION 1607, TABLE 1607.1 UNIFORM DESIGN LL 100 PSF, 300 POUND CONCENTRATED LOAD
   1.2. RAILS TO BE DESIGNED FOR 50PLF UNIFORM LOAD OR 200 POUND CONCENTRATED LOAD.
   1.3. ACCESS PLATFORMS TO BE PER IBC-2015 SECTION 1607, TABLE 1607.1 UNIFORM DESIGN LL 60 PSF. PLATFORMS ALSO TO BE DESIGNED FOR LOADS FOR ALL EQUIPMENT SUPPORTED.
   1.4. EQUIPMENT SUPPORTS TO BE DESIGNED PER EQUIPMENT SUPPLIER LOADS.
2. SUPPLIERS OF ELEMENTS IN THIS SECTION TO PROVIDE DRAWINGS SIGNED AND SEALED FOR THE COMMONWEALTH OF VIRGINIA INDICATING ALL STRUCTURAL ELEMENTS, ANCHORAGE, AND DESIGN LOADS.
3. MATERIALS TO BE PER D-002 SECTION J UNLESS OTHERWISE NOTED.

G. MISCELLANEOUS

1. REFERENCE C AND D SERIES DRAWINGS FOR SITE PLANS, BUILDING LOCATIONS, AND ELEVATIONS.
2. COORDINATE OPENINGS AND EMBEDDED ITEMS IN CONCRETE WORK WITH ALL TRADES.
3. NOTIFY ENGINEER OF ANY DISCREPANCIES DISCOVERED WITH OTHER TRADES.
4. CONSTRUCTION LOADS SHALL NOT BE GREATER THAN THE DESIGN LOADS INDICATED IN B.1 UNLESS REVIEWED AND APPROVED BY THE ENGINEER.
5. EQUIPMENT OPENINGS INDICATED ARE FOR REFERENCE ONLY. COORDINATE EXACT LOCATIONS, DIMENSIONS AND DETAILS WITH EQUIPMENT MANUFACTURERS.
6. TEMPORARILY BRACE THE STRUCTURE TO RESIST ALL LOADS OR COMBINATIONS OF LOADS UNTIL ALL PERMANENT ELEMENTS ARE IN PLACE AND ALL CONNECTIONS ARE COMPLETE AS SHOWN.
7. ALL COMPONENTS OF STAIRS INCLUDING THREADS, STRINGERS AND CONNECTIONS NOT DETAILED IN THE STRUCTURAL DOCUMENTS ARE THE RESPONSIBILITY OF OTHERS.

H. ABBREVIATIONS LIST – (SOME OF THE LISTED ABBREVIATIONS MAY NOT APPEAR ON THE DRAWINGS)

A&B	ABOVE & BELOW	HORIZ	HORIZONTAL
AA	ADHESIVE ANCHOR	INV	INVERT
ADH	ADHESIVE	ISJT	ISOLATION JOINT
AHR	ANCHOR	KB	KNEE BRACE
AR	ANCHOR ROD	LONG	LONGITUDINAL
BFG	BELOW FINISH GRADE	MBR	MEMBER
BLKG	BLOCKING	MC	MOMENT CONNECTION
BOT	BOTTOM	MFR REC	MANUFACTURER RECOMMENDATION
BRG	BEARING	OH	OVERHANG
BU	BUILT-UP	OPP	OPPOSITE
CB	CARRIAGE BOLT	OTLKR	OUTLOOKER
CJ	CONSTRUCTION JOINT	PROJ	PROJECTION
CNCL	CONCEAL(ED)	REC	RECESSED
CSK	COUNTER SUNK	REINF	REINFORCING
DBA	DEFORMED BAR ANCHOR	SIM	SIMILAR
EQL SP	EQUALLY SPACED	STAG	STAGGERED
FAS BD	FASCIA BOARD	STIF	STIFFENER
FLASH	FLASHING	STIR	STIRRUP
FLG	FLANGE	T&B	TOP & BOTTOM
FSTNR	FASTENER	TB	THROUGH BOLT
FTG	FOOTING	TFA	TO FLOOR ABOVE
FURG	FURRING	TFB	TO FLOOR BELOW
GT	GROUT	THK	THICK(NESS)
HAS	HEADED ANCHOR STUD	TYP	TYPICAL
HDR	HEADER	VIF	VERIFY IN FIELD
HGR	HANGER	VNR	VENEER
HLDN	HOLDDOWN	WWF	WELDED WIRE FABRIC
HSS	HOLLOW STRUCTURAL SECTION (TUBE STEEL)		

MINIMUM WALL REINFORCING

SIZE	CURTAIN	VERTICAL	HORIZONTAL
CONCRETE			
6"	SINGLE	#4 @ 18" O.C	#4 @ 16" O.C.
8"	SINGLE	#4 @ 18" O.C	#4 @ 12" O.C.
10"	SINGLE	#5 @ 18" O.C	#5 @ 15" O.C.
12"	DOUBLE	#4 @ 18" O.C	#4 @ 16" O.C.
MASONRY			
4"	SINGLE	#3 @ 24" O.C	"K-WEB" @ 16" O.C.*
6"	SINGLE	#4 @ 48" O.C	2-#4 @ 48" O.C.
8"	SINGLE	#5 @ 48" O.C	2-#5 @ 48" O.C.
10"	SINGLE	#5 @ 32" O.C	2-#5 @ 48" O.C.
12"	SINGLE	#6 @ 48" O.C	2-#6 @ 48" O.C.

NOTES:
* – STD. "K-WEB" W/ 2-9 GA. WIRES

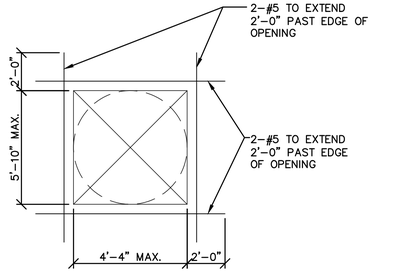
ALL REINFORCING TO BE GRADE 60 EXCEPT #3 AND SMALLER WHICH MAY BE GRADE 40.

1 S-001 SCALE: N.T.S.

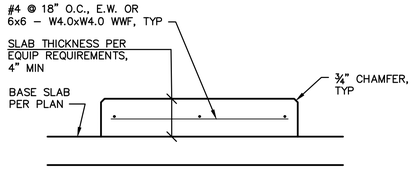
REBAR LAP SCHEDULE

BAR #	CONCRETE			MASONRY
	3000 PSI	4000 PSI	5000 PSI	
#3	25"	21"	19"	15"
#4	33"	28"	25"	24"
#5	41"	36"	32"	30"
#6	49"	43"	38"	36"
#7	58"	50"	45"	42"
#8	66"	57"	51"	48"
#9	74"	64"	57"	54"
#10	82"	71"	64"	60"
#11	90"	78"	70"	66"

3 S-001 SCALE: N.T.S.



5 S-001 TYPICAL OPENING IN CONC. WALL SCALE: N.T.S.



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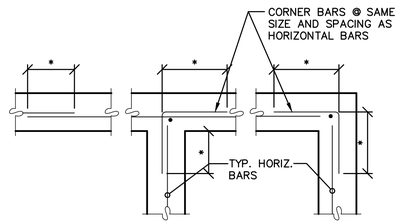
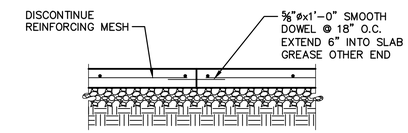


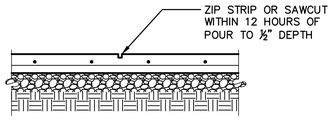
PLAN

NOTE:
* INDICATES LAP, SEE REBAR LAP SCHEDULE

2 S-001 TYPICAL REINFORCING @ CORNER SCALE: N.T.S.

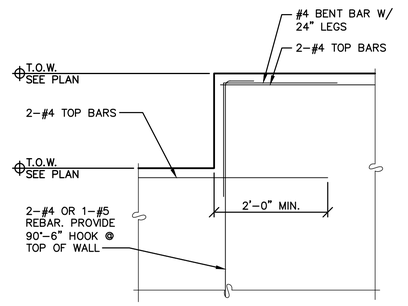


TYPICAL CONSTRUCTION JOINT
(PROVIDED AS REQ'D WHERE CONTROL JOINT SHOWN)



TYPICAL CONTROL JOINT

4 S-001 TYPICAL SLAB JOINTS SCALE: N.T.S.



6 S-001 TYPICAL WALL STEP SCALE: N.T.S.

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Lic. No. 33450
10/24/2022
REGISTERED PROFESSIONAL ENGINEER

MOUNT JACKSON WWTP
EQUALIZATION PROJECT

OWNER:
TOWN OF MOUNT JACKSON
MOUNT JACKSON, VIRGINIA

MARK	DATE	DESCRIPTION
0	10/24/2022	BID SET

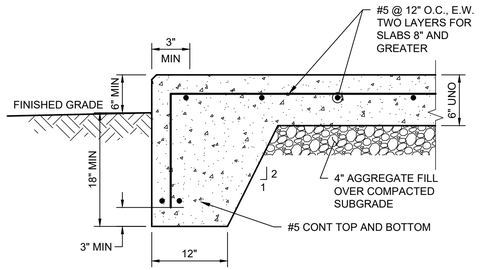
PROJECT NO: TCS2241
DATE: OCTOBER 24, 2022
DRAWN BY: MCT
CHECKED BY: CRLM
SHEET TITLE

STRUCTURAL NOTES

S-001

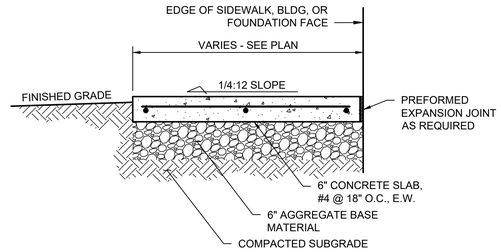
SHEET 15 OF 20

X:\PROJ\TCS2241-MCD-MTJAXWWTP_EQ\CAD\TCS2241S-001.DWG PLOT: 10/28/2022 8:41 AM



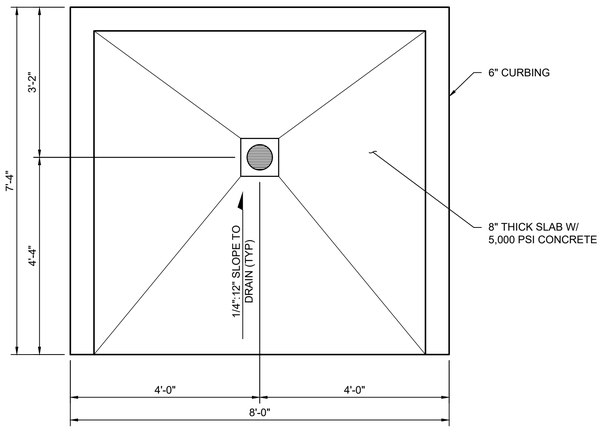
D1 TURN DOWN SLAB DETAIL

N.T.S.

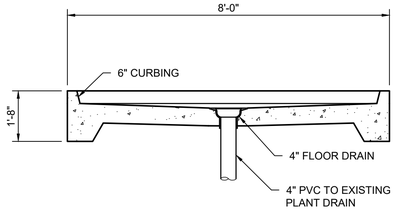


D2 CONCRETE SIDEWALK AND STOOP DETAIL

N.T.S.



PLAN VIEW



SECTION VIEW

D3 DUMPSTER CONTAINMENT PAD

N.T.S.

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STRUCTURAL DETAILS

S-501

SHEET 16 OF 20

GENERAL NOTES:

- THE FOLLOWING NOTES APPLY TO THE ENTIRE PROJECT.

- UTILITY SERVICE:
  a. IF NECESSARY,COORDINATE WITH THE UTILITY FOR THE EXTENSION OF UNDERGROUND POWER SERVICE TO THE SITE AND INSTALL UTILITY SUPPLIED EQUIPMENT AS REQUIRED BY THE UTILITY.
  b. COORDINATE WITH THE UTILITY TO ENSURE THAT PANELBOARD DPB AND ASSOCIATED DISTRIBUTION BREAKERS EACH HAVE AN AIC RATING WHICH MEETS AND/OR EXCEEDS THAT WHICH IS DELIVERABLE TO THE SITE.
  c. IF NECESSARY, THE CONTRACTOR SHALL PROVIDE AND INSTALL A UTILITY TRANSFORMER CONCRETE PAD WITH LOAD SIDE CONDUIT/WIRE TO THE SERVICE ENTRANCE EQUIPMENT.

3. ALL PANELBOARD SCHEDULES SHALL BE LAMINATED AND SHALL REFLECT AS-BUILT CONDITIONS.

4. PROVIDE AND INSTALL BONDING BUSHINGS ON ALL SERVICE CONNECTIONS AND GROUNDING LOCKNUTS ON ALL PANEL CONNECTORS.

5. LIGHTNING/SURGE ARRESTOR:
   a. PROVIDE AND INSTALL UL 1449 LIGHTNING/SURGE ARRESTER AS AN INTEGRAL COMPONENT TO EACH PANEL AND PANELBOARD. COORDINATE INSTALLATION REQUIREMENTS AND CIRCUIT BREAKER SELECTION WITH THE PANELBOARD MANUFACTURER. ALL ENCLOSURES INSTALLED UNDER THIS CONTRACT SHALL BE PAD LOCKABLE AND SHALL BE SUPPLIED WITH COMMON KEYED LOCKING DEVICES.

6. POWER, CONTROL AND NETWORK WIRING/CABLE REQUIREMENTS:
   a. ALL WIRE INSTALLED UNDER THIS CONTRACT FOR 120V TO 600V POWER FEEDERS, DISTRIBUTION AND BRANCH CIRCUITS SHALL BE COPPER AND SHALL BE MINIMALLY RATED FOR 75 DEGREES C WET CONDITIONS.
   b. TSP CABLE FOR ANALOG SIGNALS SHALL BE BELDON 8760 MULTI-CONDUCTOR - SHIELDED TWISTED PAIR: 18 AWG STRANDED (16x30) TINNED COPPER CONDUCTORS, POLYETHYLENE INSULATION, TWISTED PAIR, OVERALL BELDFOIL® SHIELD (100% COVERAGE), 20 AWG STRANDED TINNED COPPER DRAIN WIRE, PVC JACKET AND 60 C RATED. ANALOG SIGNALS/WIRING SHALL BE INSTALLED IN A DEDICATED CONDUIT.
   c. CONDUCTORS CARRYING DIGITAL SIGNALS SHALL BE 14 AWG COPPER 60 C RATED WITH PVC JACKETING. DIGITAL SIGNALS/WIRING SHALL BE INSTALLED IN A DEDICATED CONDUIT.
   d. ALL ETHERNET CABLES SHALL BE SHIELDED CAT6 60 C CABLE RATED FOR WET CONDITIONS, METALLIC AND NON-METALLIC CONDUIT USE.
   e. ALL FIBER OPTIC CABLE FURNISHED AND INSTALLED SHALL MEET THE FOLLOWING:
   i. 6 STRAND, MULTIMODE, 50/125 10GB, OM4, DISTRIBUTION CABLE, OFNP PLENUM RATED, INDOOR/OUTDOOR, TIGHT BUFFER, AQUA OUTER JACKET. OCC # DX006TAL39QP.
   ii. BURIED FIBER OPTIC CABLE SHALL BE IN 1.5" GALV. STEEL CONDUIT PAINTED ORANGE BURIED AT LEAST 12 INCHES BELOW GRADE.
   iii. INSTALLED INSIDE A BUILDING SHALL BE IN 1.5" ORANGE COLORED SCH. 80 PVC CONDUIT.
   iv. ATTACHED TO AN EXISTING STRUCTURE EXPOSED TO ELEMENTS SHALL BE IN A 1.5" ORANGE COLORED SCH. 80 PVC CONDUIT.
   v. ALL BENDS AND TRANSITIONS SHALL COMPLY WITH MANUFACTURER STATED MINIMUM BEND RADIUS AND TERMINATION REQUIREMENTS.

7. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH LOCAL CODES AND REGULATIONS.

8. ALL EQUIPMENT SHALL BE PROVIDED WITH LAMICOID NAMEPLATES (3/16" LETTERING MIN.). PLATES SHALL BE BLACK WITH WHITE LETTERS.

9. ALL ENCLOSURES AND CONTROL PANELS SHALL BE AS FOLLOWS UNLESS SPECIFICALLY NOTED OTHERWISE:
   a. UL LISTED FOR THE INTENDED PURPOSE. THIS INCLUDES UL5O8A FOR ALL "ENCLOSED INDUSTRIAL CONTROL PANELS".
   b. ENCLOSURES MOUNTED INSIDE A BUILDING: UL TYPE-12 MINIMUM. ENCLOSURES MOUNTED INSIDE THE CHEMICAL BUILDING: UL TYPE 3R MINIMUM. ENCLOSURES MOUNTED OUTSIDE: UL TYPE 4X MINIMUM.
   c. ALL ENCLOSURES SHALL BE PROVIDED WITH AMBIENT COMPENSATION AS REQUIRED BY THE INSTALLED EQUIPMENT: AIR CONDITIONER FOR ANY ENCLOSURE WITH A VFD THAT IS MOUNTED OUTSIDE; HEATER AND COOLING FANS FOR ALL ENCLOSURES.
   d. ENCLOSURES REQUIRED FOR EQUIPMENT NOT LOCATED WITHIN 1FT OF AN ADJACENT WALL SHALL BE MOUNTED TO AN ELECTRICAL EQUIPMENT STRUCTURE. ALL CONDUIT EXTENDING TO/FROM THE STRUCTURE SHALL BE BELOW GRADE AND SHALL BE STUBBED UP UNDER AND EXTENDED TO THE APPROPRIATE ENCLOSURE.

11. REFERENCE SITE PLAN DRAWINGS FOR EQUIPMENT SITE LOCATIONS AND DISTANCES.

12. GROUNDING ELECTRODES FOR EACH NEW BUILDING AND STRUCTURE:
   a. PROVIDE A CONCRETE ENCASED GROUNDING ELECTRODE IN EVERY NEW BUILDING AND STRUCTURE THAT HAS CAST IN PLACE CONCRETE FOUNDATION AS PART OF THIS PROJECT PER NEC 250.32, 250.35 AND 250,52(A)(3)(2) AND CONNECT TO GROUNDING SYSTEM AS REQUIRED. SEE DETAIL 1 ON S-101 AND COORDINATE WITH CONCRETE SUB-CONTRACTOR.

13. CONDUIT SPECIFICATION
   a. ALL ABOVE GRADE CONDUIT SHALL BE SCH 80 PVC UV RESISTANT, SOLVENT WELDED AND RATED FOR WET AND CORROSIVE ENVIRONMENTS UNLESS NOTED OTHERWISE.
   b. ALL CONDUIT INSIDE AN ENCLOSED BUILDING SHALL BE SCH 80 PVC UV RESISTANT, SOLVENT WELDED AND RATED FOR WET AND CORROSIVE ENVIRONMENTS UNLESS NOTED OTHERWISE.
   c. ALL BELOW GRADE CONDUIT NOT IN A DUCT BANK SHALL BE SCH 80 PVC, SOLVENT WELDED AND RATED FOR WET AND CORROSIVE ENVIRONMENTS.

14. PANELBOARD SPECIFICATION
   a. PROVIDE NEMA PB1 DEAD-FRONT PANELBOARDS, ENCLOSURES AND SUPPORTING COMPONENTS OF TYPES, STANDARDS AND SIZES AS INDICATED OR OTHERWISE COMPLIANT WITH THE NEC, UL AND ESTABLISHED INDUSTRY STANDARDS FOR THE INDICATED APPLICATION. ELECTRICAL COMPONENTS, DEVICES AND ACCESSORIES LABELED AND MARKED FOR INTENDED LOCATION AND APPLICATION.
   b. PANELBOARD SHORT-CIRCUIT CURRENT RATING TO BE FULLY RATED FOR SYSTEM. SHORT CIRCUIT CURRENT RATING SHALL BE GREATER THAN OR EQUAL TO THE FAULT CURRENT DELIVERABLE TO THE PANELBOARD.
   c. PANELBOARDS SHALL HAVE COPPER PHASE BUSSES, COPPER GROUND BUS, AND 100 PERCENT RATED COPPER NEUTRAL BUS. ALL CIRCUIT BREAKERS TO BE BOLT-ON TYPE. CIRCUIT BREAKERS TO HAVE INTERRUPTING CAPACITY TO MEET AVAILABLE FAULT CURRENTS. PANELBOARDS RATED 240V OR LESS SHALL HAVE AIC RATING NO LESS THAN 22KA. PANELBOARDS RATED ABOVE 240V AND LESS THAN 600V SHALL HAVE AIC RATING NO LESS THAN 65KA.
   d. DESIGN ENCLOSURES FOR RECESSED OR SURFACE MOUNTING AS INDICATED. PROVIDE ENCLOSURES WITH DOOR-IN-DOOR CONSTRUCTION. ENCLOSURES SHALL BE RATED FOR ENVIRONMENTAL CONDITIONS AT INSTALLED LOCATION.
      1) INDOOR LOCATIONS SUBJECT TO DUST, DIRT AND DRIPPING LIQUIDS (NONCORROSIVE): NEMA 250, TYPE 12
      2) OUTDOOR LOCATIONS: NEMA 250, TYPE 4X
      3) WET OR DAMP INDOOR LOCATIONS: NEMA 250, TYPE 3R
   e. ENCLOSURES TO MATCH PANELBOARDS. ENCLOSURES AND PANELBOARD TO BE SAME MANUFACTURER. PROVIDE ENCLOSURE WITH CLEAR PANEL SCHEDULE POUCH AND BLANK SCHEDULE CARD.
   f. FOR TYPE 3R, PROVIDE RUST INHIBITING COATING UNDER BAKED ENAMEL FINISH. PROVIDE PROPERLY MATCHED ENCLOSURES MANUFACTURED BY THE SAME MANUFACTURER AS THE PANELBOARD.
   g. ALL MCC / PANELBOARDS FURNISHED AND INSTALLED SHALL BE FROM THE SAME MANUFACTURER FOR COMMONALITY AND FAMILIARITY OF COMPONENTS AND FEATURES.

15. THE CONTRACTOR SHALL CONSIDER VOLTAGE DROP WHEN DETERMINING THE EXACT ROUTING OF BRANCH CIRCUIT AND FEEDER WIRING ADJUST WIRE AND CONDUIT SIZE AS NECESSARY TO COMPLY WITH THE NEC.

16. ALL PLCS ON THIS PROJECT SHALL BE ALLEN BRADLEY MICROLOGIX OR COMPACTLOGIX TYPE.

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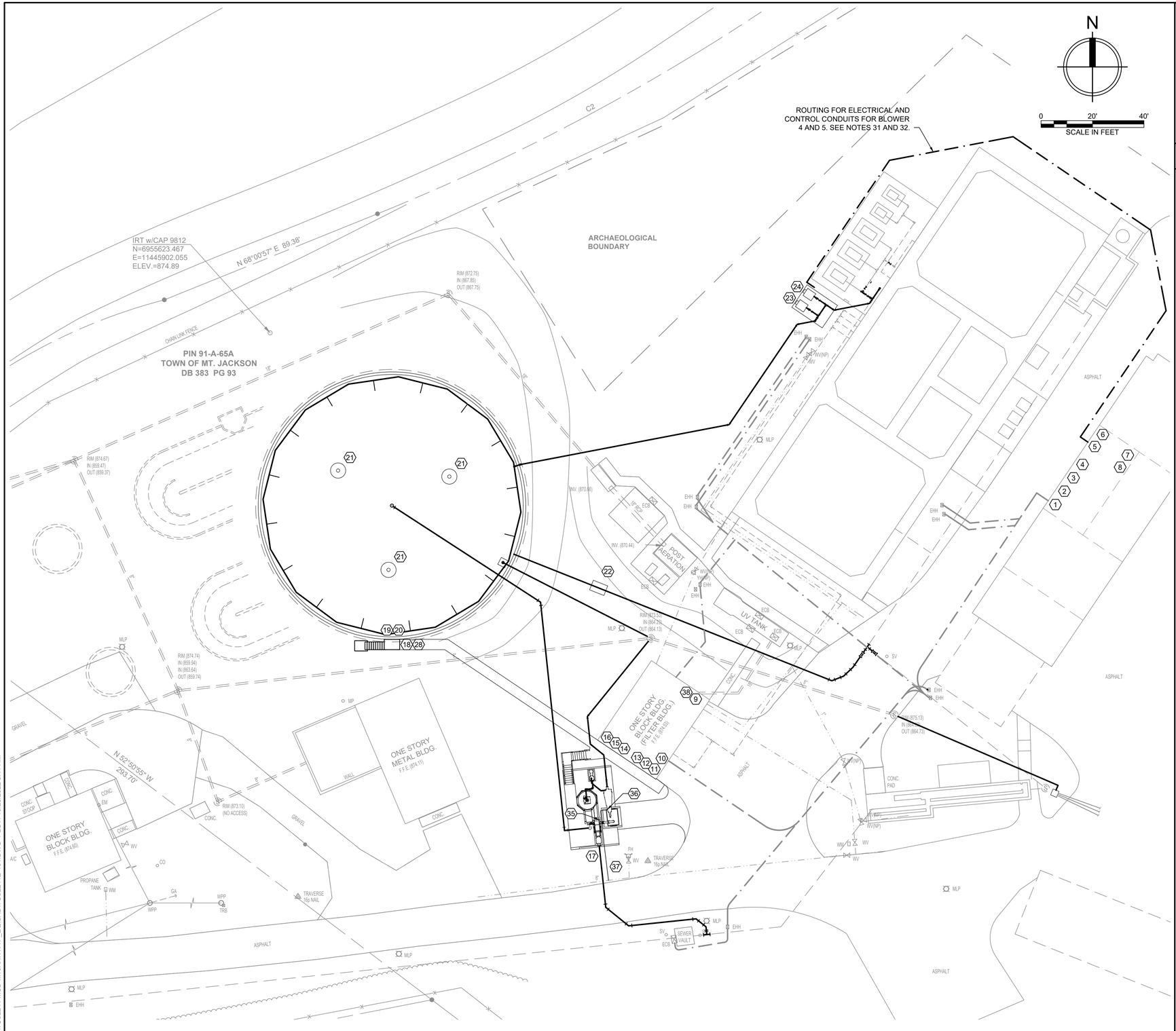
ELECTRICAL NOTES

E-001

SHEET 17 OF 20



GENERAL NOTES:

A. SEE E-001 FOR ADDITIONAL REQUIREMENTS.

B. SEE E-601 FOR SUPPLEMENTAL INFORMATION FOR I&C CONTROL WIRING AND SCADA PROGRAMMING.

C. SEE E-801 FOR ADDITIONAL CONDUIT AND WIRING REQUIRED FOR THIS PROJECT.

D. ALL FIBER OPTIC RUNS SHALL PROVIDE AN 18" SQUARE 12" DEEP WATER TIGHT TRANSITION BOX WITH 3 FT OF IN-LINE CONTINUOUS RUN COILED FIBER CABLE AT THE START/FINISH OF EXTERIOR EACH RUN AND AT THE TRANSITION FROM EXTERIOR TO INTERIOR CONDUITS. SEE E-001 FOR FIBER CABLE TYPE AND INSTALLATION (MINIMUM RADIUS) REQUIREMENTS.

KEY NOTES:

1. EXISTING PANEL H1.
2. EXISTING XFMR T-1.
3. EXISTING PANEL L1.
4. EXISTING PANEL L1A.
5. EXISTING MAIN DISCONNECT.
6. EXISTING ATS.
7. EXISTING PANEL MDP.
8. EXISTING MCC1 (AQUA AEROBICS PANEL). SEE NOTE 33.
9. CHEM SCAN UNIT.
10. POINT I/O REMOTE NETWORK HEAD. SEE NOTE 33.
11. EXISTING PANEL H3.
12. EXISTING XFMR T3.
13. EXISTING PANEL L3.
14. MIXER 1 MOTOR STARTER.
15. MIXER 2 MOTOR STARTER.
16. MIXER 3 MOTOR STARTER.
17. SCREEN AND GRIT CONTROL PANEL. SEE NOTE 29.
18. LEVEL ELEMENT. SEE NOTE 28.
19. MIXER CONTROL PANEL. SEE NOTE 25.
20. FUSED DISCONNECT. SEE NOTES 26 AND 27.
21. 5HP ANOXIC FLOATING MIXER.
22. MODULATING VALVE. SEE NOTE 30.
23. SBR BLOWER NO. 5. SEE NOTE 32.
24. SBR BLOWER NO. 4. SEE NOTE 31.
25. 1.5"C W/ 3 #12 AND 1 #12 GND FROM MIXER CONTROL PANEL TO EXISTING PANEL H-3. 1"C W/ 5 #14 FROM MIXER CONTROL PANEL TO NEW REMOTE HEAD IN FILTER BUILDING.
26. 480V 3P FUSED DISCONNECT FOR MIXER MOUNTED ON PLATFORM HANDRAIL, TYP OF 3.
27. 1"C W/ 3 #10 AND 1 #10 GND FROM MIXER DISCONNECT TO NEW WALL MOUNTED MOTOR STARTER WITH THERMAL OVERLOAD PROTECTION LOCATED IN FILTER BUILDING, TYP OF 3. 1C W/ 3 #10 AND 1 #10 GND FROM MOTER STARTER TO A NEW 3P 480V 30 AMP BREAKER IN EXISTING PANEL H3 IN FILTER BUILDING, TYP OF 3. 3/4"C W/ 4 #14 FROM MOTOR STARTER TO POINT I/O REMOTE NETWORK HEAD IN FILTER BUILDING, TYP OF 3.
28. PRESSURE TRANSDUCER TO BE MOUNTED TO THE 4" TANK FLANGED WALL PIPE WITH A BLIND FLANGE, STAINLESS STEEL NIPPLE AND STAINLESS BALL VALVE. BALL VALVE SHALL FACILITATE REMOVAL OF PRESSURE TRANSDUCER WITHOUT REMOVING TANK FROM SERVICE. ON SAMPLE CIRCUIT, DUPLEX GFCI WITH IN-USE COVER ON STAINLESS STEEL UNISTRUT MOUNTED 24" ABOVE GRADE FOR COMPOSITE SAMPLER. 3/4"C W/ 2 #12 AND 1 #12 GND FROM LEVEL TRANSMITTER AND NEW GFCI OUTLET TO NEW 120V 20 AMP BREAKER IN EXISTING PANEL L3.
29. 480V 3P FUSED DISCONNECT MOUNTED ON SS UNISTRUT. 1.5"C W/ 4 #8 AND 1 #8 GND FROM SCREEN/GRIT CONTROL PANEL TO NEW 3P 480V 40 AMP BREAKER IN EXISTING PANEL H3 IN FILTER BUILDING. 3/4"C W/ 2 FIBER CABLES (1 ACTIVE, 1 SPARE) FROM SCREEN/GRIT CONTROL PANEL TO POINT I/O REMOTE NETWORK HEAD IN FILTER BUILDING WITH ETHERNET FIBER SWITCH AT STARTING AND TERMINUS.
30. 3/4"C W/ 4 #12 AND 1 #12 GND FROM MODULATING VALVE TO NEW 3P 480V 20 AMP BREAKER IN EXISTING PANEL H3. 3/4"C W/ 4 TSP (2 ACTIVE, 2 SPARE) FROM VALVE TO POINT I/O REMOTE NETWORK HEAD IN FILTER BUILDING. 3/4"C W/ 2 #14 (1 ACTIVE, 1 SPARE) FROM VALVE TO POINT I/O REMOTE NETWORK HEAD IN FILTER BUILDING.
31. 3"C W/ 4 #10 AND #4 GND FROM NEW BLOWER 4 TO EXISTING PANEL MDP IN EXISTING ELECTRICAL ROOM. NEW 3P 480V 75 AMP BREAKER IN EXISTING PANEL MDP. 3/4"C W/ 1 FIBER CABLE WITH ETHERNET SWITCHES FROM BLOWER 4 TO EXISTING MCC1 (AQUA AEROBIC PANEL) IN EXISTING ELECTRICAL ROOM.
32. 3"C W/ 4 #1/0 AND #4 GND FROM NEW BLOWER 5 TO EXISTING PANEL MDP IN EXISTING ELECTRICAL ROOM. NEW 3P 480V 75 AMP BREAKER IN EXISTING PANEL MDP. 3/4"C W/ 1 FIBER CABLE WITH ETHERNET SWITCHES FROM BLOWER 5 TO EXISTING MCC1 (AQUA AEROBIC PANEL) IN EXISTING ELECTRICAL ROOM.
33. UTILIZE SPARE CONDUITS IN EXISTING DUCT BANK FOR ROUTING FIBER FROM FILTER BUILDING TO EXISTING MCC1. 1"C W/ 2 FIBER CABLES (1 ACTIVE, 1 BACKUP) WITH ETHERNET SWITCHES FROM NEW POINT I/O REMOTE NETWORK HEAD IN FILTER BUILDING TO EXISTING MCC1 (AQUA AEROBIC PANEL) IN EXISTING ELECTRICAL ROOM.
34. 3/4"C W/ 2 #12 AND 1 #12 GND FROM CHEM SCAN UNIT TO NEW 120V 20 AMP BREAKER IN EXISTING PANEL L3. 3/4"C W/ 2 CAT 5 CABLES (1 ACTIVE, 1 SPARE) FROM CHEM SCAN UNIT TO NEW POINT I/O REMOTE NETWORK HEAD IN FILTER BUILDING.
35. 3/4"C W/ 2 #12 AND 1 #12 GND FOR SCREEN WASH WATER HEAT TRACE TO PANEL L3 IN FILTER BUILDING WITH 120V 20 AMP BREAKER.
36. 3/4"C W/ 2 #12 AND 1 #12 GND FOR GRIT WASH WATER HEAT TRACE TO PANEL L3 IN FILTER BUILDING WITH 120V 20 AMP BREAKER.
37. 3/4"C W/ 2#12 AND 1 #12 GND FOR RPZ HOT BOX TO PANEL L3 IN FILTER BUILDING WITH 120V 20 AMP BREAKER.
38. EXISTING FIBER JUNCTION PANEL.

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ELECTRICAL SITE PLAN

E-101

SHEET 18 OF 20

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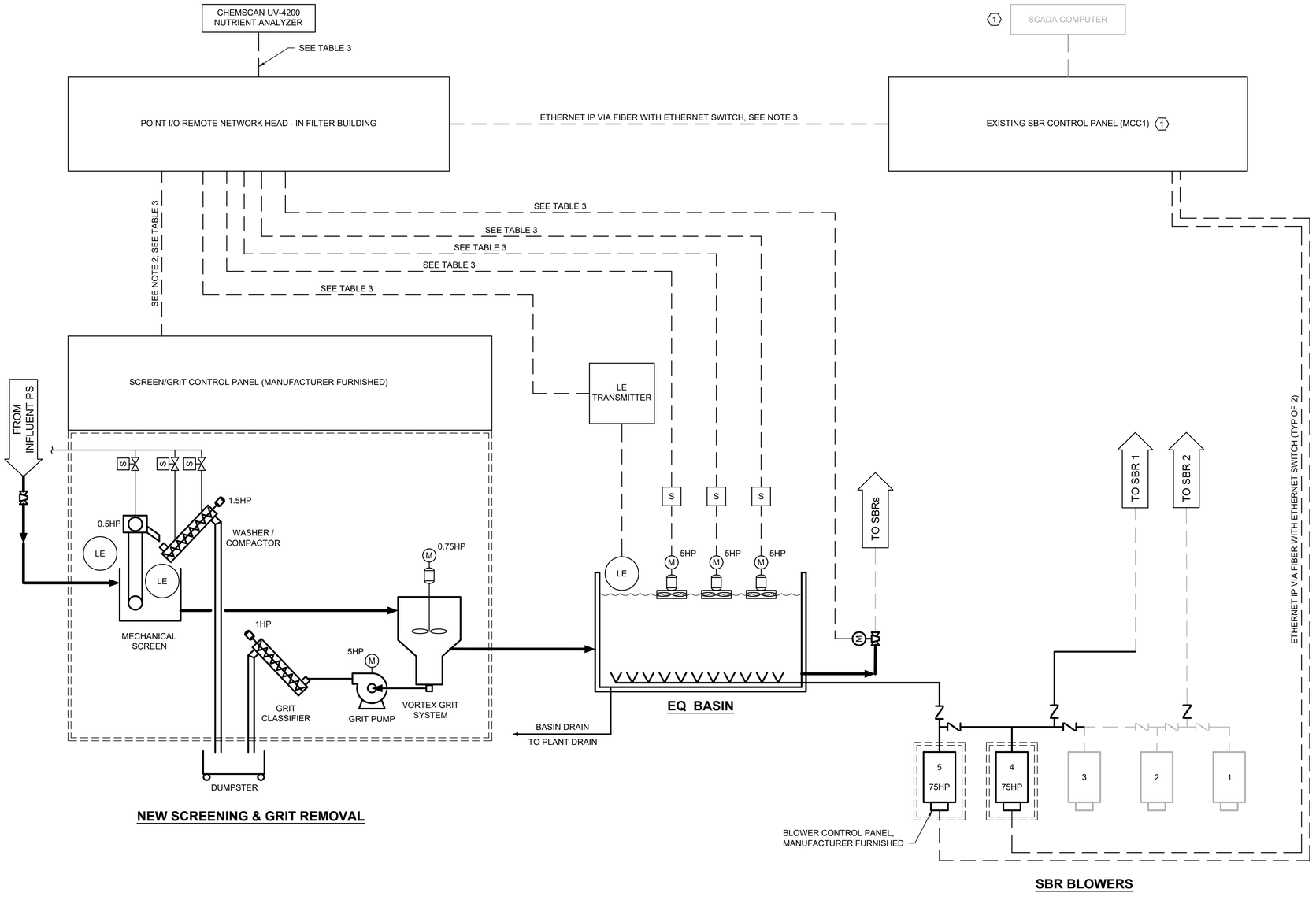

NEW SCREENING & GRIT REMOVAL

SBR BLOWERS

TABLE 1						
CONNECTED I/O POINTS & ETHERNET PORTS AT EACH REMOTE NETWORK HEAD						
REMOTE NETWORK HEAD LOCATION	AI	AO	DI	DO	ETHERNET IP	MODBUS TCP
FILTER BLDG	2	1	5	6	2	CAPABLE

TABLE 2					
MINIMUM INSTALLED I/O POINTS & ETHERNET PORTS AT EACH REMOTE NETWORK HEAD					
REMOTE NETWORK HEAD LOCATION	AI	AO	DI	DO	ETHERNET PORTS
FILTER BLDG	8	8	12	12	4

TABLE 3

DESCRIPTION OF SIGNAL & PLC/SCADA PROGRAMMING FEATURES	SIGNAL TYPE	SCREEN/ GRIT	EQ LEVEL	EQ MIXER 1	EQ MIXER 2	EQ MIXER 3	EQ VALVE	SBR BLOWER No. 4	SBR BLOWER No. 5	CHEM SCAN NUTRIENT ANALYZER
REMOTE START	DO	✓		1	1	1		✓	✓	
REMOTE STOP	DO	✓		1	1	1		✓	✓	
LOCAL/REMOTE CONTROL STATUS	DI	✓						✓	✓	
STATUS INDICATION	DI	✓		1	1	1		✓	✓	✓
GENERAL ALARM	DI	✓	1				1	✓	✓	✓
SPARE DIGITAL CABLE/CONDUCTOR(S)			1	1	1	1	1			
SPEED CONTROL OR POSITION CONTROL	AO						1			
FEED BACK ON SPEED OR POSITION INDICATION	AI						1			
INSTRUMENT READING(S)	AI	✓	1					✓	✓	✓
SPARE ANALOG CABLE(S)			1				2			
ETHERNET IP VIA FIBER W/ ETHERNET SWITCHES	NETWORK	✓						✓	✓	
ETHERNET IP VIA CAT 5 CABLE	NETWORK									✓
SPARE NETWORK CABLES	NETWORK	1						2		1

LEGEND

- EXISTING FEATURE
- EXISTING PROCESS FLOW
- NEW FEATURE
- PROCESS FLOW
- COMPONENTS SPECIFIED AS PART OF A PACKAGE SYSTEM

GENERAL SHEET NOTES

A. THIS DRAWING ONLY SCHEMATICALLY REPRESENTS INSTRUMENTATION AND CONTROL FRAMEWORK. REFER TO E-001 AND E-801 FOR ALL POWER WIRING AND CONDUIT INFORMATION.

B. REFER TO E-001 FOR CONTROL WIRE/CABLE AND CONDUIT SPECIFICATIONS.

C. REFER TO E-101 AND E-801 FOR SIZE AND QUANTITY OF CONTROL WIRE/CABLE AND SIZE AND QUANTITY OF CONTROL CONDUITS.

D. THE GENERAL CONTRACTOR SHALL ENGAGE THE SERVICES OF VALLEY AUTOMATION INC. (VAI) OF LURAY VIRGINIA AS THE POINT I/O AND FIBER OPTIC CONTROLS SYSTEM SUBCONTRACTOR RESPONSIBLE FOR THE REMOTE NETWORK HEAD(S) AND THE ASSOCIATED FIBER FOR THIS PROJECT. VAI SHALL BE RESPONSIBLE FOR FURNISHING ALL PANELS, SOFTWARE, HARDWARE, PLC PROGRAMING, ANCILLARY EQUIPMENT AS REQUIRED AND COMMISSIONING TO CREATE THE REMOTE NETWORK HEAD(S) AND THE ASSOCIATED FIBER DESCRIBED, REFERENCED, AND SHOWN ON THIS SHEET.

E. THE GENERAL CONTRACTOR'S ELECTRICAL SUBCONTRACTOR (ES) WILL BE RESPONSIBLE FOR FURNISHING AND INSTALLING ALL ELECTRICAL AND INSTRUMENTATION CONTROL WIRING, CONDUIT AND FIBER OPTIC CABLE. THE ES SHALL INSTALL AND TERMINATE ALL FIELD INSTRUMENTATION CONTROL DEVICES AND SHALL LAND AND TERMINATE ALL POWER AND INSTRUMENTATION CONTROL WIRING EXCEPT FOR THE FOLLOWING:

1. VAI SHALL TERMINATE ALL CONTROL WIRING IN PANELS FURNISHED BY VAI.
2. VAI SHALL PERFORM ALL FIBER OPTIC TERMINATIONS.

KEY NOTES:

1. THE GENERAL CONTRACTOR SHALL ENGAGE THE SERVICES OF AQUA AEROBIC OF ROCKFORD ILLINOIS TO FURNISH AND INSTALL ALL NECESSARY SOFTWARE, PROGRAMMING, HARDWARE, AND INSTALLATION SERVICES THAT ARE NECESSARY TO UPGRADE THE EXISTING SBR CONTROL PANEL PURSUANT TO THE FOLLOWING:
   a. INCORPORATE ALL NEW CONTROL SIGNALS AS SCHEMATICALLY INDICATED ON THIS DRAWING AND AS DESCRIBED ON E-001 AND E-101. NEW CONTROL SIGNALS WILL BE CONVEYED TO THE UPGRADED SBR CONTROL PANEL USING ETHERNET IP PROTOCOLS USING FIBER OPTIC WITH ETHERNET SWITCHES.
   b. SBR "FAST FILL" CONTROL SCHEME UTILIZING NEW MODULATING EQ CONTROL VALVE, LEVEL ELEMENTS IN THE EQ TANK AND SBR TANKS WITH AN APPROPIATE CONTROL ALGORITHM TO HAVE FAST FILL BE CONTROLLED BY THE FOLLOWING:
      1) CONCLUDE FAST FILL IF EQ TANK REACHES AN OPERATOR ADJUSTABLE LOW-LEVEL SETTING (INITIAL SETTING EQ 50% FULL).
      2) CONCLUDE FAST FILL AFTER AN OPERATOR ADJUSTABLE DURATION OF TIME HAS ELAPSED FOR FILLING A SINGLE SBR (INITIAL SETTING 1 HOUR).
      3) CONCLUDE FAST FILL IF THE FILLING SBR TANK REACHES AN OPERATOR ADJUSTABLE LEVEL SETTING (INITIAL SETTING 2 FT BELOW HWL).
      4) PROVIDE A TOGGLE ON THE FAST FILL SCREEN ON THE SBR HMI TO ENABLE STORM 1 AND STORM 2 MODES TO BE INACTIVATED.
      5) INCORPORATE EQ TANK HIGH-LEVEL SET POINT (OPERATOR ADJUSTABLE) FOR TRIGGERING STORM MODE 2 AND 3.
   c. DEDICATED SBR AERATION BLOWER SCHEME: TWO BLOWERS FOR DEDICATED OPERATION OF SBR 1; TWO BLOWERS FOR DEDICATED OPERATION OF SBR 2 AND ONE SHARED BACKUP BLOWER.
   d. DEDICATED SBR BLOWER OPERATIONAL SCHEME SHALL ENABLE THE ELIMINATION OF UTILIZING THE EXISTING ELECTRICALLY ACTUATED AIR CONTROL VALVES.
   e. DEVELOP AND INSTALL A SCADA SCREEN FOR THE NEW INFLUENT SCREEN AND GRIT SYSTEM PERSUANT TO TABLE 3.
   f. UPDATE THE SBR AND SBR BLOWER SCADA SCREEN TO REFLECT NEW BLOWERS AND DEDICATED CONFIGURATION.
   g. UPDATE SBR CONTROL LOGIC IN THE SBR PLC TO ENABLE ALL CYCLE TIME CONFIGURATIONS THAT ARE NOW POSSIBLE DUE TO THE NEW DEDICATED BLOWER CONFIGURATION. (I.E. REMOVE RESTRICTIONS LOGIC).
   h. UPDATE THE EXISTING ALLEN BRADLEY PLC (SLK 50) AND ALL RELATED EXISTING I/O CARDS/COMPONENTS WITH AN AB COMPACT LOGIX PLC AND RELATED COMPONENTS WHICH ALSO INCORPORATES THE NEW CONTROL SIGNALS THAT ARE SCHEMATICALLY SHOWN ON THIS DRAWING.
2. ETHERNET IP VIA FIBER TO CONVEY THE FOLLOWING SIGNALS FROM THE SCREENING & GRIT PACKAGE SYSTEM TO THE REMOTE NETWORK HEAD TO ENABLE THE FOLLOWING TO BE CONTROLLED AND OBSERVED FROM THE EXISTING PLANT SCADA SYSTEM:
   a. REMOTE START OF THE SCREENING SYSTEM; REMOTE STOP OF THE SCREENING SYSTEM; REMOTE START OF THE GRIT SYSTEM; REMOTE STOP OF THE GRIT SYSTEM; DISPLAY OF LOCAL/REMOTE CONTROL STATUS FOR EACH SCREENING SUB-SYSTEM THAT HAS A FIELD MOUNTED HOA SWITCH; DISPLAY OF LOCAL/REMOTE CONTROL STATUS FOR EACH GRIT SUB-SYSTEM THAT HAS A FIELD MOUNTED HOA SWITCH; STATUS INDICATION OF ALL MOTORS; UPSTREAM WATER LEVEL OF SCREEN; DOWNSTREAM WATER LEVEL OF SCREEN, GENERAL ALARM FOR SCREENING SYSTEM; GENERAL ALARM FOR GRIT SYSTEM.
3. UTILIZE EXISTING FIBER STRANDS WHICH TERMINATE IN FIBER JUNCTION BOX IN FILTER BUILDING AND AT EXISTING SBR CONTROL PANEL.

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COMMONWEALTH OF VIRGINIA
CARL ROBERT LAWRENCE MANGRUM
Lic. No. 33450
10/24/2022
REGISTERED PROFESSIONAL ENGINEER

MOUNT JACKSON WWTP
EQUALIZATION PROJECT

OWNER:
TOWN OF MOUNT JACKSON
MOUNT JACKSON, VIRGINIA

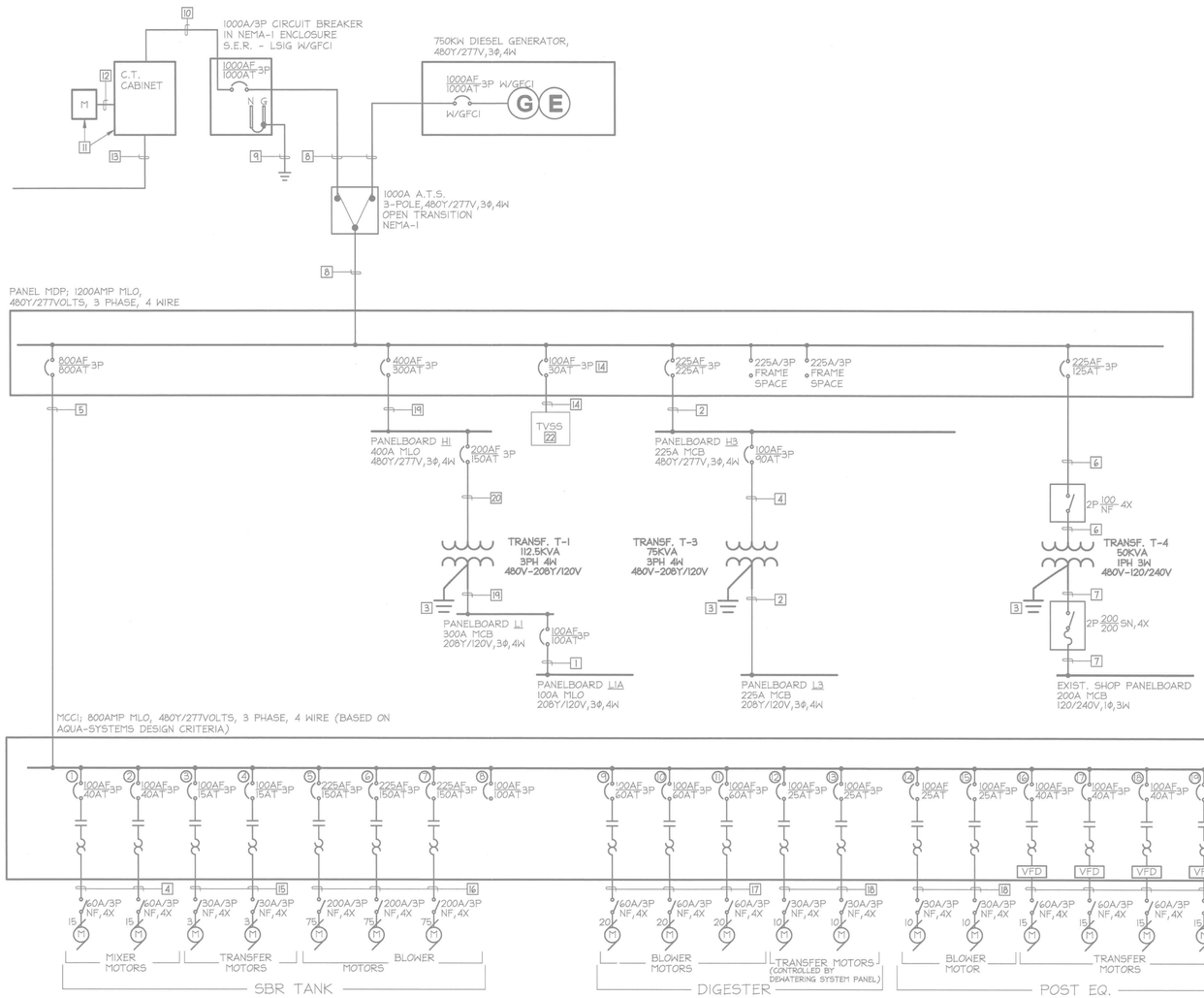
MARK	DATE	DESCRIPTION
0	10/24/2022	BID SET

PROJECT NO: TCS2241
DATE: OCTOBER 24, 2022
DRAWN BY: MCT
CHECKED BY: CRLM
SHEET TITLE

I&C AND CONTROL NETWORK SCHEMATIC

E-601

SHEET 19 OF 20



EXISTING ELECTRICAL SERVICE SINGLE LINE DIAGRAM

NOT TO SCALE

PANEL H3 — 480/277 VOLTS, 3 PHASE, SURF. MOUNTING, 4 WIRE, 225 A M.C.B. 22 MINIMUM KAIC SYMMETRICAL (W/ GND. BUS)

CIR. NO.	TO FEED	LOAD - KVA A PH.	B PH.	C PH.	CCT.BRKR. AMP-POLES	WIRE SIZE	CIR. NO.	TO FEED	LOAD - KVA A PH.	B PH.	C PH.	CCT.BRKR. AMP-POLES	WIRE SIZE
1	LIGHTING	0.90			20 A- 1 P	12	2					20 A- 1 P	12
3	O.S. LIGHTING		0.42		20 A- 1 P	12	4					20 A- 1 P	12
5	SPACE						6	SPARE				20 A- 1 P	
7	FILTER CONTROL PANEL	1.60			20 A- 3 P	12	8	SPARE				20 A- 1 P	
			1.60				10	SPARE				20 A- 1 P	
				1.60			12	SPARE				20 A- 1 P	
13	FILTER CONTROL PANEL	1.60			20 A- 3 P	12	14	SPARE				20 A- 1 P	
			1.60				16	SPARE				20 A- 1 P	
				1.60			18	SPACE				1 P	
19							20	SPACE				1 P	
							22	SPACE				1 P	
							24	SPACE				1 P	
25	MOTOR OPERATED GATE	1.00			15 A- 3 P	10	26	SPACE				1 P	
			1.00				28	SPACE				1 P	
				1.00			30	SPACE				1 P	
31	SPACE				1 P		32	SPACE				1 P	
33	SPACE				1 P		34	SPACE				1 P	
35	SPACE				1 P		36	SPACE				1 P	
37	PANEL L3 VIA XRMR T-3	3.68			90 A- 3 P	3	39						
			5.12										
				3.84									
	SUB-TOTAL KVA	20.29	22.92	19.80				SUB-TOTAL KVA					
								TOTAL BY PHASE KVA					
	LOCATED IN SPACE : Filter Building - Electrical Room							TOTAL BY PHASE AMP					
								TOTAL PANEL KVA					

NOTES :

PANEL L3 — 208/120 VOLTS, 3 PHASE, SURF. MOUNTING, 4 WIRE, 225 A M.C.B. 10 MINIMUM KAIC SYMMETRICAL (W/ GND. BUS)

CIR. NO.	TO FEED	LOAD - KVA A PH.	B PH.	C PH.	CCT.BRKR. AMP-POLES	WIRE SIZE	CIR. NO.	TO FEED	LOAD - KVA A PH.	B PH.	C PH.	CCT.BRKR. AMP-POLES	WIRE SIZE
1	RECEPTACLES	0.90			20 A- 1 P	12	2	COMPOSITE SAMP.	1.50			20 A- 1 P	12
3	RECEPTACLES		0.72		20 A- 1 P	12	4			1.00		20 A- 1 P	12
5	EF-6			0.86	20 A- 1 P	12	6	UV-DISINF. REC			1.40	20 A- 1 P	12
7	SPARE				20 A- 1 P		8	UV-DISINF. REC	1.40			20 A- 1 P	12
9	FIRE ALARM NAC2		1.00		20 A- 1 P	12	10	UV-DISINF. REC		1.40		20 A- 1 P	12
11	EUH-6				20 A- 1 P		12	UV-DISINF. REC			1.40	20 A- 1 P	12
13	NORTH				20 A- 1 P		14	REC. UV-DISINF. RECIRCULATION STATION	0.18			20 A- 1 P	12
15	EUH-5				20 A- 1 P		16			1.00		20 A- 1 P	12
17	SOUTH				20 A- 1 P		18	REC. NON-POT.			0.18	20 A- 1 P	12
19	SPARE				20 A- 1 P		20	SPACE				1 P	
21	SPARE				20 A- 1 P		22	SPACE				1 P	
23	SPARE				20 A- 1 P		24	SPACE				1 P	
25	SPARE				20 A- 1 P		26	SPACE				1 P	
27	SPARE				20 A- 1 P		28	SPACE				1 P	
29	SPARE				20 A- 1 P		30	SPACE				1 P	
31	SPARE				20 A- 1 P		32	SPACE				1 P	
33	SPACE				1 P		34	SPACE				1 P	
35	FRONT GATE				1 P		36	SPACE				1 P	
37	METER PIT SUMP PUMP				1 P		38	SPACE				1 P	
39	INFLUENT FLOW METER				1 P		40	SPACE				1 P	
41	SPACE				1 P		42	SPACE				1 P	
	SUB-TOTAL KVA	0.90	1.72	0.86				SUB-TOTAL KVA	3.08	3.40	2.98		
								TOTAL BY PHASE KVA	3.98	5.12	3.84		
	LOCATED IN SPACE : Filter Building - Electrical Room							TOTAL BY PHASE AMP	33.17	42.67	32.00		
								TOTAL PANEL KVA		12.94			

NOTES:

PANEL MDP1 — 480/277 VOLTS, 3 PHASE, 1200 A M.L.O. PANELBOARD ASSEMBLY FULLY RATED AT, SURF. MOUNTING, 4 WIRE, 42 MINIMUM KAIC SYMMETRICAL (W/ GND. BUS)

CIR. NO.	TO FEED	LOAD - KVA A PH.	B PH.	C PH.	CCT.BRKR. AMP-POLES	WIRE SIZE	CIR. NO.	TO FEED	LOAD - KVA A PH.	B PH.	C PH.	CCT.BRKR. AMP-POLES	WIRE SIZE
1	PANEL H1	53.29			300 A- 3 P	350	2	SPACE					
			54.14			KCMIL	4	SPACE					
				46.67			6	SPACE					
7	PANEL H3	34.50			225 A- 3 P	4/0	8	SPACE					
			39.11				10	SPACE					
				31.16			12	SPACE					
13	MCC1	147.53			800 A- 3 P	2SETS	14	SPACE					
	AQUA-SYSTEM		147.53			500	16	SPACE					
	CONTROL PANEL			147.53		KCMIL	18	SPACE					
19	EXISTING SHOP	15.30			125 A- 2 P	1	20	SPACE					
	BUILDING PANEL		15.30				22	SPACE					
23	SPACE				1 P		24	SPACE					
25	NON-POTABLE	11.07			80 A- 3 P	4	26	SPACE					
	WATER PUMPS		11.07				28	SPACE					
				11.07			30	SPACE					
31	TVSS				30 A- 3 P	10	32	SPACE					
							34	SPACE					
							36	SPACE					
37	SPACE						38	SPACE					
39	SPACE						40	SPACE					
41	SPACE						42	SPACE					
	SUB-TOTAL KVA	261.68	267.14	236.42				SUB-TOTAL KVA					
								TOTAL BY PHASE KVA	261.68	267.14	236.42		
	LOCATED IN SPACE : Control Building Electrical Room							TOTAL BY PHASE AMP	944.69	964.40	853.51		
								TOTAL PANEL KVA		765.24			

NOTES :

EXISTING PANEL SCHEDULES

NOT TO SCALE

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ELECTRICAL SINGLE DIAGRAM

E-801

SHEET 20 OF 20

X:\PROJ\TCS2241-MCD-MTJAXWWTP_EQ\CAD\TCS2241E-801.DWG PLOT: 10/28/2022 8:41 AM