SEWAGE TREATMENT SYSTEM DESIGN

FOR:
Ian and Quinessa Avery
8141 Bridle Rd
Cincinnati, OH 45244
Hamilton County
0500-0142-0047-00
4.104 acres

BY:
Cindaco Design
P.O. Box 19684
Cincinnati, OH 45219
513-909-4768
mmorris@cindaco.com
Site Visit Date: 1/23/23

PERMITTING:
Hamilton County Public Health

DESIGN DETAILS:
Jet J-500PLT with UV to Infiltrator 1500 gal single compartment dose tank to plow-in drip irrigation with upper and lower drains
NOTE: THIS SYSTEM IS DESIGNED WITH THE ABILITY TO ADD ADDITIONAL DRIP ZONES SHOULD THEY BE NEEDED IN THE FUTURE.

DESIGN RATIONALE:
This sewage treatment system is a replacement sts for a 4 bedroom existing residential structure. For this design, a bedroom is defined as a room with at least 70 sf, multiple means of egress which is not through another room, a closet or area that can be easily finished as a closet, a door or opening that can be easily finished with a door. Each room that meets all four criteria is counted as a bedroom. For every two rooms that meet three of four criteria an additional bedroom will be added to the total count, because these rooms have a high likelihood to be used as a bedroom in the future. 120 gallons per day (gpd) per bedroom is used to calculate the Daily Design Flow per OAC 3701-29-11 (B)(1).

Daily Design Peak Flow: 480 gpd. Peak flow should not be reached on a routine basis.

Average Flow: 288 gpd can be accommodated routinely with typical residential wastewater strength as specified in OAC 3701-29 for households.

Soil Conditions: silt loam with strong granular structure, >10% field verified slope, with a perched seasonal water table 18" below grade, and flow restrictive layer 20" below grade. The soil is not highly weathered, therefore requires 24" vertical separation distance and 8" in-situ soil. The soil has 18" in-situ soil, and the infiltrative surface is 7" max below grade, therefore the infiltrative distance is 11". 24" soil credit depth credit is provided. Based on these soil conditions, the Linear Loading Rate (LLR) is 2.4 gpd/LF, and the Soil Infiltrative Loading Rate (SILR) is 0.25 gpd/sf with Pretreated effluent for drip system microdosing.

Minimum Design Length: 480 gpd ÷ 2.4 gpd/LF = 200 LF. 146 LF is provided in this design. This utilizes a 27% length reduction allowed per OAC 3701-29-15 (N)(2)(h).

Minimum Design Area: 480 gpd ÷ 0.25 gpd/SF = 1920 SF. 2,286 SF is provided in this design.

Based on the existing conditions, current and future use of property, site encumbrances, available systems types, maintenance, cost, etc., Owner chose plow-in drip irrigation with upper and lower drains with Pretreated effluent. **A VARIANCE IS REQUIRED FOR SETBACK DISTANCES AND FOR SYSTEM LENGTH.**

SYSTEM COST INFORMATION:
The property owner has been informed of system options and associated costs. Cindaco Design estimates the system costs as follows
Installation Cost: $50,000-65,000
Annual Operation Cost: $500-1,000
*This is a general estimate of system cost based on prior experience and is not a bid for installation

CHANGES AND USE OF THIS DESIGN:
This plan is the sole ownership of the designer and may not be altered, changed, used, or manipulated without approval of designer and the permitting health department. Cindaco Design is available to answer questions about design and make adjustments as needed.

SYSTEM INSTALLATION, OPERATION, AND MAINTENANCE:
All system components must be installed, operated, and maintained in accordance with manufacturer specifications, Ohio Department of Health (ODH) product approval, and permitting health department permit terms and conditions. If conflicts exist, consult Cindaco Design.
Installation, operation and maintenance manuals:
Health Department Installation Manual:
https://www.hamiltoncountyhealth.org/wp-content/uploads/HSTS-Manual-Part-1.pdf
Septic Tank / Pretreatment Unit: www.cindaco.com/design/resources
Dose Tank: www.cindaco.com/design/resources
Pump: www.cindaco.com/design/resources
Control Panel(s): Sheet C-7
Floats/Transducer: www.cindaco.com/desing/resources
General operation/maintenance: https://www.epa.gov/septic/how-care-your-septic-system

STS PLANS APPROVED
OCT 18 2023
HCPH-Water Quality Division

It the installation contractor's responsibility to verify that the system can be installed as designed based on the preliminary layout by designer. It is the installation contractor's and property owner's responsibility to inform designer of any changes in site conditions that could effect the installation, operation, or maintenance of the STS. Soil disturbances may affect the performance of soil absorption components, cause the system to fail, or necessitate relocation. If changes are required to the design, redesign fees may apply. It is the owner and installation contractor's responsibility to locate underground utilities. If utilities interfere with with the designed system, construction shall not proceed without approval from designer and the permitting authority. No clearwater connections (downspouts, pool/spa water, foundation drains, cisterns, etc.) shall be connected to the STS. All system components must meet horizontal isolation distances in OAC 3701-29-06 (G)(3)

SYSTEM PROTECTION
Property Owner, Installation Contractor, and General Contractor (if applicable) are responsible to protect all primary and reserve soil absorption areas from disturbance. Only excavate and/or chisel plow soil absorption area when dry and friable to a depth of 12" or the infiltrative surface depth plus 1", whichever is greater. Excavation shall conform to the permitting health department's installation manual. Keep wheeled vehicles off of soil absorption areas at all times. Replacement/reserve area, if designated on plan, is set aside for the future replacement of the system should this system fail. Reserve area shall remain undisturbed indefinitely or until municipal sewers are installed to serve the property or a replacement system is installed. **Clearing of soil absorption area shall be performed by hand or with small, tracked equipment with low ground pressure (less than 5 psi) when the soil is dry. Disturbance to the soil due to clearing may invalidate this design.** After installation, no paint, chemicals, bleach, etc. shall enter system. See https://www.epa.gov/septic/how-care-your-septic-system for general system care instructions.

DISCLAIMER:
This plan set is not a site plan to be used for constructing anything other than the STS. If an accurate legal site plan is required, contact a professional surveyor. This plan offers no guarantee as to the accuracy of the of the information provided. This plan offers no guarantee for site stability. If site stability may be an issue, consult a geotechnical engineer. This plan is only as accurate as the information provided by the property owner to the designer. If no survey is provided, local GIS is used for the basis of the plan. Easements, right-of-ways, hidden objects, or information not communicated to the designer invalidates the design. It is the property owner's responsibility to review this plan and information provided to verify all site conditions and deign assumptions are correct. If conflicts are found or additional information must be supplied, the owner shall not proceed until the approval is granted. This design shall in no way be taken as a guarantee that the system will function in a satisfactory manor for any given period of time, or that Cindaco Deisgn or any of its agents or employees assume any liability for damages, consequential or direct, which are caused, or which may be caused by a malfunction of the STS.

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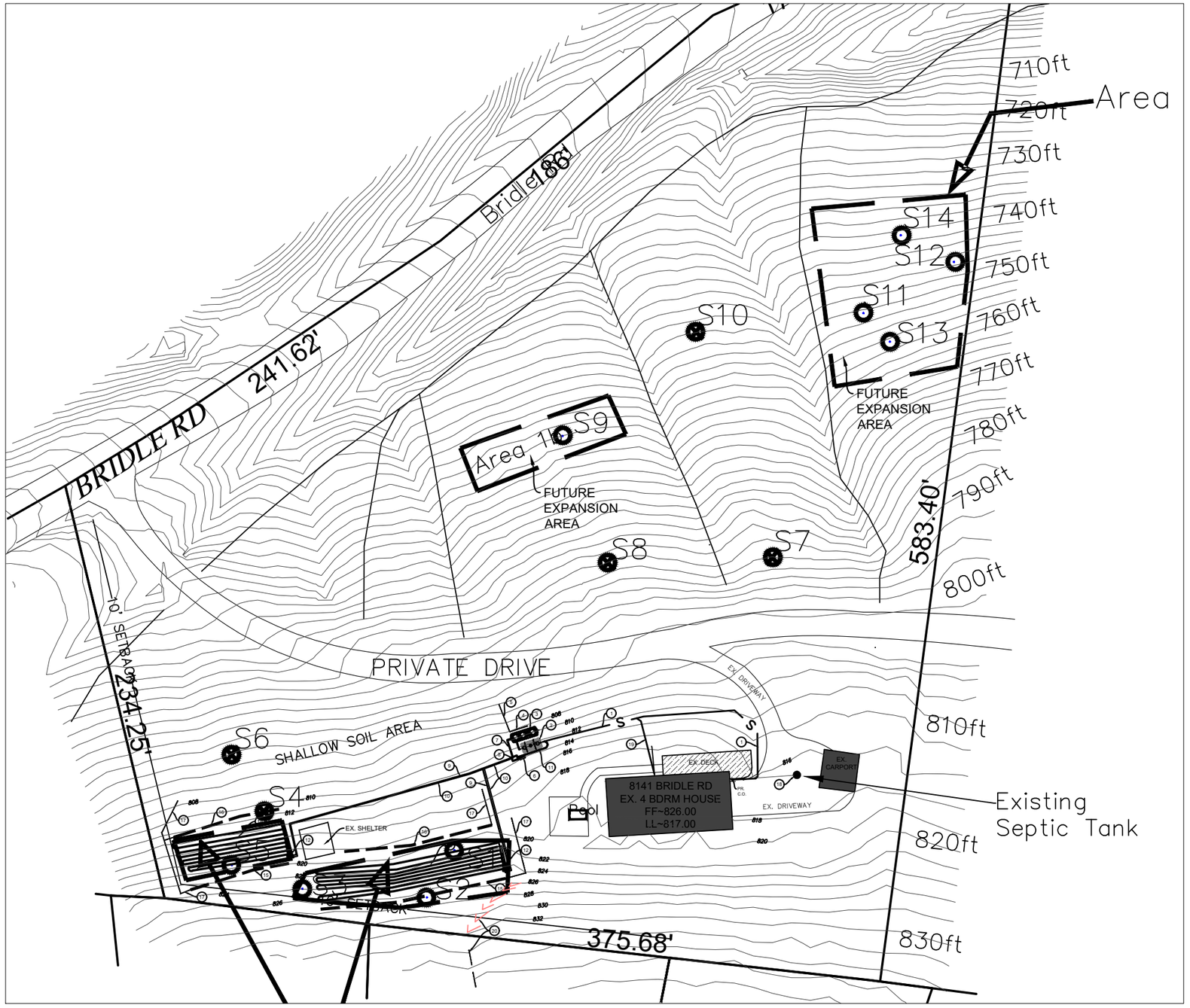
8141 BRIDLE RD - REPLACEMENT STS - AVERY
COVER SHEET
8141 Bridle Rd, Cincinnati, OH 45244

CINDACO design
513-909-4768
P.O. BOX 19684
CINCINNATI, OH 45219

DRN BY:	MAM
JOB #	D22-017
DATE:	Oct. 17, 2023
SHEET:	COVER

8141 BRIDLE RD - REPLACEMENT STS - AVERY

8141 Bridle Rd, Cincinnati, OH 45244



GENERAL NOTES:

1. Caution tape or fencing should be installed around the soil absorption area and reserve area (if applicable) prior to commencement of clearing or earthwork activities.
2. Unless notes otherwise, all piping is pressure rated schedule 40 PVC (ASTM D2665/D1785), all stainless steel is Grade 304, all sand is ODOT C-33 concrete sand. Refer to plans for other aggregate specs.
3. All piping shall be bed in gravel or firm in-situ soil, well supported, and backfilled with gravel or native soil in a manor to minimize settling. Maintain 12" min cover (30" min for drip systems) unless noted otherwise.
4. Installer must verify system can be installed per design prior to commencement of installation.
5. Any modifications proposed by the installer must be approved by the designer and permitting body, and must be noted on the final as-built.
6. Wheeled vehicles and heavy equipment are prohibited from traveling over the soil absorption and reserve area(s).
7. All STS components must maintain a minimum of 10' from property lines, easements, right of way, buildings, hardscapes, driveways, geothermal horizontal closed loop systems, properly sealed wells, intermittent streams, swales, irrigation lines, gray water recycling systems, and utilities.
8. All STS Components must maintain 50' from surface water, cut banks, perennial streams/rivers, wetlands, and vertical open and closed loop geothermal heating/cooling systems.
9. Building sewer shall be a minimum of 10' from water service lines, except when within 5' of the foundation where they enter the building and where lines must cross. Where water service lines and sewer lines cross, provide 12" minimum vertical separation with preference of sewer below water service. Keep water service line joints at least 10' from crossing, and sleeve sewer with 20' of larger diameter Sch 40 pipe with sealed ends.
10. Clearwater connections to STS are prohibited (downspouts, foundation drains, drain tiles, cistern overflows, stormwater drains, garage floor drains, exterior floor drains, etc.). Clearwater discharges must be routed away from STS components. Existing connections on replacement systems must be disconnected and rerouted.
11. Flags set by designer represent the drip tube lines.
12. Soil Investigation performed by Clearcreek Environmental.
13. FF and LL elevations are for reference only. This is not a survey and no survey has been performed.
14. Installations in Hamilton County require electrical inspection by Inspection Bureau, Inc. (IBI), 513-381-6080

STS PLANS APPROVED
OCT 18 2023
HCPH-Water Quality Division

LEGEND

	Soil boring location
	Steep slope
—X—	Fence
—E—	Electric service
—W—	Water service
—G—	Gas service
—S—	Sanitary sewer lateral
—SF—	Silt fence
PR.	Proposed
EX.	Existing
FF	First floor
LL	Lower level
BM	Benchmark
R/W	Right of way
CB	Catch basin
YD	Yard drain
O.C.	On center
T/W	Top of wall
B/W	Bottom of wall
E/	Edge of
C/L	Centerline
EG	Existing grade
FG	Finished grade
TYP	Typical for all
ADF	Average daily flow
DDF	Daily design flow
GPD	Gallons per day

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GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 60 ft.

8141 BRIDLE RD - REPLACEMENT STS - AVERY
STS SITE PLAN
8141 Bridle Rd, Cincinnati, OH 45244

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DRN BY:	MAM
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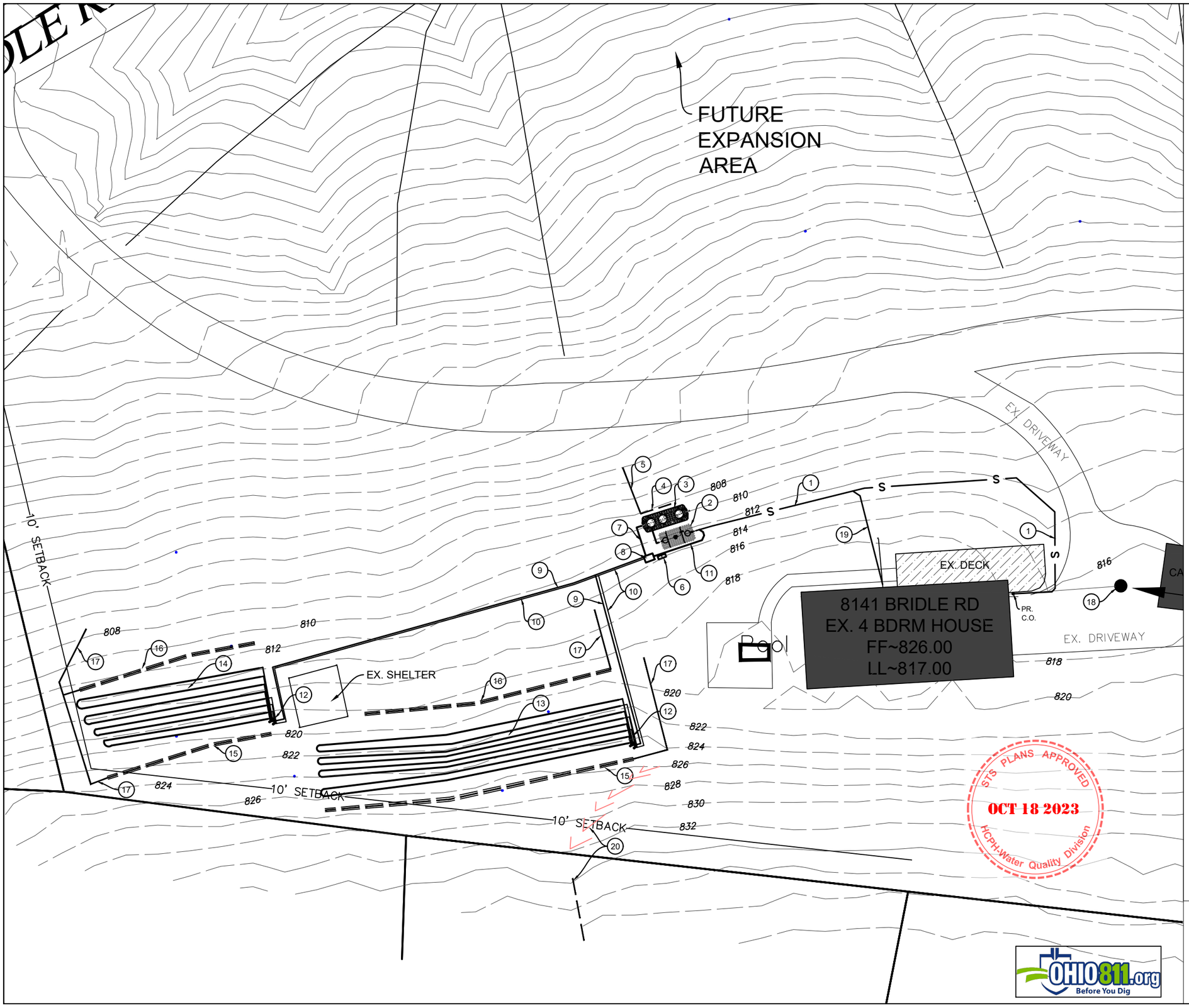
SHEET:	C-1



(X) KEY NOTE LEGEND:

1. PROPOSED SANITARY SEWER. 4" SCH 40 PVC @ 1% MIN. INSTALL CLEANOUT 5' MAX FROM FOUNDATION AND EVERY 75' MAX THEREAFTER.
2. AEROBIC TREATMENT UNIT, SEE C-3 FOR DETAILS.
3. DOSE TANK, SEE C-3 FOR DETAILS
4. TANK EXCAVATION DRAIN, 4" PERFORATED SDR35 @ 0.5% MIN.
5. TANK EXCAVATION DRAIN DISCHARGE SEGMENT, SEE C-3 FOR DETAILS
6. CONTROL PANEL(S), SEE C-3 FOR DETAILS
7. FORCE MAIN, 1.5" SCH 40 PVC, 30" DEEP MIN, REMAINS FULL
8. HYDRAULIC UNIT/VALVE RACK, SEE DETAILS ON C-4. 1.5" SCH 40 PVC VALVE RACK DRAIN, DISCHARGE TO TANK EXCAVATION AGGREGATE BACKFILL.
9. ZONE 1 AND 2 COMMON SUPPLY (1" SCH 40 PVC). BURY PIPE 30" DEEP MIN FOR FROST PROTECTION.
10. ZONE 1 AND 2 COMMON RETURN (1" SCH 40 PVC). BURY PIPE 30" DEEP MIN FOR FROST PROTECTION.
11. VALVE RACK FLUSH DRAIN, 1.5" SCH 40 PVC @ 1% MIN TO BUILDING SEWER
12. TOP FEED MANIFOLD, SEE DETAILS ON C-5.
13. PLOW-IN DRIP ZONE 1. SEE DETAILS ON C-4, C-5, AND C-6.
14. PLOW-IN DRIP ZONE 2. SEE DETAILS ON C-4, C-5, AND C-6.
15. INTERCEPTOR DRAIN. SEE DETAILS ON C-4
16. PERIMETER DRAIN. SEE DETAILS ON C-4
17. DRAIN DISCHARGE SEGMENT. SOLID 4" SDR35 OR SCH 40 PVC @ 1% MIN. LAST 10' AND WHERE PIPE HAS LESS THAN 12" COVER SHALL BE SCH 40 PVC. PROVIDE NON-CORROSIVE ANIMAL GUARD AT EXIT.
18. EX. TANK. ABANDON PER OAC 3701-29-21 AND COUNTY PERMITTING AND REPORTING REQUIREMENTS
19. EX. GRAYWATER DISCHARGE. REPLACE TO HOUSE FOUNDATION WITH 4" SCH 40 PVC AT 1% MIN.
20. EX. DRAIN FROM NEIGHBORING PROPERTY. DIRECT RUNOFF AWAY FROM SYSTEM.

GRAPHIC SCALE

15 0 7.5 15 30 60

(IN FEET)
1 inch = 30 ft.

8141 BRIDLE RD - REPLACEMENT STS - AVERY

STS LAYOUT

8141 Bridle Rd, Cincinnati, OH 45244

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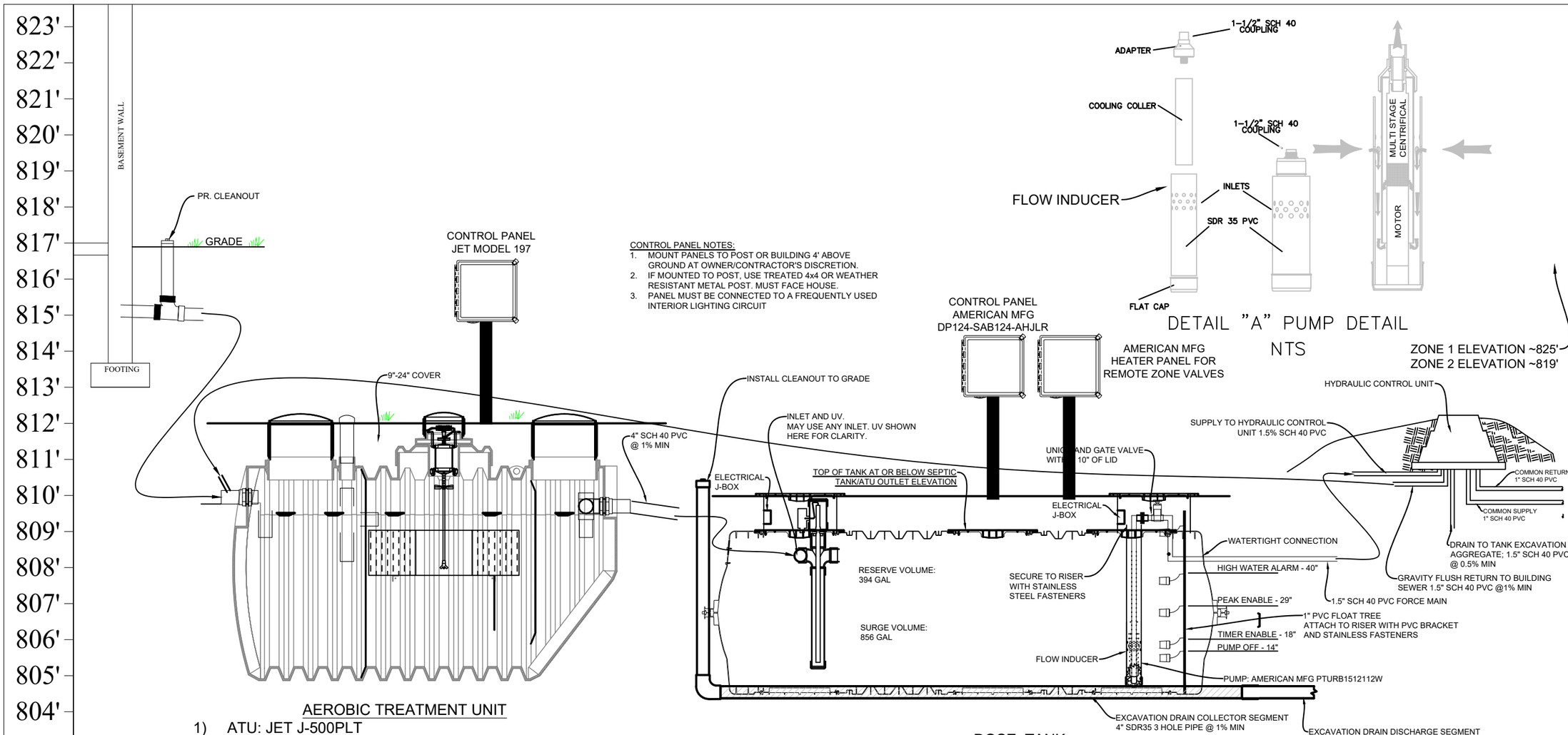
CINCINNATI, OH 45219

DRN BY:	MAM
JOB #	D22-017
DATE:	Oct. 17, 2023
SHEET:	C-2



DETAIL "A" PUMP DETAIL

NTS

AEROBIC TREATMENT UNIT

1) ATU: JET J-500PLT
2) WATERTIGHT RISERS TO GRADE (24" max height)
3) INSTALL PER MANUFACTURER INSTRUCTIONS
4) JET 700++ AERATOR MOTOR
5) ALL PENETRATIONS SHALL BE WATERTIGHT
6) BED IN 6" MIN #8 PER MANUFACTURER INSTRUCTIONS
7) BACKFILL WITH #8 PER MANUFACTURER INSTRUCTIONS

DOSE TANK

1) INFILTRATOR IM-1530 1500 GAL SINGLE COMPARTMENT DOSE TANK
2) UV AT INLET: JET MODEL 952
3) 24" DIA WATERTIGHT RISERS TO GRADE
4) BED WITH 6" MIN #8 CRUSHED LIMESTONE PER MANUFACTURER INSTRUCTIONS
5) BACKFILL WITH #8 OR #57 CRUSHED LIMESTONE PER MANUFACTURER INSTRUCTIONS
6) FLOAT MEASUREMENTS FROM BOTTOM OF TANK
7) ALL TANKS IN COMMON EXCAVATION
8) ALL PENETRATIONS SHALL BE WATERTIGHT

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8141 BRIDLE RD - REPLACEMENT STS - AVERY

STS PROFILE

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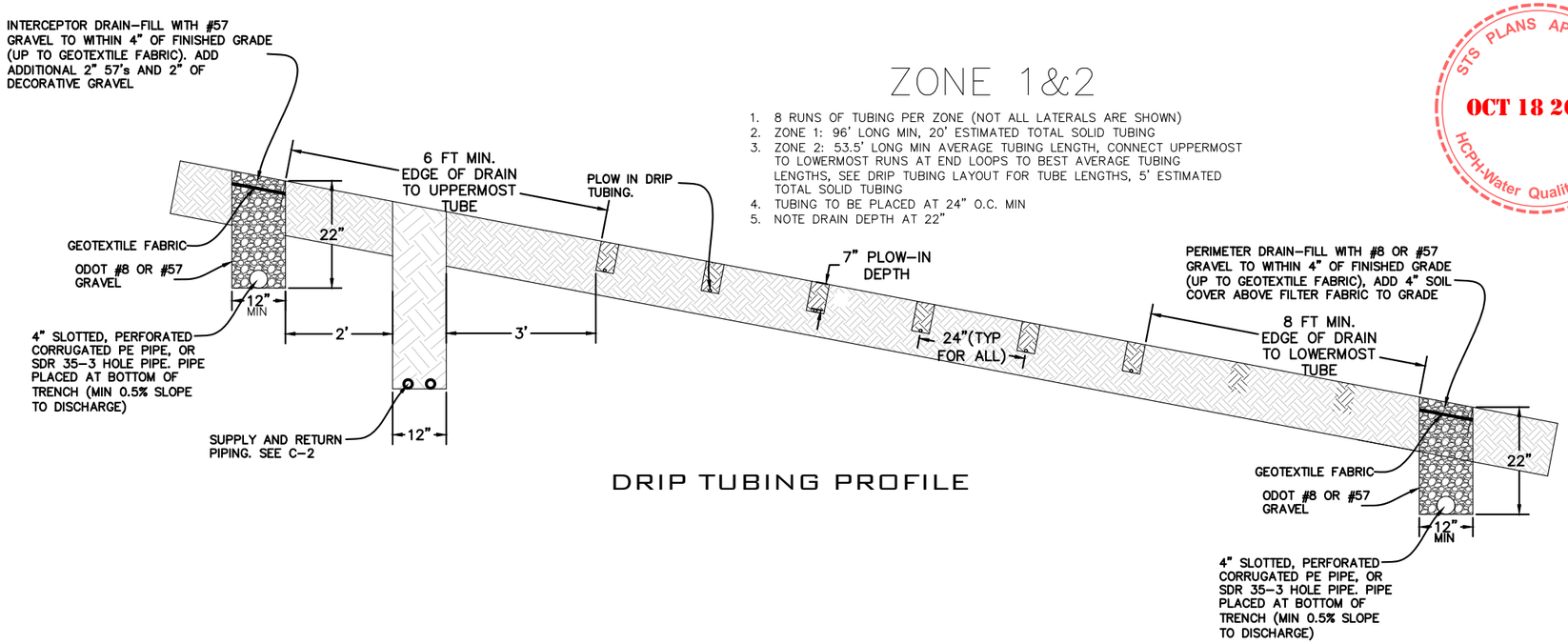
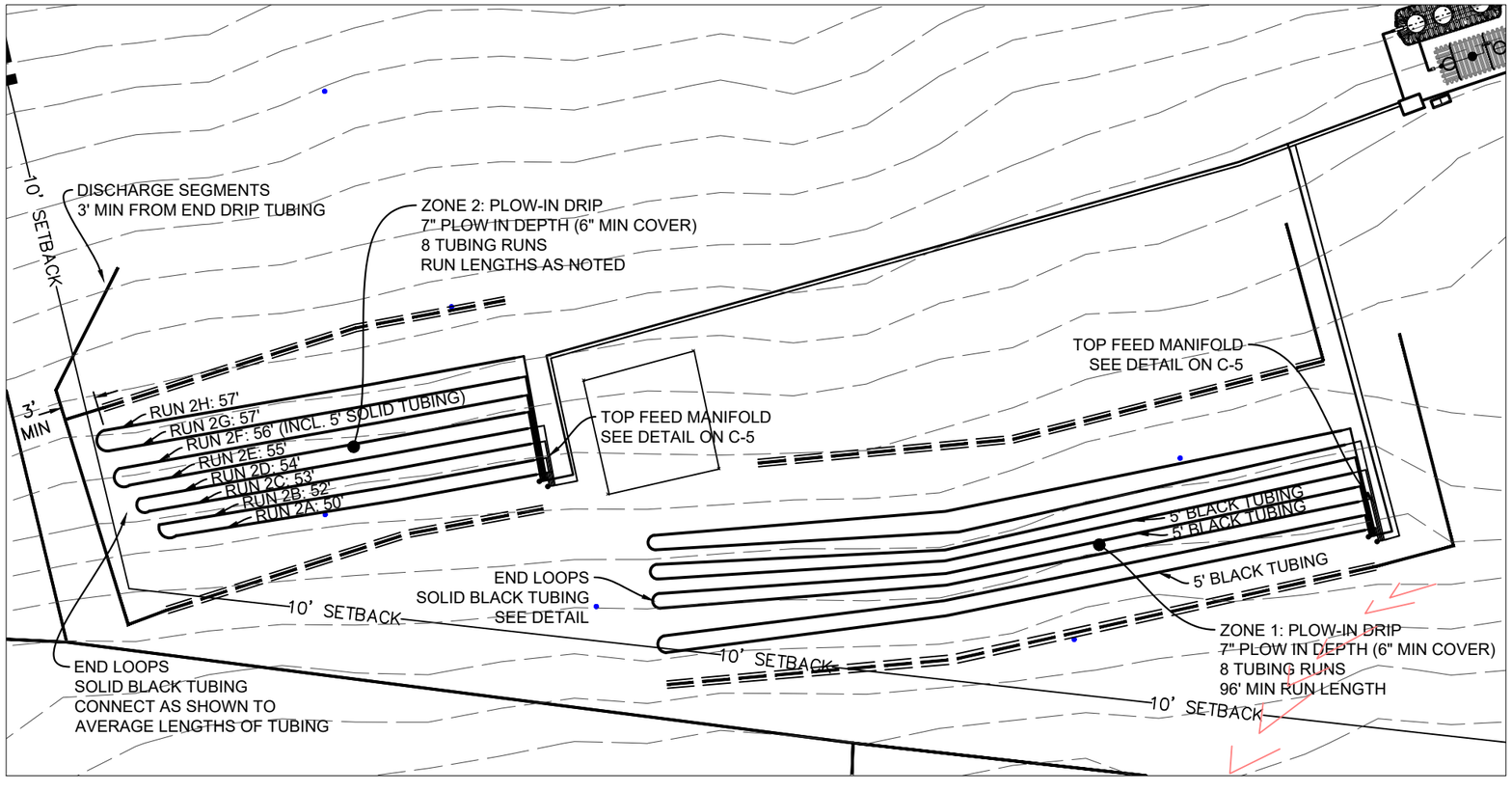
SHEET:	C-3



DRIP TUBING PROFILE



DRIP TUBING LAYOUT

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New/Replacement	Replacement	
Daily Design Flow	480	gpd
Design LLR	2.4	gpd/ft
Length Reduction	26%	
Allowable LLR	3.24	gpd/ft
Design SILR	0.25	gpd/sf

Zone 1

Design Length	96	ft
Tubing Runs	8	
Tubing Spacing	24	in
Total Area	1536	sf
Solid Tubing	20	ft
Solid Tubing Area	40	sf
Effective Area	1496	sf
Total Tubing Length	768	ft
Runs/Lateral	2	
Laterals	4	
Max Lateral Length	192	ft

Zone 2

Design Length	53.5	ft
Tubing Runs	8	
Tubing Spacing	24	in
Total Area	856	sf
Solid Tubing	5	ft
Solid Tubing Area	10	sf
Effective Area	846	sf
Total Tubing Length	434	ft
Runs/Lateral	2	
Laterals	4	
Max Lateral Length	109	ft

TOTAL

Length	149.5	ft
Effective Area	2342	sf
Max Soil Loading Rate	0.21	gpd/sf
Flow Division	By Zone Length	
Linear Loading Rate	3.21	

DRIP SYSTEM CALCULATINS

8141 BRIDLE RD - REPLACEMENT STS - AVERY
LAYOUT DETAILS
8141 Bridle Rd, Cincinnati, OH 45244

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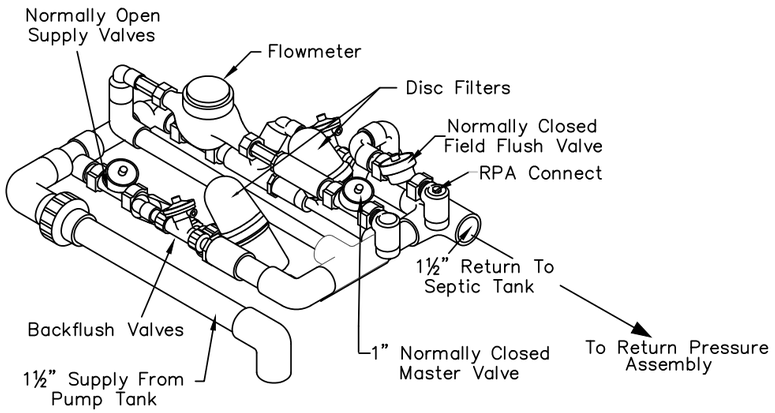
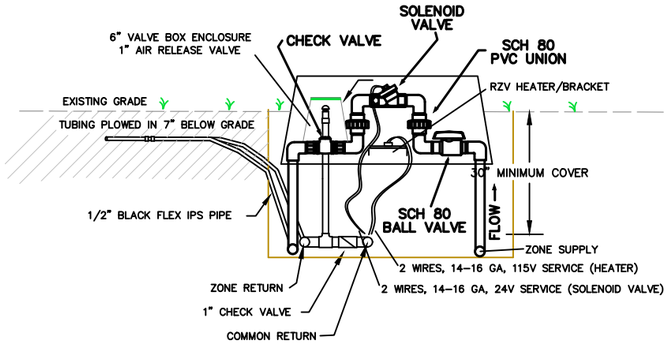
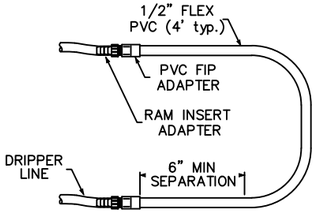
DRN BY:	MAM
JOB #	D22-017
DATE:	Oct. 17, 2023
SHEET:	C-4

AMERICAN MFG. COMPANY
ONE ZONE, TWO–FILTER – 15 GPM
HYDRAULIC UNIT





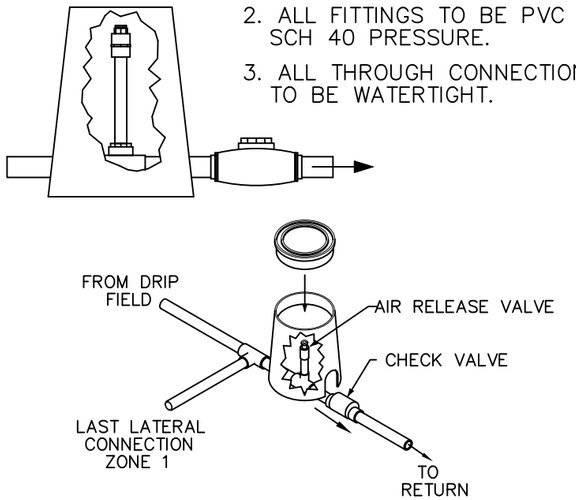
PLOW–IN W/ REMOTE ZONE VALVE
MANIFOLD TRENCH DETAIL
(NOT TO SCALE)



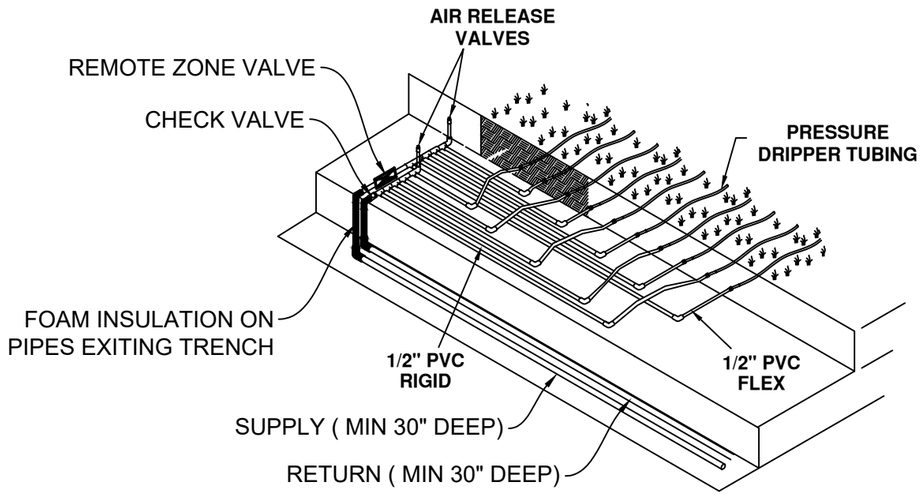
BURIED DRIP LOOP CONNECTION
NTS

NOTES:

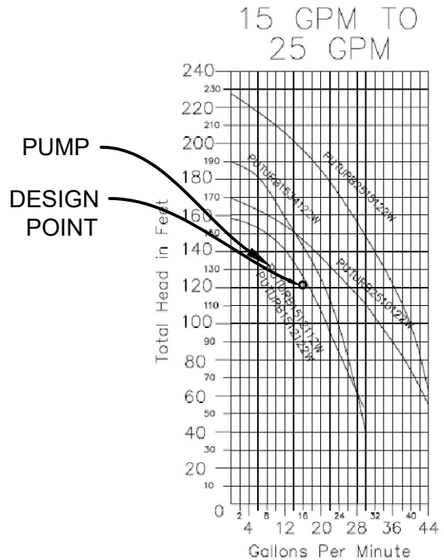
1. PUMP & FLOATS SERVICEABLE FROM GROUND SURFACE.
2. ALL FITTINGS TO BE PVC SCH 40 PRESSURE.
3. ALL THROUGH CONNECTIONS TO BE WATERTIGHT.



ZONE RETURN AIR RELEASE & CHECK VALVE DETAIL



**MANIFOLD TRENCH SCHMATIC ONLY. NOT INTENDED TO SHOW DRIP FIELD, REMOTE ZONE VALVE, OR AIR RELEASE DETAILS. MAY NOT REFLECT ACTUAL NUMBER OF LATERALS.*



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SYSTEM DETAILS
8141 Bridle Rd, Cincinnati, OH 45244

CINCINNATI, OH 45219
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513-909-4768
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design

DRN BY:	MAM
JOB #	D22-017
DATE:	Oct. 17, 2023
SHEET:	C-5

AMERICAN MANUFACTURING COMPANY

SEPTIC DRIP CALCULATION SHEET

Job Name: **8141 Bridle Road** Location: **Hamilton co., Ohio**
Project No.: Date: **3/20/2023**

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OCT 18 2023
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1	480	GALLONS PER DAY	4	NO. OF BEDROOMS
2				
3	149.5	FT. (Length	15.73244	FT. (Width) AREA FOR DISPOSAL LAYO 2352 FT2
4	2	ZONES		
5	1176	TOTAL DRIPPER LINE PROVIDED	(Zone 1 + Zone 2)	
6	1500	SEPTIC TANK SIZE (gallons)		
7	1500	DOSING TANK SIZE (gallons)		
8	-	GALLONS PER INCH IN DOSING TANK (Provided From Manufacturer)		
9	ZONE ONE			
10	1496	TOTAL ABSORPTION AREA (FT2)		
11	748	LINEAR FEET OF DRIP TUBING (1	(Total Tubing for Zone 1)	
12	192	LONGEST LATERAL LENGTH (FT)	3.5	Fill Ratio (Minimum 3.5)
13	3.80	DOSING FLOW RATE (GPM)	(Length of tubing /2) x (0.61 Gal/Hr) / (60 Min/Hr.)	
14	4	NO. RETURN FIELD FLUSH CONNECTIONS (#/zone)		
15	6.40	FIELD FLUSH FLOW RATE (GPM	(1.6 gpm/Connection) x (no. of field flush connections)	
16	10.20	TOTAL FLOW REQUIRED (GPM)	(Dosing flow rate + Field flushing flow rate)	
17	ZONE TWO			
18	856	TOTAL ABSORPTION AREA (FT2)		
19	428	LINEAR FEET OF DRIP TUBING (	(Total Tubing for Zone 2)	
20	109	LONGEST LATERAL LENGTH (FT)	3.5	Fill Ratio (Minimum 3.5)
21	2.18	DOSING FLOW RATE (GPM)	(Length of tubing /2) x (0.61 Gal/Hr) / (60 Min/Hr.)	
22	4	NO. RETURN FIELD FLUSH CONNECTIONS (#/zone)		
23	6.40	FIELD FLUSH FLOW RATE (GPM	(1.6 gpm/Connection) x (no. of field flush connections)	
24	8.58	TOTAL FLOW REQUIRED (GPM)	(Dosing flow rate + Field flushing flow rate)	
25	11.00	MAXIMUM DESIGN TOTAL FLUSHING FLOW (GPM)		
26	8	FEET OF HEAD LOSS FROM HYDRAULIC UNIT (TDH) (Based (Chart 2A)		
27	HYDRAULIC UNIT SUPPLY LINE			
28	1.5"	PIPE DIAMETER (Inches)	(From pump to Hydraulic Unit)	
29	15	LENGTH SUPPLY PIPE (FT)	(From pump to Hydraulic Unit)	
30	6	FEET OF STATIC LIFT	(From pump to Hydraulic Unit)	
31	8	TOTAL FEET HEAD LOSS IN LINE (Dynamic Head Loss + #30)		

32 FORCE MAIN SUPPLY LINE PIPE SIZE & LENGTH:

33	1"	ZONE 1 SIZE	100	ZONE 1 LENGTH	6	FT. HEAD LOSS
34	1"	ZONE 2 SIZE	185	ZONE 2 LENGTH	8	FT. HEAD LOSS

(Friction losses through supply piping at the specific size, distance and flow, as listed above)

35 RETURN FLUSH LINE SIZE & RETURN:

36	1"	ZONE 1 SIZE	100	ZONE 1 LENGTH	3	FT. HEAD LOSS
37	1"	ZONE 2 SIZE	185	ZONE 2 LENGTH	5	FT. HEAD LOSS

(Friction losses through return piping at the specific size, distance and flow, as listed above)

38 STATIC HEAD:
39 14 FEET OF TOTAL STATIC HEAD LOSS (Vertical Lift)
(From the base of the Hydraulic Unit to the highest run of dripper tubing)

40 TOTAL PRESSURE LOSS (Add Items 26, 31, 33/34, 36/37, 39 + Flushing):
41 57 ZONE 1 HEAD LOSS, INCLUDES 18 FEET FLUSHING (Chart 3A)
42 59 ZONE 2 HEAD LOSS, INCLUDES 16 FEET FLUSHING (Chart 3A)
(Total head loss includes friction from;pump to HU, through HU, supply piping, return piping, Chart 2A, and Chart 3A)

43 PUMP SIZING:
44 59 MAXIMUM TOTAL PRESSURE LOSS (Highest 41 or 42)
45 123 DISC FILTER BACKFLUSH (#31 + 115ft. @ 15 GPM)
46 15 GPM @ 123 FEET 115 VOLTS 1 PHASE 0.5

47 TIMED DOSING PER ZONE:
48 ZONE ONE:
49 3.80 Dosing GPM 8.95 Min/Dose 34.0 Gallons Per Dose
50 5.4 Ave. Cycles 9.0 Peak Cycles (Run Frequencies)
51 ZONE TWO:
52 2.18 Dosing GPM 8.95 Min/Dose 19.5 Gallons Per Dose
53 5.4 Ave. Cycles 9.0 Peak Cycles (Run Frequencies)

	AS PROVIDED		AS GIVEN FROM SITE EVALUATION OR DESIGNER
56 LANDSCAPE LINEAR LOADING RATE ZONE 1 :	3.2	GPD/LF	
57 LANDSCAPE LINEAR LOADING RATE ZONE 2 :	3.2	GPD/LF	2.4 GPD/LF
58 SOIL LOADING RATE ZONE 1:	0.20	GPD/Sq. Ft.	0.25* GPD/Sq. Ft.
59 SOIL LOADING RATE ZONE 2:	0.20	GPD/Sq. Ft.	*for 12" drjl depth credit
60 AVERAGE DOSING REST TIMES:	134	Minutes	
61 PEAK DOSING REST TIMES:	80	Minutes	

Title: CALCULATION SHEET - PLOW-IN

8141 Bridle Road
Hamilton Co., Ohio

DR. BY: BRS
CK. BY: BRS
DATE: 03/20/2023
SCALE: None

SHEET NO. FILE:

StreamKey
Engineered Plumbing & Wastewater Solutions
10515 Reading Road, Cincinnati, Ohio 45241
513-792-1221 phone / 513-792-1223 fax

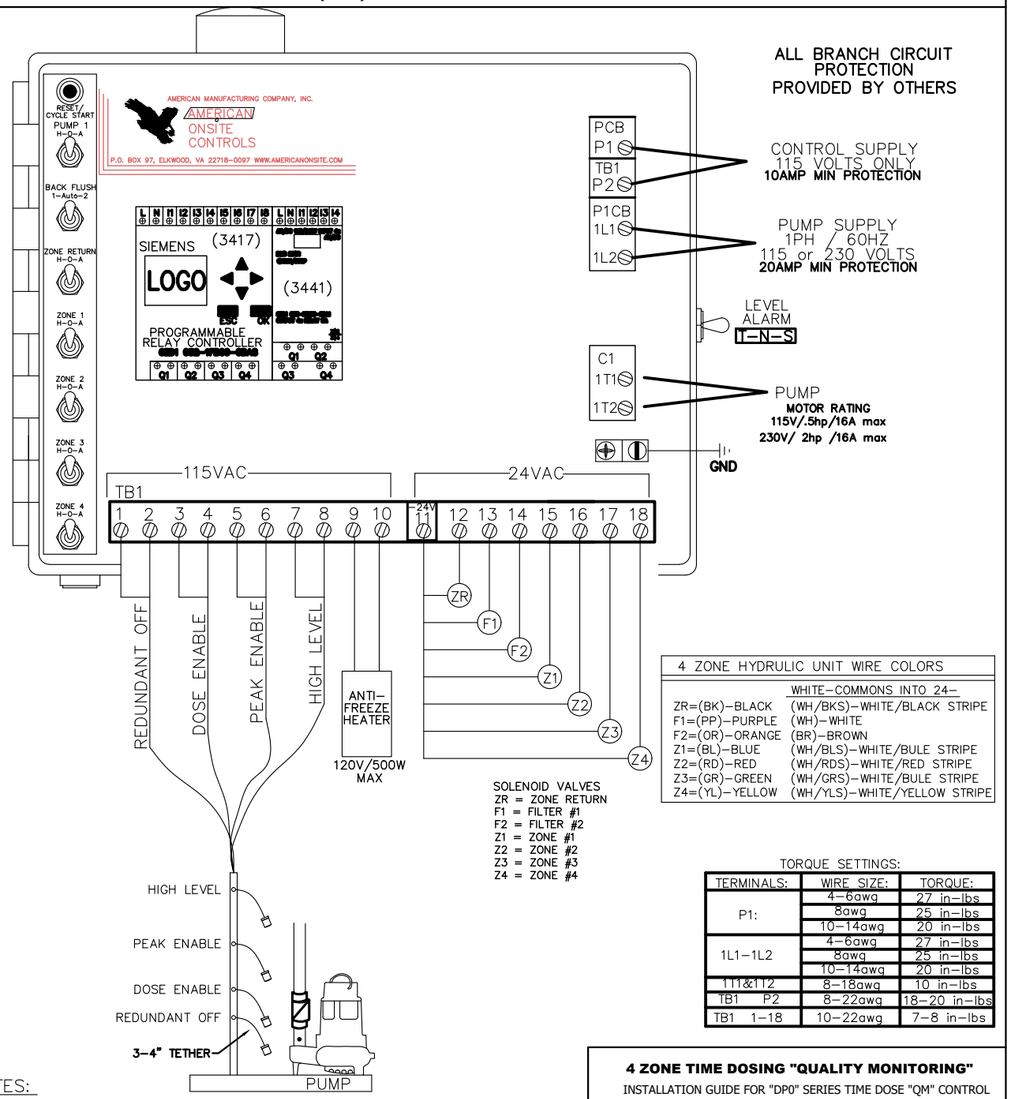
8141 BRIDLE RD - REPLACEMENT STS - AVERY
AMERICAN MFG CALC SHEET
8141 Bridle Rd, Cincinnati, OH 45244

CINDACO design
513-909-4768
P.O. BOX 19684
CINCINNATI, OH 45219

DRN BY: MAM
JOB # D22-017
DATE: Oct. 17, 2023
SHEET: C-6

AMERICAN ONSITE CONTROLS

AMERICAN MANUFACTURING COMPANY INC.
P.O. BOX 97 ELKWOOD, VA 22718
(800) 345-3132 www.americanonsite.com



4 ZONE HYDRULIC UNIT WIRE COLORS	WHITE-COMMONS INTO 24-
ZR=(BK)-BLACK	(WH/BKS)-WHITE/BLACK STRIPE
F1=(PP)-PURPLE	(WH)-WHITE
F2=(OR)-ORANGE	(BR)-BROWN
Z1=(BL)-BLUE	(WH/BLS)-WHITE/BULE STRIPE
Z2=(RD)-RED	(WH/RDS)-WHITE/RED STRIPE
Z3=(GR)-GREEN	(WH/GRS)-WHITE/BULE STRIPE
Z4=(YL)-YELLOW	(WH/YLS)-WHITE/YELLOW STRIPE

SOLENOID VALVES
ZR = ZONE RETURN
F1 = FILTER #1
F2 = FILTER #2
Z1 = ZONE #1
Z2 = ZONE #2
Z3 = ZONE #3
Z4 = ZONE #4

TORQUE SETTINGS:

TERMINALS:	WIRE SIZE:	TORQUE:
P1:	4-6awg	27 in-lbs
	8awg	25 in-lbs
	10-14awg	20 in-lbs
1L1-1L2	4-6awg	27 in-lbs
	8awg	25 in-lbs
	10-14awg	20 in-lbs
1T1&1T2	8-18awg	10 in-lbs
TB1 P2	8-22awg	18-20 in-lbs
TB1 1-18	10-22awg	7-8 in-lbs

NOTES:

1. PLEASE REVIEW ALL PAGES AND INSERTS IN THIS MANUAL BEFORE ATTEMPTING TO INSTALL ANY CONTROL EQUIPMENT.
2. DASHED LINES REPRESENT OPTIONAL EQUIPMENT
3. TIME DOSING IS CONTROLLED BY A SIEMENS LOGO! SEE ADDITIONAL MANUAL FOR PROGRAMMING INSTRUCTIONS.
4. BF=BACKFLUSH, AND ZR=ZONE RETURN

4 ZONE TIME DOSING "QUALITY MONITORING"
INSTALLATION GUIDE FOR "DP0" SERIES TIME DOSE "QM" CONTROL
NEMA 4X, 1 PHASE, OPTIONS: A,J,L

MODEL#: DP024-SAB124-AJL		
DWG#: X9114-4Z-ZM		REVISION: -
DATE: 04/19/12	DRAWN BY: SPC	APPROVED:
FILE PATH: S:/DATA/CONTROLS/AUTOCAD2000LT/X&LIGHTNING/X9114-4Z.dwg		PAGE: 1

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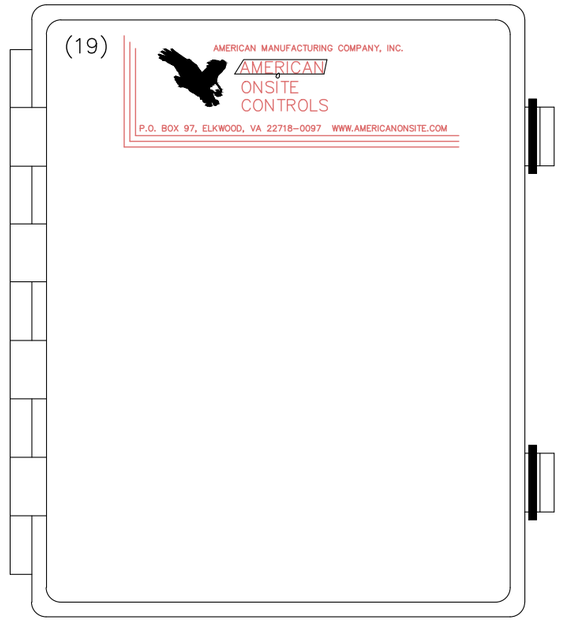
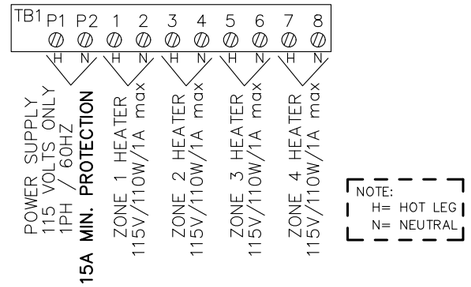
STS PLANS APPROVED
OCT 18 2023
HCPH-Water Quality Division



TORQUE SETTINGS:

TERMINALS:	WIRE SIZE:	TORQUE:
P1	14-10awg	20 in-lbs
	8awg	25 in-lbs
	6-4awg	27 in-lbs
TB1(ALL TERMINALS)	8-22awg	18-20 in-lbs



INSTALLATION NOTES:

PLEASE REVIEW ALL PAGES AND INSERTS IN THIS MANUAL BEFORE ATTEMPTING TO INSTALL ANY CONTROL EQUIPMENT.

1. DASHED LINES (- - -) REPRESENT TERMINALS, EQUIPMENT, AND/OR OPTIONS THAT MAY OR MAY NOT BE PRESENT IN EACH SYSTEM COVERED BY THIS MANUAL.
2. BRANCH CIRCUIT PROTECTION MUST BE PROVIDED BY OTHERS. CONSULT NEC AND/OR LOCAL CODES.
3. SINGLE (1) PHASE PUMP MOTORS MUST HAVE INTEGRAL THERMAL OVERLOAD PROTECTION.
4. TEMPERATURE RATING OF FIELD INSTALLED COPPER CONDUCTORS MUST MUST BE AT LEAST 140°F (60°C).
5. FOR PUMPS THAT REQUIRE EXTERNAL CAPACITOR INSTALLATION KITS, SEE K" PACK INSTALLATION INSERT PROVIDED
6. PUMP SUPPLY MUST MATCH REQUIRED PUMP VOLTAGE. CONDUIT ENTRANCE MUST MATCH ENCLOSURE RATING
7. PUMP AND PANEL VOLTAGE CODE MUST BE EQUVALENT TO INCOMING PUMP AND CONTROL POWER SUPPLIES.
8. OVERLOAD/MOTOR PROTECTOR UNIT MAY REQUIRE ADJUSTMENT TO MATCH PUMP FULL LOAD AMPS (FLA)
9. SEPARATE OVERLOAD (O.L.) NOT REQUIRED WHEN MOTOR PROTECTORS (MP) ARE SUPPLIED.
10. THE MANUFACTURER RECOMMENDS THAT CONTROL/ALARM SUPPLY BE SEPARATE FROM THE PUMP SUPPLY.
11. REFER TO BACKPLATE LAYOUT ON PAGE 3 FOR THE REQUIRED TORQUE SETTINGS FOR EACH COMPONENT.

REMOTE HEATER 4 ZONE
INSTALLATION GUIDE FOR "X4" SERIES CONTROL
POWER SUPPLY 115 VOLTS FOR 4 REMOTE HEATERS

MODEL#: HEATER REMOTE 4ZN		
DWG#: X8974-4	ITEM#: HEATERREMOTE4ZN	REVISION: B
DATE: 07/24/07	DRAWN BY: RJW	APPROVED:
FILE PATH: S:\Data\Controls\AutoCADLt2000\X_Lightning-Panels\X8974HeaterRemote4zn.dwg		PAGE: 1

8141 BRIDLE RD - REPLACEMENT STS - AVERY
CONTROL PANEL DETAILS
8141 Bridle Rd, Cincinnati, OH 45244

CINDACO design
513-909-4768
P.O. BOX 19684
CINCINNATI, OH 45219

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