RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
ONSITE WASTEWATER TREATMENT SYSTEM CONSTRUCTION PERMIT
www.dem.ri.gov/septic

FOR RIDEM USE ONLY

APPLICATION No. _____ DATE RECEIVED ____/____/____ AMOUNT RECEIVED $_____ CHECK #_____ NOTE_____

TYPE OF APPLICATION (CHECK ALL THAT APPLY)

- ☒ NEW BUILDING CONSTRUCTION
- ☐ ALTERATION
- ☐ REPAIR
- ☐ TRANSFER
- ☒ A/E TECHNOLOGY TYPE ORENCO AX100/GST
- ☐ VARIANCE
- ☐ REDESIGN
- ☐ JOINT OWTS / WETLANDS PD

SITE INFORMATION

BURLINGAME STATE PARK AND CAMP GROUND (BUILDING 6)
1-100 BURLINGAME PARK ROAD, CHARLESTOWN
NO. STREET / CITY/TOWN / POLE #

PLAT NUMBER 15 LOT NUMBER 10 SUBDIVISION LOT NUMBER N.A.

LOT SIZE 847 ~~SF~~/ACRES

SUBDIVISION NAME N.A.

SUBDIVISION SITE SUITABILITY CERTIFICATION # N.A.

OWNER INFORMATION

STATE OF RI DEM
LAST NAME / FIRST NAME / M.I.

235 PROMENADE ST. PROVIDENCE 02908
NO. STREET / CITY/TOWN / ZIP CODE

RIDEM APPLICATION HISTORY

PREVIOUS SITE TESTING ☒ YES ☐ NO APPLICATION # 2205-1139

DEPTH TO APPROVED WATER TABLE 48" HOW DETERMINED SOIL EVALUATION

TEST HOLE # 4C DATE EXCAVATED 8/18/21 WETLANDS within 200' OF OWTS ☐ YES ☒ NO

WETLAND DETERMINATION ☐ YES ☒ NO RIDEM FILE # _____ DATE ____/____/____

LARGE SYSTEM ☒ YES ☐ NO OCI FILE # IF APPLICABLE _____

DESIGN INFORMATION

BUILDING USE: ☐ Residential ☐ Commercial _____
☒ Other BATHHOUSE

WATER SUPPLY: ☐ public water ☒ public well ☐ private well

OF DESIGN UNITS 150

UNIT DESIGN FLOW 50 gallons per SITE (unit) TOTAL DAILY FLOW 7,500 gallons

TANK SIZE 15,000 gallons DESIGN LOADING RATE 3.5 gpd/sf

MINIMUM REQUIRED LEACHFIELD AREA 2,143 square feet

LEACHFIELD TYPE GRAVEL SAND TREATMENT (GST)

TOTAL AREA OF LEACHFIELD PROVIDED 5,040 square feet

CERTIFICATION

I, KEVIN HARROP (print), the undersigned licensed OWTS designer, certify that I prepared this application and accompanying forms, submittals, plans and sketches in accordance with the RULEs of the RIDEM pertaining to OWTS and that all the information provided on this application and accompanying forms, submittals, plans and sketches is true and accurate.

Designer's Signature Kevin R Harrop License # D3155

Designer's Email Kharrop@cwltd.net Phone # 401-434-8880

Business/Company Name CAPUTO and WICK LTD.

I certify that a) I am the owner of the property indicated under the site information on this application, b) I will hire a licensed OWTS installer to install the system proposed herein, c) the system will be installed in strict accordance with this application, d) I will hire and retain the licensed OWTS designer of record to witness and inspect the installation of the system, e) I assume all responsibility for the truth and accuracy of this application and all liability and responsibility for any improper installations of the system on this site and agree to hold the RIDEM harmless from any and all claims relating whatsoever to the system. In the case of a transfer application, I acknowledge that the permit application and plans previously approved and accompanying this application are the operative documents subject to certification.

Owner's Phone Number (401) 222-4700 ext. 2774307

Owner's Email MEGAN.DIPRETE@DEM.RI.GOV

Owner(s) Signature _____

PERMIT APPROVAL SECTION: DO NOT WRITE BELOW THIS LINE

Based upon the representations of the owner and the owner's agents, including the representations of the owner's OWTS designer, and the truth and accuracy of all information submitted, this application for an OWTS is hereby approved. The RIDEM assumes no responsibility or liability for the future safe operation or maintenance of the aforesaid system, of the fitness or suitability of this system to this site, nor does it assume any responsibility for the accuracy and truth of the owner's, or the owner's agent's representations. This approval is subject to future suspension or revocation in the event that subsequent examination reveals any data indicated on any application, form, submittal, plan or sketch to be incorrect, or not in compliance with the RULES or any conditions at the site are such that the approved design is not in accordance with the RULES, or in the event that the system discharges inadequately treated wastewater to waters of the State or fails to operate satisfactorily in any other manner.

IMPORTANT: Additional terms of approval as circled.

A. Bottom of leaching area excavation must be inspected by the RIDEM prior to placement of any gravel or stone.
B. System installation must be inspected by RIDEM prior to covering any component of the system with backfill.
C. Applicant shall comply with all requirements, conditions and stipulations of variance(s) approved on _____.
D. Joint Permit: Designer of record must contact RIDEM prior to start of any site construction.
E. A/E Technology: additional installation, operation or maintenance requirements may apply (see A/E Technology Certification.)
F. Copy of this form and Operation/Maintenance contract must be filed in land evidence records prior to conformance.
G. Proposed construction falls within "Coastal Zone". Contact Rhode Island Coastal Resources Management Council.
H. Proper erosion and sedimentation controls must be installed prior to start of construction.
I. Transfer: See original permit for all applicable conditions.
J. Other

Signature of RIDEM Official	Date of Approval	Date of Expiration

DEM SEE INSTRUCTIONS ON REVERSE SIDE

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
235 Promenade Street, Providence, Rhode Island 02908

February 27, 2023

State of Rhode Island
Rhode Island Department of Environmental Management Division of Planning and Development
235 Promenade Street
Providence, RI 02908

RE: Bathhouse "B"
Burlingame State Park and Campground
Charlestown, RI
OWTS Application No. 2205-1139

Dear Applicant:

Attached herewith are revised monitoring and reporting requirements applicable to the above listed permit. As you are aware the above listed Onsite Wastewater Treatment System (OWTS) permit is granted based on a maximum daily design flow of **7,500** gallons per day and includes 1 - 15,000 gallon septic tank, 1 - 7,500 gallon anoxic tank, 1 - 6,000 gallon recirculation tank, 2 - Advantex AX 100 filter pods followed by a 6 x 6 pump chamber to a Gravel Sand Treatment (GST) type of leaching system.

Advanced treatment systems are utilized to mitigate against possible adverse impacts of residual onsite wastewater pollutants on groundwater quality and surface water quality. Owners of advanced OWTSs with design flows ≥2,000 gallons per day are subject to regular monitoring and reporting. The following stipulations now apply to your permit:

1. The following discharge limits as measured at the 6 x 6 pump chamber shall apply:

Orenco Systems, Inc. AdvanTex AX-100 – Mode 1	
Biochemical Oxygen Demand (5 Day)	≤ 20 mg/L
Total Suspended Solids	≤ 20 mg/L
Oil & Grease	≤ 5 mg/L

2. Wastewater flow shall not exceed a maximum daily flow of **7,500** gallons per day. Wastewater flow shall be monitored and recorded to ensure compliance with this stipulation.

3. Sampling and testing shall be conducted quarterly at the compliance point specified in Item 1 above. Sampling and measurements shall be representative of the monitored activity. The Permittee shall sample and test the wastewater in each system as follows:

   Dissolved Oxygen (mg/L) – *Field Test*
   Effluent Temperature (°F) – *Field Test*
   pH (s.u.) – *Field Test*
   Biochemical Oxygen Demand (5-Day) (mg/L)
   Total Suspended Solids (mg/L)
   Oil and Grease (mg/L)
   Alkalinity (mg/L)

4. Corrective Action – Corrective action must be taken as soon as practicable following receipt of monitoring results which indicate that system modifications or maintenance is required. The system must be resampled no sooner than seven (7) days after any adjustment is made to the system and within thirty (30) days of the routine quarterly sample date. Samples must be analyzed for each of the parameters listed in Item 3 for any post corrective action sampling events.

5. Annual Report – All monitoring results including wastewater flow data shall be submitted to the DEM in the form of an annual report. The annual report is due **February 15th** of each year. The annual report must summarize all monitoring results and corrective actions implemented during the previous calendar year. A clear determination regarding the compliance status of the OWTS must be made as part of the annual report. The annual report must include a copy of the most recent Operation and Maintenance Contract as proof of compliance with this requirement.

6. The Permittee shall properly operate and maintain all facilities and equipment associated with the OWTS in accordance with the most recent operation and maintenance (O&M) plan. The O&M plan specifies procedures for operation, process control, record keeping, monitoring, weekly maintenance checks, other routine and periodic maintenance, safety and security. Also, the O&M plan includes a contingency plan to address emergency actions and procedures in the event of equipment failure and power loss.

7. Your permit approval is for the discharge of sanitary waste only. No toxic, hazardous or industrial processing waste may be discharged into the system.

8. All septage, sludges, screenings or other pollutants removed from the system shall be disposed in accordance with all applicable state and federal laws.

9. The permit may be automatically transferred by the Permittee to a new owner provided:

    a. The current Permittee notifies the DEM by certified mail at least thirty (30) days in advance of the proposed transfer date;

    b. The notice includes the name and address of the new Permittee and a written agreement between the existing and new Permittee containing a specific date for the transfer of permit responsibility, surety and liability between them and;

    c. The DEM does not notify the existing Permittee and the proposed new Permittee of its intent to modify or reissue the permit.

10. The operator or person in responsible charge of the OWTS shall have at a minimum a Rhode Island Class 1 Wastewater Treatment Plant Operator Certification or an equivalent certification from another jurisdiction acceptable to the DEM. If the operator is not employed directly by the Permittee, a service agreement with the operator shall be entered into and continuously maintained, and a copy of the active service agreement shall be submitted to the DEM as part of the annual report.

11. The permit may be modified, suspended, or revoked for cause. The DEM reserves the right to revise the permit to ensure compliance with applicable state and federal regulations. Failure to comply with the conditions of this permit approval letter may result in an enforcement action.

12. The Permittee shall allow the DEM or their authorized representative to access the OWTS and work areas to inspect equipment, practices, records pertinent to this permit and stipulated compliance requirements, and to sample and monitor the wastewater for the purposes of determining compliance.

13. In the event of treatment interruption, bypass or sewage overflow, the Permittee shall notify the DEM verbally within twenty-four (24) hours. Such incident shall be reported in writing within five (5) days after it becomes known to the Permittee, the report shall include the date and time(s) of the incident, the duration of the incident, and actions taken to correct the problem and prevent a reoccurrence.

14. For purposes of notification, monitoring, compliance or inquiries pursuant to this permit, all correspondence, telephone calls and other contacts must reference the OWTS permit number and shall be directed to:

The Rhode Island Department of Environmental Management
Onsite Wastewater Treatment Systems Program
235 Promenade Street
Providence, RI 02908
Telephone: (401) 222-3961
www.dem.ri.gov/septic

Should you have any questions concerning these permit requirements, please contact Tom Angelone by email at tom.angelone@dem.ri.gov or by phone at 401-222-3961, extension 2777607.

Very truly yours,

Mohamed J. Freij, P.E., PLS
Supervising Sanitary Engineer

KF

Enclosure(s)

cc: Joseph L. Warner Jr., Charlestown Building Official

BURLINGAME STATE PARK AND CAMPGROUND

TH-4A – GROUND ELEV: 72.1 – AUGUST 18, 2021

		HORIZON	BOUNDARIES	SOIL	COLORS	RE-DOX					
HORIZON	DEPTH	DIST	TOPO	MATRIX	RE-DOX FEATURES	Ab. S. CONTR.	TEXTURE	STRUCTURE	CONSISTENCE	SOIL CATEGORY	
Ap	0 – 9"	C	S	2.5YR 6/3			Ls	2gbd	VFr	3	
Bw	9" – 30"	C	S	10YR 5/6			Ls	2gbd	Fr	3	
C	30" – 120"	C	S	2.5YR 7/3			Ls	2gbd	Fr	3	

SOIL CLASS: B OBSERVED STANDING GROUNDWATER – NA OBSERVED WEEPING GROUNDWATER – NA
ESTIMATED SEASONAL HIGH WATER TABLE – 120" (ELEV.: 62.1) PERFORMED BY: KAMAL HINGORANY

TH-4B – GROUND ELEV: 71.5 – AUGUST 18, 2021

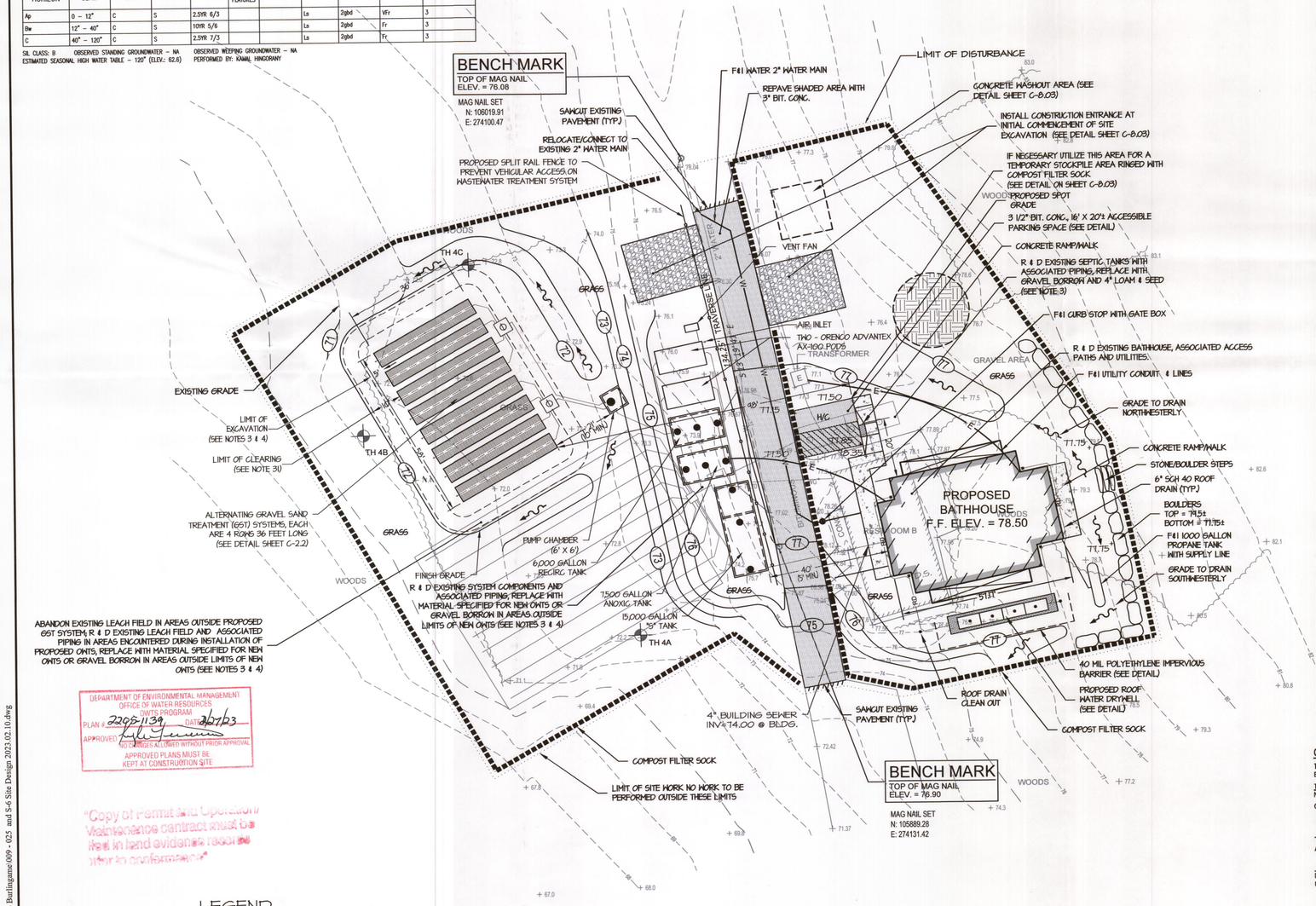
		HORIZON	BOUNDARIES	SOIL	COLORS	RE-DOX					
HORIZON	DEPTH	DIST	TOPO	MATRIX	RE-DOX FEATURES	Ab. S. CONTR.	TEXTURE	STRUCTURE	CONSISTENCE	SOIL CATEGORY	
FILL	0 – 10"	C	S	–			–	–	–	–	
P	10" – 28"	C	S	10YR 4			Ls	2gbd	Fr	3	
Bw	28" – 48"	C	S	2.5YR 7/3			Ls	2gbd	Fr	3	
C	48" – 120"	C	S	2.5YR 7/3	5YR 4/4	M M P	Ls	2gbd	Fr	3	

SOIL CLASS: B OBSERVED STANDING GROUNDWATER – NA OBSERVED WEEPING GROUNDWATER – NA
ESTIMATED SEASONAL HIGH WATER TABLE – 120" (ELEV.: 61.5) PERFORMED BY: KAMAL HINGORANY

TH-4C – GROUND ELEV: 72.6 – AUGUST 18, 2021

		HORIZON	BOUNDARIES	SOIL	COLORS	RE-DOX					
HORIZON	DEPTH	DIST	TOPO	MATRIX	RE-DOX FEATURES	Ab. S. CONTR.	TEXTURE	STRUCTURE	CONSISTENCE	SOIL CATEGORY	
Ap	0 – 12"	C	S	2.5YR 6/3			Ls	2gbd	VFr	3	
Bw	12" – 40"	C	S	10YR 5/6			Ls	2gbd	Fr	3	
C	40" – 120"	C	S	2.5YR 7/3			Ls	2gbd	Fr	3	

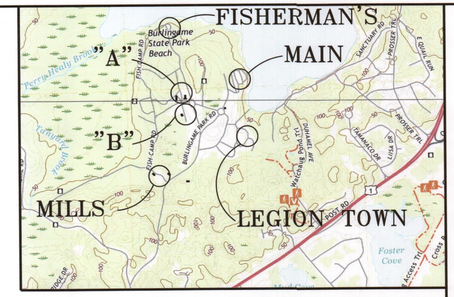
SIL CLASS: B OBSERVED STANDING GROUNDWATER – NA OBSERVED WEEPING GROUNDWATER – NA
ESTIMATED SEASONAL HIGH WATER TABLE – 120" (ELEV.: 62.6) PERFORMED BY: KAMAL HINGORANY



"Copy of Permit and Operation/Maintenance contract must be kept in land evidence record before conformance"

LEGEND

— 100 —	EXISTING CONTOUR	F.S. 100x00	FINISHED SPOT GRADE
—(100)—	PROPOSED CONTOUR	+ 100.00	EXISTING SPOT GRADE
RI. STD.	RHODE ISLAND STANDARD		SPLIT RAIL FENCE
INV.	INVERT OF PIPE		DEEP OBSERVATION HOLE
P. V. C.	POLYVINYL CHLORIDE PIPE		OUT CROP OR SURFACE ROCK
S. D. R.	STANDARD DIMENSION RATIO	—E—	EXIST. UNDERGROUND ELECTRIC
CONC.	CONCRETE	— W —	EXIST. WATER
BIT.	BITUMINOUS	—T—	EXIST. UNDERGROUND TELEPHONE
TYP.	TYPICAL		FINISH GRADE SURFACE FLOW DIRECTION



LOCUS MAP

NOTES:

1. ALL WORK SHALL CONFORM TO THE RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT, OFFICE OF WATER RESOURCES "RULES AND REGULATIONS ESTABLISHING MINIMUM STANDARDS RELATING TO LOCATION, DESIGN, CONSTRUCTION AND MAINTENANCE OF ONSITE WASTEWATER TREATMENT SYSTEMS", LATEST EDITION.
2. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO CAPUTO AND WICK LTD. FOR APPROVAL OF ALL PROPOSED CONSTRUCTION MATERIALS AND EQUIPMENT PRIOR TO ANY CONSTRUCTION.
3. EXISTING ONSITE WASTEWATER TREATMENT SYSTEM (OWTS) PRECAST STRUCTURES ARE TO BE PUMPED OUT, RINSED WITH CLEAN WATER AND PUMPED OUT AGAIN. PUMPING MUST BE PERFORMED BY A STATE LICENSED SEPTIC HAULER AND THE CONTENTS OF THE TANK DISPOSED OF PROPERLY. AFTER PUMPING, THE EXISTING OWTS STRUCTURES MUST BE FILLED WITH FLOWABLE FILL OR REMOVED AND REPLACED WITH GRAVEL BORROW AND 4" LOAM AND SEED.
4. REMOVE ALL PORTIONS OF THE EXISITNG OWTS WITHIN 5' OF THE GRAVEL SAND TREATMENT SYSTEM; AND ALL FILL, A HORIZON SOIL, B HORIZON SOIL AND SCARIFY 3" OF THE C HORIZON SOIL BELOW THE GRAVEL SAND TREATMENT SYSTEM AND THOUGHLY MIX WITH ASTM C-33 SAND (SEE NOTE 16) TO INTERFACE THE FILL WITH THE SOIL AND REPLACE ALL REMOVED SOIL WITH ASTM C-33 SAND. A AND B SOIL HORIZON LAYERS ARE TO BE REMOVED IN THIS APPLICATION DUE TO COMPACTION CAUSED BY PREVIOUS SYSTEM INSTALLATION AND FILL BEING PLACED ABOVE.
5. UNSUITABLE MATERIAL USED TO BACKFILL THE TEST HOLES SHALL BE REMOVED AND REPLACED WITH WITH ASTM C-33 SAND (SEE NOTE 16).
6. ASTM C-33 SAND (SEE NOTE 16) MUST BE PLACED ON SCARIFIED, RELATIVELY DRY NATURAL SOIL. THE CONTRACTOR SHALL PROVIDE FOR DEWATERING AS REQUIRED AND ALL WORK SHALL BE PERFORMED UNDER DRY CONDITIONS.
7. BUILDING SEWER PIPE TO BE 4" P. V. C. SCH. 40 UNLESS OTHERWISE NOTED.
8. PLACE 6" MINIMUM COMPACTED CRUSHED STONE UNDER SEPTIC TANK, ANOXIC TANK, RECIRCULATION TANK, PUMP CHAMBER, ADVANTEX TREATMENT TANKS AND SYSTEM STRUCTURES.
9. INLET AND OUTLET TEES FOR SEPTIC TANK, ANOXIC TANK, RECIRCULATION TANK AND PUMP CHAMBER ARE TO BE LOCATED DIRECTLY BELOW ACCESS COVERS.
10. SEPTIC TANK, ANOXIC TANK, RECIRCULATION TANK, PUMP CHAMBER AND ADVANTEX TREATMENT TANK RISERS/COVERS TO BE AT FINISH GRADE.
11. IF CONDITIONS ENCOUNTERED DURING CONSTRUCTION VARY SUBSTANTIALLY FROM THOSE SHOWN ON THIS PLAN, NOTIFY CAPUTO AND WICK, LTD. BEFORE PROCEEDING WITH CONSTRUCTION. IF IN DOUBT, ASK.
12. NEW SEPTIC TANK SHALL MEET ALL OF THE REQUIREMENTS OF 250-RICR-150-10-6.27.
13. INSPECTION OF THE SEPTIC TANK, ANOXIC TANK, RECIRCULATION TANK, PUMP CHAMBER AND ADVANTEX TREATMENT TANK SHALL BE PART OF THE MAINTENANCE SERVICE FOR THE OWTS AND ALL COMPONENTS SHALL BE CLEANED WHEN REQUIRED.
14. IT IS RECOMMENDED THAT THE SEPTIC TANK BE INSPECTED TWICE A YEAR, AND BE CLEANED WHEN THE SOLIDS EQUAL ONE THIRD THE LIQUID DEPTH.
15. MINIMUM PERIMETER INVERT ELEVATION = 70.25. NO FINISHED GRADE BELOW 70.25 FROM THE EDGE OF THE GRAVEL SAND TREATMENT SYSTEM FOR A 10 FEET MINIMUM.
16. THE SAND MEDIA USED IN CONSTRUCTION SHALL MEET THE ASTM C-33 SPECIFICATIONS. SIEVE ANALYSIS FROM PROPOSED SOURCE IS REQUIRED TO BE SUBMITTED TOGETHER WITH SHOP DRAWINGS. TESTING OF SAND MATERIAL DELIVERED TO THE SITE IS REQUIRED.
17. OWTS INSTALLER MUST BE FAMILIAR WITH ADVANTEX PRODUCTS AND GRAVEL SAND TREATMENT SYSTEMS PROPOSED FOR THIS SITE. SEE ADVANTEX INSTALLATION MANUAL, GRAVEL SAND TREATMENT SYSTEM DESIGN AND INSTALLATION MANUAL, AND RIDEM GUIDELINES FOR ADDITIONAL DETAILS OF INSTALLATION.
18. INSTALLATION SHALL BE IN STRICT CONFORMANCE WITH THE ORENCO ADVANTEX INSTALLATION MANUAL AND GRAVEL SAND TREATMENT SYSTEM INSTALLATION MANUAL AND ALL OTHER APPLICABLE SECTIONS OF 250-RICR150-6. THE INSTALLATION SHALL ONLY BE PERFORMED BY A RHODE ISLAND DEM LICENSED INSTALLER WHO HAS RECEIVED TRAINING AND IS AUTHORIZED IN WRITING BY THE VENDORS TO INSTALL THE SYSTEM. AUTHORIZATION FROM THE VENDORS SHALL BE SUBMITTED TO ENGINEER PRIOR TO ANY CONSTRUCTION.
19. REFER TO 250-RICR-150-10-6 AND RIDEM GUIDELINES FOR ADDITIONAL INFORMATION CONCERNING THE INSTALLATION, OPERATION AND MAINTENANCE OF THE SYSTEM. THE INSTALLER AND OWNER SHOULD REVIEW AND APPLY 250-RICR-150-10-6 AND RIDEM GUIDELINES. THE SYSTEM TO BE CONSTRUCTED BY A INSTALLER LICENSED BY RIDEM AND THOROUGHLY FAMILIAR WITH THE INSTALLATION OF ADVANTEX TREATMENT DEVICES AND GRAVEL SAND TREATMENT SYSTEMS.
20. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION WITH THE DESIGN ENGINEER IN ORDER TO FACILITATE WITNESSING THE REQUIRED PHASES OF THE SYSTEM INSTALLATION AS STATED IN 250-RICR-150-6.47 OF THE "REGULATIONS". FAILURE OF THE CONTRACTOR TO NOTIFY THE DESIGN ENGINEER IN A TIMELY MANNER MAY REQUIRE THE CONTRACTOR TO EXCAVATE AND EXPOSE SYSTEM COMPONENTS FOR OBSERVATION.
21. THE DESIGNER EXPRESSLY DISCLAIMS ANY RESPONSIBILITY FOR THE INSTALLATION AND MAINTENANCE OF THE SYSTEM. IT SHALL BE THE RESPONSIBILITY OF THE INSTALLER TO CONSTRUCT THE SYSTEM IN ACCORDANCE WITH THE ABOVE REFERENCED REGULATIONS.
22. CONTRACTOR SHALL CONTACT "DIG-SAFE" PRIOR TO CONSTRUCTION. LOCATION OF UTILITIES ON THIS PLAN ARE FROM EXISTING INFORMATION, BUT ARE ONLY TO BE CONSIDERED APPROXIMATE.
23. THERE ARE NO PUBLIC WELLS, EXISTING OR PROPOSED, FOUND TO BE LOCATED WITHIN 500 FEET OF THE PROPOSED OWTS EXCEPT AS SHOWN.
24. NO FRESHWATER WETLANDS OBSERVED WITHIN 200 FEET OF THE PROPOSED OWTS. THIS SITE DOES NOT LIE WITHIN A CRITICAL RESOURCE AREA.
25. I CERTIFY THAT THERE ARE NO WELLS FOUND TO BE LOCATED WITHIN 200 FEET OF THE PROPOSED LEACHING AREA, OTHER THAN AS SHOWN ON THIS PLAN. I ALSO CERTIFY THAT THERE ARE NO EXISTING OR PROPOSED DRAINS, FOUNDATION DRAINS OR SUB DRAINS FOUND TO BE LOCATED WITHIN 25 FEET OF THIS PROPOSED OWTS.
26. ALL PIPE JOINTS, PIPE CONNECTIONS AND ACCESS COVERS ARE TO WATERTIGHT.
27. PRESSURE PIPE SHALL BE INSTALLED TO MAINTAIN SLOPE BACK TO TANK/PUMP CHAMBER TO DRAIN BETWEEN PUMPING CYCLES. ELIMINATE ANY HIGH OR LOW POINTS THAT MAY PREVENT DRAINING AND/OR AIR POCKETS
28. CONTRACTOR TO PAY ANY REQUIRED INSTALLATION FEES.
29. CONTROL PANEL AND ALARM TO BE MOUNTED INSIDE BUILDING IN A CONSPICUOUS LOCATION, EXACT LOCATION TO BE COORDINATED WITH OWNER. ALL CONTROL PANELS AND JUNCTION BOXES SHALL BE NEMA 4X.
30. THE PUMP DOSING CONTROLS WILL BE FIELD TESTED IN THE PRESENCE OF THE DESIGN ENGINEER AND ORENCO REPRESENTATIVE. ADJUSTMENT TO CONTROLS ARE THE CONTRACTORS RESPONSIBILITY. CONTRACTOR MUST MAKE WATER AVAILABLE FOR TESTING OF THE CONTROL FLOATS.
31. ALL TREES AND SHRUBS SHALL BE CLEAR AND NO NEW ONES SHALL BE PLANTED WITHIN 10' OF THE GRAVEL SAND TREATMENT SYSTEM.
32. THE GRAVEL SAND TREATMENT SYSTEM LOCATION SHALL BE STAKED OUT AND PROTECTED PRIOR TO ANY SITE PREPARATION ACTIVITIES.
33. NO IMPERVIOUS SURFACE IS TO PLACED ABOVE THE GST (LEACHING) SYSTEM.
34. MATERIAL AND EQUIPMENT FROM ALTERNATE MANUFACTURERS MAY BE USED IF EQUAL. APPROVAL FOR ALTERNATE MATERIAL AND/OR EQUIPMENT IS REQUIRED FROM THE OWNER AND ENGINEER. FULL SPECIFICATIONS FOR ALTERNATE EQUIPMENT MUST BE PROVIDED BY THE CONTRACTOR. IF ACCEPTABLE, THE CONTRACTOR MUST PREPARE AND SUBMIT FOR AN RIDEM OWTS CONSTRUCTION PERMIT BASED UPON THE REDESIGN.

DESIGN DATA

DAILY SEWAGE FLOW:
50 GPD/CAMPSITE x 150 CAMPSITES = 7500 GALLONS PER DAY (G.P.D.)
GROUND WATER TABLE : 120"
DEPTH TO IMPERVIOUS : NOT ENCOUNTERED
SOIL CLASS: B, SOIL CATEGORY: 3, LOADING RATE: 0.70 GALS./S.F./DAY
SEPTIC TANK REQUIREMENTS VOLUME = 2 X 7,500 G.P.D = 15,000 GALLONS
LEACHING AREA REQUIREMENTS:
GRAVEL SAND TREATMENT (GST) SYSTEM WITH CATEGORY 1 TREATMENT
(ORENCO ADVANTEX TREATMENT AX100)
ASSIGNED EFFLUENT LOADING RATE = 3.5 GPD PER S. F.
SQUARE FOOTAGE OF GST REQUIRED =7500 GPD / 3.5 GPD PER S.F. = 2,143 S.F.
LENGTH OF GST 6212 REQUIRED = 2,143 S.F./17.5 S.F./L.F. = 123 L.F.
LENGTH OF GST 6212 SPECIFIED: 288 L.F.
TOTAL GST SYSTEM CAPACITY = 288 L.F. X 17.5 S.F./L.F. X 3.5 G.P.D./S.F. = 17,640 GPD
17,640 GPD > 7,500 GPD ~ CAPACITY = 235% OF ANTICIPATED DESIGN FLOW

Environmental Management FEB 21 2023 Office of Water Resources

CERTIFICATION:

THIS SURVEY HAS BEEN CONDUCTED AND THE PLAN HAS BEEN PREPARED PURSUANT TO SECTION 9 OF THE RULES AND REGULATIONS ADOPTED BY THE RHODE ISLAND STATE BOARD OF REGISTRATION FOR PROFESSIONAL LAND SURVEYORS ON NOVEMBER 25, 2015, AS FOLLOWS:

TYPE OF BOUNDARY SURVEY: NOT A BOUNDARY SURVEY
MEASUREMENT SPECIFICATION:
OTHER TYPE OF SURVEY:
DATA ACCUMULATION SURVEY (LOCATIONS) CLASS III
TOPOGRAPHIC SURVEY ACCURACY T-2 (IMMEDIATE AREA AROUND DWELLING AND OWTS AS IDENTIFIED)

THE PURPOSE OF THIS SURVEY IS TO DEPICT THE EXISTING CONDITIONS IN THE PROJECT AREA FOR CONSTRUCTION AND THE DESIGN OF A NEW ONSITE WASTEWATER TREATMENT SYSTEM.

David T. Bray 8/10/2022
DAVID T. BRAY PLS NO. 1899 DATE
CAPUTO AND WICK LTD., COA NO. A177

DAVID T. BRAY — No. 1899 — PROFESSIONAL LAND SURVEYOR
8-10-2022

KEVIN R. HARROP — No. 9200 — REGISTERED PROFESSIONAL ENGINEER CIVIL
D3155

STATE OF RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
DIVISION OF PLANNING AND DEVELOPMENT

DEMOLITION AND REBUILD OF BATHHOUSES
BURLINGAME STATE PARK AND CAMPGROUND
CHARLESTOWN, RHODE ISLAND

BATHHOUSE "B" - SITE PLAN

Dwg: Scale: 1" = 20'
Contract No. x Date: FEBRUARY, 2023
C-1.2
10

OWTS SUBMISSION - FEBRUARY 16, 2023

J:\Rhodelsland\Charlestown\RIDEM - Burlingame\009 - 025 and S-6 Site Design 2023.02.10.dwg

BURLINGAME STATE PARK AND CAMPGROUND

TH-4A – GROUND ELEV: 72.1 – AUGUST 18, 2021

HORIZON	DEPTH	HORIZON DIST	BOUNDARIES TOPO	SOIL MATRIX	COLORS RE-DOX FEATURES	RE-DOX Ab. S. CONTR.	TEXTURE	STRUCTURE	CONSISTENCE	SOIL CATEGORY
Ap	0 – 9"	C	S	2.5YR 6/3			Ls	2gbd	VFr	3
Bw	9" – 30"	C	S	10YR 5/6			Ls	2gbd	Fr	3
C	30" – 120"	C	S	2.5YR 7/3			Ls	2gbd	Fr	3

SOIL CLASS: B OBSERVED STANDING GROUNDWATER – NA OBSERVED WEEPING GROUNDWATER – NA
ESTIMATED SEASONAL HIGH WATER TABLE – 120" (ELEV.: 62.1) PERFORMED BY: KAMAL HINGORANY

TH-4B – GROUND ELEV: 71.5 – AUGUST 18, 2021

HORIZON	DEPTH	HORIZON DIST	BOUNDARIES TOPO	SOIL MATRIX	COLORS RE-DOX FEATURES	RE-DOX Ab. S. CONTR.	TEXTURE	STRUCTURE	CONSISTENCE	SOIL CATEGORY
FILL	0 – 10"	C	S	–			–	–	–	–
P	10" – 28"	C	S	10YR 2			Ls	2gbd	Fr	3
Bw	28" – 48"	C	S	2.5YR 7/3			Ls	2gbd	Fr	3
C	48" – 120"	C	S	2.5YR 7/3	5YR 4/4	M M P	Ls	2gbd	Fr	3

SOIL CLASS: B OBSERVED STANDING GROUNDWATER – NA OBSERVED WEEPING GROUNDWATER – NA
ESTIMATED SEASONAL HIGH WATER TABLE – 120" (ELEV.: 61.5) PERFORMED BY: KAMAL HINGORANY

TH-4C – GROUND ELEV: 72.6 – AUGUST 18, 2021

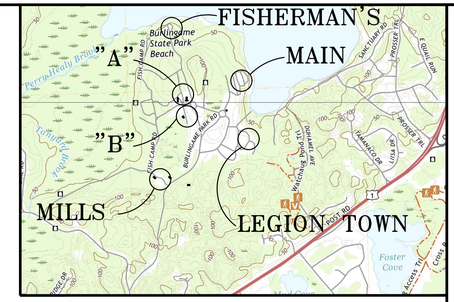
HORIZON	DEPTH	HORIZON DIST	BOUNDARIES TOPO	SOIL MATRIX	COLORS RE-DOX FEATURES	RE-DOX Ab. S. CONTR.	TEXTURE	STRUCTURE	CONSISTENCE	SOIL CATEGORY
Ap	0 – 12"	C	S	2.5YR 6/3			Ls	2gbd	VFr	3
Bw	12" – 40"	C	S	10YR 5/6			Ls	2gbd	Fr	3
C	40" – 120"	C	S	2.5YR 7/3			Ls	2gbd	Fr	3

SIL CLASS: B OBSERVED STANDING GROUNDWATER – NA OBSERVED WEEPING GROUNDWATER – NA
ESTIMATED SEASONAL HIGH WATER TABLE – 120" (ELEV.: 62.6) PERFORMED BY: KAMAL HINGORANY

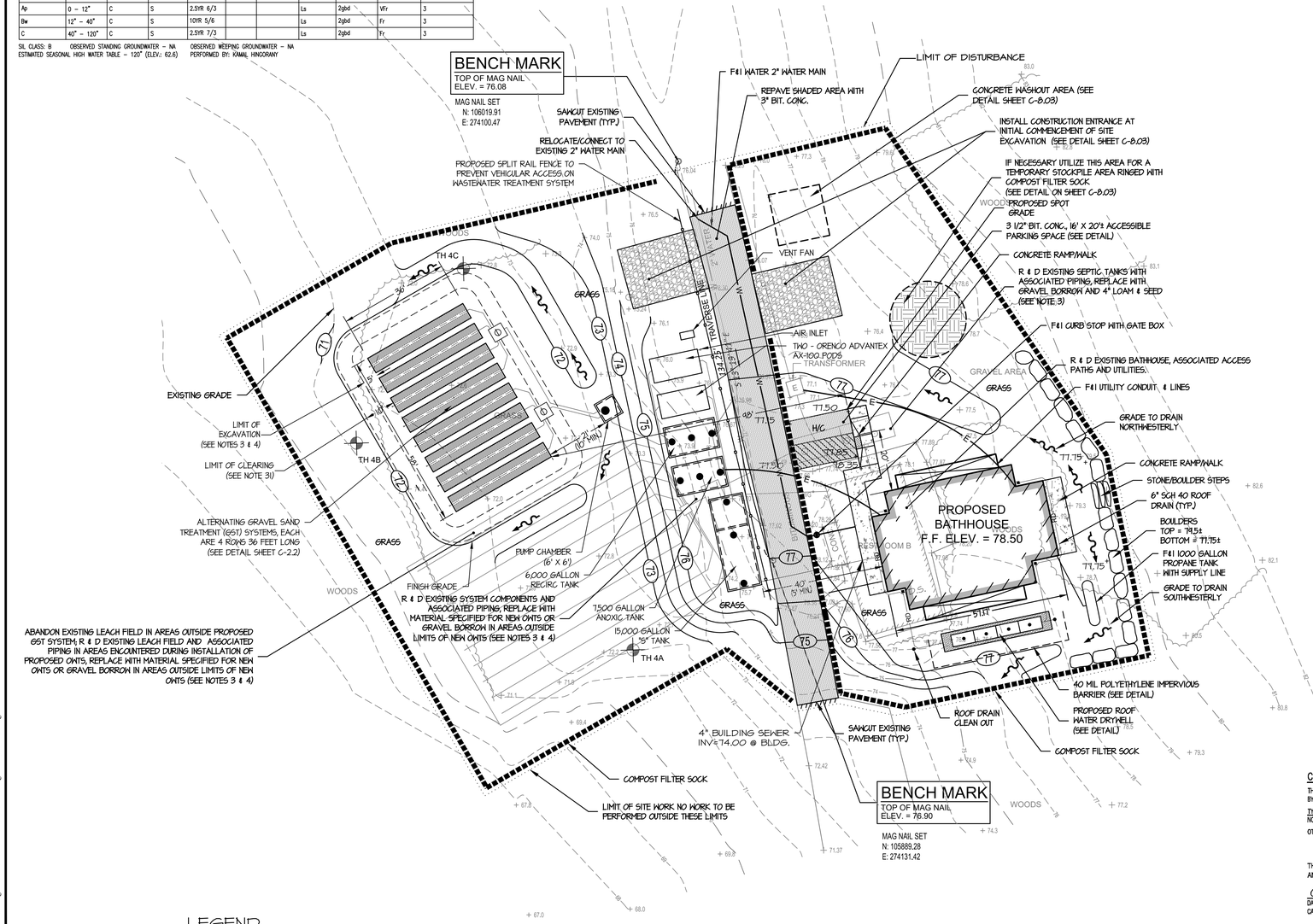
N.

20 10 0 20 40 60

SCALE IN FEET



LOCUS MAP



NOTES:

1. ALL WORK SHALL CONFORM TO THE RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT, OFFICE OF WATER RESOURCES "RULES AND REGULATIONS ESTABLISHING MINIMUM STANDARDS RELATING TO LOCATION, DESIGN, CONSTRUCTION AND MAINTENANCE OF ONSITE WASTEWATER TREATMENT SYSTEMS", LATEST EDITION.
2. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO CAPUTO AND WICK LTD. FOR APPROVAL OF ALL PROPOSED CONSTRUCTION MATERIALS AND EQUIPMENT PRIOR TO ANY CONSTRUCTION.
3. EXISTING ONSITE WASTEWATER TREATMENT SYSTEM (OWTS) PRECAST STRUCTURES ARE TO BE PUMPED OUT, RINSED WITH CLEAN WATER AND PUMPED OUT AGAIN. PUMPING MUST BE PERFORMED BY A STATE LICENSED SEPTIC HAULER AND THE CONTENTS OF THE TANK DISPOSED OF PROPERLY. AFTER PUMPING, THE EXISTING OWTS STRUCTURES MUST BE FILLED WITH FLOWABLE FILL OR REMOVED AND REPLACED WITH GRAVEL BORROW AND 4" LOAM AND SEED.
4. REMOVE ALL PORTIONS OF THE EXISITNG OWTS WITHIN 5' OF THE GRAVEL SAND TREATMENT SYSTEM; AND ALL FILL, A HORIZON SOIL, B HORIZON SOIL AND SCARIFY 3" OF THE C HORIZON SOIL BELOW THE GRAVEL SAND TREATMENT SYSTEM AND THOUGHLY MIX WITH ASTM C-33 SAND (SEE NOTE 16) TO INTERFACE THE FILL WITH THE SOIL AND REPLACE ALL REMOVED SOIL WITH ASTM C-33 SAND. A AND B SOIL HORIZON LAYERS ARE TO BE REMOVED IN THIS APPLICATION DUE TO COMPACTION CAUSED BY PREVIOUS SYSTEM INSTALLATION AND FILL BEING PLACED ABOVE.
5. UNSUITABLE MATERIAL USED TO BACKFILL THE TEST HOLES SHALL BE REMOVED AND REPLACED WITH WITH ASTM C-33 SAND (SEE NOTE 16).
6. ASTM C-33 SAND (SEE NOTE 16) MUST BE PLACED ON SCARIFIED, RELATIVELY DRY NATURAL SOIL. THE CONTRACTOR SHALL PROVIDE FOR DEWATERING AS REQUIRED AND ALL WORK SHALL BE PERFORMED UNDER DRY CONDITIONS.
7. BUILDING SEWER PIPE TO BE 4" P. V. C. SCH. 40 UNLESS OTHERWISE NOTED.
8. PLACE 6" MINIMUM COMPACTED CRUSHED STONE UNDER SEPTIC TANK, ANOXIC TANK, RECIRCULATION TANK, PUMP CHAMBER, ADVANTEX TREATMENT TANKS AND SYSTEM STRUCTURES.
9. INLET AND OUTLET TEES FOR SEPTIC TANK, ANOXIC TANK, RECIRCULATION TANK AND PUMP CHAMBER ARE TO BE LOCATED DIRECTLY BELOW ACCESS COVERS.
10. SEPTIC TANK, ANOXIC TANK, RECIRCULATION TANK, PUMP CHAMBER AND ADVANTEX TREATMENT TANK RISERS/COVERS TO BE AT FINISH GRADE.
11. IF CONDITIONS ENCOUNTERED DURING CONSTRUCTION VARY SUBSTANTIALLY FROM THOSE SHOWN ON THIS PLAN, NOTIFY CAPUTO AND WICK, LTD. BEFORE PROCEEDING WITH CONSTRUCTION. IF IN DOUBT, ASK.
12. NEW SEPTIC TANK SHALL MEET ALL OF THE REQUIREMENTS OF 250-RICR-150-10-8.27.
13. INSPECTION OF THE SEPTIC TANK, ANOXIC TANK, RECIRCULATION TANK, PUMP CHAMBER AND ADVANTEX TREATMENT TANK SHALL BE PART OF THE MAINTENANCE SERVICE FOR THE OWTS AND ALL COMPONENTS SHALL BE CLEANED WHEN REQUIRED.
14. IT IS RECOMMENDED THAT THE SEPTIC TANK BE INSPECTED TWICE A YEAR, AND BE CLEANED WHEN THE SOLIDS EQUAL ONE THIRD THE LIQUID DEPTH.
15. MINIMUM PERIMETER INVERT ELEVATION = 70.25. NO FINISHED GRADE BELOW 70.25 FROM THE EDGE OF THE GRAVEL SAND TREATMENT SYSTEM FOR A 10 FEET MINIMUM.
16. THE SAND MEDIA USED IN CONSTRUCTION SHALL MEET THE ASTM C-33 SPECIFICATIONS. SIEVE ANALYSIS FROM PROPOSED SOURCE IS REQUIRED TO BE SUBMITTED TOGETHER WITH SHOP DRAWINGS. TESTING OF SAND MATERIAL DELIVERED TO THE SITE IS REQUIRED.
17. OWTS INSTALLER MUST BE FAMILIAR WITH ADVANTEX PRODUCTS AND GRAVEL SAND TREATMENT SYSTEMS PROPOSED FOR THIS SITE. SEE ADVANTEX INSTALLATION MANUAL, GRAVEL SAND TREATMENT SYSTEM DESIGN AND INSTALLATION MANUAL, AND RIDEM GUIDELINES FOR ADDITIONAL DETAILS OF INSTALLATION.
18. INSTALLATION SHALL BE IN STRICT CONFORMANCE WITH THE ORENCO ADVANTEX INSTALLATION MANUAL AND GRAVEL SAND TREATMENT SYSTEM INSTALLATION MANUAL AND ALL OTHER APPLICABLE SECTIONS OF 250-RICR150-6. THE INSTALLATION SHALL ONLY BE PERFORMED BY A RHODE ISLAND DEM LICENSED INSTALLER WHO HAS RECEIVED TRAINING AND IS AUTHORIZED IN WRITING BY THE VENDORS TO INSTALL THE SYSTEM. AUTHORIZATION FROM THE VENDORS SHALL BE SUBMITTED TO ENGINEER PRIOR TO ANY CONSTRUCTION.
19. REFER TO 250-RICR-150-10-6 AND RIDEM GUIDELINES FOR ADDITIONAL INFORMATION CONCERNING THE INSTALLATION, OPERATION AND MAINTENANCE OF THE SYSTEM. THE INSTALLER AND OWNER SHOULD REVIEW AND APPLY 250-RICR-150-10-6 AND RIDEM GUIDELINES. THE SYSTEM TO BE CONSTRUCTED BY A INSTALLER LICENSED BY RIDEM AND THOROUGHLY FAMILIAR WITH THE INSTALLATION OF ADVANTEX TREATMENT DEVICES AND GRAVEL SAND TREATMENT SYSTEMS.
20. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION WITH THE DESIGN ENGINEER IN ORDER TO FACILITATE WITNESSING THE REQUIRED PHASES OF THE SYSTEM INSTALLATION AS STATED IN 250-RICR-150-6.47 OF THE "REGULATIONS". FAILURE OF THE CONTRACTOR TO NOTIFY THE DESIGN ENGINEER IN A TIMELY MANNER MAY REQUIRE THE CONTRACTOR TO EXCAVATE AND EXPOSE SYSTEM COMPONENTS FOR OBSERVATION.
21. THE DESIGNER EXPRESSLY DISCLAIMS ANY RESPONSIBILITY FOR THE INSTALLATION AND MAINTENANCE OF THE SYSTEM. IT SHALL BE THE RESPONSIBILITY OF THE INSTALLER TO CONSTRUCT THE SYSTEM IN ACCORDANCE WITH THE ABOVE REFERENCED REGULATIONS.
22. CONTRACTOR SHALL CONTACT "DIG-SAFE" PRIOR TO CONSTRUCTION. LOCATION OF UTILITIES ON THIS PLAN ARE FROM EXISTING INFORMATION, BUT ARE ONLY TO BE CONSIDERED APPROXIMATE.
23. THERE ARE NO PUBLIC WELLS, EXISTING OR PROPOSED, FOUND TO BE LOCATED WITHIN 500 FEET OF THE PROPOSED OWTS EXCEPT AS SHOWN.
24. NO FRESHWATER WETLANDS OBSERVED WITHIN 200 FEET OF THE PROPOSED OWTS. THIS SITE DOES NOT LIE WITHIN A CRITICAL RESOURCE AREA.
25. I CERTIFY THAT THERE ARE NO WELLS FOUND TO BE LOCATED WITHIN 200 FEET OF THE PROPOSED LEACHING AREA, OTHER THAN AS SHOWN ON THIS PLAN. I ALSO CERTIFY THAT THERE ARE NO EXISTING OR PROPOSED DRAINS, FOUNDATION DRAINS OR SUB DRAINS FOUND TO BE LOCATED WITHIN 25 FEET OF THIS PROPOSED OWTS.
26. ALL PIPE JOINTS, PIPE CONNECTIONS AND ACCESS COVERS ARE TO WATERTIGHT.
27. PRESSURE PIPE SHALL BE INSTALLED TO MAINTAIN SLOPE BACK TO TANK/PUMP CHAMBER TO DRAIN BETWEEN PUMPING CYCLES. ELIMINATE ANY HIGH OR LOW POINTS THAT MAY PREVENT DRAINING AND/OR AIR POCKETS
28. CONTRACTOR TO PAY ANY REQUIRED INSTALLATION FEES.
29. CONTROL PANEL AND ALARM TO BE MOUNTED INSIDE BUILDING IN A CONSPICUOUS LOCATION, EXACT LOCATION TO BE COORDINATED WITH OWNER. ALL CONTROL PANELS AND JUNCTION BOXES SHALL BE NEMA 4X.
30. THE PUMP DOSING CONTROLS WILL BE FIELD TESTED IN THE PRESENCE OF THE DESIGN ENGINEER AND ORENCO REPRESENTATIVE. ADJUSTMENT TO CONTROLS ARE THE CONTRACTORS RESPONSIBILITY. CONTRACTOR MUST MAKE WATER AVAILABLE FOR TESTING OF THE CONTROL FLOATS.
31. ALL TREES AND SHRUBS SHALL BE CLEAR AND NO NEW ONES SHALL BE PLANTED WITHIN 10' OF THE GRAVEL SAND TREATMENT SYSTEM.
32. THE GRAVEL SAND TREATMENT SYSTEM LOCATION SHALL BE STAKED OUT AND PROTECTED PRIOR TO ANY SITE PREPARATION ACTIVITIES.
33. NO IMPERVIOUS SURFACE IS TO PLACED ABOVE THE GST (LEACHING) SYSTEM.
34. MATERIAL AND EQUIPMENT FROM ALTERNATE MANUFACTURERS MAY BE USED IF EQUAL. APPROVAL FOR ALTERNATE MATERIAL AND/OR EQUIPMENT IS REQUIRED FROM THE OWNER AND ENGINEER. FULL SPECIFICATIONS FOR ALTERNATE EQUIPMENT MUST BE PROVIDED BY THE CONTRACTOR. IF ACCEPTABLE, THE CONTRACTOR MUST PREPARE AND SUBMIT FOR AN RIDEM OWTS CONSTRUCTION PERMIT BASED UPON THE REDESIGN.

DESIGN DATA

DAILY SEWAGE FLOW:
50 GPD/CAMPSITE x 150 CAMPSITES = 7500 GALLONS PER DAY (G.P.D.)
GROUND WATER TABLE : 120"
DEPTH TO IMPERVIOUS : NOT ENCOUNTERED
SOIL CLASS: B, SOIL CATEGORY: 3, LOADING RATE: 0.70 GALS./S.F./DAY
SEPTIC TANK REQUIREMENTS VOLUME = 2 X 7,500 G.P.D = 15,000 GALLONS
LEACHING AREA REQUIREMENTS:
GRAVEL SAND TREATMENT (GST) SYSTEM WITH CATEGORY 1 TREATMENT
(ORENCO ADVANTEX TREATMENT AX100)
ASSIGNED EFFLUENT LOADING RATE = 3.5 GPD PER S. F.
SQUARE FOOTAGE OF GST REQUIRED =7500 GPD / 3.5 GPD PER S.F. = 2,143 S.F.
LENGTH OF GST 6212 REQUIRED = 2,143 S.F./17.5 S.F./L.F. = 123 L.F.
LENGTH OF GST 6212 SPECIFIED: 288 L.F.
TOTAL GST SYSTEM CAPACITY = 288 L.F. X 17.5 S.F./L.F. X 3.5 G.P.D./S.F. = 17,640 GPD
17,640 GPD > 7,500 GPD ~ CAPACITY = 235% OF ANTICIPATED DESIGN FLOW

CERTIFICATION:

THIS SURVEY HAS BEEN CONDUCTED AND THE PLAN HAS BEEN PREPARED PURSUANT TO SECTION 8 OF THE RULES AND REGULATIONS ADOPTED BY THE RHODE ISLAND STATE BOARD OF REGISTRATION FOR PROFESSIONAL LAND SURVEYORS ON NOVEMBER 25, 2015, AS FOLLOWS:

TYPE OF BOUNDARY SURVEY: NOT A BOUNDARY SURVEY
MEASUREMENT SPECIFICATION:

OTHER TYPE OF SURVEY:
DATA ACCUMULATION SURVEY (LOCATIONS) — CLASS III
TOPOGRAPHIC SURVEY ACCURACY — T-2 (IMMEDIATE AREA AROUND DWELLING AND OWTS AS IDENTIFIED)

THE PURPOSE OF THIS SURVEY IS TO DEPICT THE EXISTING CONDITIONS IN THE PROJECT AREA FOR CONSTRUCTION AND THE DESIGN OF A NEW ONSITE WASTEWATER TREATMENT SYSTEM.

David T. Bray 8/10/2022
DAVID T. BRAY PLS NO. 1899 — DATE
CAPUTO AND WICK LTD., COA NO. A177

DAVID T. BRAY — RHODE ISLAND — No. 1899 — PROFESSIONAL LAND SURVEYOR
8/10/2022

KEVIN R. HARROP — No. 9200 — REGISTERED PROFESSIONAL ENGINEER — CIVIL
D3155

LEGEND

—— 100 ——	EXISTING CONTOUR	F.G. 100x00	FINISHED SPOT GRADE
(100)	PROPOSED CONTOUR	+ 100.00	EXISTING SPOT GRADE
RI. STD.	RHODE ISLAND STANDARD		SPLIT RAIL FENCE
INV.	INVERT OF PIPE		DEEP OBSERVATION HOLE
P. V. C.	POLYVINYL CHLORIDE PIPE		OUT CROP OR SURFACE ROCK
S. D. R.	STANDARD DIMENSION RATIO	—E—	EXIST. UNDERGROUND ELECTRIC
CONC.	CONCRETE	—W—	EXIST. WATER
BIT.	BITUMINOUS	—T—	EXIST. UNDERGROUND TELEPHONE
TYP.	TYPICAL		FINISH GRADE SURFACE FLOW DIRECTION

CAPUTO AND WICK LTD. - 1150 PAWTUCKET AVENUE - RUMFORD R.I. 02916

STATE OF RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
DIVISION OF PLANNING AND DEVELOPMENT

DEMOLITION AND REBUILD OF BATHHOUSES
BURLINGAME STATE PARK AND CAMPGROUND
CHARLESTOWN, RHODE ISLAND

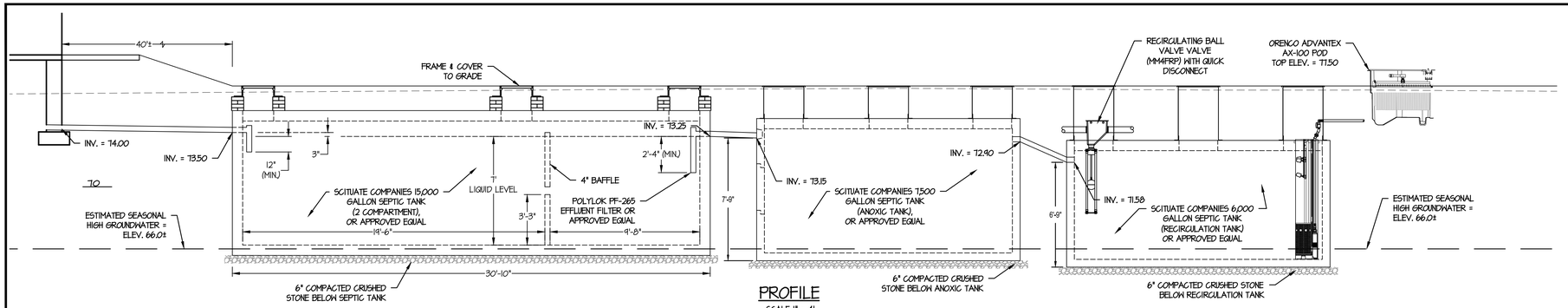
BATHHOUSE "B" - SITE PLAN

Dwg: Scale: 1" = 20'
Contract No. x Date: FEBRUARY, 2023

C-1.2
10

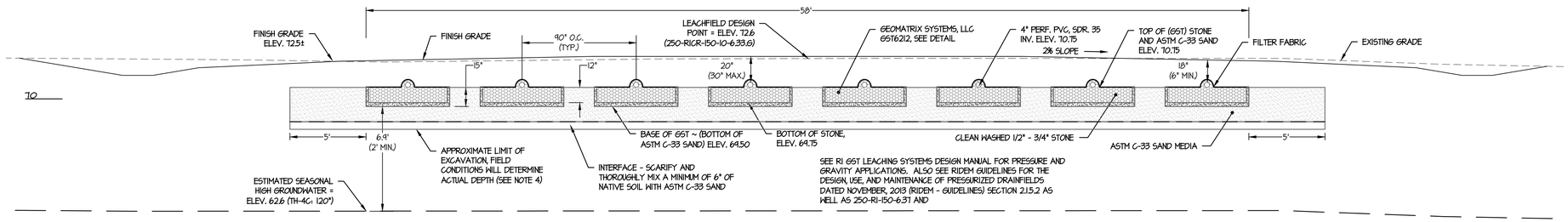
OWTS SUBMISSION - FEBRUARY 16, 2023

J:\Rhode Island\Charlestown\RIDEM - Burlingame\009 - 025 and S-6 Site Design 2023\02.10.dwg



PROFILE

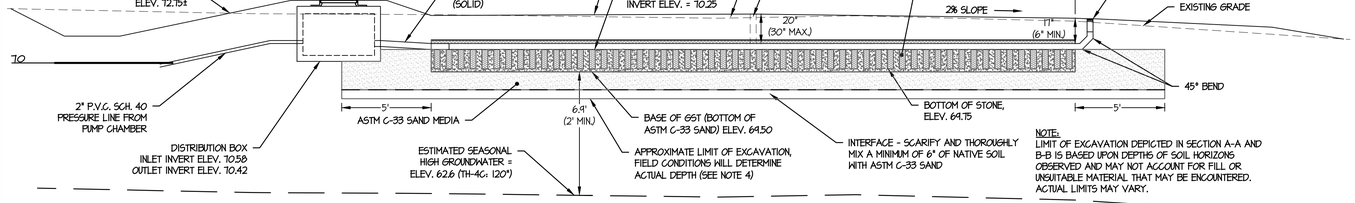
SCALE 1" = 4'



SEE RI GST LEACHING SYSTEMS DESIGN MANUAL FOR PRESSURE AND GRAVITY APPLICATIONS. ALSO SEE RIDEM GUIDELINES FOR THE DESIGN, USE, AND MAINTENANCE OF PRESSURIZED DRAINFIELDS DATED NOVEMBER, 2013 (RIDEM - GUIDELINES) SECTION 2.1.5.2 AS WELL AS 250-RI-150-6.31 AND

GRAVEL TREATMENT SYSTEM (GST) SECTION B-B

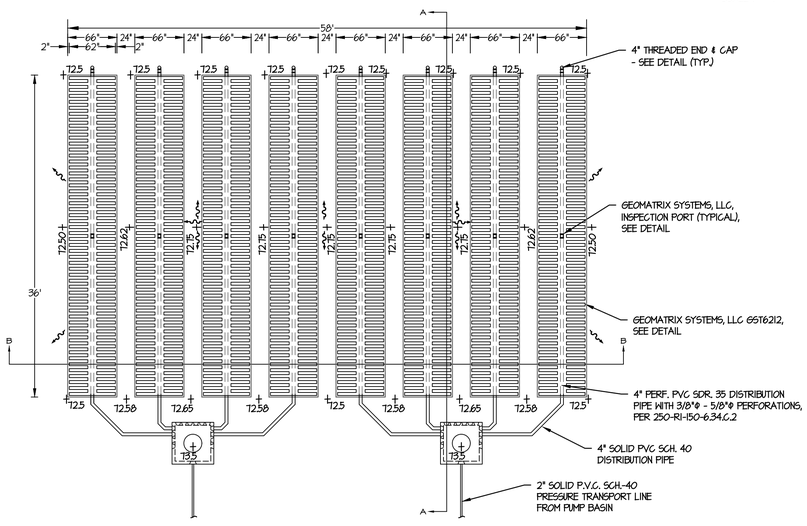
SCALE 1" = 4'



NOTE:
LIMIT OF EXCAVATION DEPICTED IN SECTION A-A AND B-B IS BASED UPON DEPTHS OF SOIL HORIZONS OBSERVED AND MAY NOT ACCOUNT FOR FILL OR UNSUITABLE MATERIAL THAT MAY BE ENCOUNTERED. ACTUAL LIMITS MAY VARY.

GRAVEL TREATMENT SYSTEM (GST) SECTION A-A

SCALE 1" = 4'



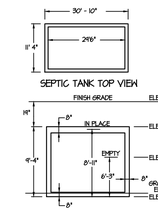
GRAVEL SAND TREATMENT SYSTEM (GST) PLAN VIEW

SCALE 1" = 8'

ELEVATION SCHEDULE

DESCRIPTION	ELEVATION
INVERT AT FOUNDATION - TO SEPTIC TANK	74.00
INVERT IN - SEPTIC TANK	73.50
LIQUID LEVEL IN SEPTIC TANK	73.25
INVERT IN - ANOXIC TANK	73.15
INVERT OUT - ANOXIC TANK	72.90
INVERT IN RECIRC TANK	71.58
BOTTOM OF RECIRCULATION TANK	64.83
TOP OF ADVANTEX AX-100	77.50
INVERT OUT - RECIRCULATION TANK TO PUMP BASIN	73.50
INV. IN PUMP BASIN	70.00
TOP OF PUMP BASIN RIM	73.50
ELEVATION HIGH LEVEL ALARM/ALT. PUMP	67.83
ELEVATION PUMP ON	67.67
ELEVATION PUMP OFF	65.83
ELEVATION LOW LEVEL ALARM	65.67
INV. 2" OUT PUMP BASIN	70.00
BOTTOM OF PUMP BASIN	69.50
INVERT INTO DISTRIBUTION BOX	71.58
INVERT OUT OF DISTRIBUTION BOX	71.42
ELEV. TOP OF COVER STONE ABOVE DISTRIBUTION PIPE	71.75
INV. 4" PERF. DISTRIBUTION PIPE GST	71.25
BOTTOM OF GST STONE	70.25
BASE OF GST SAND	70.00
EST. SEASONAL HIGH GW	62.6 (TH-4C)
MAX. FINISHED GRADE AT GST	74.08
MIN. FINISHED GRADE AT GST	72.08

PUMP CURVE: MYERS SRM4



VOLUMES
TOP SLAB: 11.33' WIDE X 30.83' LONG X 0.67' THICK = 232.96 C.F. (CUBIC FOOT)
SIDES: 2 SIDES x 10.00' LONG X 8.00' HIGH X 0.67' WIDE = 106.61 C.F.
2 SIDES x 30.83' LONG X 8.00' HIGH X 0.67' WIDE = 328.84 C.F.
BOTTOM: 11.33' WIDE X 30.83' LONG X 0.67' THICK = 232.96 C.F.
BAFFLE: 10.00' LONG X 7.25' HIGH X 0.33' WIDE = 28.92 C.F.
TOTAL VOLUME OF CONCRETE FOR TANK = 925.40 C.F.
EARTH: 11.33' WIDE X 30.83' LONG X 1.58' THICK = 551.40 C.F.

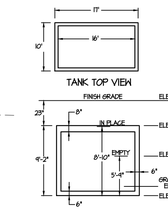
CONSTANTS (HEIGHTS)
CONCRETE: 150 POUNDS/C.F.
EARTH: 100 POUNDS/C.F.
WATER: 62.4 POUNDS/C.F.
COUNTER HEIGHT: N.A.

HEIGHT OF TANK IN PLACE
CONCRETE: 925.40 C.F. X 150 POUNDS/C.F. = 138,810 POUNDS (EMPTY TANK)
COUNTER HEIGHT: = 0 POUNDS
EARTH: 551.40 C.F. X 100 POUNDS/C.F. = 55,140 POUNDS (EARTH COVER)
TOTAL HEIGHT OF TANK SET IN PLACE = 194,000 POUNDS (EMPTY)

DETERMINE BUOYANCY POINT FOR EMPTY TANK PRIOR TO BACKFILL
BOTTOM SLAB AREA: 11.33' WIDE X 30.83' LONG = 349.44 S.F.(SQUARE FEET)
TANK: 349.44 S.F.X BP X 62.4 POUNDS/C.F. = 138,810 POUNDS (EMPTY TANK)
BP = 138,810 POUNDS ÷ 62.4 POUNDS/C.F. ÷ 349.44 S.F.
BP = 6.37' ~ 6'-4"± (ELEV. 71.45)

DETERMINE BUOYANCY POINT FOR EMPTY TANK IN PLACE
BP = 194,000 POUNDS ÷ 62.4 POUNDS/C.F. ÷ 349.44 S.F.
BP = 8.90' ~ 8'-11"± (ELEV. 74.48)

BUOYANCY CALCULATIONS FOR 15,000 GALLON SEPTIC TANK



VOLUMES
TOP SLAB: 10.00' WIDE X 17.00' LONG X 0.67' THICK = 113.33 C.F. (CUBIC FOOT)
SIDES: 2 SIDES x 9.00' LONG X 8.00' HIGH X 0.50' WIDE = 72.00 C.F.
2 SIDES x 17.00' LONG X 8.00' HIGH X 0.50' WIDE = 136.00 C.F.
BOTTOM: 10.00' WIDE X 17.00' LONG X 0.50' THICK = 85.00 C.F.
TOTAL VOLUME OF CONCRETE FOR TANK = 406.33 C.F.
EARTH: 10.00' WIDE X 17.00' LONG X 1.92' THICK = 326.40 C.F.

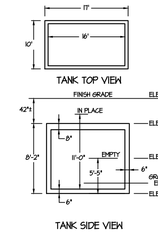
CONSTANTS (HEIGHTS)
CONCRETE: 150 POUNDS/C.F.
EARTH: 100 POUNDS/C.F.
WATER: 62.4 POUNDS/C.F.
COUNTER HEIGHT: N.A.

HEIGHT OF TANK
CONCRETE: 406.33 C.F. X 150 POUNDS/C.F. = 60,950 POUNDS (EMPTY TANK)
COUNTER HEIGHT: = 0 POUNDS
EARTH: 326.40 C.F. X 100 POUNDS/C.F. = 32,640 POUNDS (EARTH COVER)
TOTAL HEIGHT OF TANK SET IN PLACE = 93,540 POUNDS (EMPTY)

DETERMINE BUOYANCY POINT FOR EMPTY TANK PRIOR TO BACKFILL
BOTTOM SLAB AREA: 10.00' WIDE X 17.00' LONG = 170.00 S.F.(SQUARE FEET)
TANK: 170.00 S.F.X BP X 62.4 POUNDS/C.F. = 60,950 POUNDS (EMPTY TANK)
BP = 60,950 POUNDS ÷ 62.4 POUNDS/C.F. ÷ 170.00 S.F.
BP = 5.75' ~ 5'-9"± (ELEV. 71.00)

DETERMINE BUOYANCY POINT FOR EMPTY TANK IN PLACE
BP = 93,540 POUNDS ÷ 62.4 POUNDS/C.F. ÷ 170.00 S.F.
BP = 8.82' ~ 8'-10"± (ELEV. 74.22)

BUOYANCY CALCULATIONS FOR 7,500 ANOXIC TANK



VOLUMES
TOP SLAB: 10.00' WIDE X 17.00' LONG X 0.67' THICK = 113.33 C.F. (CUBIC FOOT)
SIDES: 2 SIDES x 9.00' LONG X 7.00' HIGH X 0.50' WIDE = 63.00 C.F.
2 SIDES x 17.00' LONG X 7.00' HIGH X 0.50' WIDE = 119.00 C.F.
BOTTOM: 10.00' WIDE X 17.00' LONG X 0.50' THICK = 85.00 C.F.
TOTAL VOLUME CONCRETE FOR TANK =380.33 C.F.
EARTH: 10.00' WIDE X 17.00' LONG X 3.5' THICK = 595.00 C.F.

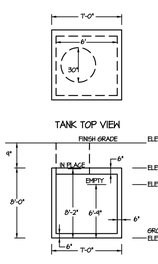
CONSTANTS (HEIGHTS)
CONCRETE: 150 POUNDS/C.F.
EARTH: 100 POUNDS/C.F.
WATER: 62.4 POUNDS/C.F.
COUNTER HEIGHT: N.A.

HEIGHT OF TANK AND EARTH COVER
CONCRETE: 380.33 C.F. X 150 POUNDS/C.F. = 57,050 POUNDS (EMPTY TANK)
COUNTER HEIGHT: = 0 POUNDS
EARTH: 595.00 C.F. X 100 POUNDS/C.F. = 59,500 POUNDS (EARTH COVER)
TOTAL HEIGHT OF TANK SET IN PLACE = 116,550 POUNDS (EMPTY)

DETERMINE BUOYANCY POINT FOR EMPTY TANK PRIOR TO BACKFILL
BOTTOM SLAB AREA: 10.00' WIDE X 17.00' LONG = 170.00 S.F.(SQUARE FEET)
TANK: 170.00 S.F.X BP X 62.4 POUNDS/C.F. = 57,050 POUNDS (EMPTY TANK)
BP = 57,050 POUNDS ÷ 62.4 POUNDS/C.F. ÷ 170.00 S.F.
BP = 5.37' ~ 5'-3"± (ELEV. 70.20)

DETERMINE BUOYANCY POINT FOR EMPTY TANK IN PLACE
BP = 116,550 POUNDS ÷ 62.4 POUNDS/C.F. ÷ 170.00 S.F.
BP = 10.98' ~ 11'-0"± (ELEV. 75.82)

BUOYANCY CALCULATIONS FOR 6,000 RECIRCULATION TANK



AREAS
TOP: (7.0' X 7.0' = 49.0 S.F.) - (11' X 1.25'^{2} = 4.91 S.F.) = 44.09 S.F. (SQUARE FEET)

VOLUMES
TOP SLAB: 44.09 S.F. X 0.50' THICK = 22.05 C.F. (CUBIC FOOT)
SIDES: 2 SIDES x 7.0' LONG X 7.0' HIGH X 0.50' THICK = 49.00 C.F.
2 SIDES x 6.0' LONG X 7.0' HIGH X 0.50' THICK = 42.00 C.F.
BOTTOM: 7.00 WIDE X 7.00' LONG X 0.50' THICK = 24.50 C.F.
TOTAL VOLUME OF CONCRETE FOR TANK = 137.55 C.F.
EARTH: 44.09 S.F. X 0.75' THICK = 33.07 C.F.

CONSTANTS (HEIGHTS)
CONCRETE: 150 POUNDS/C.F.
EARTH: 100 POUNDS/C.F.
WATER: 62.4 POUNDS/C.F.

HEIGHT OF TANK AND EARTH COVER
CONCRETE: 137.55 C.F. X 150 POUNDS/C.F. = 20,633 POUNDS (EMPTY TANK)
EARTH: 33.07 C.F. X 100 POUNDS/C.F. = 3,307 POUNDS (EARTH COVER)
TOTAL HEIGHT OF TANK SET IN PLACE = 23,940 POUNDS (EMPTY)

DETERMINE BUOYANCY POINT FOR EMPTY TANK PRIOR TO BACKFILL
BOTTOM SLAB AREA: = 26.78 S.F.
CHAMBER: 44.00 S.F. X BP X 62.4 POUNDS/C.F. = 20,633 POUNDS (EMPTY TANK)
BP = 20,633 POUNDS ÷ 62.4 POUNDS/C.F. ÷ 44.00 S.F.
BP = 6.75' ~ 6'-9"± (ELEV. 70.25)

DETERMINE BUOYANCY POINT FOR EMPTY TANK IN PLACE
BP = 23,940 POUNDS ÷ 62.4 POUNDS/C.F. ÷ 44.00 S.F.
BP = 7.83' ~ 7'-10"± (ELEV. 71.33)

BUOYANCY CALCULATIONS FOR PUMP CHAMBER

PUMPING AND SYSTEM SPECIFICATIONS/DATA:

PUMP CHAMBER PUMP MODEL:
MYERS SRM4 SUBMERSIBLE SEWAGE PUMP
HORSEPOWER - 0.4; SINGLE PHASE
2" INCH DISCHARGE; 230 VOLTS; 60 HZ 6 AMPS
LIFT OUT (2)
MYERS SRA 200 WITH STAINLESS STEEL BRACKETS
CONTROL PANEL MODEL
MYERS CE-210W ALTERNATING
ENCLOSURE - NEMA 1 (NEMA 4X IF EXPOSED TO WEATHER)
VOLTAGE - 230
HIGH LEVEL ALARM - VISUAL AND AUDIO
FLOATS MODEL
MYERS MODEL 20VM SJE OR EQUAL

PUMP CHAMBER DISCHARGE VOLUME PER CYCLE:
6' X 8' INTERIOR @ 1' - 10" = 66 CUBIC FEET X 7.48 GALLONS/CF = 494 GAL./CYCLE
2" PIPE DRAIN BACK: APPROXIMATELY 8 GAL.
494 GALLONS/CYCLE - 8 GALLONS = 486 GAL./CYCLE
7500 GPS/ 2 GST SYSTEMS = 3750 GPD/486 GAL./CYCLE = 7.7 ~ 8 CYCLES/DAY/GST

FLOATS - ON, OFF, HIGH AND LOW WATER:
HIGH WATER - ELEVATION 67.83
PUMP ON - ELEVATION 67.67
PUMP OFF - ELEVATION 65.83
LOW WATER - ELEVATION 65.67

ORENCO AX-100 TREATMENT SYSTEM DATA REVIEWED AND PROVIDED BY ATLANTIC SOLUTIONS (CONTROL PANEL - TIME DOSED)

GRAVEL SAND TREATMENT (GST) SYSTEM DATA REVIEWED BY GEOMATRIX SYSTEMS LLC.

CAPUTO AND WICK LTD. - 1150 PAWTUCKET AVENUE - RUMFORD R.I. 02916

BURLINGAME STATE PARK AND CAMPGROUND

STATE OF RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
DIVISION OF PLANNING AND DEVELOPMENT

DEMOLITION AND REBUILD OF BATHHOUSES
BURLINGAME STATE PARK AND CAMPGROUND
CHARLESTOWN, RHODE ISLAND

BATHHOUSE "B" - OWTS DETAILS

Dwg: Scale: 1" = 20'
Contract No. x Date: FEBRUARY, 2023

C-2.2
16

OWTS SUBMISSION - FEBRUARY 16, 2023

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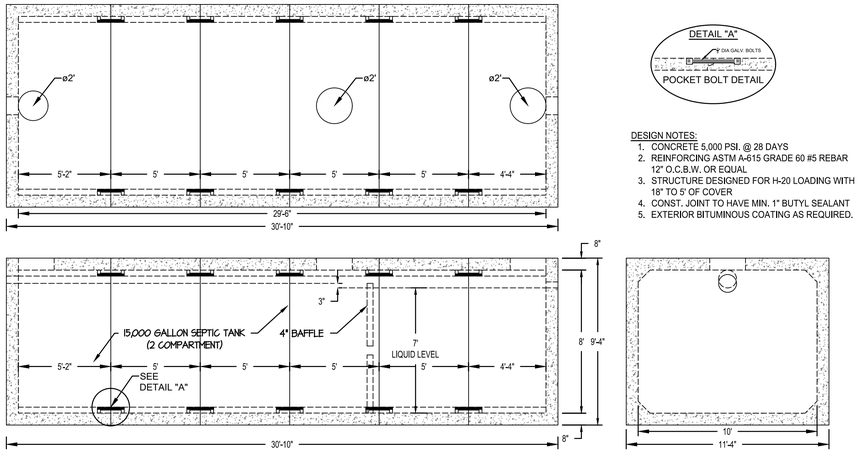
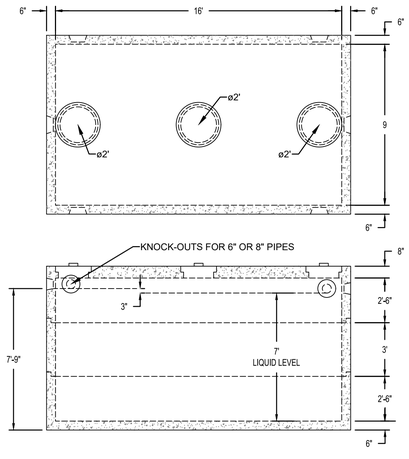


15,000 GALLON TWO COMPARTMENT SEPTIC TANK

SCALE 1" - 4'

DESIGN NOTES:

1. CONCRETE 5,000 PSI. @ 28 DAYS
2. REINFORCING ASTM A-615 GRADE 60 #5 REBAR 12" O.C.B.W. OR EQUAL
3. STRUCTURE DESIGNED FOR H-20 LOADING WITH 18" TO 5' OF COVER
4. CONST. JOINT TO HAVE MIN. 1" BUTYL SEALANT
5. EXTERIOR BITUMINOUS COATING AS REQUIRED.

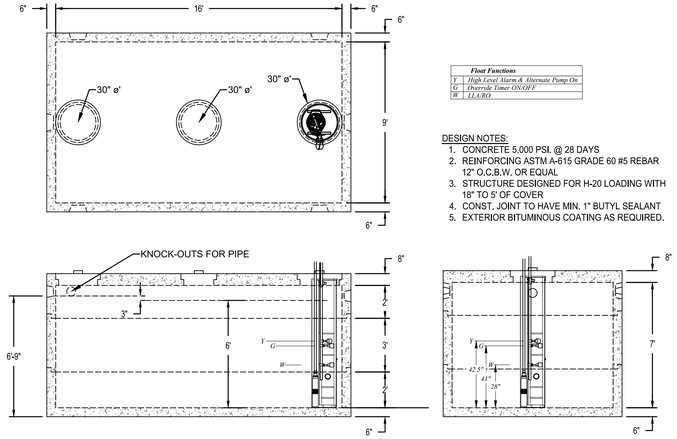


7, 500 GALLON ANOXIC TANK

SCALE 1" - 4'

DESIGN NOTES:

1. CONCRETE 5,000 PSI. @ 28 DAYS
2. REINFORCING ASTM A-615 GRADE 60 #5 REBAR 12" O.C.B.W. OR EQUAL
3. STRUCTURE DESIGNED FOR H-20 LOADING WITH 18" TO 5' OF COVER
4. CONST. JOINT TO HAVE MIN. 1" BUTYL SEALANT
5. EXTERIOR BITUMINOUS COATING AS REQUIRED.



Float Functions	
Y	High Level Alarm & Alternate Pump On
G	Override Timer ON/OFF
W	LEAD

DESIGN NOTES:

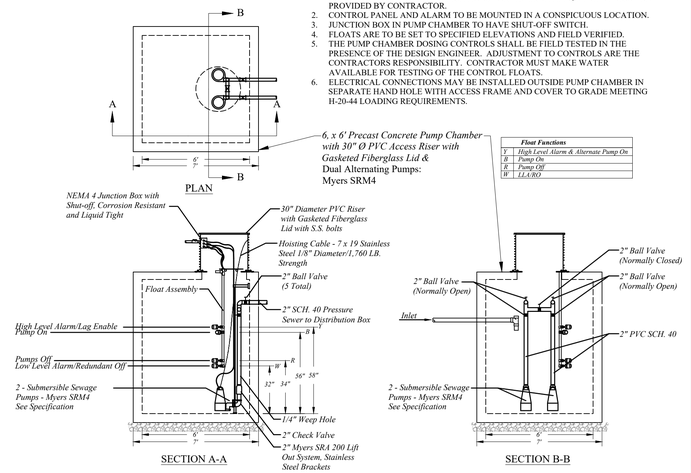
1. CONCRETE 5,000 PSI. @ 28 DAYS
2. REINFORCING ASTM A-615 GRADE 60 #5 REBAR 12" O.C.B.W. OR EQUAL
3. STRUCTURE DESIGNED FOR H-20 LOADING WITH 18" TO 5' OF COVER
4. CONST. JOINT TO HAVE MIN. 1" BUTYL SEALANT
5. EXTERIOR BITUMINOUS COATING AS REQUIRED.

6,000 GALLON RECIRCULATION TANK

SCALE 1" - 4'

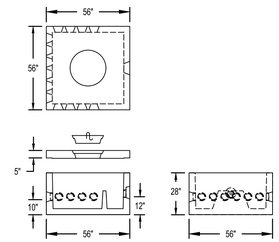
PUMPING NOTES:

1. EQUIPMENT FROM OTHER MANUFACTURER'S MAY BE USED IF EQUAL. APPROVAL FOR ALTERNATE EQUIPMENT REQUIRED FROM ENGINEER PRIOR TO CONSTRUCTION. FULL SPECIFICATIONS FOR ALTERNATE EQUIPMENT MUST BE PROVIDED BY CONTRACTOR.
2. CONTROL PANEL AND ALARM TO BE MOUNTED IN A CONSPICUOUS LOCATION.
3. JUNCTION BOX IN PUMP CHAMBER TO HAVE SHUT-OFF SWITCH.
4. FLOATS ARE TO BE SET TO SPECIFIED ELEVATIONS AND FIELD VERIFIED.
5. THE PUMP CHAMBER DOSING CONTROLS SHALL BE FIELD TESTED IN THE PRESENCE OF THE DESIGN ENGINEER. ADJUSTMENT TO CONTROLS ARE THE CONTRACTORS RESPONSIBILITY. CONTRACTOR MUST MAKE WATER AVAILABLE FOR TESTING OF THE CONTROL FLOATS.
6. ELECTRICAL CONNECTIONS MAY BE INSTALLED OUTSIDE PUMP CHAMBER IN SEPARATE HAND HOLE WITH ACCESS FRAME AND COVER TO GRADE MEETING H-20-44 LOADING REQUIREMENTS.



PUMP CHAMBER DETAIL

SCALE 1" - 4'



DISTRIBUTION BOX WITH 14 OUTLETS

SCALE 1" - 4'

CAPUTO AND WICK LTD. - 1150 PAWTUCKET AVENUE - RUMFORD R.I. 02916

BURLINGAME STATE PARK AND CAMPGROUND

STATE OF RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
DIVISION OF PLANNING AND DEVELOPMENT

DEMOLITION AND REBUILD OF BATHHOUSES
BURLINGAME STATE PARK AND CAMPGROUND
CHARLESTOWN, RHODE ISLAND

OWTS PRECAST STRUCTURES DETAILS

Dwg:
Scale: 1" = 20'
Contract No. X
Date: FEBRUARY, 2023

C-3.1
21

OWTS SUBMISSION - FEBRUARY 16, 2023

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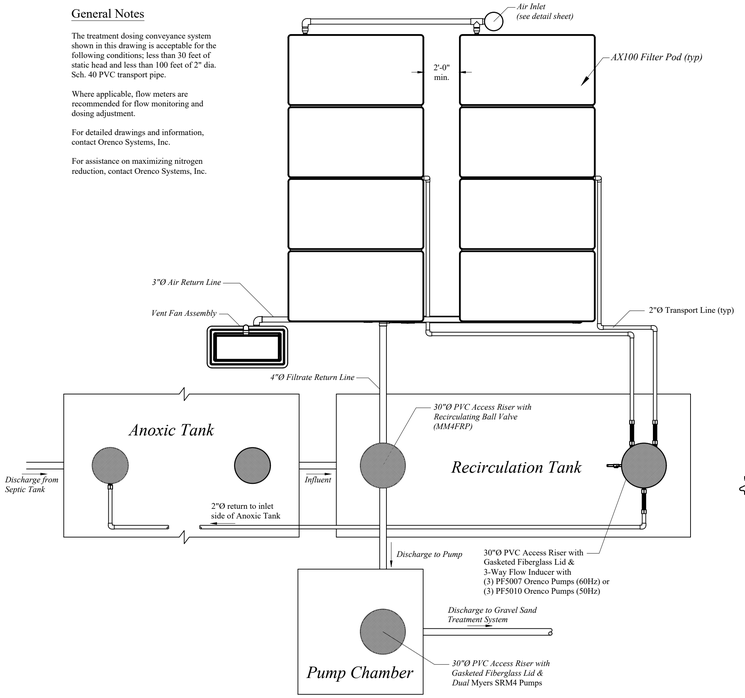
General Notes

The treatment dosing conveyance system shown in this drawing is acceptable for the following conditions; less than 30 feet of static head and less than 100 feet of 2" dia. Sch. 40 PVC transport pipe.

Where applicable, flow meters are recommended for flow monitoring and dosing adjustment.

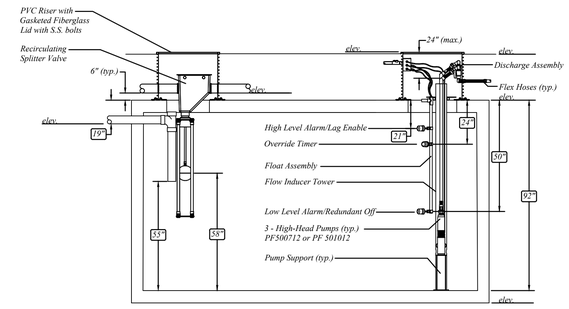
For detailed drawings and information, contact Orenco Systems, Inc.

For assistance on maximizing nitrogen reduction, contact Orenco Systems, Inc.



AdvanTex AX100 SYSTEM - MANIFOLDED VENT INLET
2 POD CONFIGURATION

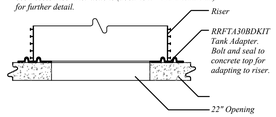
SCALE 1" - 4'



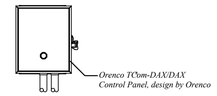
RECIRCULATION TANK FLOAT AND RSV SETTINGS

NOT TO SCALE

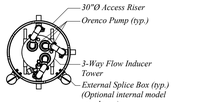
Note:
See Access Riser Instructions (document # NIN-RLA-RR-1) for further detail.



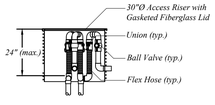
30" Riser Attachment Detail for Concrete Tank
Scale: NTS



Control Panel Detail
Not To Scale

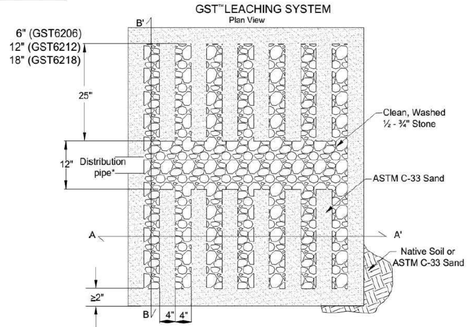


3-Way Flow Inducer
Typical Plumbing Example
Scale: 1" = 3'-0"

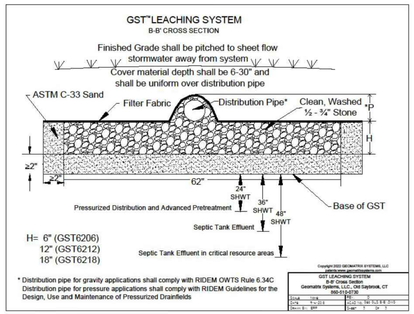


3-Way Flow Inducer
Typical Plumbing Profile
Scale: 1" = 3'-0"

GST Schematics

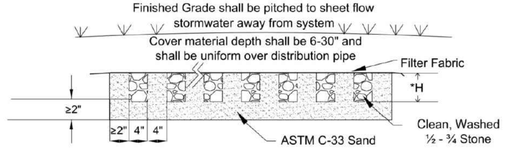


* Distribution pipe for gravity systems shall comply with RIDEM OWTS Rule 6.34C Distribution pipe for pressure applications shall comply with RIDEM Guidelines for the Design, Use and Maintenance of Pressurized Drainfields.

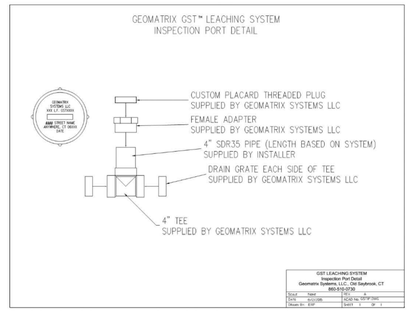


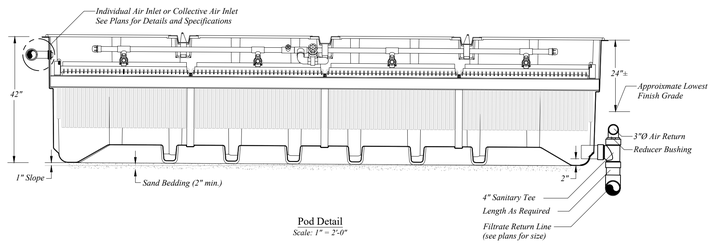
* Distribution pipe for gravity applications shall comply with RIDEM OWTS Rule 6.34C Distribution pipe for pressure applications shall comply with RIDEM Guidelines for the Design, Use and Maintenance of Pressurized Drainfields

GEOMATRIX GST™ LEACHING SYSTEM
A-A' CROSS SECTION

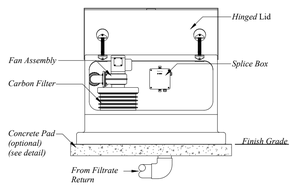


*H= 6" (GST6206)
12" (GST6212)
18" (GST6218)

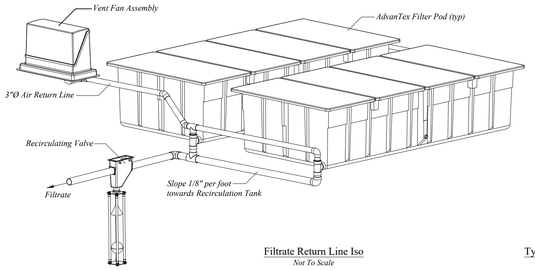




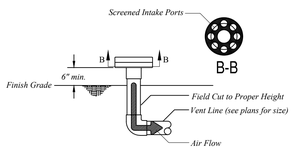
Pod Detail
Scale: 1" = 2'-0"



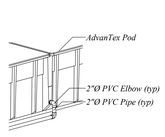
Above Ground Fan Assembly
Scale: 1" = 2'-0"



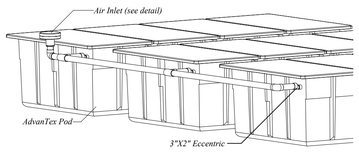
Filtrate Return Line Iso
Not To Scale



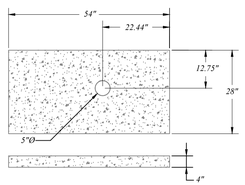
Collective Air Inlet Detail
Scale: 1" = 2'-0"



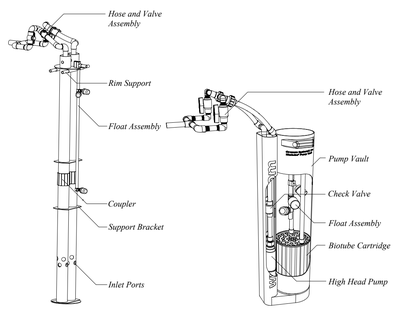
Typical Pod Inlet Connection
Not To Scale



Collective Air Inlet Option
Not To Scale

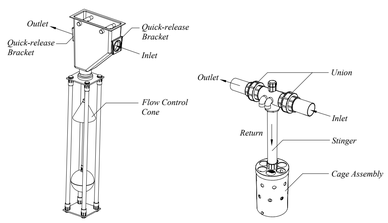


Fan Assembly Pad Detail
Scale: 1" = 2'-0"



Duplex Flow Inducer Tower Detail
Scale: NTS

Duplex Pump Vault Detail
Scale: NTS



Recirculating Ball Valve Detail
Scale: NTS

Recirculating Splitter Valve Detail
Scale: NTS

COLLECTIVE AIR INLET DETAIL

SCALE: VARIES

AdvanTex AX100 SYSTEM - MISCELLANEOUS DETAILS

SCALE: VARIES

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BURLINGAME STATE PARK AND CAMPGROUND

STATE OF RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
DIVISION OF PLANNING AND DEVELOPMENT

DEMOLITION AND REBUILD OF BATHHOUSES
BURLINGAME STATE PARK AND CAMPGROUND
CHARLESTOWN, RHODE ISLAND

OWTS DETAILS

Dwg:
Scale: 1" = 20'
Contract No. x
Date: FEBRUARY, 2023

C-3.2
22

OWTS SUBMISSION - FEBRUARY 16, 2023

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STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment Systems Program

20.0179 4A, 4B, 4C
SHEET 1-3

Site Evaluation Form
Part A – Soil Profile Description **Application Number** _____

Property Owner: RHODE ISLAND STATE OF (DEM) DIVISION OF PARKS
Property Location: 1-100 BURLINGAME PARK RD, CHARLESTOWN, RI PLAT 15 LOT 10
Date of Test Hole: 8/18/21
Soil Evaluator: KAMAL HINGORANY License Number: D4005
Weather: CLOUDY Shaded: Yes ☐ No ☒ Time: 9:30AM

TH 4A Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
Ap	0-9	C	S	2.5YR 6/3	-		-		Ls	2gbd	VFr	3
Bw	9-30	C	S	10YR 5/6	-		-		Ls	2gbd	Fr	3
C	30-120	C	S	2.5YR 7/3	-		-		Ls	2gbd	Fr	3

TH 4B Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
FILL	0-10	C	S	-	-		-		-	-	-	-
P	10-28	C	S	10YR 5/6	-		-		Ls	2gbd	Fr	3
Bw	28-48	C	S	2.5YR 7/3	-		-		Ls	2gbd	Fr	3
C	48-120	C	S	2.5YR 7/3	-		-		Ls	2gbd	Fr	3

TH 4A Soil Class B Total Depth 120" Impervious/Limiting Layer Depth 120"(og) GW Seepage Depth - SHWT 120"(og)
TH 4B Soil Class B Total Depth 120" Impervious/Limiting Layer Depth 120"(og) GW Seepage Depth - SHWT 120"(og)

Comments:

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment Systems Program

20.0179 4A, 4B, 4C
SHEET 2-3

Site Evaluation Form
Part A – Soil Profile Description **Application Number** _____

Property Owner: RHODE ISLAND STATE OF (DEM) DIVISION OF PARKS
Property Location: 1-100 BURLINGAME PARK RD, CHARLESTOWN, RI PLAT 15 LOT 10
Date of Test Hole: 8/18/21
Soil Evaluator: KAMAL HINGORANY License Number: D4005
Weather: CLOUDY Shaded: Yes ☐ No ☒ Time: 9:30

TH 4 C Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
Ap	0-12	C	S	2.5YR 6/3	-		-		Ls	2gbd	VFr	3
Bw	12-40	C	S	10YR 5/6	-		-		Ls	2gbd	Fr	3
C	40-120	C	S	2.5YR 7/3	-		-		Ls	2gbd	Fr	3

TH____ Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				

TH 4C Soil Class B Total Depth 120" Impervious/Limiting Layer Depth 120" (og) GW Seepage Depth - SHWT 120" (og)

TH_____ Soil Class_____ Total Depth_____ Impervious/Limiting Layer Depth_____ (og) GW Seepage Depth_____ SHWT_____ (og)

Comments: _____

Part B

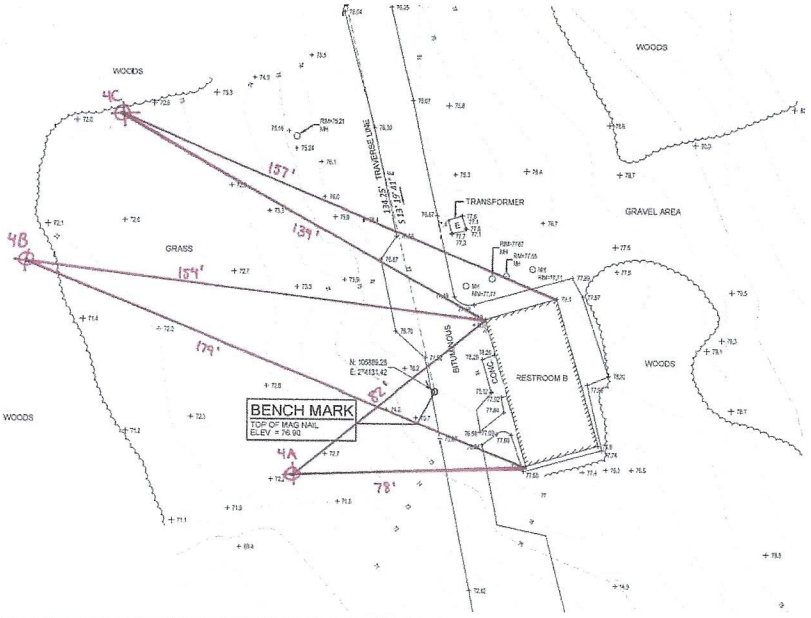
Site Evaluation – to be completed by Soil Evaluator or Class II or III Designer

20.0179 4A, 4B, 4C
SHEET 3-3

Please use the area below to locate:

1. Test holes and bedrock test holes,
2. Approximate direction of due north,
3. Offsets from all test holes to fixed points such as street, utility pole, or other permanent, marked object.*
   ***OFFSETS MUST BE SHOWN**

Key:
- Approximate location of test holes
- Approximate location of bedrock test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north



*LEACHING FIELD NOT LOCATED

N

SHWT	THs
TH	Depth
4A	120"
4B	120"
4C	120"

1. Relief and Slope: _____
2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes? If yes, locate on above sketch. NO ☒ YES ☐
3. Restrictive Layer or Bedrock within 4' below original ground within 25 feet of test hole? Provide all test hole locations & depths above. NO ☒ YES ☐
4. Presence of existing or proposed private drinking water wells within 200 feet of test holes? If yes, locate on above sketch. NO ☒ YES ☐
5. Public drinking water wells within 500 feet of test holes? If yes, locate on above sketch. NO ☒ YES ☐
6. Is site within the watershed of a public drinking water reservoir or other critical area defined in Rule 6.42? NO ☒ YES ☐
7. Has soil been excavated from or fill deposited on site? If yes, locate on above sketch. NO ☒ YES ☐
8. Site's potential for flooding or ponding: NONE ☒ SLIGHT ☐ MODERATE ☐ SEVERE ☐
9. Landscape position: SHOULDER
10. Vegetation: GRASS
11. Indicate approximate location of property lines and roadways.
12. Additional comments, site constraints or additional information regarding site: _____

Certification

The undersigned hereby certifies that all information on this application and accompanying forms, submittals and sketches are true and accurate and that I have been authorized by the owner(s) to conduct these necessary field investigations and submit this request.

Part A prepared by: _____ D4005 (Signature / License #)

Part B prepared by: _____ D4005 (Signature / License #)

DO NOT WRITE IN THIS SPACE

Witnessed Soil Evaluation Decision: Concur ☐ Inconclusive ☐ Disclaim ☐

Unwitnessed Soil Evaluations Decision: Accept ☐ Inconclusive ☐ Disclaim ☐

Wet Season Determination required ☐ **Additional Field Review Required** ☐

Explanation: _____

Signature Authorized Agent _____ Date _____

Bathhouse "B" and System Replacement Project
Burlingame State Park and Campground
Charlestown, Rhode Island

DESIGN NARRATIVE

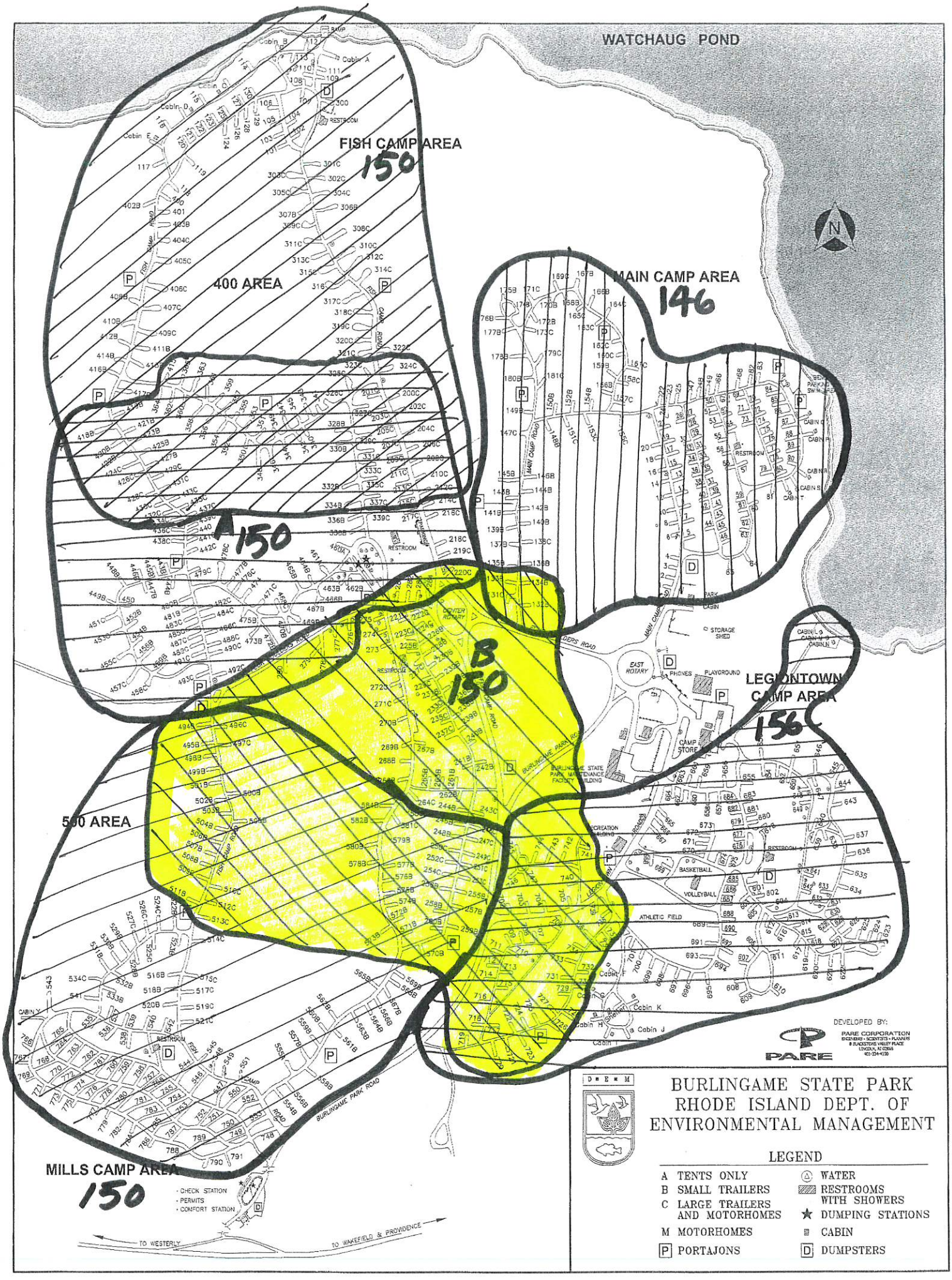
RIDEM is in the process of replacing the Bathhouse and Onsite Wastewater System (OWTS) at this location. Soil logs can be found on Sheet C-1.2 together with the proposed site layout and System Design Data and Notes. Details for the system are on Sheets C-2.2, C-3.1 and C-3.2.

Soil evaluations for this OWTS location were conducted on August 18, 2021, soils are Category 3 and the Estimated Seasonal High Water Table depth at the OWTS is 120" or at elevation 62.6±.

In total the six bathhouses for the overall campground accommodate approximately 720 campsites. Utilizing the RIDEM wastewater design flow for a campground with washroom and toilets of 50 gallons per day we determine a daily flow for the entire campground to be approximately 36,000 gallons per day (GPD). The average daily flow per acre of the campground is (36,000 GPD / 847 Acres) 42.5 GPD/Acre. The average daily flow for each bathhouse is approximately 6,000 GPD. In calculating an estimated daily flow for the Bathhouse "B" OWTS we took a conservative approach utilizing 150 campsites at 50 GPD/campsite to determine a design flow for the Bathhouse "B" to be 7,500 GPD which is greater than the 6,000 GPD average. Please see the attached campsite map which depicts the campsites (as highlighted) chosen to be included within the 150 sites utilized for sizing the OWTS. Please note that sites throughout the campground overlap to agree with the conservative estimate. The system as sized is oversized and is considered a large system. The system is used on a seasonal basis between the months of April and October.

The OWTS will utilize Two (2) Orenco AdvanTEX AX100 Pods for advanced treatment. This system is a Category 1 advanced treatment technology. The system will treat the wastewater and reduce the biochemical oxygen demand (BOD) and comply with the latest Orenco system design criteria and thus the RIDEM OWTS criteria. See attached Final Design Review Letter from Orenco.

The systems drainfield is designed as a Geomatrix Gravel Sand Treatment (GST) System. The Loading Rate for Category 1 Technology for the GST is 3.5 GPD/square feet (SF). The minimum size drainfield is 7,500 GPD/3.5 GPD/SF which equals 2,143 SF. We propose to use the GST 6212 and the minimum size drainfield requirement for this application is 123 lineal feet (LF). We propose to use the 288 lineal feet (LF) of GST 6212 which provides 17.5 S.F. per LF, which equals 5,040 SF. and is greater than 2,143 SF (minimum size). The GST system has been divided into two equal drainfields and the GST are spaced 7'6" on center. The two drainfields consist of 4 rows each 36 feet long and 62" wide with a stone depth of 12" below the 4" perforated distribution pipe. See pump selection and system specifications on Sheet C-2.2 for additional information. Please see the attached review letter from Geomatrix.


WATCHAUG POND
FISH CAMP AREA
150
400 AREA
A
150
MAIN CAMP AREA
146
B
150
LEGIONTOWN
CAMP AREA
156
500 AREA
MILLS CAMP AREA
150
• CHECK STATION
• PERMITS
• COMFORT STATION
TO WESTERLY
TO WAKEFIELD & PROVIDENCE
BURLINGAME PARK ROAD
DEEP ROAD
MAIN CAMP ROAD
FISH CAMP ROAD
EAST ROTARY
PLAYGROUND
PHONES
STORAGE SHED
CAMP STORE
RECREATION BUILDING
BASKETBALL
VOLLEYBALL
ATHLETIC FIELD
RESTROOM
DEVELOPED BY:
PARE CORPORATION
ENGINEERS · SCIENTISTS · PLANNERS
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401-334-4100
PARE
D E M
BURLINGAME STATE PARK
RHODE ISLAND DEPT. OF
ENVIRONMENTAL MANAGEMENT
LEGEND
A TENTS ONLY
B SMALL TRAILERS
C LARGE TRAILERS AND MOTORHOMES
M MOTORHOMES
P PORTAJONS
WATER
RESTROOMS WITH SHOWERS
DUMPING STATIONS
CABIN
D DUMPSTERS

PROTECTING THE WORLD'S WATER

01/19/2023

Kevin Harrop
Caputo & Wick
1150 Pawtucket Ave
Rumford, RI 02916

Subject: Final Design Review of Burlingame Park/Bathhouse B

Kevin,

Orenco Systems, Inc. ("Orenco") has received the Plans with all required fields completed (attached to this letter), a copy of the plan set showing the designed site layout and configuration plans, and other documents that comprise the Final Design for the Burlingame Park project. Orenco staff reviews the Final Design of all wastewater collection and treatment systems for commercial applications to ensure that the design is compliant with the most current version of the system's applicable design criteria published by Orenco for the specified parameters provided by the system's designer in the Plans. The findings and conclusions of my review of this Final Design are as follows:

Design Basis

The system has been designed for a Type 2, Park application. Influent flow and constituent concentrations and effluent constituent concentration requirements have been provided by the system's designer on the attached Plans and were used in my review of the Final Design.

The influent flow on the Plans were not extrapolated from the metered flows from the subject site, but in our experience, they are consistent with influent flows from other, similar Type 2, Park systems that Orenco has previously observed. As such, I have no reason to doubt the accuracy of the designer's findings and assumptions as to the influent flow, and find that it was reasonable for the designer to use them as the design basis for the system.

System Design

The proposed Final Design of the system consists of a park. Influent will enter a 15,000 gallon Primary Tank, which will then flow into a 7,500 gallon Pre-Anoxic Tank. From here, flow will gravity discharge into a 6,000 gallon Recirculation Tank. The recirc-filtrate blend in this tank will pump into (2) AX100 pods and the filtrate will enter a splitter valve in the front of the Recirculation Tank where it will either be recirculated again or siphon to a drain field.

Design Criteria

The applicable design criteria for this system, which I used to conduct the review of its Final Design, is revision 8.0 of document NDA-ATX-1, titled *Orenco® AdvanTex® Design Criteria, Commercial Treatment Systems*, which was published by Orenco in October, 2020. A copy of the design criteria can be downloaded from Orenco's online document library at www.orenco.com/corporate/doclibrary.cfm.

Findings

The findings of my review as to whether the Final Design complies with Orenco's design criteria for treating wastewater to the effluent constituent concentration requirements provided in the Plans are as follows:

Primary Treatment

The Final Design specifies the use of 1 - 15,000 U.S. Gallon Primary concrete and 1 - 7,500 U.S. Gallon Primary concrete tanks in series for primary treatment. Using the flow data specified on the Plans the hydraulic retention times for grease capture and primary treatment calculate as follows:

Primary Tank(s) Hydraulic Retention Time (HRT)[1]				
Design Average Flow (gpd)	Design Maximum Day Flow (gpd)	Effective Combined Primary Tankage (gpd)	Avg HRT (days)	Max Day HRT (days)
3,500	7,500	22,500	6.4	3.0

[1] Design Max Day Flow is the maximum daily flow a facility is expected to receive no more than one day within any week's time.

The Primary Tank Sizing Recommendations states that the recommended primary tankage for a Park treatment system should be sized to at a minimum of 3 days of hydraulic retention time at the Design Max Day Flow. Therefore, the configuration and specifications of the primary treatment tanks in the Final Design satisfy Orenco's recommendation for primary tankage for this Park application. This pre-anoxic tank should be sized equal to one day at maximum day design flow and is considered part of the overall primary tank volume.

Recirculation Tank — Standard Stage

The Final Design further specifies the use of 1 - 6,000 U.S. Gallon concrete tank for recirculation and blending of the AdvanTex-treated effluent with primary tank effluent. Using the flow data specified on the Plans the tank is sized to be equal to 80% of the Maximum Day Design Flow. The recirculation tank for the standard stage should be sized at a minimum of 75% of the Maximum Day Design Flow. Therefore, the specification of the recirculation-blend tank in the Final Design satisfies Orenco's design criteria.

Hydraulic Load — Standard Stage

The Final Design specifies the use of 2 - AX100 pods, which contain a nominal surface area of 200 square feet of treatment media. Using the flow data specified on the Plans the hydraulic loading rate for the system calculates as follows:

Hydraulic Loading Rate (HLR) — Standard Stage				
Design Average Flow (gpd)	Design Maximum Day Flow (gpd)	Nominal Textile Area (sq. ft.)	Average HLR (gal. per day/sq. ft.)	Peak HLR (gal. per day/sq. ft.)
3,500	7,500	200	17.5	37.5

According to the AdvanTex System Loading Chart in the applicable design criteria, the standard AdvanTex treatment system (Stage 1) should not be hydraulically loaded more than 25 gpd/square foot at Design Average Flow or 50 gpd/square foot at Design Max Day Flow. Therefore, the specified type and number of AdvanTex pods in the Final Design satisfy Orenco's design criteria to achieve the effluent quality listed in the design criteria at a 95% confidence level for this Type 2, Park application.

Organic Load — Standard Stage

The following influent characteristics provided on the Plans were estimated and not derived from direct sampling. Even though the influent characteristics were not derived from direct sampling, the values provided are consistent with values we have seen in other, similar Type 2, Park applications.

Influent (Primary Tank Effluent) Characteristics — Loading to Textile	
Average BOD_5 (mg/L)	Average TSS (mg/L)
250	200

Based on the average influent biochemical oxygen demand (BOD_5) concentration and flow data specified on the Plans, the system will receive approximately 7.3 pounds of BOD_5 per day at Design Average Flow, and 15.6 pounds of BOD_5 per day at Maximum Day Design Flow. Using this information, the organic loading rate of the system calculates as:

Organic Loading Rate (OLR) — Standard Stage				
Average Organic Load (lbs/day)	Maximum Organic Load (lbs/day)	Nominal Treatment Area (sq. ft.)	Average OLR (lbs BOD/sq. ft./day)	Maximum OLR (lbs BOD/sq. ft./day)
7.3	15.6	200	0.04	0.08

Conclusions

I have reviewed the Final Design of the Burlingame Park wastewater treatment system, and have found that the design is compliant with the most current version of the system's applicable design criteria published by Orenco for the specified parameters provided by the system's designer in the Plans. In addition, I noted no anomalies in the site layout or configuration of the system during my review.

Compliance Table — Meets Minimum Design Standards	
	Standard Stage
Recirc Tank Size	Yes
Hydraulic Load	Yes
Organic Load	Yes

As such, the system as designed satisfactorily complies with Orenco's design criteria to meet the following effluent limits specified in the Plans at a 95% confidence level, provided that all influent flows and constituent concentrations specified in the Plans are not exceeded:

Expected Effluent Quality	
Constituent	**Average (mg/L)**
BOD_5	20
TSS	20

It is important to note that even though the AdvanTex Treatment System has the capability to meet or exceed the required treatment parameters, there is no way that Orenco can guarantee that a particular system will be operated or maintained in a manner consistent with the Final Design reviewed. Once the facility is placed into operation, the influent flows and constituent concentrations to the facility should be monitored, and if flow or any of the influent constituent concentrations exceed those listed in the Plans, measures should be taken to reduce the flow or constituent concentration to those listed. However, if additional treatment capacity becomes necessary, the system is designed to have the capability to expand to account for the new flow or constituent concentration.

Proper air ventilation is a critical feature of all commercial AdvanTex Treatment Systems, and as such, adequate active ventilation is required for all systems. In addition, please note that disposing of toxics or chemicals into the system is strictly prohibited. Examples of toxics include restaurant degreasers, cleansers, wax strippers for linoleum, carpet shampoo, waste products, or any other toxins. Furthermore, water softener brine discharge is prohibited from being discharged into the AdvanTex Treatment System. Failure to adhere to these policies will void Orenco's limited product warranties.

If you have any questions about my review process, findings, or conclusions, please feel free to call or e-mail me.

Sincerely,

Caleb Castleman
Systems Engineering
Orenco Systems Inc.
(800) 348-9843 ext. 548
ccastleman@orenco.com

Project: Burlingame State Park and Camp Ground
Location: Bathhouse "B"

Description	Input values	Units
Finish Grade	76.50	Elevation
Water Table Elevation	66.00	Elevation
Bottom of Tank Elevation	65.58	Elevation
Lowest Pipe Invert	73.25	Elevation
Counter Weight	0.00	lbs
Soil Above Tank	19.00	Inches
Length of Tank	30.83	Feet
Width of Tank	11.33	Feet
Depth of Tank	9.33	Feet
Top of Concrete Thickness	8.00	Inches
Bottom of Concrete Thickness	8.00	Inches
Sides Concrete Thickness	8.00	Inches
Two Compartment Tank		
Compartment Wall Thickness	4.00	Inches
Compartment Wall Height	87.00	Inches
	Computed Value	
Submerged Depth	0.42	Feet
Top/Bottom Surface Area of Tank	349.43	SF
Displaced Volume	146.76	CF
Volume of Tank Top	232.96	CF
Volume of Tank Sides	435.53	CF
Volume of Tank Bottom	232.96	CF
Volume of Baffle	24.17	CF
Weight of Tank Top	34,943.38	lbs
Weight of Tank Sides	65,330.02	lbs
Weight of Tank Bottom	34,943.38	lbs
Weight of Baffle	3,624.88	lbs
Total Weight of Tank	138,841.66	lbs
Volume of Soil	553.27	CF
Weight of Soil Above Tank	55,327.02	lbs
Uplift Created by Submerged Tank	9,157.96	lbs
Total Weight of Tank, Counter Weight and Soil	194,168.68	lbs
Exceeds Displaced Volume by	185,010.72	lbs
Buoyance Point for Empty Tank	6.37	Feet (above bottom)
Buoyance Point for Empty Tank	71.95	Elev
Buoyance Point for Tank in Place	8.90	Feet (above bottom)
Buoyance Point for Tank in Place	74.48	Elev

(Soil friction has not been taken into account)

Buoyancy Calculations | 7,500 Gallon Anoxic Tank | 3/4/2022
Rev. 2/19/2023

Project: Burlingame State Park and Camp Ground
Location: Bathhouse "B"

Description	Input values	Units
Finish Grade	76.50	Elevation
Water Table Elevation	66.00	Elevation
Bottom of Tank Elevation	65.40	Elevation
Lowest Pipe Invert	72.90	Elevation
Counter Weight	0.00	lbs
Soil Above Tank	23.00	Inches
Length of Tank	17.00	Feet
Width of Tank	10.00	Feet
Depth of Tank	9.17	Feet
Top of Concrete Thickness	8.00	Inches
Bottom of Concrete Thickness	6.00	Inches
Sides Concrete Thickness	6.00	Inches
Two Compartment Tank		
Compartment Wall Thickness	0.00	Inches
Compartment Wall Height	0.00	Inches
	Computed Value	
Submerged Depth	0.60	Feet
Top/Bottom Surface Area of Tank	170.00	SF
Displaced Volume	102.00	CF
Volume of Tank Top	113.33	CF
Volume of Tank Sides	208.00	CF
Volume of Tank Bottom	85.00	CF
Volume of Baffle	0.00	CF
Weight of Tank Top	17,000.00	lbs
Weight of Tank Sides	31,199.74	lbs
Weight of Tank Bottom	12,750.00	lbs
Weight of Baffle	0.00	lbs
Total Weight of Tank	60,949.74	lbs
Volume of Soil	325.83	CF
Weight of Soil Above Tank	32,583.33	lbs
Uplift Created by Submerged Tank	6,364.80	lbs
Total Weight of Tank, Counter Weight and Soil	93,533.07	lbs
Exceeds Displaced Volume by	87,168.27	lbs
Buoyance Point for Empty Tank	5.75	Feet (above bottom)
Buoyance Point for Empty Tank	71.15	Elev
Buoyance Point for Tank in Place	8.82	Feet (above bottom)
Buoyance Point for Tank in Place	74.22	Elev

(Soil friction has not been taken into account)

Buoyancy Calculations | 6,000 Gallon Recirculation Tank | 3/4/2022

Project: Burlingame State Park and Camp Ground
Location: Bathhouse "B"

Description	Input values	Units
Finish Grade	76.50	Elevation
Water Table Elevation	66.00	Elevation
Bottom of Tank Elevation	64.83	Elevation
Lowest Pipe Invert	71.58	Elevation
Counter Weight	0.00	lbs
Soil Above Tank	42.00	Inches
Length of Tank	17.00	Feet
Width of Tank	10.00	Feet
Depth of Tank	8.17	Feet
Top of Concrete Thickness	8.00	Inches
Bottom of Concrete Thickness	6.00	Inches
Sides Concrete Thickness	6.00	Inches
Two Compartment Tank		
Compartment Wall Thickness	0.00	Inches
Compartment Wall Height	0.00	Inches
	Computed Value	
Submerged Depth	1.17	Feet
Top/Bottom Surface Area of Tank	170.00	SF
Displaced Volume	198.90	CF
Volume of Tank Top	113.33	CF
Volume of Tank Sides	182.00	CF
Volume of Tank Bottom	85.00	CF
Volume of Baffle	0.00	CF
Weight of Tank Top	17,000.00	lbs
Weight of Tank Sides	27,300.13	lbs
Weight of Tank Bottom	12,750.00	lbs
Weight of Baffle	0.00	lbs
Total Weight of Tank	57,050.13	lbs
Volume of Soil	595.00	CF
Weight of Soil Above Tank	59,500.00	lbs
Uplift Created by Submerged Tank	12,411.36	lbs
Total Weight of Tank, Counter Weight and Soil	116,550.13	lbs
Exceeds Displaced Volume by	104,138.77	lbs
Buoyance Point for Empty Tank	5.38	Feet (above bottom)
Buoyance Point for Empty Tank	70.21	Elev
Buoyance Point for Tank in Place	10.99	Feet (above bottom)
Buoyance Point for Tank in Place	75.82	Elev

(Soil friction has not been taken into account)

Project: Burlingame State Park and Camp Ground
Location: Building "B"

Description	Input values	Units
Finish Grade	72.25	Elevation
Water Table Elevation	63.50	Elevation
Bottom of Chamber Elevation	63.50	Elevation
Lowest Pipe Invert	70.00	Elevation
Counter Weight	0.00	lbs
Soil Above Chamber	9.00	Inches
Chamber Length	7.00	Feet
Chamber Width	7.00	Feet
Diameter of Openning	2.50	Feet
Chamber Interior Height	7.00	Feet
Top of Concrete Thickness	6.00	Inches
Bottom of Concrete Thickness	6.00	Inches
Concrete Wall Thickness	6.00	Inches
	Computed Value	
Submerged Depth	0.00	Feet
Top Surface Area of Chamber	44.09	SF
Surface Area of Chamber Sides	182.00	SF
Bottom Surface Area of Chamber	49.00	SF
Displaced Volume	0.00	CF
Volume of Chamber Top	22.05	CF
Volume of Chamber Sides	91.00	CF
Volume of Chamber Bottom	24.50	CF
Weight of Chamber Top	3,306.84	lbs
Weight of Tank Side	13,650.00	lbs
Weight of Chamber Bottom	3,675.00	lbs
Total Weight of Chamber	20,631.84	lbs
Volume of Soil	33.07	CF
Weight of Soil Above Chamber	3,306.84	lbs
Uplift Created by Submerged Chamber	0.00	lbs
Total: Chamber, Counter Weight and Soil	23,938.69	lbs
Exceeds Displaced Volume by	23,938.69	lbs
Buoyance Point for Empty Chamber	6.75	Feet (above bottom)
Buoyance Point for Empty Chamber	70.25	Elev
Buoyance Point for Chamber in Place	7.83	Feet (above bottom)
Buoyance Point for Chamber in Place	71.33	Elev

(Soil friction has not been taken into account)

Technical Data Sheet

Duplex Control Panels

Applications

Orenco Duplex Control Panels are used to control dual pumps, alarms, and other equipment as specified in pressure sewers and onsite septic systems.

Orenco® DAX2 Control Panel

General

Orenco Duplex Control Panels are specifically engineered for pressure sewer (STEP) systems and onsite septic treatment systems that require the use of two alternating pumps. Standard features include circuit breakers, an automatic/manual/off motor control toggle for each pump, an audio/visual high level alarm, an alarm reset, and a duplex alternator. Other standard features and options are listed on page 2. Orenco panels are designed for use with mechanical and/or mercury float switches. Listed per UL 508 in the US and Canada.

Standard Models

DAX1, DAX2

Product Code Diagram

DAX ☐ ☐ ☐

Standard options (list in order):
- PT = programmable timer
- RO = redundant off relay
- CS = current sensor
- ETM = elapsed time meter
- CT = event counter
- HT = heater
- SA = surge arrestor
- PRL = pump run light
- PL = power light

Intrinsically safe relays:
- Blank = standard, no IR relays
- IR = intrinsically safe relays

Pump voltage:
- 1 = 120 VAC
- 2 = 120 VAC or 240 VAC

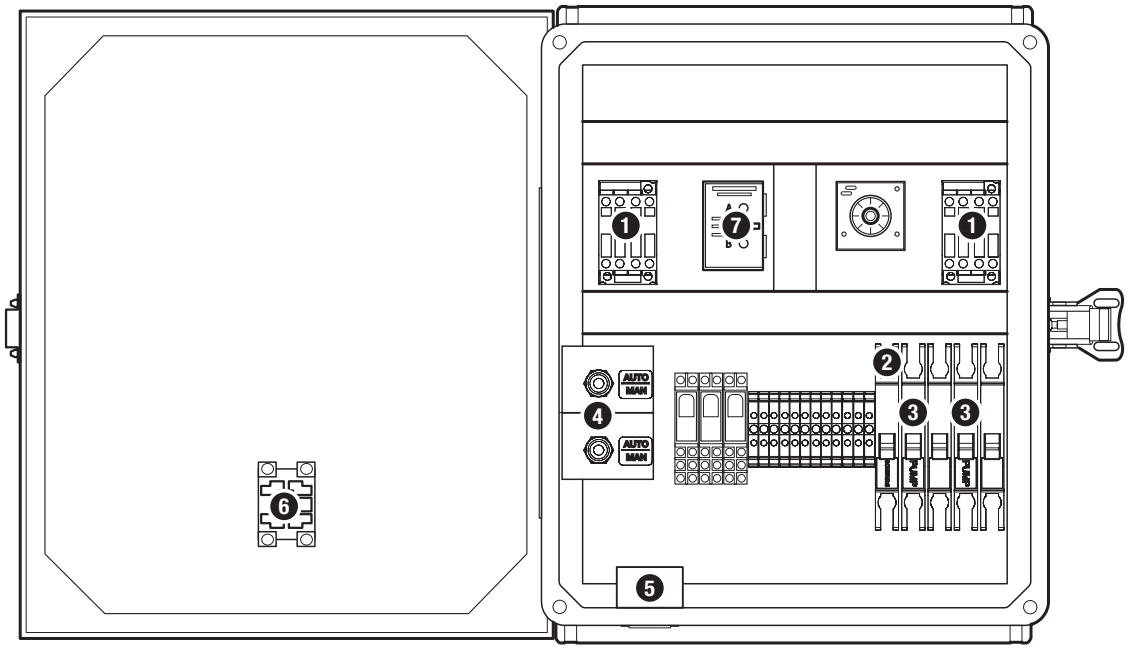
DAX series duplex control panel

Materials of Construction

Enclosure	UV-resistant fiberglass, UL Type 4X
Hinges	Stainless steel

Specifications

Panel Ratings	
DAX1:	120 V, 1 hp, 16 amps, single phase, 60 Hz.
DAX2:	240 V, 3 hp, 16 amps, single phase, 60 Hz.
Dimensions	
Height, in. (mm)	15.5 (394)
Width, in. (mm)	13.5 (343)
Depth, in. (mm)	6.7 (170)



Orenco® DAX2PTRO 240 V panel

Standard Components

Feature	Specification(s)
1. Motor-Start Contactor	120 V, 16 FLA, 1 hp (0.75 kW), 60 Hz; 2.5 million cycles at FLA (10 million at 50% of FLA). 240 V, 16 FLA, 3 hp (2.24 kW), 60 Hz; 2.5 million cycles at FLA (10 million at 50% of FLA).
2. Controls Circuit Breaker	10 A, OFF/ON switch. Single-pole 120 V. DIN rail mounting with thermal magnetic tripping characteristics.
3. Pump Circuit Breakers	20 A, OFF/ON switch. Single-pole 120 V or double-pole 240 V. DIN rail mounting with thermal magnetic tripping characteristics.
4. Toggle Switches	20 A, 1hp (0.75 kW). Single-pole, double-throw HOA switch,
5. Audible Alarm	95 dB at 24 in. (610 mm), warble-tone sound.
6. Visual Alarm	7/8-in. (22-mm) diameter red lens, "Push-to-silence." UL Type 4X rated, 1 W LED light, 120 V.
7. Duplex Alternator	120 V. Cross-wired style for independent lag pump function. Selector switch for locking one pump into lead position.
Audible Alarm Silence Relay (Not shown)	120 V. Automatic reset. DIN rail mount.

Optional Features

Feature	Specification(s)	Code Adder
Intrinsically Safe Control Relays	Listed per UL 698A, for Class 1 Div. 1, groups A, B, C, D hazardous locations (requires larger enclosure).	IR
Programmable Timer	120 V. Repeat cycle from 0.05 seconds to 30 hours. Separate variable controls for OFF & ON time periods.	PT
Redundant Off Relay	120 V. Provides a secondary off. Sounds alarm on low level condition. DIN rail mount.	RO
Elapsed Time Meter	120 V, 7-digit, non-resettable. Limit of 99,999 hours; accurate to 0.01 hours.	ETM
Event Counter	120 V, 6-digit, non-resettable.	CT
Heater	Anti-condensation heater. Self-adjusting: radiates additional wattage as temperature drops.	HT
Surge Arrestor	Status light on unit; protects incoming power supply from electrical surges.	SA
Pump Run Light	7/8-in. (22-mm) diameter green lens. UL Type 4X rated, 1 W LED light, 120 V.	PRL
Power Light	7/8-in. (22-mm) diameter green lens. UL Type 4X rated, 1 W LED light, 120 V.	PL

Orenco Systems® Inc. , 814 Airway Ave., Sutherlin, OR 97479 USA • 800-348-9843 • 541-459-4449 • www.orenco.com

Orenco SYSTEMS

Technical Data Sheet

PF-Series Submersible Effluent Pumps: 1-Phase, 60-Hz, 4-inch (100-mm)

Applications

Our PF-Series 4-inch (100-mm) Submersible Effluent Pumps are designed to transport screened effluent (with low TSS counts) from septic tanks or dosing tanks. These pumps are constructed of lightweight, corrosion-resistant stainless steel and engineered plastics, and are field-serviceable and repairable with common tools. They're also CSA- and UL-certified to U.S. and Canadian safety standards for effluent pumps.

PF-Series pumps are used in a variety of applications, including pressurized drainfields, packed-bed filters, mounds, aerobic units, effluent irrigation, liquid-only (effluent) sewers, wetlands, lagoons, and more. These pumps are designed to be used with a Biotube® pump vault or after a secondary treatment system.

C US
LR80980
LR2053896

Powered by Franklin Electric

Features/Specifications

To specify this pump for your installation, require the following:

- Minimum 24-hour run-dry capability (liquid end) with no deterioration in pump life or performance*
- 1⁄8-inch (3-mm) bypass orifice to ensure flow recirculation for motor cooling and to prevent air bind
- Liquid-end repair kits available for better long-term cost of ownership
- TRI-SEAL™ floating impeller design on 10, 20, and 30 gpm (0.6, 1.3, and 1.9 L/sec) models; floating stack design on 50 and 75 gpm (3.2 and 4.7 L/sec) models
- Franklin Electric Super Stainless motor, rated for continuous use and frequent cycling
- Type SOOW 600-V motor cable (model PF751512 uses 14 AWG, SJOOW, 300-V cord)

** Not applicable for 5-hp (3.73 kW) models*

Standard Models

See specifications chart on page 2 for a list of standard pumps. For a complete list of available pumps, call Orenco.

Product Code Diagram

PF [ ] [ ] [ ] [ ] [ ] - [ ] - [ ]

- [ ] (last): CLK = ClickTight™ compatible
- [ ]: Cord length, ft (m):‡
  Blank = 10 (3) 20 = 20 (6)
  30 = 30 (9) 50 = 50 (15)
- [ ]: Check valve:
  Blank = no internal check valve
  CV = internal check valve†
- [ ]: Voltage, nameplate:
  1 = 115* 2 = 230
- [ ]: Frequency:
  1 = single-phase 60 Hz
- [ ]: Horsepower (kW):
  05 = ½ hp (0.37) 07 = ¾ hp (0.56)
  10 = 1 hp (0.75) 15 = 1½ hp (1.11)
  20 = 2 hp (1.50) 30 = 3 hp (2.24)
  50 = 5 hp (3.73)
- [ ]: Nominal flow, gpm (L/sec):
  10 = 10 (0.6) 20 = 20 (1.3)
  30 = 30 (1.9) 50 = 50 (3.2)
  75 = 75 (4.7)
- PF: Pump, PF Series

* ½-hp (0.37 kW) only
† Available for 10 gpm (0.6 L/sec), 1/2 hp (0.37 kW)
‡ Note: 20-ft cords are available only for pumps through 1½ hp

Specifications

Pump Model	Design gpm (L/sec)	Horsepower (kW)	Phase	Nameplate voltage	Actual voltage	Design flow amps	Max amps	Discharge size and material[1]	Length in. (mm)	Min. liquid level in. (mm)	Weight lb (kg)	Rated cycles per day
PF100511 [9]	10 (0.6)	0.50 (0.37)	1	115	120	12.7	12.7	1 ¼ in. GFP	23.0 (660)	16 (406)	26 (12)	300
PF100511CV [9]	10 (0.6)	0.50 (0.37)	1	115	120	12.7	12.7	1 ¼ in. GFP	23.0 (660)	16 (406)	26 (12)	300
PF100512 [9]	10 (0.6)	0.50 (0.37)	1	230	240	6.3	6.3	1 ¼ in. GFP	23.0 (660)	16 (406)	26 (12)	300
PF100712 [4, 5, 9]	10 (0.6)	0.75 (0.56)	1	230	240	8.3	8.3	1 ¼ in. GFP	25.9 (658)	17 (432)	30 (14)	300
PF101012 [5, 6, 9]	10 (0.6)	1.00 (0.75)	1	230	240	9.6	9.6	1 ¼ in. GFP	27.9 (709)	18 (457)	33 (15)	100
PF200511 [9]	20 (1.3)	0.50 (0.37)	1	115	120	12.3	12.5	1 ¼ in. GFP	22.3 (566)	18 (457)	25 (11)	300
PF200512 [9]	20 (1.3)	0.50 (0.37)	1	230	240	6.4	6.5	1 ¼ in. GFP	22.5 (572)	18 (457)	26 (12)	300
PF201012 [4, 5, 9]	20 (1.3)	1.00 (0.75)	1	230	240	10.5	10.5	1 ¼ in. GFP	28.4 (721)	20 (508)	33 (15)	100
PF201512 [4, 5]	20 (1.3)	1.50 (1.11)	1	230	240	12.4	12.6	1 ¼ in. GFP	34.0 (864)	24 (610)	41 (19)	100
PF300511 [9]	30 (1.9)	0.50 (0.37)	1	115	120	11.8	11.8	1 ¼ in. GFP	21.3 (541)	20 (508)	28 (13)	300
PF300512 [9]	30 (1.9)	0.50 (0.37)	1	230	240	6.2	6.2	1 ¼ in. GFP	21.3 (541)	20 (508)	25 (11)	300
PF300712 [9]	30 (1.9)	0.75 (0.56)	1	230	240	8.5	8.5	1 ¼ in. GFP	24.8 (630)	21 (533)	29 (13)	300
PF301012 [4, 9]	30 (1.9)	1.00 (0.75)	1	230	240	10.4	10.4	1 ¼ in. GFP	27.0 (686)	22 (559)	32 (15)	100
PF301512 [4, 5]	30 (1.9)	1.50 (1.11)	1	230	240	12.6	12.6	1 ¼ in. GFP	32.8 (833)	24 (610)	40 (18)	100
PF302012 [5, 6, 7]	30 (1.9)	2.00 (1.49)	1	230	240	11.0	11.0	1 ¼ in. SS	35.5 (902)	26 (660)	44 (20)	100
PF303012 [5, 6, 7, 8]	30 (1.9)	3.00 (2.23)	1	230	240	16.8	16.8	1 ¼ in. SS	44.5 (1130)	33 (838)	54 (24)	100
PF305012 [5, 6, 7, 8]	30 (1.9)	5.00 (3.73)	1	230	240	25.6	25.8	1 ¼ in. SS	66.5 (1689)	53 (1346)	82 (37)	100
PF500511 [9]	50 (3.2)	0.50 (0.37)	1	115	120	12.1	12.1	2 in. SS	20.3 (516)	24 (610)	27 (12)	300
PF500512 [9]	50 (3.2)	0.50 (0.37)	1	230	240	6.2	6.2	2 in. SS	20.3 (516)	24 (610)	27 (12)	300
PF500712 [9]	50 (3.2)	0.75 (0.56)	1	230	240	8.5	8.5	2 in. SS	23.7 (602)	25 (635)	31 (14)	300
PF501012 [9]	50 (3.2)	1.00 (0.75)	1	230	240	10.1	10.1	2 in. SS	27.0 (686)	26 (660)	35 (16)	100
PF501512 [4]	50 (3.2)	1.50 (1.11)	1	230	240	12.5	12.6	2 in. SS	32.5 (826)	30 (762)	41 (19)	100
PF503012 [4, 5, 7, 8]	50 (3.2)	3.00 (2.23)	1	230	240	17.7	17.7	2 in. SS	43.0 (1092)	37 (940)	55 (25)	100
PF505012 [5, 6, 7, 8]	50 (3.2)	5.00 (3.73)	1	230	240	26.2	26.4	2 in. SS	65.4 (1661)	55 (1397)	64 (29)	100
PF751012 [9]	75 (4.7)	1.00 (0.75)	1	230	240	9.9	10.0	2 in. SS	27.0 (686)	27 (686)	34 (15)	100
PF751512	75 (4.7)	1.50 (1.11)	1	230	240	12.1	12.3	2 in. SS	33.4 (848)	30 (762)	44 (20)	100

1 GFP = glass-filled polypropylene; SS = stainless steel. The 1 ¼-in. NPT GFP discharge is 2 7⁄8 in. octagonal across flats; the 1 ¼-in. NPT SS discharge is 2 1⁄8 in. octagonal across flats; and the 2-in. NPT SS discharge is 2 7⁄8 in. hexagonal across flats. Discharge is female NPT threaded, U.S. nominal size, to accommodate Orenco® discharge hose and valve assemblies. Consult your Orenco Distributor about fittings to connect hose and valve assemblies to metric-sized piping.

2 Minimum liquid level is for single pumps when installed in an Orenco Biotube® Pump Vault or Universal Flow Inducer. In other applications, minimum liquid level should be top of pump. Consult Orenco for more information.

3 Weight includes carton and 10-ft (3-m) cord.

4 High-pressure discharge assembly required.

5 Do not use cam-lock option (Q) on discharge assembly.

6 Custom discharge assembly required for these pumps. Contact Orenco.

7 Capacitor pack (sold separately or installed in a custom control panel) required for this pump. Contact Orenco.

8 Torque locks are available for all pumps and are supplied with 3-hp and 5-hp pumps.

9 ClickTight™ compatible.

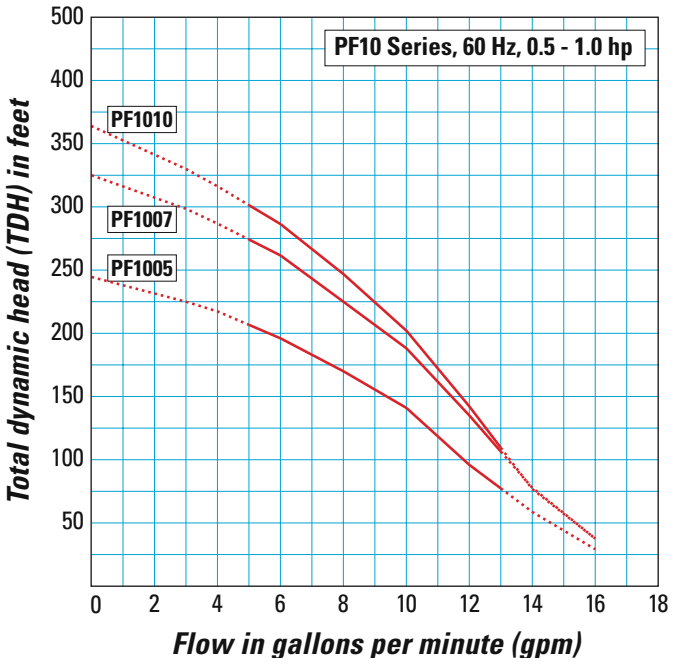
Materials of Construction

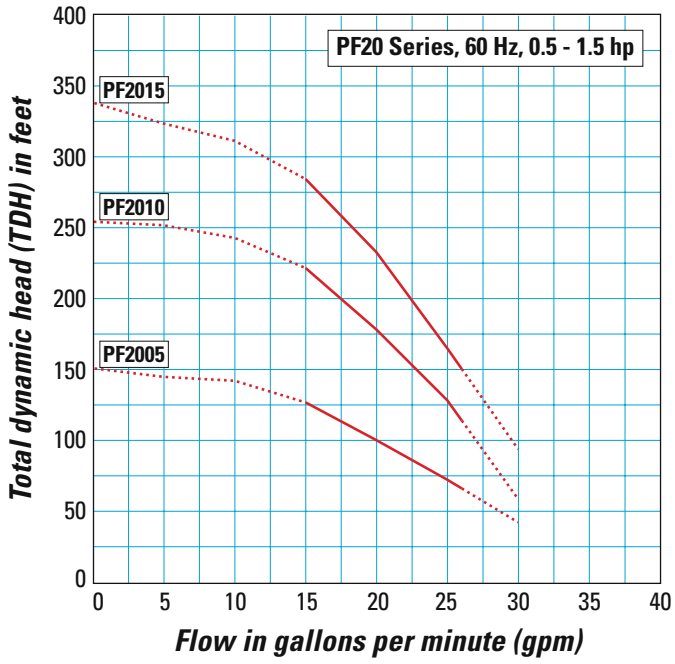
Discharge	Glass-filled polypropylene or stainless steel
Discharge bearing	Engineered thermoplastic (PEEK)
Diffusers	Glass-filled PPO (Noryl GFN3)
Impellers	Celcon® acetal copolymer on 10-, 20-, and 30-gpm models; 50-gpm impellers are Noryl GFN3
Intake screen	Polypropylene
Suction connection	Stainless steel
Drive shaft	7/16-in. hexagonal stainless steel, 300 series
Coupling	Sintered stainless steel, 300 series
Shell	Stainless steel, 300 series
Motor	Franklin motor exterior constructed of stainless steel. Motor filled with deionized water and propylene glycol for constant lubrication. Hermetically sealed motor housing ensures moisture-free windings. All thrust absorbed by Kingsbury-type thrust bearing. Rated for continuous duty. Single-phase motors are equipped with surge arrestors for added security. Single-phase motors through 1.5 hp (1.11 kW) have built-in thermal overload protection, which trips at 203-221˚ F (95-105˚ C).

Using a Pump Curve

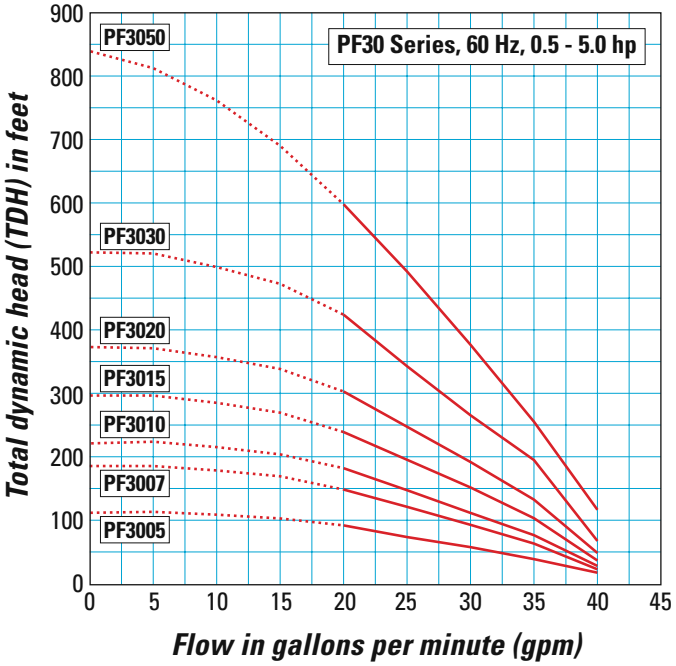
A pump curve helps you determine the best pump for your system. Pump curves show the relationship between flow and pressure (total dynamic head or "TDH"), providing a graphical representation of a pump's optimal performance range. Pumps perform best at their nominal flow rate. These graphs show optimal pump operation ranges with a solid line and show flow rates outside of these ranges with a dashed line. For the most accurate pump specification, use Orenco's PumpSelect™ software.

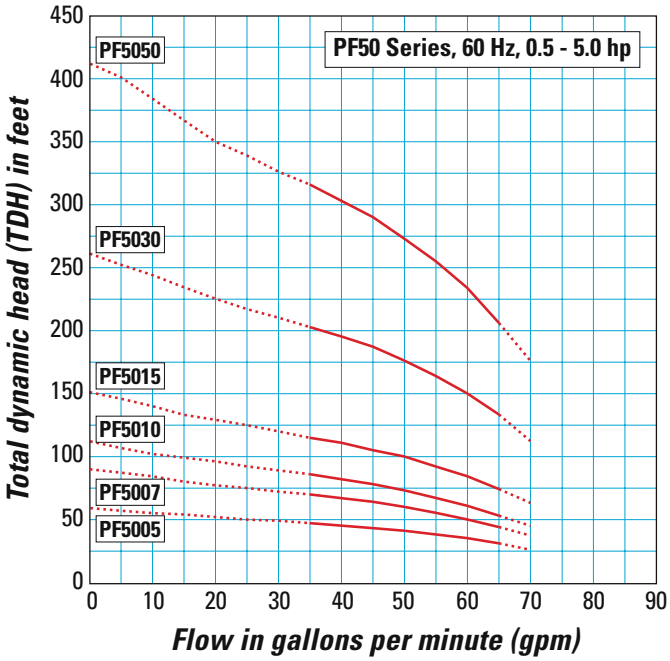
Pump Curves

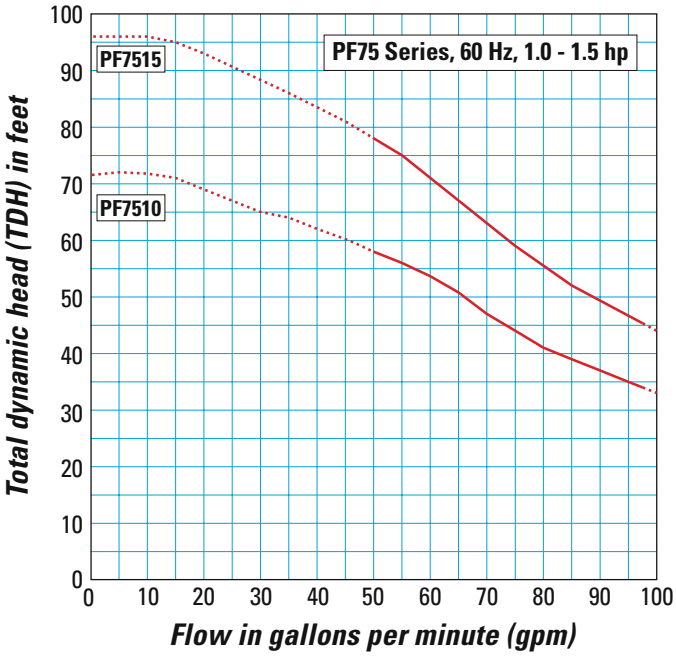




Pump Curves, cont.







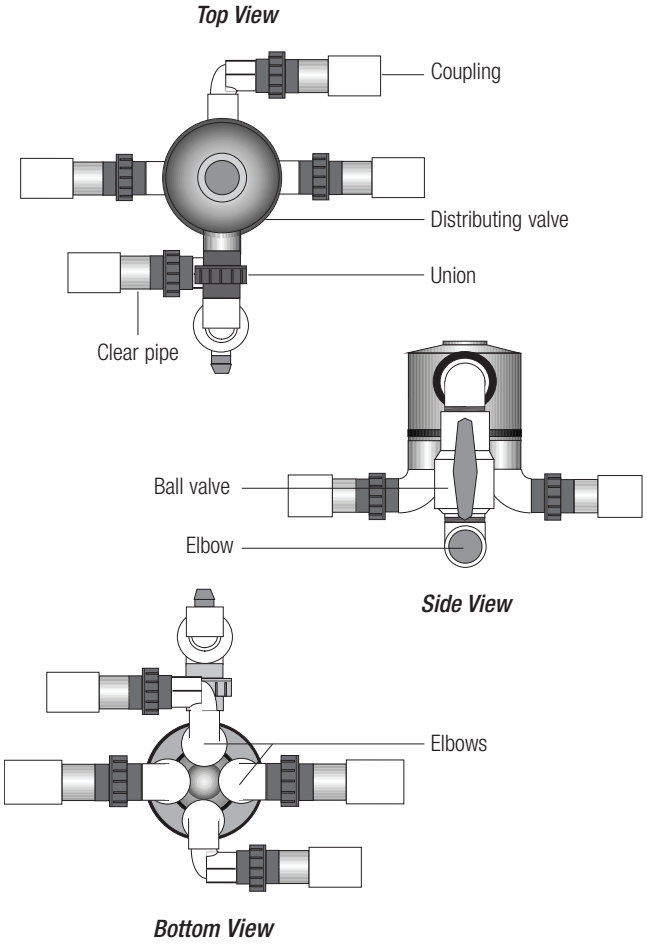
Orenco® SYSTEMS

Technical Data Sheet

Distributing Valves

Applications

Automatic Distributing Valve Assemblies are used to pressurize multiple zone distribution systems including textile filters, sand filters and drainfields.



General

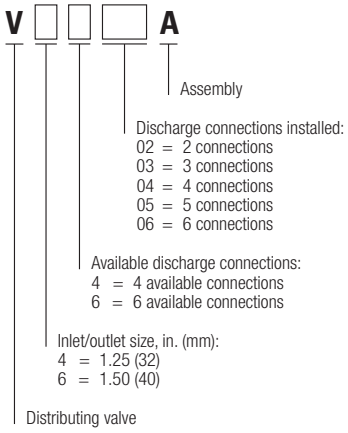
Orenco's Automatic Distributing Valve Assemblies are mechanically operated and sequentially redirect the pump's flow to multiple zones or cells in a distribution field. Valve actuation is accomplished by a combination of pressure and flow. They allow the use of smaller horsepower pumps on large sand filters and drainfields. For example, a large community drainfield requiring 300 gpm (18.90L/sec) can use a six-line valve assembly to reduce the pump flow rate requirement to only 50 gpm (3.14L/sec).

Orenco only warrants Automatic Distributing Valves when used in conjunction with High-Head Effluent Pumps with Biotube® pump vaults to provide pressure and flow requirements, and to prevent debris from fouling valve operation. An inlet ball valve, a section of clear pipe, and a union for each outlet are provided for a complete assembly that is easy to maintain and monitor. Ideal valve location is at the high point in the system. Refer to Automatic Distributing Valve Assemblies (NTP-VA-1) for more information.

Standard Models

V4402A, V4403A, V4404A, V4605A, V4606A, V6402A, V6403A, V6404A, V6605A, V6606A.

Product Code Diagram



Materials of Construction

All Fittings	Sch. 40 PVC per ASTM specification
Unions	Sch. 80 PVC per ASTM specification
Ball Valve	Sch. 40 PVC per ASTM specification
Clear Pipe	Sch. 40 PVC per ASTM specification

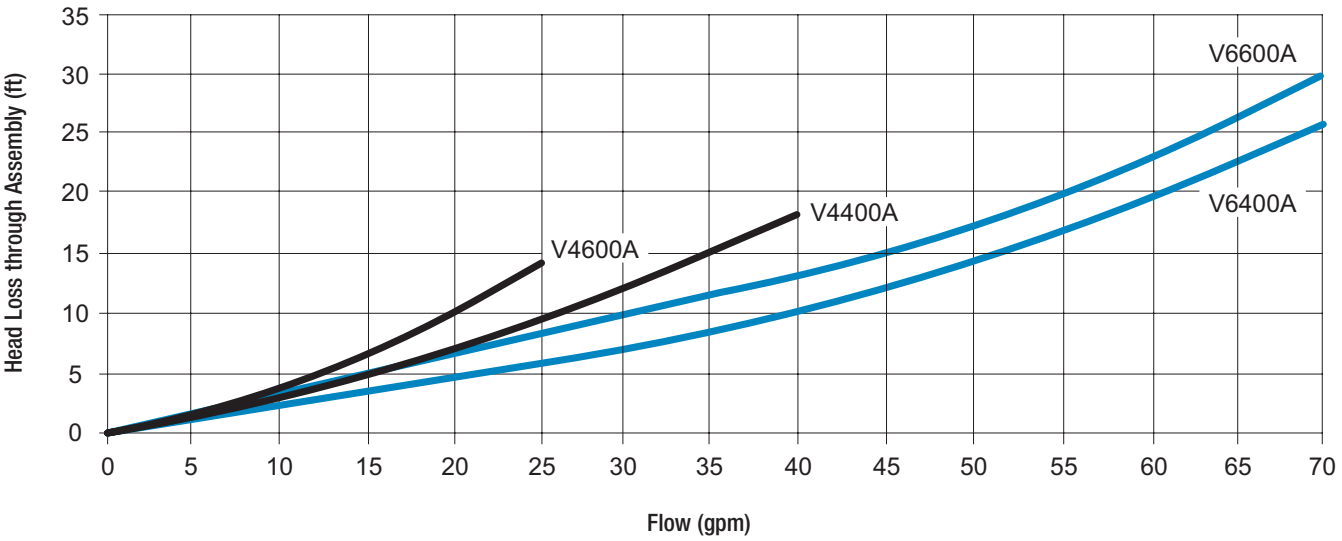
Specifications

Model	Inlet Size, in. (mm)	Outlets Size, in. (mm)	Flow Range, gpm (L/sec)	Max Head, ft (m)	Min. Enclosure*
V4402A	1.25 (32)	1.25 (32)	10 – 40 (0.63 – 2.52)	170 (51.816)	VB1217
V4403A	1.25 (32)	1.25 (32)	10 – 40 (0.63 – 2.52)	170 (51.816)	VB1217
V4404A	1.25 (32)	1.25 (32)	10 – 40 (0.63 – 2.52)	170 (51.816)	VB1217
V4605A	1.25 (32)	1.25 (32)	10 – 40 (0.63 – 2.52)	170 (51.816)	RR2418
V4606A	1.25 (32)	1.25 (32)	10 – 40 (0.63 – 2.52)	170 (51.816)	RR2418
V6402A	1.50 (38)	1.50 (38)	15 – 100 (0.95 – 6.31)	345 (105.16)	RR2418
V6403A	1.50 (38)	1.50 (38)	15 – 100 (0.95 – 6.31)	345 (105.16)	RR2418
V6404A	1.50 (38)	1.50 (38)	15 – 100 (0.95 – 6.31)	345 (105.16)	RR2418
V6605A	1.50 (38)	1.50 (38)	15 – 100 (0.95 – 6.31)	345 (105.16)	RR2418
V6606A	1.50 (38)	1.50 (38)	15 – 100 (0.95 – 6.31)	345 (105.16)	RR2418

** When using an enclosed basin, choose the next larger-sized diameter.*

Table 1. Automatic Distributing Valve Assembly Headloss Equations

Model Series	Equation	Operating Range, gpm (L/sec)
V4400A	$H_L = 0.085 \times Q^{1.45}$	10 - 40 (0.63 – 2.52)
V4600A	$H_L = 0.085 \times Q^{1.58}$	10 - 25 (0.63 – 1.57)
V6400A	$H_L = 0.0045 \times Q^2 + 3.5 \times (1 - e^{-0.060})$	15 - 70 (0.95 – 4.42)
V6600A	$H_L = 0.0049 \times Q^2 + 5.5 \times (1 - e^{-0.10})$	15 - 70 (0.95 – 4.42)



Orenco Systems® Inc. , 814 Airway Ave., Sutherlin, OR 97479 USA • 800-348-9843 • 541-459-4449 • www.orenco.com

Orenco SYSTEMS

Technical Data Sheet

AdvanTex® AX100 Textile Filter

Applications

Orenco's AdvanTex® AX100 Treatment System is an innovative technology for onsite treatment of domestic-strength wastewater. The heart of the system is the AdvanTex Filter, a sturdy, watertight fiberglass basin filled with an engineered textile material. This lightweight, highly absorbent textile material treats a tremendous amount of wastewater in a small space. AX100 Treatment Systems are ideal for:

- New construction
- System upgrades and repairs
- Small sites
- Poor soils
- Pretreatment
- Nitrogen reduction
- Price-sensitive markets

For sizing, see AdvanTex® Design Criteria (NDA-ATX-COMM-1-PKG).

The heart of the AdvanTex® AX100 Treatment System is this sturdy, watertight fiberglass basin filled with an engineered textile material.

Features/Specifications

To specify this product, require the following:

- Wastewater treatment to better than secondary treatment standards
- Consistent treatment, even during peak flows
- Timer operation for flow monitoring, flow modulation, and surge control
- Fixed-film, engineered textile media, operated in an unsaturated condition
- Consistent media quality
- Low energy consumption
- Low maintenance requirements
- Complete pre-manufactured package, ready to install
- Watertight construction, corrosion-proof materials, and components
- Foam-core lid provides insulation value of R-6 (RSI-1.1)
- Quiet operation

Standard Model

AX100

Specifications**

Length, in. (mm)	191 (4851)
Width, in. (mm)	94 (2388)
Height, in. (mm)	42 (1067)
Area (footprint), ft^2 (m^2)	128 (11.9)
Dry Weight, lb (kg)	1616 (733)

* *Covered by U.S. patent numbers 6,540,920; 6,372,137; 5,531,894; 5,480,561; 5,360,556*

** *Nominal values provided. See AdvanTex® Treatment System drawings for exact dimensions.*

AdvanTex® Vent Fan Assembly

Orenco Systems® Incorporated
800-348-9843

Applications

Orenco's AdvanTex® Vent Fan Assembly consists of a water-proof fiberglass enclosure with equipment for venting onsite wastewater treatment systems. One enclosure can hold a vent fan with carbon filter and an optional heater.

The vent fan is used in commercial-sized AdvanTex Treatment Systems to gently pull air through the textile media, ensuring that adequate oxygen is available for biological treatment. The carbon filter scrubs the air that the system exhausts. An optional heater can be added where climate requires heating of the air that enters the AdvanTex textile filter pods.

Standard Models

AXVFACF — AX above ground Vent Fan Assembly with LMF-3 Fan

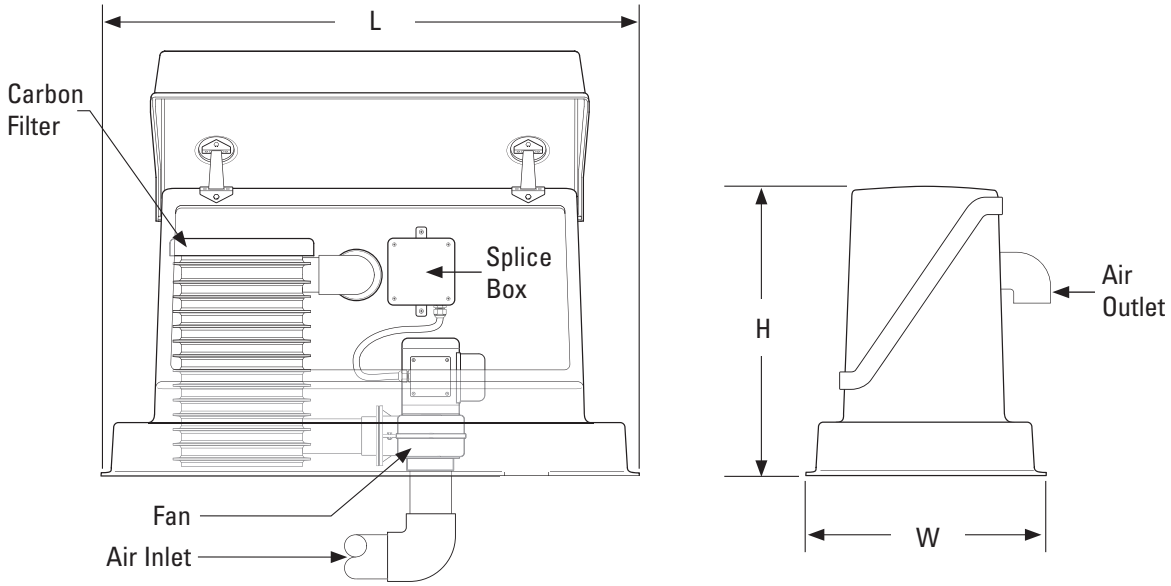
AXVFACF-HT — AX above ground Vent Fan Assembly with LMF-3 Fan and HT10 Heater

Enclosure

Physical Specifications

Materials of Construction	
Shell	Fiberglass-reinforced polyester (FRP)
Hardware	Stainless steel
Exterior finish	Green, textured, UV resistant
Straps	Nylon

Dimensions	
Length (L)	50 in. (1270 mm)
Width (W)	24 in. (610 mm)
Height (H)	30 in. (762 mm)
Volume	15.1 ft^3 (0.43 m^3)
Area (footprint)	8.3 ft^2 (0.77 m^2)



AdvanTex® Vent Fan Assembly (continued)

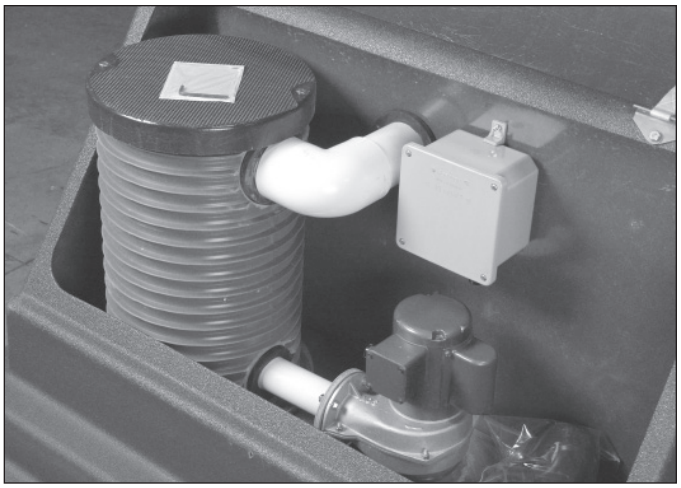
Fan

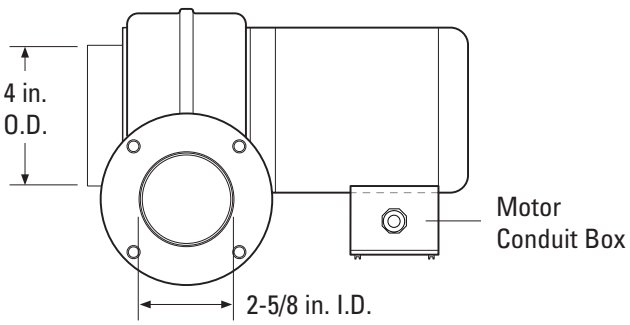
Physical Specifications

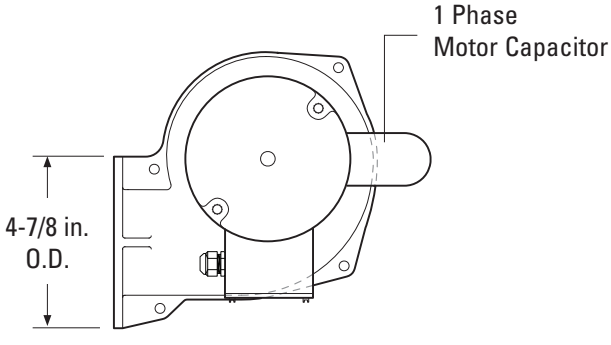
Dimensions	
Inlet O.D.	4 in. (100 mm)
Inlet nominal pipe size	4 in. (100 mm)
Outlet I.D.	2-5/8 in. (67 mm)
Outlet Flange O.D.	4-7/8 in. (124 mm)

Materials of Construction	
Housing	Aluminum
Wheel	Steel

Performance Data	60 Hz	50 Hz
Horsepower (kW)	0.08 (0.06 kW)	0.08 (0.06 kW)
Phase	1 phase	1 phase
Volts	115/230	110/220
Amperage	1.4 A/0.7 A	1.8 A/0.9 A
RPM	3400	2900
CFM at 0" H_2O static pressure	245	205
CFM at 0.4" H_2O static pressure	220	170
CFM at 0.8" H_2O static pressure	190	130
CFM at 1.5" H_2O static pressure	120	N/A

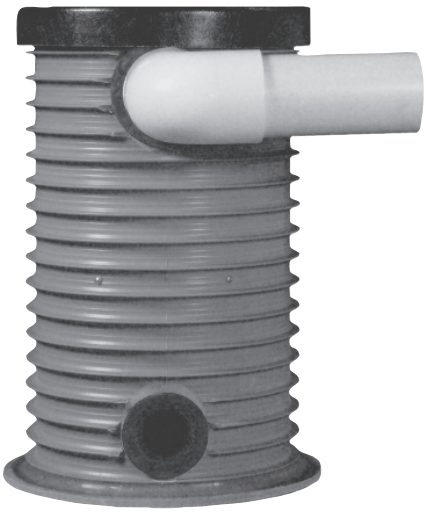






AdvanTex® Vent Fan Assembly (continued)

Carbon Filter Basin

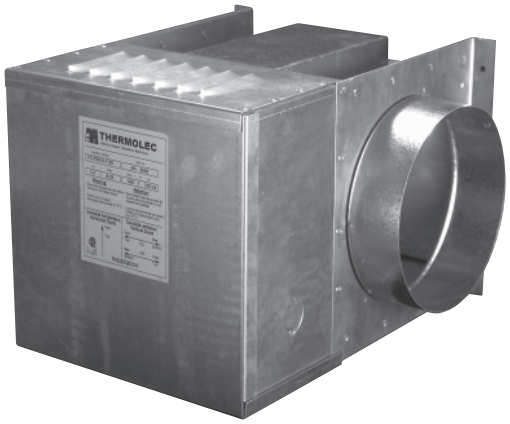


Physical Specifications

Dimensions	
Outlet diameter	Accepts nominal 3-in. PVC pipe
Inlet diameter	Accepts nominal 2-in. PVC pipe
Height	21.5 in. (546 mm)
Diameter	12 in. (305 mm)

Materials of Construction	
Housing	PVC
Bottom	Fiberglass-reinforced polyester (FRP)
Interior supports	Polypropylene grid and polyethylene screen
Support rings	PVC
Lid	Fiberglass
Fill material	Activated carbon

Heater (Optional)



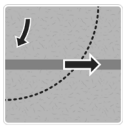
Physical Specifications

Dimensions	
Outlet diameter	Fits nominal 3-in. Class 125 PVC pipe
Length (inlet to outlet)	11.75 in. (297 mm)
Width	11.25 in. (286 mm)
Depth	8.25 in. (210 mm)

Performance Data

Watts	1000
Volts	120
Amps	8.3

TENCATE Mirafi®



Miragrid® 22XT

Miragrid® 22XT geogrid is composed of high molecular weight, high tenacity polyester multifilament yarns woven in tension and finished with a PVC coating. Miragrid® 22XT geogrid is inert to biological degradation and resistant to naturally encountered chemicals, alkalis, and acids.

Miragrid 22XT geogrid is used as soil reinforcement in MSE structures such as segmental retaining walls, precast modular block walls, wire faced walls, geosynthetic wrapped faced walls and steepened slopes. Miragrid 22XT is also used in MSE stabilized platforms for voids bridging, embankments on soft soils, landfill veneer stability, reducing differential settlement and for foundation seismic stability.

TenCate Geosynthetics Americas is accredited by Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP).

MECHANICAL PROPERTIES	TEST METHOD	UNIT	MINIMUM AVERAGE ROLL VALUE
			MD
Tensile Strength @ Ultimate	ASTM D6637 (Method B)	lbs/ft (kN/m)	20559 (300.0)
Tensile Strength @ 5% strain	ASTM D6637 (Method B)	lbs/ft (kN/m)	6700 (97.8)
Mass/Unit Area[1]	(ASTM D5261)	oz/yd^2 (g/m^2)	28.2 (956)
			MINIMUM ROLL VALUE
Creep Rupture Strength[2]	ASTM D5262/D6992	lbs/ft (kN/m)	14277 (208.3)
Long Term Design Strength[3]		lbs/ft (kN/m)	12361 (180.4)

PHYSICAL PROPERTIES	UNIT	ROLL CHARACTERISTIC
Roll Dimensions[4] (width x length)	ft (m)	12 x 200 (3.6 x 61)
Roll Area	yd^2 (m^2)	267 (220)
Estimated Roll Weight	lbs (kg)	470 (213)
Label Roll Color		WHITE

[1] Typical Value
[2] 75-year design life based on NTPEP Report REGEO-2016-01-069. .
[3] Long Term Design Strength for sand, silt, clay. RF_{CR} = 1.44; RF_{ID} = 1.05; RF_D = 1.1 (Installation damage reduction factor for other soils available upon request).
[4] Special order roll lengths are available upon request

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ETQR19

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TENCATE GEOSYNTHETICS

PENTAIR

MYERS®

MODEL SRM4

4/10 HORSEPOWER RESIDENTIAL SEWAGE PUMP

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MYERS® MODEL SRM4
Residential Sewage Pump

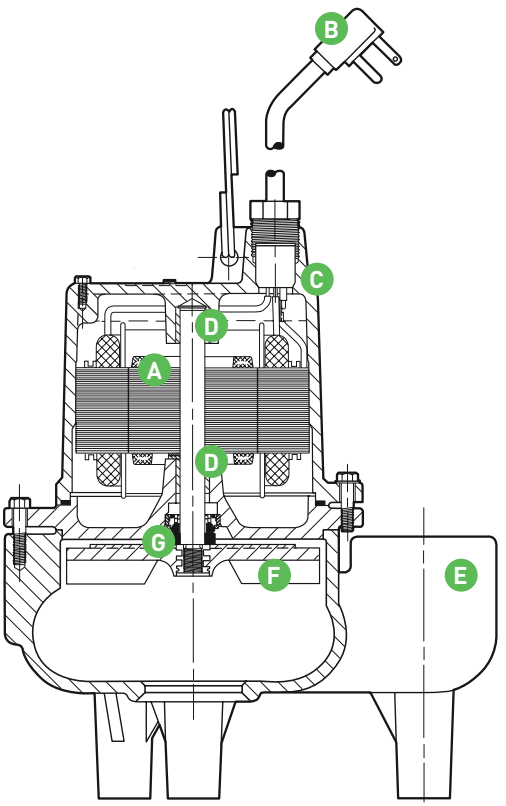
The Right Choice

The SRM4 solids handling pump is the most reliable 4/10 horsepower residential sewage pump available today. The SRM4 is a plumbers/contractors dream! Its recessed impeller design allows 2" solids to pass freely through the volute without the chance of jamming the impeller. The SRM4 series pump has a national field-proven record of reliability. Look to your Myers distributor for the answer to your residential sewage handling needs ... and across the counter will be the Myers mini solids handling, the SRM4. It works for you! For more information, call your Myers distributor today, or the Myers Ohio sales office at 419-289-6898.

Product Capabilities		
Capacities To	95 gpm	360 lpm
Heads To	18 ft. 19 ft. shutoff	5.5 m 5.8 m
Pump Down Range Float Switch	7 to 14 in.	178 to 356 mm
Solids Handling Capacity	2 in.	50.8 mm
Liquids Handling	raw sewage, effluent, drain water	
Intermittent Liquid Temp.	up to 140˚F	up to 60˚C
Motor Electrical Data	4/10 HP shaded pole 1650 RPM	
Electrical	115V, 12A or 230V, 6A, 1Ø, 60 Hz.	
Acceptable pH Range	6 – 9	
Discharge, NPT	2 in.	50.8 mm
Min. Sump Diameter Simplex Duplex	 18 in. 30 in.	 457 mm 762 mm

Note: Consult factory for applications outside these recommendations.

Pump Features and Applications



A. 4/10 HP Motor
Pressed in place and oil-filled for best alignment and heat transfer. Built-in overload protection.

B. Power Cord
Quick-disconnect watertight fitting.

C. Motor Housing
Heavy cast iron for efficient heat transfer.

D. Dual Thrust Washers, Sleeve Bearings
Oil lubricated, enhance smooth operation and extend pump life..

E. Cast Iron Volute
Passes 2" diameter solids.

F. Recessed Impeller
Operates out of volute passage, allowing maximum flow of liquids and solids.

G. Mechanical Shaft Seal
Carbon and ceramic faces, body is stationary, prevents string or trash from winding on seal..

Mechanical Float Switch
Mercury-free, 90° angle operation. (Piggyback models only).

Durable Motor Will Deliver Many Years Of Reliable Service.

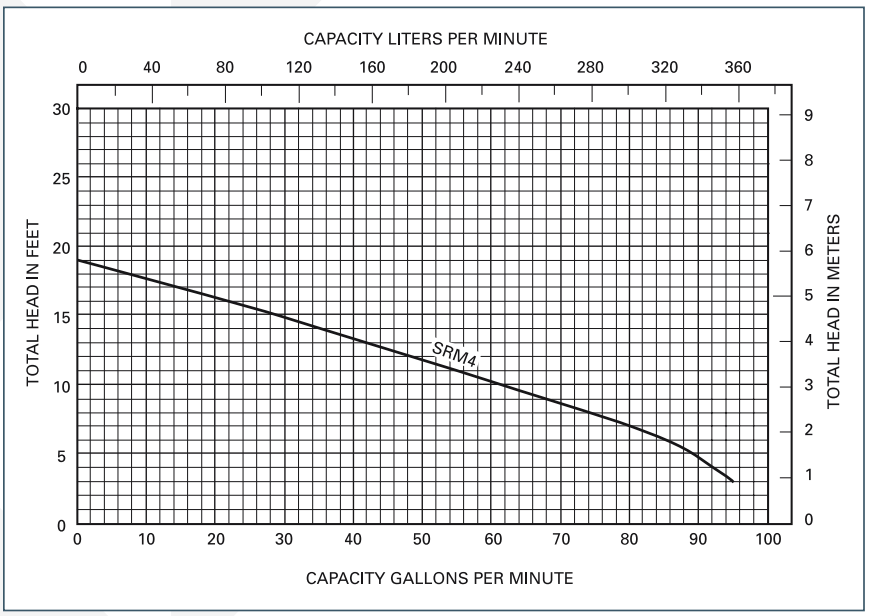
- Oil-filled motor for maximum heat dissipation and continuous bearing lubrication.
- Overload protected shaded pole motor eliminates starting switches.
- Recessed vortex impeller provides minimal radial loading for long bearing life.

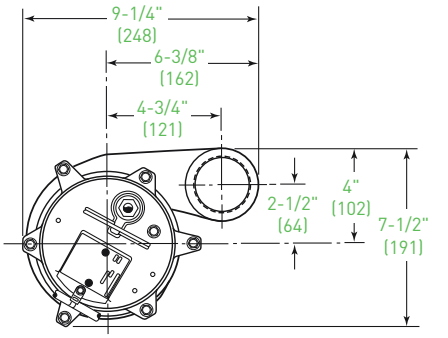
The SRM4P Is Engineered For Many Years Of Maintenance-Free Operation.

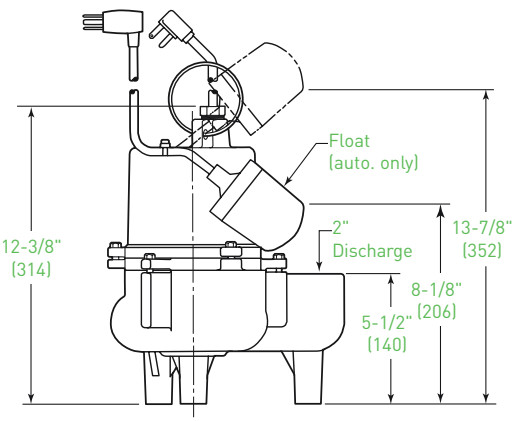
- Wide-angle piggy-back float switch for maximum draw down. (Automatic models.)
- Pump can be operated manually by unplugging piggy-back switch and plugging pump directly into outlet (Automatic models).
- Recessed vortex impeller operates completely out of volute and provides free flow through passage for solids and liquids.

Performance Data and Dimensions [Dimensions in mm]

1650 RPM







PENTAIR

740 EAST 9TH STREET,
ASHLAND, OHIO 44805
WWW.FEMYERS.COM

269 TRILLIUM DRIVE, KITCHENER,
ONTARIO, CANADA N2G 4W5
WWW.FEMYERS.COM

January 13, 2023

David T. Bray, PLS
President
Caputo & Wick LTD
1150 Pawtucket Ave.
Rumford, RI 02916-1897
Phone: (401) 434-8880

RE: Burlingame State Park and Camp Ground, Charlestown, RI

Dear Mr. Bray:

This letter will confirm that you have been trained and certified to design GST™ Leaching Systems by Geomatrix Systems, LLC ("Geomatrix") in the State of Rhode Island.

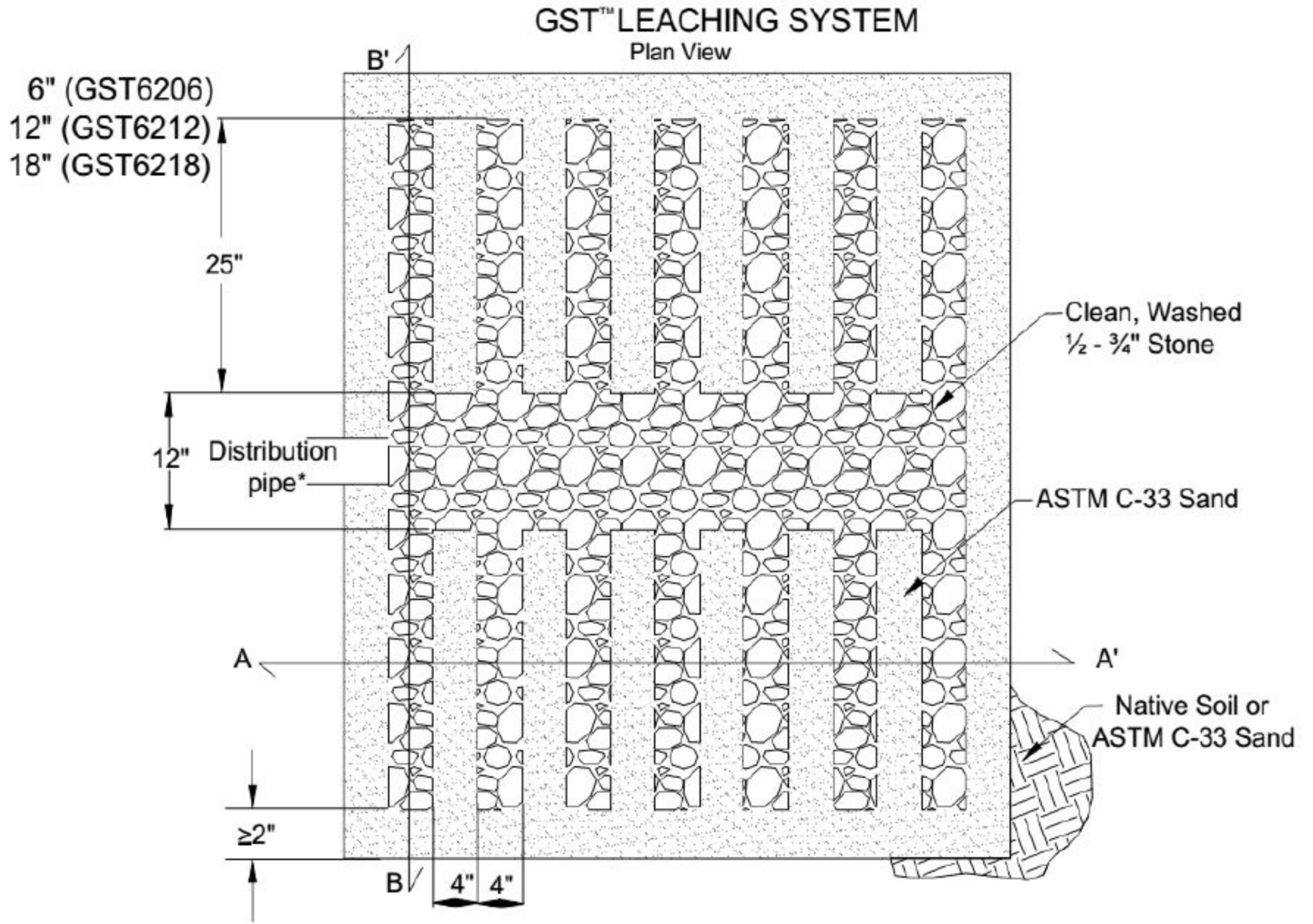
This letter also confirms that Geomatrix has reviewed the design of the GST Leaching System proposed for installation at Burlingame State Park and Camp Ground, Charlestown, RI and found the site and design to be suitable and in compliance with the approved design manuals for the aforementioned product.

If you have any questions, please contact me.

Sincerely,
GEOMATRIX SYSTEMS, LLC

David Jewett

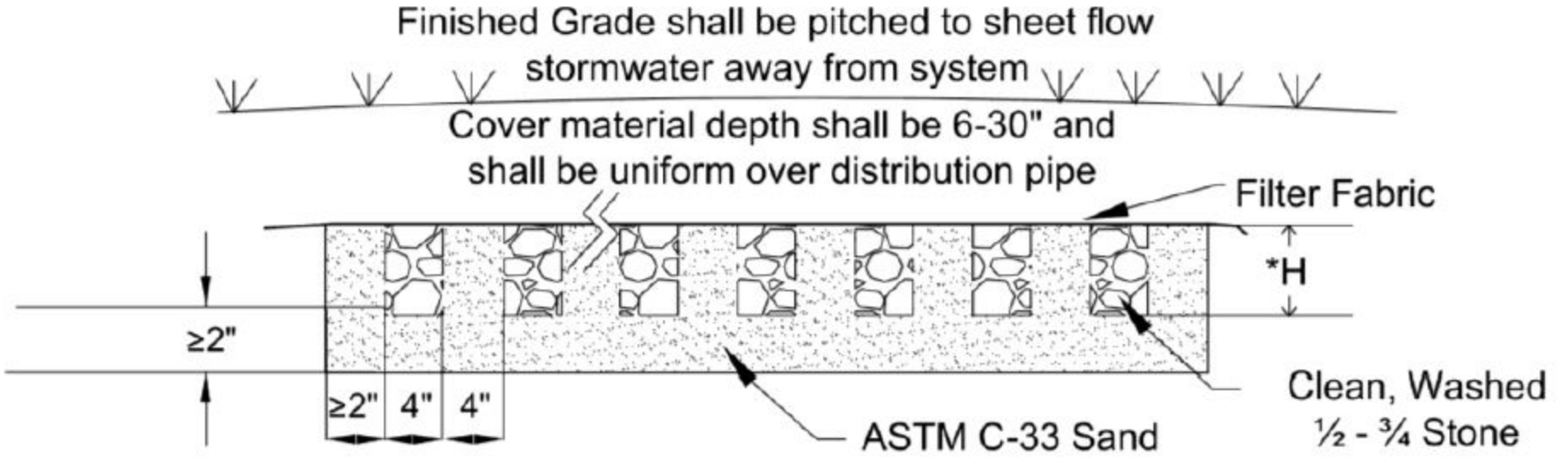
GST Schematics



* Distribution pipe for gravity systems shall comply with RIDEM OWTS Rule 6.34C
Distribution pipe for pressure applications shall comply with RIDEM Guidelines for the Design, Use and Maintenance of Pressurized Drainfields.

GEOMATRIX GST™ LEACHING SYSTEM

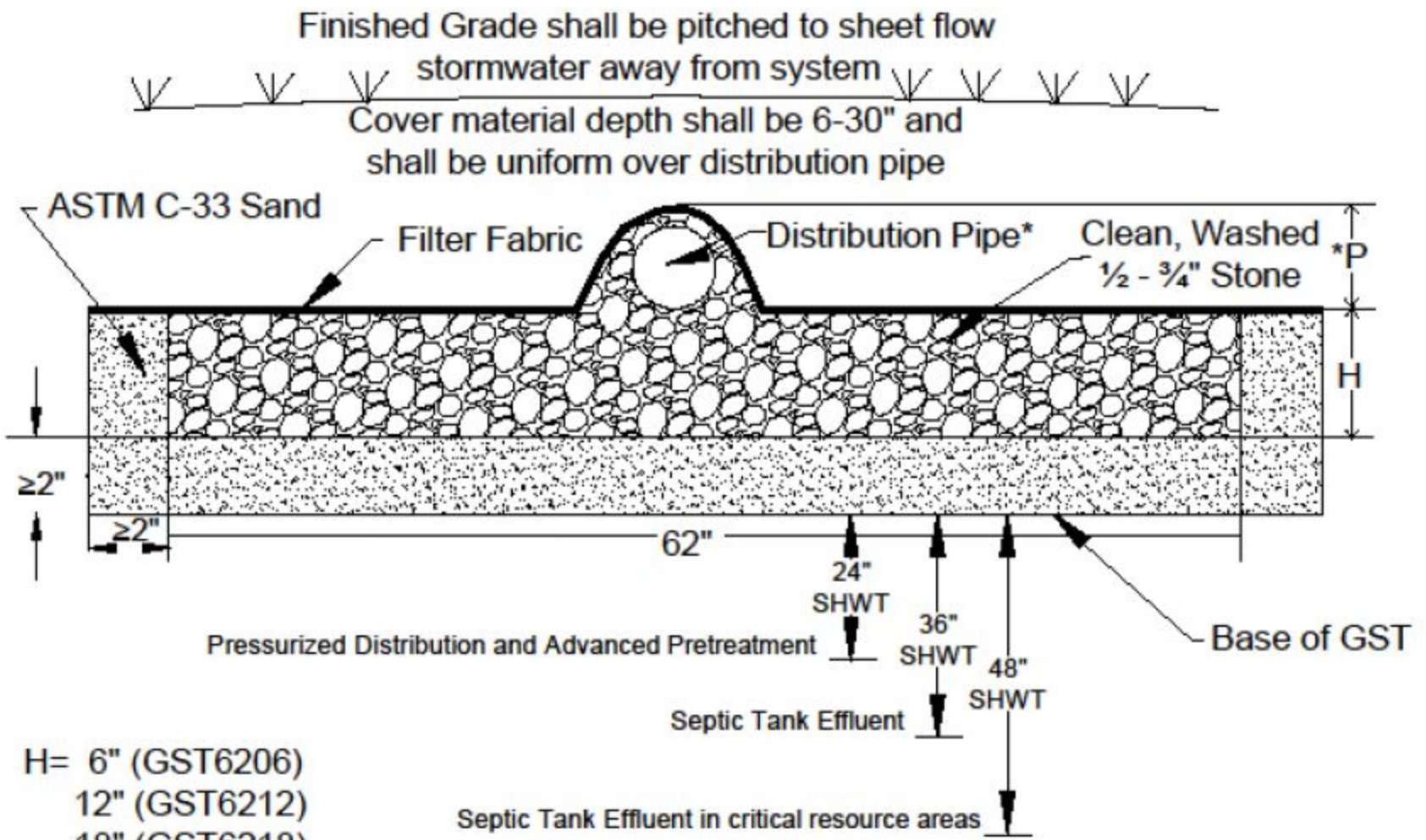
A-A' CROSS SECTION



*H= 6" (GST6206)
12" (GST6212)
18" (GST6218)

GST™ LEACHING SYSTEM

B-B' CROSS SECTION

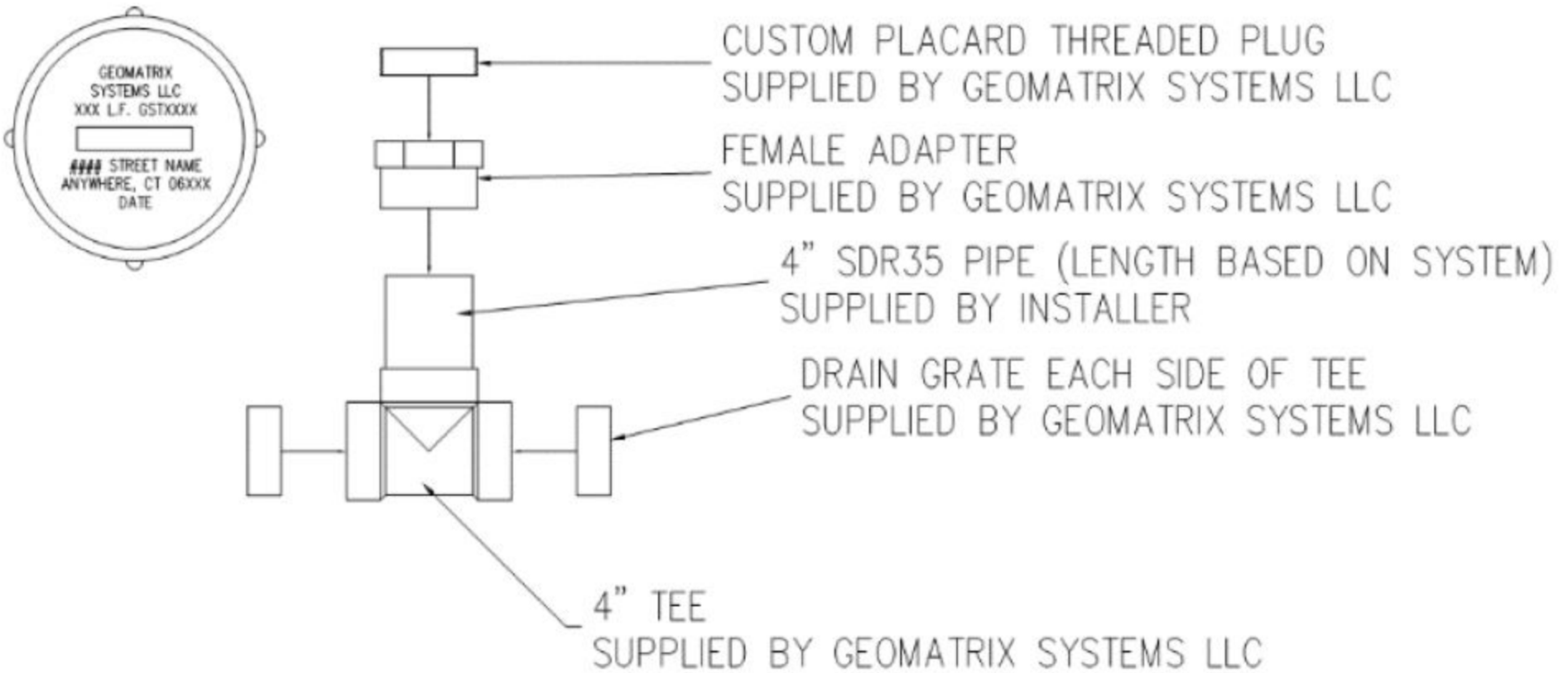


H= 6" (GST6206)
12" (GST6212)
18" (GST6218)

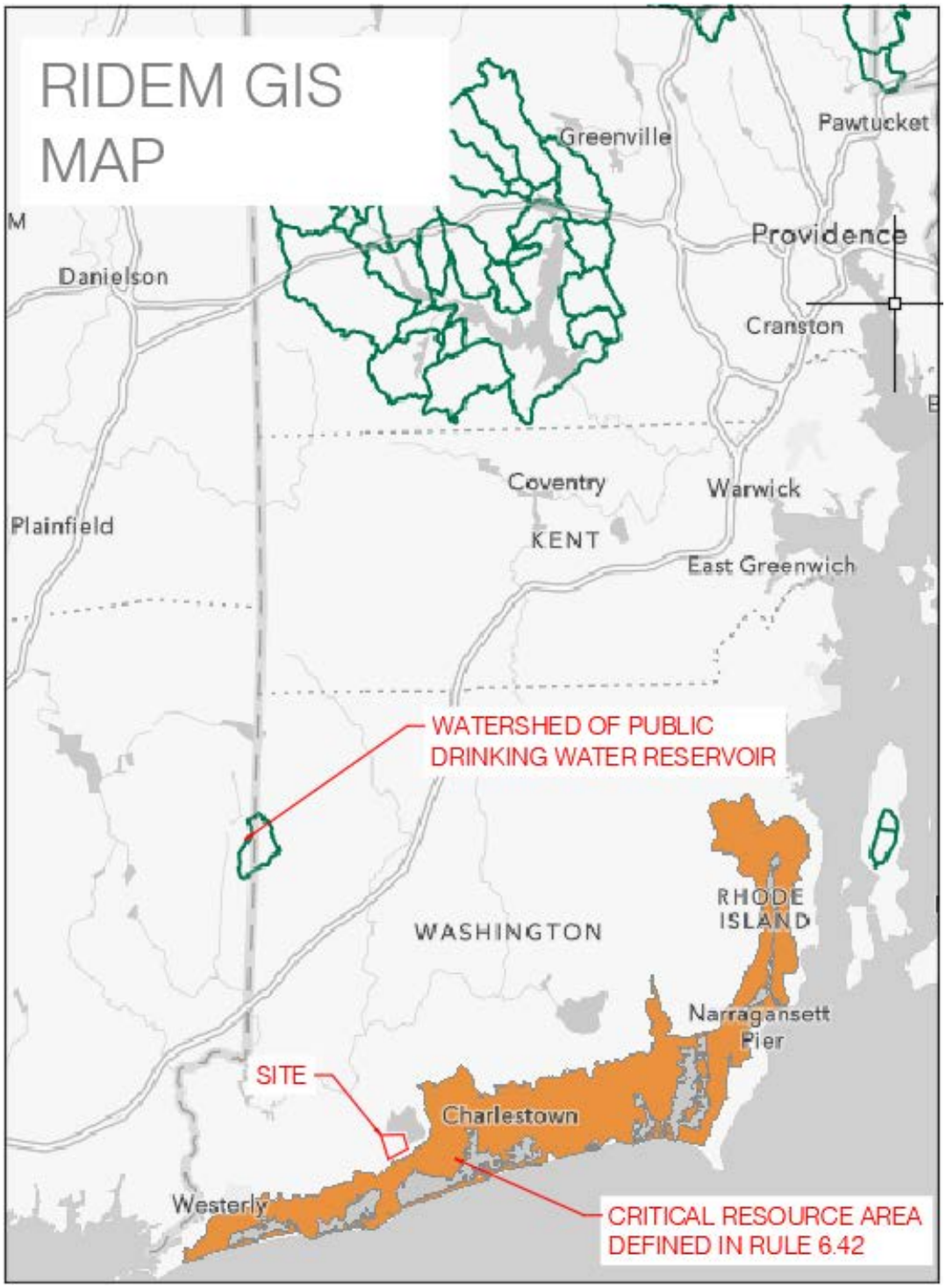
* Distribution pipe for gravity applications shall comply with RIDEM OWTS Rule 6.34C
Distribution pipe for pressure applications shall comply with RIDEM Guidelines for the Design, Use and Maintenance of Pressurized Drainfields

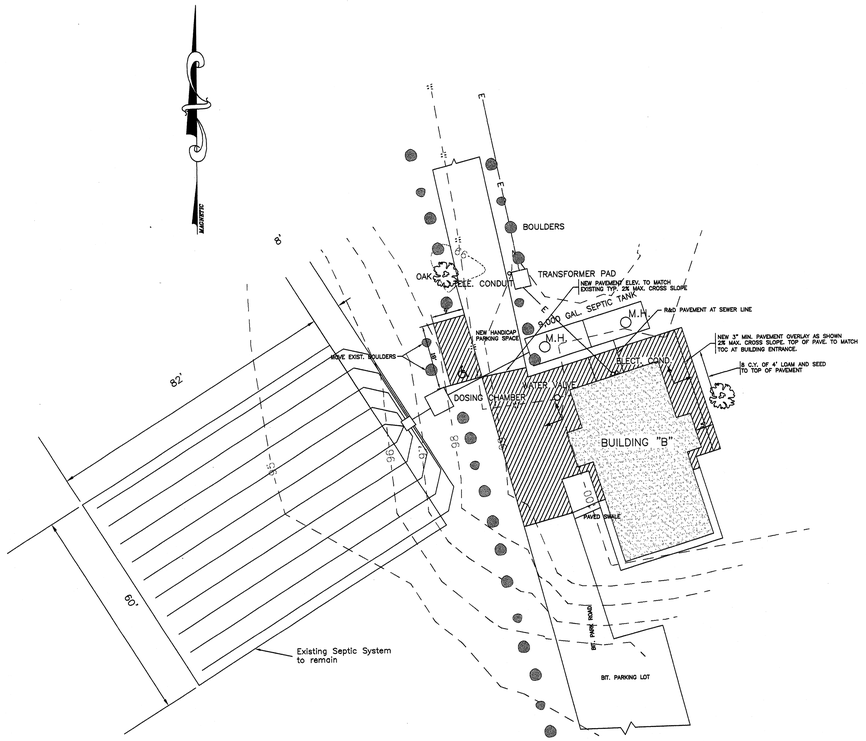
GST LEACHING SYSTEM B-B' Cross Section Geomatrix Systems, LLC., Old Saybrook, CT 860-510-0730	
SCALE: NONE	REV: D
DATE: 9-4-2018	ACAD No. G60 GLS B-B'.DWG
DRAWN BY: ERP	SHEET 3 OF 3

GEOMATRIX GST™ LEACHING SYSTEM
INSPECTION PORT DETAIL



GST LEACHING SYSTEM Inspection Port Detail Geomatrix Systems, LLC., Old Saybrook, CT 860-510-0730	
SCALE NONE	REV. A
DATE 6/2/2015	ACAD No. GSTIP.DWG
DRAWN BY: ERP	SHEET 1 OF 1


RIDEM GIS MAP
Greenville
Pawtucket
Providence
Danielson
Cranston
Coventry
Warwick
Plainfield
KENT
East Greenwich
WATERSHED OF PUBLIC DRINKING WATER RESERVOIR
RHODE ISLAND
WASHINGTON
Narragansett Pier
SITE
Charlestown
Westerly
CRITICAL RESOURCE AREA DEFINED IN RULE 6.42



Site Plan Building "B"

Scale: 1" = 20'

Notes:

1. All features shown are existing unless noted otherwise.

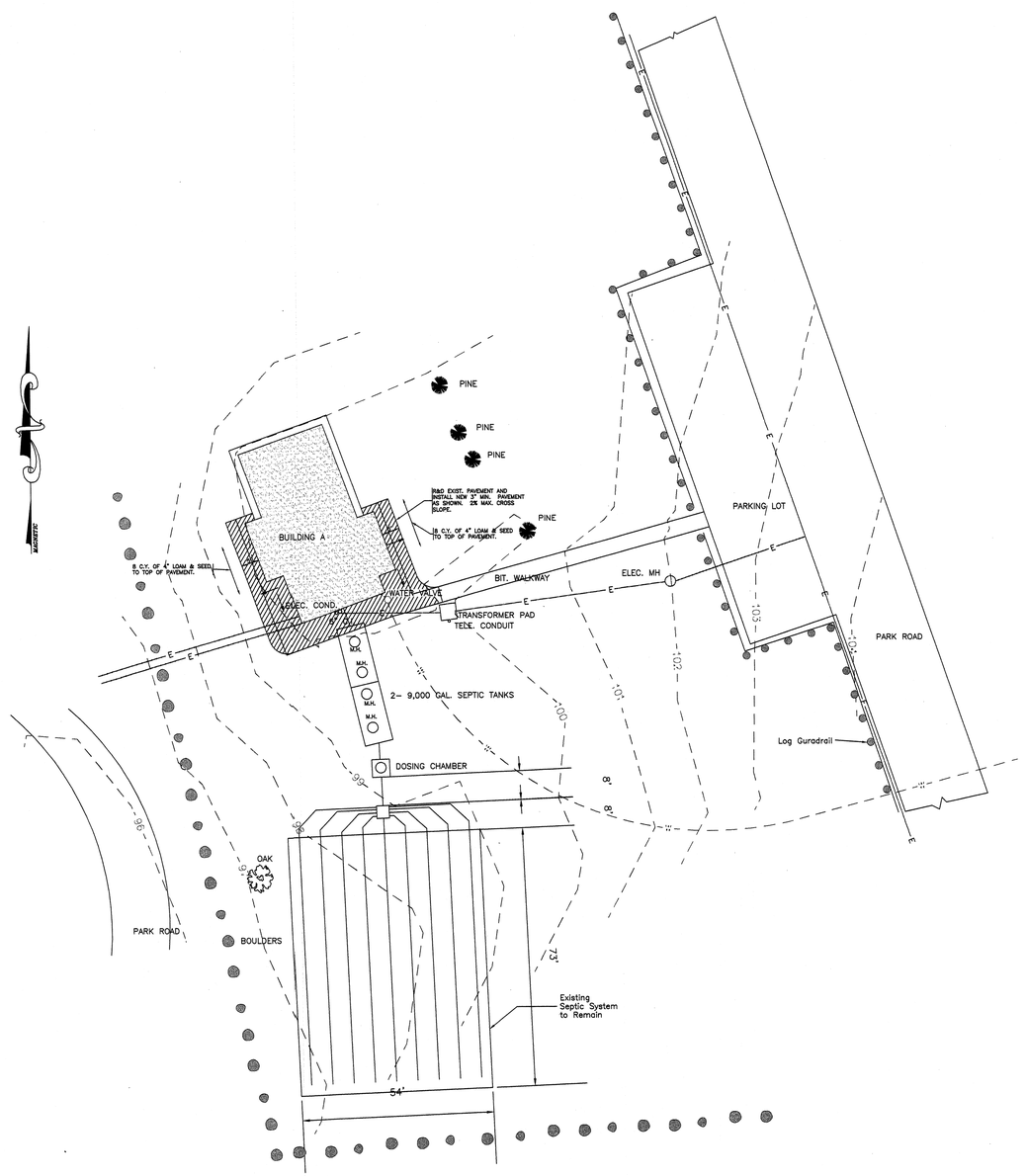
2. Locations of all utilities shown are approximate, Contractor to verify exact locations of all utilities in the field, both overhead and underground, with DIGSAFE. Any damage to utilities shall be the Contractor's responsibility.

3. Construction work area is 20' outside of building, walkway to parking area, and parking area.

4. Contractor must restore the site to it's original condition at the completion of all work. Any grassed areas to be loamed and seeded with 4" min. loam. Any pavement areas to be repaved per the specifications.

5. Each utility company is to be notified at least 24 hrs. before any work impacting their utilities begins.

6. adjust valve covers and M.H. covers to new grade as required.



Site Plan Building "A"

Scale: 1" = 20'

No.	Description	Date

REVISIONS:

D ■ E ■ M

STATE OF RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
DIVISION OF PLANNING AND DEVELOPMENT

RENOVATIONS TO A&B TOLIETS
BURLINGAME STATE PARK
CHARLESTOWN, RI

Design by:	LL
Drawn by:	CVP
Checked by:	LL
Date:	JUNE 2002
Scale:	1"=20'
Project No.:	

LISA T. LAWLESS
No. 6026
REGISTERED PROFESSIONAL ENGINEER

SITE PLANS BUILDINGS A & B

C2

SHEET OF

CHA 5594 02 76

“Building “A” Bathhouse and Onsite Wastewater Treatment System Replacement”

For

Rhode Island Department of Environmental Management
Burlingame State Park and Campground

Burlingame Park Road
Charlestown, Rhode Island

Assessors Map 15 – Lot 10
Area: 847 Acres±

July 2022
Rev.: March 2023

Prepared by

Caputo & Wick Ltd.
1150 Pawtucket Avenue
Rumford, Rhode Island 02916-1897
401-434-8880

Environmental Management

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
ONSITE WASTEWATER TREATMENT SYSTEM CONSTRUCTION PERMIT

www.dem.ri.gov/septic

MAR - 8 2023

FOR RIDEM USE ONLY

Office of Water Resources

APPLICATION No. 2205-1130 DATE RECEIVED 08/ /22 AMOUNT RECEIVED $ Waived CHECK # ——— NOTE

TYPE OF APPLICATION (CHECK ALL THAT APPLY)

- ❑ NEW BUILDING CONSTRUCTION
- ❑ ALTERATION
- ❑ REPAIR
- ❑ TRANSFER
- ❑ A/E TECHNOLOGY TYPE
- ❑ VARIANCE
- ❑ REDESIGN
- ❑ JOINT OWTS / WETLANDS PD

SITE INFORMATION

BURLINGAME STATE PARK AND CAMPGROUND (BUILDING "A")
1 BURLINGAME PARK ROAD CHARLESTOWN

NO. STREET CITY/TOWN POLE #

PLAT NUMBER 15 LOT NUMBER 1 SUBDIVISION LOT NUMBER N.A.

LOT SIZE 947 SF/ACRES

SUBDIVISION NAME N.A.

SUBDIVISION SITE SUITABILITY CERTIFICATION # N.A.

OWNER INFORMATION

STATE OF RI DEM

LAST NAME FIRST NAME M.I.

235 PROMENADE ST. PROVIDENCE 02908

NO. STREET CITY/TOWN ZIP CODE

RIDEM APPLICATION HISTORY

PREVIOUS SITE TESTING ☒ YES ❑ NO APPLICATION # 2205-1130

DEPTH TO APPROVED WATER TABLE 24" HOW DETERMINED SOIL EVALUATION

TEST HOLE # 3B DATE EXCAVATED 3/17/21 WETLANDS within 200' OF OWTS ❑ YES ☒ NO

WETLAND DETERMINATION ❑ YES ☒ NO RIDEM FILE # ________ DATE ___/___/___

LARGE SYSTEM ☒ YES ❑ NO OCI FILE # IF APPLICABLE ________

DESIGN INFORMATION

BUILDING USE: ❑ Residential ❑ Commercial ________ ☒ Other BATHHOUSE

WATER SUPPLY: ❑ public water ☒ public well ❑ private well

OF DESIGN UNITS 150

UNIT DESIGN FLOW 50 gallons per site (unit) TOTAL DAILY FLOW 7,500 gallons

TANK SIZE 15,000 gallons DESIGN LOADING RATE 3.5 gpd/sf

MINIMUM REQUIRED LEACHFIELD AREA 2,143 square feet

LEACHFIELD TYPE GRAVEL SAND TREATMENT (GST)

TOTAL AREA OF LEACHFIELD PROVIDED 2,100 square feet

CERTIFICATION

I, KEVIN HARRUP (print), *the undersigned licensed OWTS designer, certify that I prepared this application and accompanying forms, submittals, plans and sketches in accordance with the RULEs of the RIDEM pertaining to OWTS and that all the information provided on this application and accompanying forms, submittals, plans and sketches is true and accurate.*

Designer's Signature [signature] License # D3155

Designer's Email kharrup@cox.net Phone # 401-434-9830

Business/Company Name Civil ... Ltd.

I certify that a) I am the owner of the property indicated under the site information on this application, b) I will hire a licensed OWTS installer to install the system proposed herein, c) the system will be installed in strict accordance with this application, d) I will hire and retain the licensed OWTS designer of record to witness and inspect the installation of the system, e) I assume all responsibility for the truth and accuracy of this application and all liability and responsibility for any improper installations of the system on this site and agree to hold the RIDEM harmless from any and all claims relating whatsoever to the system. In the case of a transfer application, I acknowledge that the permit application and plans previously approved and accompanying this application are the operative documents subject to certification.

Owner's Phone Number (401)222-4700 ext. 2774307

Owner's Email MEGAN DIPRETE @ DEM.RI.GOV

Owner(s) Signature M D Prete

PERMIT APPROVAL SECTION: DO NOT WRITE BELOW THIS LINE

Based upon the representations of the owner and the owner's agents, including the representations of the owner's OWTS designer, and the truth and accuracy of all information submitted, this application for an OWTS is hereby approved. The RIDEM assumes no responsibility or liability for the future safe operation or maintenance of the aforesaid system, of the fitness or suitability of this system to this site, nor does it assume any responsibility for the accuracy and truth of the owner's, or the owner's agent's representations. This approval is subject to future suspension or revocation in the event that subsequent examination reveals any data indicated on any application, form, submittal, plan or sketch to be incorrect, or not in compliance with the RULES or any conditions at the site are such that the approved design is not in accordance with the RULES, or in the event that the system discharges inadequately treated wastewater to waters of the State or fails to operate satisfactorily in any other manner.

IMPORTANT: Additional terms of approval as circled.

A. Bottom of leaching area excavation must be inspected by the RIDEM prior to placement of any gravel or stone.
B. System installation must be inspected by RIDEM prior to covering any component of the system with backfill.
C. Applicant shall comply with all requirements, conditions and stipulations of variance(s) approved on ________.
D. Joint Permit: Designer of record must contact RIDEM prior to start of any site construction.
E. A/E Technology: additional installation, operation or maintenance requirements may apply (see A/E Technology Certification.)
F. Copy of this form and Operation/Maintenance contract must be filed in land evidence records prior to conformance.
G. Proposed construction falls within "Coastal Zone". Contact Rhode Island Coastal Resources Management Council.
H. Proper erosion and sedimentation controls must be installed prior to start of construction.
I. Transfer: See original permit for all applicable conditions.
J. Other

→ Per attached testing requirements

Signature of RIDEM Official	Date of Approval	Date of Expiration
[signature]	3/15/23	3/15/28

DESIGNER

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
ONSITE WASTEWATER TREATMENT SYSTEM CONSTRUCTION PERMIT
www.dem.ri.gov/septic

FOR RIDEM USE ONLY

APPLICATION No. _____ DATE RECEIVED ____/____/____ AMOUNT RECEIVED $_____ CHECK #_____ NOTE_____

TYPE OF APPLICATION (CHECK ALL THAT APPLY)

- ☒ NEW BUILDING CONSTRUCTION
- ☐ ALTERATION
- ☐ REPAIR
- ☐ TRANSFER
- ☐ A/E TECHNOLOGY TYPE ORENCO AX100/GST
- ☐ VARIANCE
- ☐ REDESIGN
- ☐ JOINT OWTS / WETLANDS PD

SITE INFORMATION

BURLINGAME STATE PARK AND CAMPGROUND (BUILDING "A") / 1-100 BURLINGAME PARK ROAD / CHARLESTOWN / _____
NO. STREET / CITY/TOWN / POLE #

PLAT NUMBER 15 LOT NUMBER 10 SUBDIVISION LOT NUMBER N.A.

LOT SIZE 847 ~~SF~~/ACRES

SUBDIVISION NAME N.A.

SUBDIVISION SITE SUITABILITY CERTIFICATION # N.A.

OWNER INFORMATION

STATE OF RI / DEM
LAST NAME / FIRST NAME / M.I.

235 PROMENADE ST. / PROVIDENCE / 02908
NO. STREET / CITY/TOWN / ZIP CODE

RIDEM APPLICATION HISTORY

PREVIOUS SITE TESTING ☒ YES ☐ NO APPLICATION # 2205-1138

DEPTH TO APPROVED WATER TABLE 24" HOW DETERMINED SOIL EVALUATION

TEST HOLE # 3B DATE EXCAVATED 8/17/21 WETLANDS within 200' OF OWTS ☐ YES ☒ NO

WETLAND DETERMINATION ☐ YES ☒ NO RIDEM FILE # _____ DATE ____/____/____

LARGE SYSTEM ☒ YES ☐ NO OCI FILE # IF APPLICABLE _____

DESIGN INFORMATION

BUILDING USE: ☐ Residential ☐ Commercial _____
☒ Other BATHHOUSE

WATER SUPPLY: ☐ public water ☒ public well ☐ private well

OF DESIGN UNITS 150

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Designer's Signature _____ License # D3155

Designer's Email kharrop@cwltd.net Phone # 401-434-8880

Business/Company Name CAPUTO and WICK LTD.

I certify that a) I am the owner of the property indicated under the site information on this application, b) I will hire a licensed OWTS installer to install the system proposed herein, c) the system will be installed in strict accordance with this application, d) I will hire and retain the licensed OWTS designer of record to witness and inspect the installation of the system, e) I assume all responsibility for the truth and accuracy of this application and all liability and responsibility for any improper installations of the system on this site and agree to hold the RIDEM harmless from any and all claims relating whatsoever to the system. In the case of a transfer application, I acknowledge that the permit application and plans previously approved and accompanying this application are the operative documents subject to certification.

Owner's Phone Number (401)222-4700 ext. 2774307

Owner's Email MEGAN.DIPRETE@DEM.RI.GOV

Owner(s) Signature _____

PERMIT APPROVAL SECTION: DO NOT WRITE BELOW THIS LINE

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IMPORTANT: Additional terms of approval as circled.

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B. System installation must be inspected by RIDEM prior to covering any component of the system with backfill.
C. Applicant shall comply with all requirements, conditions and stipulations of variance(s) approved on _____.
D. Joint Permit: Designer of record must contact RIDEM prior to start of any site construction.
E. A/E Technology: additional installation, operation or maintenance requirements may apply (see A/E Technology Certification.)
F. Copy of this form and Operation/Maintenance contract must be filed in land evidence records prior to conformance.
G. Proposed construction falls within "Coastal Zone". Contact Rhode Island Coastal Resources Management Council.
H. Proper erosion and sedimentation controls must be installed prior to start of construction.
I. Transfer: See original permit for all applicable conditions.
J. Other

Signature of RIDEM Official	Date of Approval	Date of Expiration

DEM SEE INSTRUCTIONS ON REVERSE SIDE

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
235 Promenade Street, Providence, Rhode Island 02908

March 15, 2023

State of Rhode Island
Rhode Island Department of Environmental Management Division of Planning and Development
235 Promenade Street
Providence, RI 02908

RE: Bathhouse "A"
Burlingame State Park and Campground
Charlestown, RI
OWTS Application No. 2205-1138

Dear Applicant:

Attached herewith are revised monitoring and reporting requirements applicable to the above listed permit. As you are aware the above listed Onsite Wastewater Treatment System (OWTS) permit is granted based on a maximum daily design flow of **7,500** gallons per day and includes 1 - 15,000 gallon septic tank, 1 - 7,500 gallon anoxic tank, 1 - 6,000 gallon recirculation tank, 2 - Advantex AX 100 filter pods followed by a 6 x 6 pump chamber to a Gravel Sand Treatment (GST) type of leaching system.

Advanced treatment systems are utilized to mitigate against possible adverse impacts of residual onsite wastewater pollutants on groundwater quality and surface water quality. Owners of advanced OWTSs with design flows ≥2,000 gallons per day are subject to regular monitoring and reporting. The following stipulations now apply to your permit:

1. The following discharge limits as measured at the 6 x 6 pump chamber shall apply:

Orenco Systems, Inc. AdvanTex AX-100 – Mode 1	
Biochemical Oxygen Demand (5 Day)	≤ 20 mg/L
Total Suspended Solids	≤ 20 mg/L
Oil & Grease	≤ 5 mg/L

2. Wastewater flow shall not exceed a maximum daily flow of **7,500** gallons per day. Wastewater flow shall be monitored and recorded to ensure compliance with this stipulation.

3. Sampling and testing shall be conducted quarterly at the compliance point specified in Item 1 above. Sampling and measurements shall be representative of the monitored activity. The Permittee shall sample and test the wastewater in each system as follows:

Dissolved Oxygen (mg/L) – *Field Test*
Effluent Temperature (°F) – *Field Test*
pH (s.u.) – *Field Test*
Biochemical Oxygen Demand (5-Day) (mg/L)
Total Suspended Solids (mg/L)
Oil and Grease (mg/L)
Alkalinity (mg/L)

4. Corrective Action – Corrective action must be taken as soon as practicable following receipt of monitoring results which indicate that system modifications or maintenance is required. The system must be resampled no sooner than seven (7) days after any adjustment is made to the system and within thirty (30) days of the routine quarterly sample date. Samples must be analyzed for each of the parameters listed in Item 3 for any post corrective action sampling events.

5. Annual Report – All monitoring results including wastewater flow data shall be submitted to the DEM in the form of an annual report. The annual report is due **February 15th** of each year. The annual report must summarize all monitoring results and corrective actions implemented during the previous calendar year. A clear determination regarding the compliance status of the OWTS must be made as part of the annual report. The annual report must include a copy of the most recent Operation and Maintenance Contract as proof of compliance with this requirement.

6. The Permittee shall properly operate and maintain all facilities and equipment associated with the OWTS in accordance with the most recent operation and maintenance (O&M) plan. The O&M plan specifies procedures for operation, process control, record keeping, monitoring, weekly maintenance checks, other routine and periodic maintenance, safety and security. Also, the O&M plan includes a contingency plan to address emergency actions and procedures in the event of equipment failure and power loss.

7. Your permit approval is for the discharge of sanitary waste only. No toxic, hazardous or industrial processing waste may be discharged into the system.

8. All septage, sludges, screenings or other pollutants removed from the system shall be disposed in accordance with all applicable state and federal laws.

9. The permit may be automatically transferred by the Permittee to a new owner provided:

    a. The current Permittee notifies the DEM by certified mail at least thirty (30) days in advance of the proposed transfer date;

    b. The notice includes the name and address of the new Permittee and a written agreement between the existing and new Permittee containing a specific date for the transfer of permit responsibility, surety and liability between them and;

    c. The DEM does not notify the existing Permittee and the proposed new Permittee of its intent to modify or reissue the permit.

10. The operator or person in responsible charge of the OWTS shall have at a minimum a Rhode Island Class 1 Wastewater Treatment Plant Operator Certification or an equivalent certification from another jurisdiction acceptable to the DEM. If the operator is not employed directly by the Permittee, a service agreement with the operator shall be entered into and continuously maintained, and a copy of the active service agreement shall be submitted to the DEM as part of the annual report.

11. The permit may be modified, suspended, or revoked for cause. The DEM reserves the right to revise the permit to ensure compliance with applicable state and federal regulations. Failure to comply with the conditions of this permit approval letter may result in an enforcement action.

12. The Permittee shall allow the DEM or their authorized representative to access the OWTS and work areas to inspect equipment, practices, records pertinent to this permit and stipulated compliance requirements, and to sample and monitor the wastewater for the purposes of determining compliance.

13. In the event of treatment interruption, bypass or sewage overflow, the Permittee shall notify the DEM verbally within twenty-four (24) hours. Such incident shall be reported in writing within five (5) days after it becomes known to the Permittee, the report shall include the date and time(s) of the incident, the duration of the incident, and actions taken to correct the problem and prevent a reoccurrence.

14. For purposes of notification, monitoring, compliance or inquiries pursuant to this permit, all correspondence, telephone calls and other contacts must reference the OWTS permit number and shall be directed to:

The Rhode Island Department of Environmental Management
Onsite Wastewater Treatment Systems Program
235 Promenade Street
Providence, RI 02908
Telephone: (401) 222-3961
www.dem.ri.gov/septic

Should you have any questions concerning these permit requirements, please contact Tom Angelone by email at tom.angelone@dem.ri.gov or by phone at 401-222-3961, extension 2777607.

Very truly yours,

Mohamed J. Freij, P.E., PLS
Supervising Sanitary Engineer

KF

Enclosure(s)

cc: Joseph L. Warner Jr., Charlestown Building Official

BURLINGAME STATE PARK AND CAMPGROUND

TH-3A – GROUND ELEV: 89.3 – AUGUST 17, 2021										
		HORIZON	BOUNDARIES	SOIL	COLORS	RE-DOX				
HORIZON	DEPTH	DIST	TOPO	MATRIX	RE-DOX FEATURES	Ab. S. CONTR.	TEXTURE	STRUCTURE	CONSISTENCE	SOIL CATEGORY
Ap	0 – 7"	C	S	2.5YR 6/3			Ls	2gbd	VFr	3
Bw	7" – 36"	C	W	10YR 5/6			Ls	2gbd	Fr	3
C	36" – 120"	C	S	2.5YR 7/3			Ls	2gbd	Fr	3

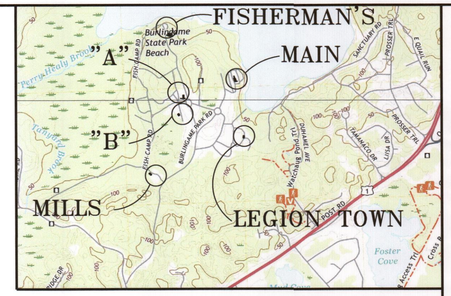
SOIL CLASS: B OBSERVED STANDING GROUNDWATER – NA
ESTIMATED SEASONAL HIGH WATER TABLE – 120" (ELEV.: 79.3)
OBSERVED WEEPING GROUNDWATER – NA
PERFORMED BY: KAMAL HINGORANY

TH-3B – GROUND ELEV: 82.7 – AUGUST 17, 2021										
		HORIZON	BOUNDARIES	SOIL	COLORS	RE-DOX				
HORIZON	DEPTH	DIST	TOPO	MATRIX	RE-DOX FEATURES	Ab. S. CONTR.	TEXTURE	STRUCTURE	CONSISTENCE	SOIL CATEGORY
Ap	0 – 6"	C	S	2.5YR 6/3			Ls	2gbd	VFr	3
Bw	7" – 24"	C	W	10YR 5/6			Ls	2gbd	Fr	3
C1	24" – 28"	C	S	2.5YR 7/3			Ls	2gbd	Fr	3
C2	28" – 120"	–	–	2.5YR 7/3	5YR 4/4	M M P	Ls	2gbd	Fr	3

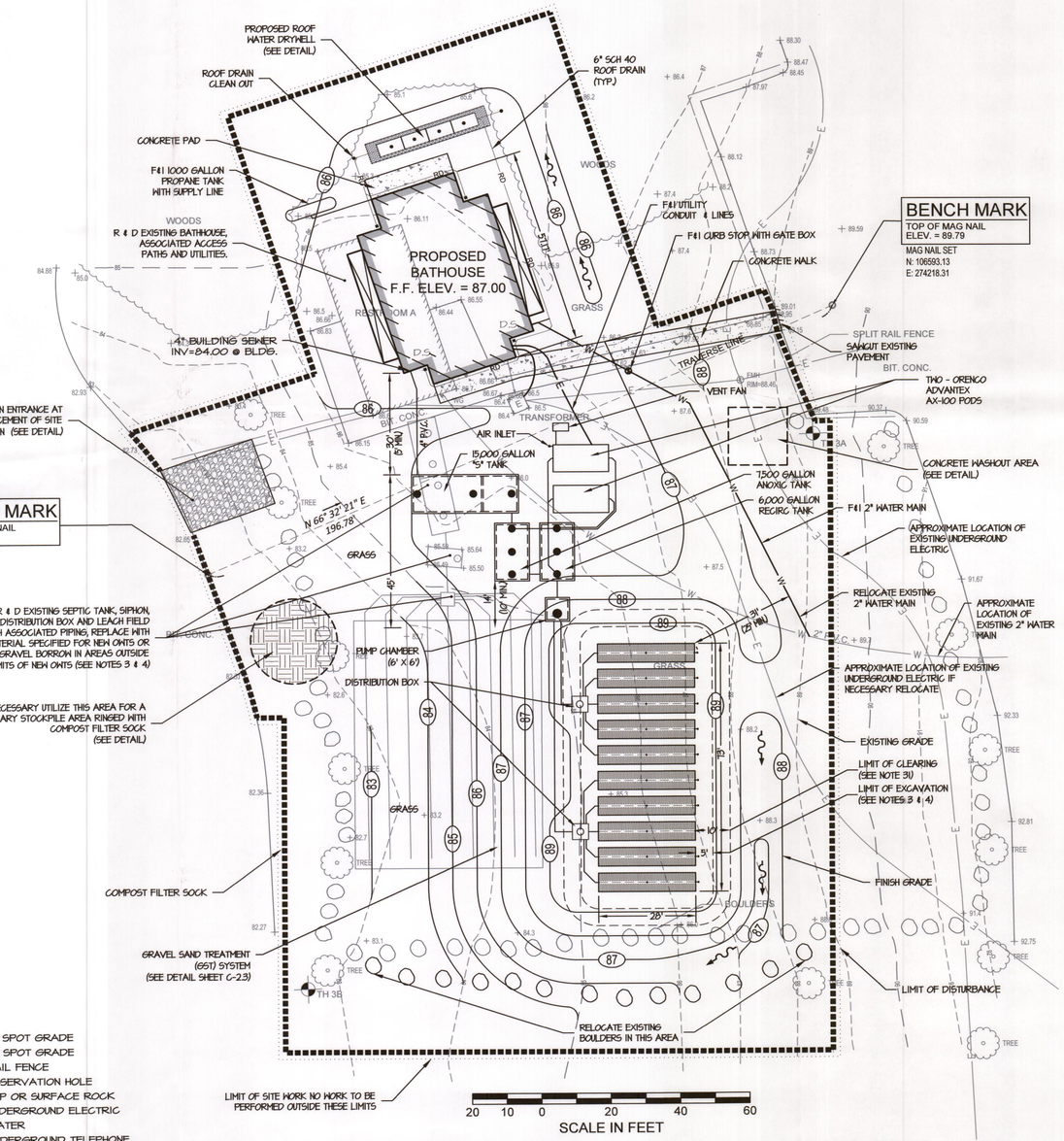
SOIL CLASS: B OBSERVED STANDING GROUNDWATER – NA
ESTIMATED SEASONAL HIGH WATER TABLE – 24" (ELEV.: 80.7)
OBSERVED WEEPING GROUNDWATER – NA
PERFORMED BY: KAMAL HINGORANY

N.

20 10 0 20 40 60
SCALE IN FEET



LOCUS MAP



LEGEND

100	EXISTING CONTOUR	+ 100.00	FINISHED SPOT GRADE
100	PROPOSED CONTOUR	+ 100.00	EXISTING SPOT GRADE
RI. STD.	RHODE ISLAND STANDARD		SPLIT RAIL FENCE
INV.	INVERT OF PIPE		DEEP OBSERVATION HOLE
P. V. C.	POLYVINYL CHLORIDE PIPE		OUT CROP OR SURFACE ROCK
S. D. R.	STANDARD DIMENSION RATIO	E	EXIST. UNDERGROUND ELECTRIC
CONC.	CONCRETE	W	EXIST. WATER
BIT.	BITUMINOUS	T	EXIST. UNDERGROUND TELEPHONE
TYP.	TYPICAL		FINISH GRADE SURFACE FLOW DIRECTION

NOTES:

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4. REMOVE ALL PORTIONS OF THE EXISITNG OWTS WITHIN 5' OF THE GRAVEL SAND TREATMENT SYSTEM; AND ALL FILL, A HORIZON SOIL, B HORIZON SOIL AND SCARIFY 3" OF THE C HORIZON SOIL BELOW THE GRAVEL SAND TREATMENT SYSTEM AND THOUGHLY MIX WITH ASTM C-33 SAND (SEE NOTE 16) TO INTERFACE THE FILL WITH THE SOIL, AND REPLACE ALL REMOVED SOIL WITH ASTM C-33 SAND. A AND B SOIL HORIZON LAYERS ARE TO BE REMOVED IN THIS APPLICATION DUE TO COMPACTION CAUSED BY PREVIOUS SYSTEM INSTALLATION AND FILL BEING PLACED ABOVE.
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28. CONTRACTOR TO PAY ANY REQUIRED INSTALLATION FEES.
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32. THE GRAVEL SAND TREATMENT SYSTEM LOCATION SHALL BE STAKED OUT AND PROTECTED PRIOR TO ANY SITE PREPARATION ACTIVITIES.
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34. MATERIAL AND EQUIPMENT FROM ALTERNATE MANUFACTURERS MAY BE USED IF EQUAL. APPROVAL FOR ALTERNATE MATERIAL AND/OR EQUIPMENT IS REQUIRED FROM THE OWNER AND ENGINEER. FULL SPECIFICATIONS FOR ALTERNATE EQUIPMENT MUST BE PROVIDED BY THE CONTRACTOR. IF ACCEPTABLE, THE CONTRACTOR MUST PREPARE AND SUBMIT FOR AN RIDEM OWTS CONSTRUCTION PERMIT BASED UPON THE REDESIGN.

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
OWTS PROGRAM
PLAN # 2205-1135 DATE 3/15/23
APPROVED
NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL
APPROVED PLANS MUST BE KEPT AT CONSTRUCTION SITE

"Copy of Permit and Operation Maintenance contract must be filed in land evidence records prior to conformance"

Environmental Management
MAR – 8 2023
Office of Water Resources

DESIGN DATA

DAILY SEWAGE FLOW:
50 GPD/CAMPSITE x 150 CAMPSITES = 7500 GALLONS PER DAY (G.P.D.)
GROUND WATER TABLE : 120"
DEPTH TO IMPERVIOUS : NOT ENCOUNTERED
SOIL CLASS: B, SOIL CATEGORY: 3, LOADING RATE: 0.70 GALS./S.F./DAY
SEPTIC TANK REQUIREMENTS VOLUME = 2 X 7,500 G.P.D = 15,000 GALLONS
LEACHING AREA REQUIREMENTS:
GRAVEL SAND TREATMENT (GST) SYSTEM WITH CATEGORY 1 TREATMENT (ORENCO ADVANTEX TREATMENT AX100)
ASSIGNED EFFLUENT LOADING RATE = 3.5 GPD PER S. F.
SQUARE FOOTAGE OF GST REQUIRED =7500 GPD / 3.5 GPD PER S.F. = 2,143 S.F.
LENGTH OF GST 6212 REQUIRED = 2,143 S.F./17.5 S.F./L.F. = 123 L.F.
LENGTH OF GST 6212 SPECIFIED: 280 L.F.
TOTAL GST SYSTEM CAPACITY = 280 L.F. X 17.5 S.F./L.F. X 3.5 G.P.D./S.F. = 17,150 GPD
17,150 GPD > 7,500 GPD ~ CAPACITY = 229% OF ANTICIPATED DESIGN FLOW

CERTIFICATION:

THIS SURVEY HAS BEEN CONDUCTED AND THE PLAN HAS BEEN PREPARED PURSUANT TO SECTION 8 OF THE RULES AND REGULATIONS ADOPTED BY THE RHODE ISLAND STATE BOARD OF REGISTRATION FOR PROFESSIONAL LAND SURVEYORS ON NOVEMBER 25, 2015, AS FOLLOWS:

TYPE OF BOUNDARY SURVEY: LIMITED CONTENT BOUNDARY SURVEY
MEASUREMENT SPECIFICATION: NOT A BOUNDARY SURVEY
OTHER TYPE OF SURVEY: DATA ACCUMULATION SURVEY (LOCATIONS) TOPOGRAPHIC SURVEY ACCURACY
CLASS III T-2 (IMMEDIATE AREA AROUND BATHOUSE AND OWTS)

THE PURPOSE OF THIS SURVEY IS TO DEPICT THE EXISTING CONDITIONS IN THE PROJECT AREA FOR CONSTRUCTION AND THE DESIGN OF A NEW ONSITE WASTEWATER TREATMENT SYSTEM.

David T. Bray 8/10/2022
DAVID T. BRAY PLS NO. 1899
CAPUTO AND WICK LTD., COA NO. A177
DATE

DAVID T. BRAY
No. 1899
PROFESSIONAL LAND SURVEYOR
8.10.2022

KEVIN R. HARROP
No. 9200
REGISTERED PROFESSIONAL ENGINEER
CIVIL
D3155

STATE OF RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
DIVISION OF PLANNING AND DEVELOPMENT

DEMOLITION AND REBUILD OF BATHHOUSES
BURLINGAME STATE PARK AND CAMPGROUND
CHARLESTOWN, RHODE ISLAND

BATHHOUSE "A" - SITE PLAN

Dwg:
Scale: 1" = 20'
Contract No. x
Date: MARCH, 2023

C-1.3
11

OWTS SUBMISSION - MARCH 6, 2023

J:\Rhodeisland\Charlestown\RIDEM - Burlingame\009 - 025 and S-6 Site Design 2023.03.06.dwg

BURLINGAME STATE PARK AND CAMPGROUND

TH-3A – GROUND ELEV: 89.3 – AUGUST 17, 2021											
		HORIZON	BOUNDARIES	SOIL	COLORS	RE-DOX					
HORIZON	DEPTH	DIST	TOPO	MATRIX	RE-DOX FEATURES	Ab. S. CONTR.	TEXTURE	STRUCTURE	CONSISTENCE	SOIL CATEGORY	
Ap	0 – 7"	C	S	2.5YR 6/3			Ls	2gbd	VFr	3	
Bw	7" – 36"	C	W	10YR 5/6			Ls	2gbd	Fr	3	
C	36" – 120"	C	S	2.5YR 7/3			Ls	2gbd	Fr	3	

SOIL CLASS: B OBSERVED STANDING GROUNDWATER – NA OBSERVED WEEPING GROUNDWATER – NA
ESTIMATED SEASONAL HIGH WATER TABLE – 120" (ELEV.: 79.3) PERFORMED BY: KAMAL HINGORANY

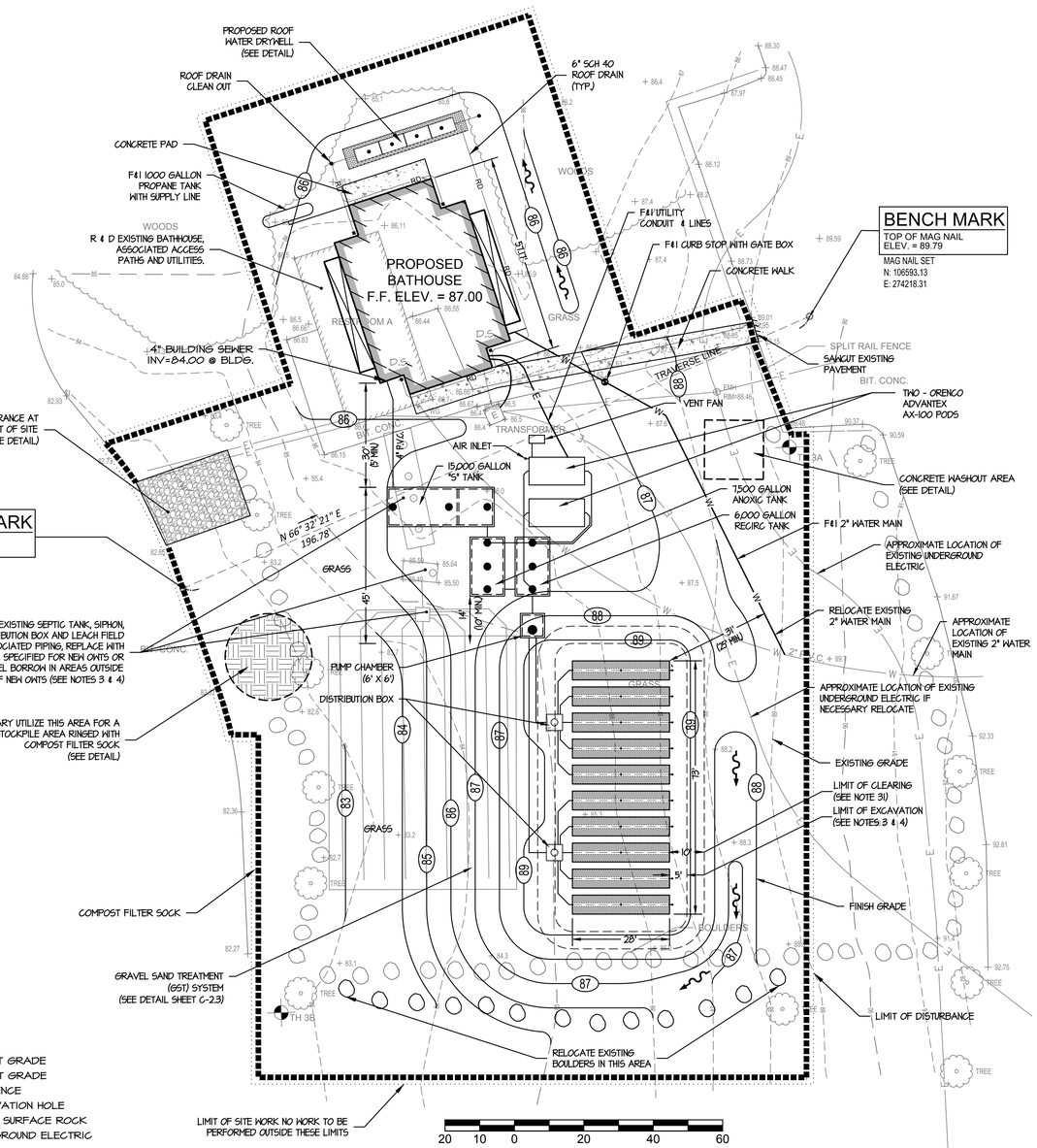
TH-3B – GROUND ELEV: 82.7 – AUGUST 17, 2021											
		HORIZON	BOUNDARIES	SOIL	COLORS	RE-DOX					
HORIZON	DEPTH	DIST	TOPO	MATRIX	RE-DOX FEATURES	Ab. S. CONTR.	TEXTURE	STRUCTURE	CONSISTENCE	SOIL CATEGORY	
Ap	0 – 6"	C	S	2.5YR 6/3			Ls	2gbd	VFr	3	
Bw	7" – 24"	C	W	10YR 5/6			Ls	2gbd	Fr	3	
C1	24" – 28"	C	S	2.5YR 7/3			Ls	2gbd	Fr	3	
C2	28" – 120"	–	–	2.5YR 7/3	5YR 4/4	M M P	Ls	2gbd	Fr	3	

SOIL CLASS: B OBSERVED STANDING GROUNDWATER – NA OBSERVED WEEPING GROUNDWATER – NA
ESTIMATED SEASONAL HIGH WATER TABLE – 24" (ELEV.: 80.7) PERFORMED BY: KAMAL HINGORANY

N.

20 10 0 20 40 60

SCALE IN FEET



LEGEND

100	EXISTING CONTOUR	+ 100.00	FINISHED SPOT GRADE
100	PROPOSED CONTOUR	+ 100.00	EXISTING SPOT GRADE
RI. STD.	RHODE ISLAND STANDARD		SPLIT RAIL FENCE
INV.	INVERT OF PIPE		DEEP OBSERVATION HOLE
P. V. C.	POLYVINYL CHLORIDE PIPE		OUT CROP OR SURFACE ROCK
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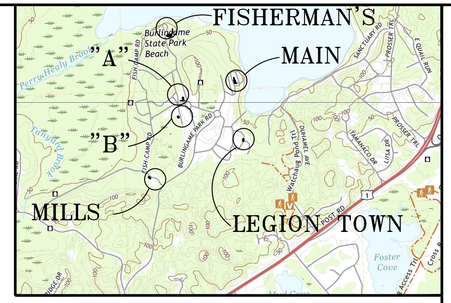

LOCUS MAP

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DESIGN DATA

DAILY SEWAGE FLOW:
50 GPD/CAMPSITE x 150 CAMPSITES = 7500 GALLONS PER DAY (G.P.D.)
GROUND WATER TABLE : 120"
DEPTH TO IMPERVIOUS : NOT ENCOUNTERED
SOIL CLASS: B, SOIL CATEGORY: 3, LOADING RATE: 0.70 GALS./S.F./DAY
SEPTIC TANK REQUIREMENTS VOLUME = 2 X 7,500 G.P.D = 15,000 GALLONS
LEACHING AREA REQUIREMENTS:
GRAVEL SAND TREATMENT (GST) SYSTEM WITH CATEGORY 1 TREATMENT (ORENCO ADVANTEX TREATMENT AX100)
ASSIGNED EFFLUENT LOADING RATE = 3.5 GPD PER S. F.
SQUARE FOOTAGE OF GST REQUIRED =7500 GPD / 3.5 GPD PER S.F. = 2,143 S.F.
LENGTH OF GST 6212 REQUIRED = 2,143 S.F./17.5 S.F./L.F. = 123 L.F.
LENGTH OF GST 6212 SPECIFIED: 280 L.F.
TOTAL GST SYSTEM CAPACITY = 280 L.F. X 17.5 S.F./L.F. X 3.5 G.P.D./S.F. = 17,150 GPD
17,150 GPD > 7,500 GPD ~ CAPACITY = 229% OF ANTICIPATED DESIGN FLOW

CERTIFICATION:

THIS SURVEY HAS BEEN CONDUCTED AND THE PLAN HAS BEEN PREPARED PURSUANT TO SECTION 9 OF THE RULES AND REGULATIONS ADOPTED BY THE RHODE ISLAND STATE BOARD OF REGISTRATION FOR PROFESSIONAL LAND SURVEYORS ON NOVEMBER 25, 2015, AS FOLLOWS:

TYPE OF BOUNDARY SURVEY: LIMITED CONTENT BOUNDARY SURVEY
MEASUREMENT SPECIFICATION: NOT A BOUNDARY SURVEY
OTHER TYPE OF SURVEY: DATA ACCUMULATION SURVEY (LOCATIONS) TOPOGRAPHIC SURVEY ACCURACY
CLASS III T-2 (IMMEDIATE AREA AROUND BATHOUSE AND OWTS)

THE PURPOSE OF THIS SURVEY IS TO DEPICT THE EXISTING CONDITIONS IN THE PROJECT AREA FOR CONSTRUCTION AND THE DESIGN OF A NEW ONSITE WASTEWATER TREATMENT SYSTEM.

DAVID T. BRAY P.L.S NO. 1899 — DATE 8/10/2022
CAPUTO AND WICK LTD., COA NO. A177

DAVID T. BRAY — No. 1899 — PROFESSIONAL LAND SURVEYOR — 8.10.2022

KEVIN R. HARROP — No. 9200 — REGISTERED PROFESSIONAL ENGINEER — CIVIL — D3155

STATE OF RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
DIVISION OF PLANNING AND DEVELOPMENT

DEMOLITION AND REBUILD OF BATHHOUSES
BURLINGAME STATE PARK AND CAMPGROUND
CHARLESTOWN, RHODE ISLAND

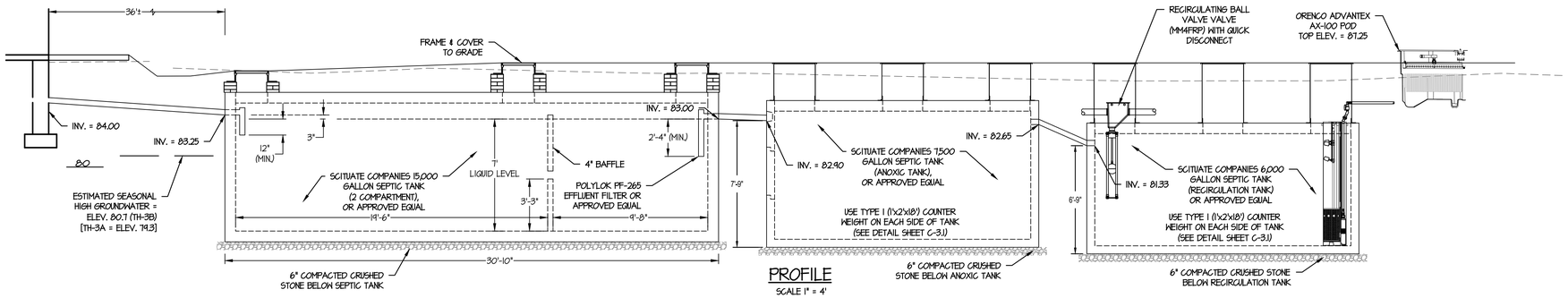
BATHHOUSE "A" - SITE PLAN

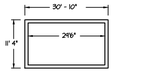
Dwg: Scale: 1" = 20'
Contract No. x Date: MARCH, 2023

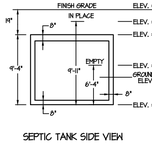
C-1.3
11

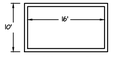
OWTS SUBMISSION - MARCH 6, 2023

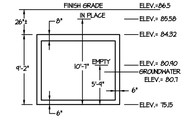
J:\Rhodeisland\Charlestown\RIDEM - Burlingame\009 - 025 - and S-6 Site Design 2023.03.06.dwg

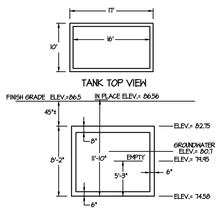


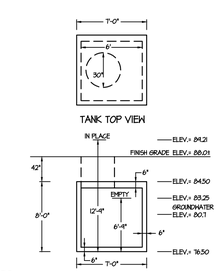












BURLINGAME STATE PARK AND CAMPGROUND

PROFILE

SCALE 1" = 4'

NOTE:
LIMIT OF EXCAVATION DEPICTED IN SECTION A-A AND B-B IS BASED UPON DEPTH TO OF SOIL HORIZON C1 AND APPROXIMATE DEPTH OF THE EXISTING SYSTEM AND MAY ACCOUNT FOR FILL, EXISTING SYSTEM COMPONENTS OF UNSUITABLE MATERIAL THAT MAY BE ENCOUNTERED. ACTUAL LIMITS MAY VARY.

GRAVEL TREATMENT SYSTEM (GST) SECTION B-B

SCALE 1" = 4'

NOTE:
LIMIT OF EXCAVATION DEPICTED IN SECTION A-A AND B-B IS BASED UPON DEPTH TO OF SOIL HORIZON C1 AND APPROXIMATE DEPTH OF THE EXISTING SYSTEM AND MAY ACCOUNT FOR FILL, EXISTING SYSTEM COMPONENTS OF UNSUITABLE MATERIAL THAT MAY BE ENCOUNTERED. ACTUAL LIMITS MAY VARY.

GRAVEL TREATMENT SYSTEM (GST) SECTION A-A

SCALE 1" = 4'

GRAVEL SAND TREATMENT SYSTEM (GST) PLAN VIEW

SCALE 1" = 8'

ELEVATION SCHEDULE

DESCRIPTION	ELEVATION
INVERT AT FOUNDATION - TO SEPTIC TANK	84.00
INVERT IN - SEPTIC TANK	83.25
LIQUID LEVEL IN SEPTIC TANK	83.00
INVERT IN - ANOXIC TANK	82.90
INVERT OUT - ANOXIC TANK	82.65
INVERT IN RECIRC TANK	81.33
BOTTOM OF RECIRCULATION TANK	74.58
TOP OF ADVANTEX AX-100	87.25
INVERT OUT - RECIRCULATION TANK TO PUMP BASIN	83.25
INV. IN PUMP BASIN	83.00
TOP OF PUMP BASIN RIM	86.25
ELEVATION HIGH LEVEL ALARM/ALT. PUMP	81.83
ELEVATION PUMP ON	81.67
ELEVATION PUMP OFF	79.83
ELEVATION LOW LEVEL ALARM	79.67
INV. 2" OUT PUMP BASIN	83.25
BOTTOM OF PUMP BASIN	76.50
INVERT INTO DISTRIBUTION BOX	88.83
INVERT OUT OF DISTRIBUTION BOX	88.67
ELEV. TOP OF COVER STONE ABOVE DISTRIBUTION PIPE	89.00
INV. 4" PERF. DISTRIBUTION PIPE GST	88.50
BOTTOM OF GST STONE	87.50
BASE OF GST SAND	87.25
EST. SEASONAL HIGH GW (4" - HIGHEST ELEV. = 87.1±)	85.10 (TH-3B)
MAX. FINISHED GRADE AT GST	91.33
MIN. FINISHED GRADE AT GST	89.33

PUMP CURVE: MYERS SRM4

PUMPING AND SYSTEM SPECIFICATIONS/DATA:

PUMP CHAMBER PUMP MODEL:
- MYERS SRM4 SUBMERSIBLE SEWAGE PUMP
  - HORSEPOWER - 0.4; SINGLE PHASE
  - 2" INCH DISCHARGE; 230 VOLTS; 60 HZ 6 AMPS
- LIFT OUT (2)
  - MYERS SRA 200 WITH STAINLESS STEEL BRACKETS

CONTROL PANEL MODEL
- MYERS CE-2IDW ALTERNATING
  - ENCLOSURE - NEMA 1 (NEMA 4X IF EXPOSED TO WEATHER)
  - VOLTAGE - 230
  - HIGH LEVEL ALARM - VISUAL AND AUDIO

FLOATS MODEL
- MYERS MODEL 20VM SJE OR EQUAL

PUMP CHAMBER DISCHARGE VOLUME PER CYCLE:
6' X 6' INTERIOR @ 1' - 10" = 66 CUBIC FEET X 7.48 GALLONS/CF = 494 GAL./CYCLE
2" PIPE DRAIN BACK: APPROXIMATELY 8 GAL.
494 GALLONS/CYCLE - 8 GALLONS = 486 GAL./CYCLE
7500 GPS/ 2 GST SYSTEMS = 3750 GPD/486 GAL./CYCLE = 7.7 ~ 8 CYCLES/DAY/GST

FLOATS - ON, OFF, HIGH AND LOW WATER:

HIGH WATER	- ELEVATION 81.83
PUMP ON	- ELEVATION 81.67
PUMP OFF	- ELEVATION 79.83
LOW WATER	- ELEVATION 79.67

ORENCO AX-100 TREATMENT SYSTEM DATA REVIEWED AND PROVIDED BY ATLANTIC SOLUTIONS
(CONTROL PANEL - TIME DOSED)

GRAVEL SAND TREATMENT (GST) SYSTEM DATA REVIEWED BY GEOMATRIX SYSTEMS LLC.

VOLUMES
TOP SLAB: 11.33' WIDE X 30.83' LONG X 0.67' THICK = 232.96 C.F. (CUBIC FOOT)
SIDES: 2 SIDES x 10.00' LONG X 8.00' HIGH X 0.67' WIDE = 106.67 C.F.
2 SIDES x 30.83' LONG X 8.00' HIGH X 0.67' WIDE = 328.89 C.F.
BOTTOM: 11.33' WIDE X 30.83' LONG X 0.67' THICK = 232.96 C.F.
BAFFLE: 10.00' LONG X 7.25' HIGH X 0.33' WIDE = 23.92 C.F.
TOTAL VOLUME OF CONCRETE FOR TANK = 925.40 C.F.
EARTH: 11.33' WIDE X 30.83' LONG X 1.58' THICK = 551.90 C.F.

CONSTANTS (WEIGHTS)
CONCRETE: 150 POUNDS/C.F.
EARTH: 100 POUNDS/C.F.
WATER: 62.4 POUNDS/C.F.
COUNTER WEIGHT: 22,306.5 (TYPE 2 - SEE SCHEDULE SHEET C-3.1)

WEIGHT OF TANK IN PLACE
CONCRETE: 925.40 C.F. X 150 POUNDS/C.F. = 138,810 POUNDS (EMPTY TANK)
COUNTER WEIGHT: = 22,306 POUNDS
EARTH: 551.90 C.F. X 100 POUNDS/C.F. = 55,190 POUNDS (EARTH COVER)
TOTAL WEIGHT OF TANK SET IN PLACE = 216,306 POUNDS (EMPTY)

DETERMINE BUOYANCY POINT FOR EMPTY TANK PRIOR TO BACKFILL
BOTTOM SLAB AREA: 11.33' WIDE X 30.83' LONG = 349.44 S.F.(SQUARE FEET)
TANK: 349.44 S.F.X BP X 62.4 POUNDS/C.F. = 138,810 POUNDS (EMPTY TANK)
BP = 138,810 POUNDS ÷ 62.4 POUNDS/C.F. ÷ 349.44 S.F.
BP = 6.37' ~ 6'-4"± (ELEV. 81.70)

DETERMINE BUOYANCY POINT FOR EMPTY TANK IN PLACE
BP = 216,306 POUNDS ÷ 62.4 POUNDS/C.F. ÷ 349.44 S.F.
BP = 9.92' ~ 9'-11"± (ELEV. 85.25)

BUOYANCY CALCULATIONS FOR 15,000 GALLON SEPTIC TANK

MUST SET IN DRY CONDITIONS

VOLUMES
TOP SLAB: 10.00' WIDE X 17.00' LONG X 0.67' THICK = 113.33 C.F. (CUBIC FOOT)
SIDES: 2 SIDES x 9.00' LONG X 8.00' HIGH X 0.50' WIDE = 72.00 C.F.
2 SIDES x 17.00' LONG X 8.00' HIGH X 0.50' WIDE = 136.00 C.F.
BOTTOM: 10.00' WIDE X 17.00' LONG X 0.50' THICK = 85.00 C.F.
TOTAL VOLUME OF CONCRETE FOR TANK = 406.33 C.F.
EARTH: 10.00' WIDE X 17.00' LONG X 2.18' THICK = 370.60 C.F.

CONSTANTS (WEIGHTS)
CONCRETE: 150 POUNDS/C.F.
EARTH: 100 POUNDS/C.F.
WATER: 62.4 POUNDS/C.F.
COUNTER WEIGHT: 12,614.4 POUNDS (TYPE 2 - SEE SCHEDULE SHEET C-3.1)

WEIGHT OF TANK
CONCRETE: 406.33 C.F. X 150 POUNDS/C.F. = 60,950 POUNDS (EMPTY TANK)
COUNTER WEIGHT: = 12,614 POUNDS
EARTH: 370.60 C.F. X 100 POUNDS/C.F. = 37,060 POUNDS (EARTH COVER)
TOTAL WEIGHT OF TANK SET IN PLACE = 110,624 POUNDS (EMPTY)

DETERMINE BUOYANCY POINT FOR EMPTY TANK PRIOR TO BACKFILL
BOTTOM SLAB AREA: 10.00' WIDE X 17.00' LONG = 170.00 S.F.(SQUARE FEET)
TANK: 170.00 S.F.X BP X 62.4 POUNDS/C.F. = 60,950 POUNDS (EMPTY TANK)
BP = 60,950 POUNDS ÷ 62.4 POUNDS/C.F. ÷ 170.00 S.F.
BP = 5.75' ~ 5'-9"± (ELEV. 80.90 - EMPTY TANK IS BUOYANT)

DETERMINE BUOYANCY POINT FOR EMPTY TANK IN PLACE
BP = 110,624 POUNDS ÷ 62.4 POUNDS/C.F. ÷ 170.00 S.F.
BP = 10.43' ~ 10'-5"± (ELEV. 85.58)

BUOYANCY CALCULATIONS FOR 7,500 ANOXIC TANK

MUST SET IN DRY CONDITIONS

VOLUMES
TOP SLAB: 10.00' WIDE X 17.00' LONG X 0.67' THICK = 113.33 C.F. (CUBIC FOOT)
SIDES: 2 SIDES x 9.00' LONG X 7.00' HIGH X 0.50' WIDE = 63.00 C.F.
2 SIDES x 17.00' LONG X 7.00' HIGH X 0.50' WIDE = 119.00 C.F.
BOTTOM: 10.00' WIDE X 17.00' LONG X 0.50' THICK = 85.00 C.F.
TOTAL VOLUME OF CONCRETE FOR TANK = 380.33 C.F.
EARTH: 10.00' WIDE X 17.00' LONG X 3.75' THICK = 637.50 C.F.

CONSTANTS (WEIGHTS)
CONCRETE: 150 POUNDS/C.F.
EARTH: 100 POUNDS/C.F.
WATER: 62.4 POUNDS/C.F.
COUNTER WEIGHT: 6,307.2 POUNDS (TYPE 1 - SEE SCHEDULE SHEET C-3.1)

WEIGHT OF TANK AND EARTH COVER
CONCRETE: 380.33 C.F. X 150 POUNDS/C.F. = 57,050 POUNDS (EMPTY TANK)
COUNTER WEIGHT: = 6,307 POUNDS
EARTH: 637.50 C.F. X 100 POUNDS/C.F. = 63,750 POUNDS (EARTH COVER)
TOTAL WEIGHT OF TANK SET IN PLACE = 127,107 POUNDS (EMPTY)

DETERMINE BUOYANCY POINT FOR EMPTY TANK PRIOR TO BACKFILL
BOTTOM SLAB AREA: 10.00' WIDE X 17.00' LONG = 170.00 S.F.(SQUARE FEET)
TANK: 170.00 S.F.X BP X 62.4 POUNDS/C.F. = 57,050 POUNDS (EMPTY TANK)
BP = 57,050 POUNDS ÷ 62.4 POUNDS/C.F. ÷ 170.00 S.F.
BP = 5.37' ~ 5'-3"± (ELEV. 79.95 - EMPTY TANK IS BUOYANT)

DETERMINE BUOYANCY POINT FOR EMPTY TANK IN PLACE
BP = 127,107 POUNDS ÷ 62.4 POUNDS/C.F. ÷ 170.00 S.F.
BP = 11.98' ~ 12'-0"± (ELEV. 86.56)

BUOYANCY CALCULATIONS FOR 6,000 RECIRCULATION TANK

MUST SET IN DRY CONDITIONS

AREAS
TOP: (7.0' X 7.0' = 49 S.F.) - (π X 1.25'^{2} = 4.91 S.F.) = 44.09 S.F. (SQUARE FEET)

VOLUMES
TOP SLAB: 44.09 S.F. X 0.50' THICK = 22.05 C.F. (CUBIC FOOT)
SIDES: 2 SIDES x 7.0' LONG X 7.0' HIGH X 0.50' THICK = 49.00 C.F.
2 SIDES x 6.0' LONG X 7.0' HIGH X 0.50' THICK = 42.00 C.F.
BOTTOM: 7.00 WIDE X 7.00' LONG X 0.50' THICK = 24.50 C.F.
TOTAL VOLUME OF CONCRETE FOR TANK = 137.55 C.F.
EARTH: 44.09 S.F. X 3.50' THICK = 154.32 C.F.

CONSTANTS (WEIGHTS)
CONCRETE: 150 POUNDS/C.F.
EARTH: 100 POUNDS/C.F.
WATER: 62.4 POUNDS/C.F.
COUNTER WEIGHT: 2,803.2 POUNDS (TYPE 1 - SEE SCHEDULE SHEET C-3.1)

WEIGHT OF TANK AND EARTH COVER
CONCRETE: 137.55 C.F. X 150 POUNDS/C.F. = 20,633 POUNDS (EMPTY TANK)
COUNTER WEIGHT: = 2,803 POUNDS
EARTH: 154.32 C.F. X 100 POUNDS/C.F. = 15,432 POUNDS (EARTH COVER)
TOTAL WEIGHT OF TANK SET IN PLACE = 38,868 POUNDS (EMPTY)

DETERMINE BUOYANCY POINT FOR EMPTY TANK PRIOR TO BACKFILL
BOTTOM SLAB AREA: = 26.73 S.F
CHAMBER: 49.00 S.F. X BP X 62.4 POUNDS/C.F. = 20,633 POUNDS (EMPTY TANK)
BP = 20,633 POUNDS ÷ 62.4 POUNDS/C.F. ÷ 49.00 S.F.
BP = 6.75' ~ 6'-9"± (ELEV. 83.25 - EMPTY CHAMBER IS BUOYANT)

DETERMINE BUOYANCY POINT FOR EMPTY TANK IN PLACE
BP = 38,868 POUNDS ÷ 62.4 POUNDS/C.F. ÷ 49.00 S.F.
BP = 12.72' ~ 12'-9"± (ELEV. 89.21)

BUOYANCY CALCULATIONS FOR PUMP CHAMBER

MUST SET IN DRY CONDITIONS

CAPUTO AND WICK LTD. - 1150 PAWTUCKET AVENUE - RUMFORD R.I. 02916

STATE OF RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
DIVISION OF PLANNING AND DEVELOPMENT

DEMOLITION AND REBUILD OF BATHHOUSES
BURLINGAME STATE PARK AND CAMPGROUND
CHARLESTOWN, RHODE ISLAND

BATHHOUSE "A" - OWTS DETAILS

Dwg:		Scale:	1" = 20'	C-2.3
Contract No.	x	Date:	MARCH, 2023	17

OWTS SUBMISSION - MARCH 6, 2023

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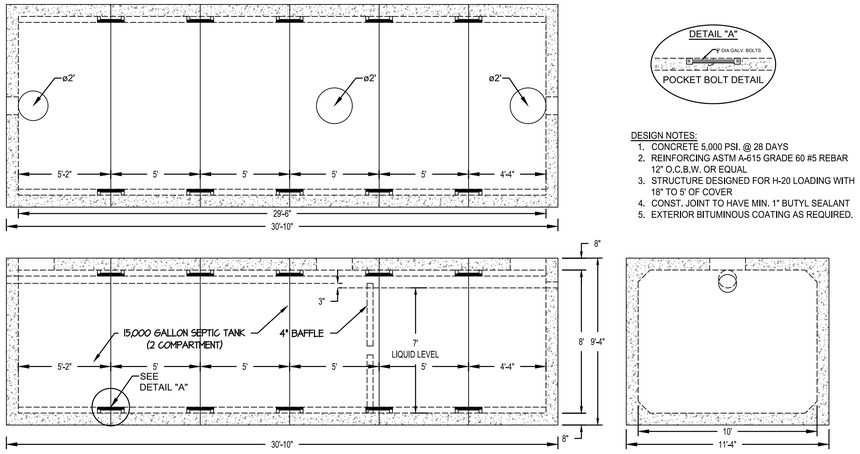
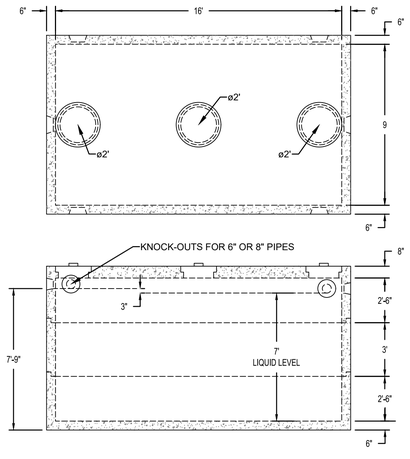


DESIGN NOTES:
1. CONCRETE 5,000 PSI. @ 28 DAYS
2. REINFORCING ASTM A-615 GRADE 60 #5 REBAR 12" O.C.B.W. OR EQUAL
3. STRUCTURE DESIGNED FOR H-20 LOADING WITH 18" TO 5' OF COVER
4. CONST. JOINT TO HAVE MIN. 1" BUTYL SEALANT
5. EXTERIOR BITUMINOUS COATING AS REQUIRED.

15,000 GALLON TWO COMPARTMENT SEPTIC TANK

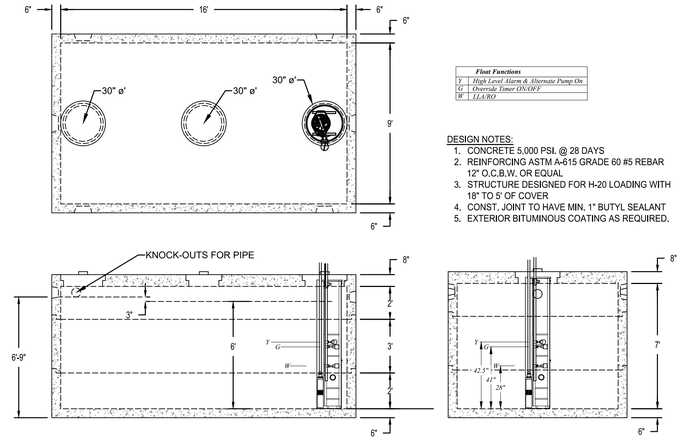
SCALE 1" - 4'



DESIGN NOTES:
1. CONCRETE 5,000 PSI. @ 28 DAYS
2. REINFORCING ASTM A-615 GRADE 60 #5 REBAR 12" O.C.B.W. OR EQUAL
3. STRUCTURE DESIGNED FOR H-20 LOADING WITH 18" TO 5' OF COVER
4. CONST. JOINT TO HAVE MIN. 1" BUTYL SEALANT
5. EXTERIOR BITUMINOUS COATING AS REQUIRED.

7, 500 GALLON ANOXIC TANK

SCALE 1" - 4'



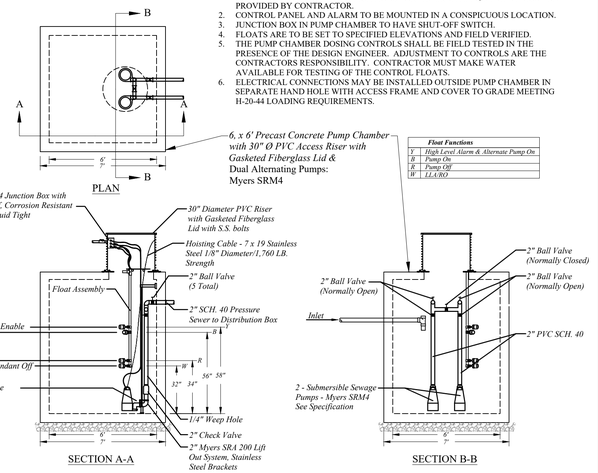
Float Functions	
Y	High Level Alarm & Alternate Pump On
G	Override Timer ON/OFF
W	LEAD

DESIGN NOTES:
1. CONCRETE 5,000 PSI. @ 28 DAYS
2. REINFORCING ASTM A-615 GRADE 60 #5 REBAR 12" O.C.B.W. OR EQUAL
3. STRUCTURE DESIGNED FOR H-20 LOADING WITH 18" TO 5' OF COVER
4. CONST. JOINT TO HAVE MIN. 1" BUTYL SEALANT
5. EXTERIOR BITUMINOUS COATING AS REQUIRED.

6,000 GALLON RECIRCULATION TANK

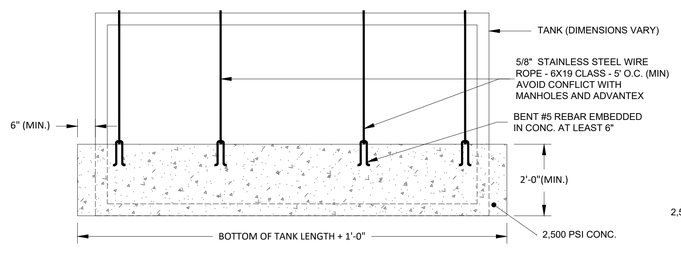
SCALE 1" - 4'

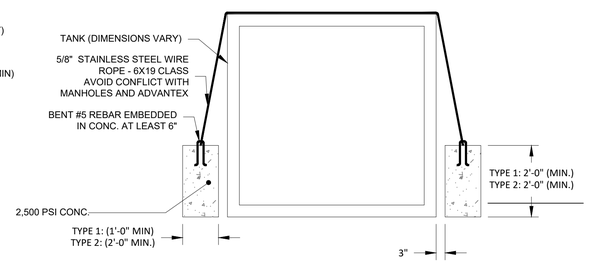
PUMPING NOTES:
1. EQUIPMENT FROM OTHER MANUFACTURER'S MAY BE USED IF EQUAL. APPROVAL FOR ALTERNATE EQUIPMENT REQUIRED FROM ENGINEER PRIOR TO CONSTRUCTION. FULL SPECIFICATIONS FOR ALTERNATE EQUIPMENT MUST BE PROVIDED BY CONTRACTOR.
2. CONTROL PANEL AND ALARM TO BE MOUNTED IN A CONSPICUOUS LOCATION.
3. JUNCTION BOX IN PUMP CHAMBER TO HAVE SHUT-OFF SWITCH.
4. FLOATS ARE TO BE SET TO SPECIFIED ELEVATIONS AND FIELD VERIFIED.
5. THE PUMP CHAMBER DOSING CONTROLS SHALL BE FIELD TESTED IN THE PRESENCE OF THE DESIGN ENGINEER. ADJUSTMENT TO CONTROLS ARE THE CONTRACTORS RESPONSIBILITY. CONTRACTOR MUST MAKE WATER AVAILABLE FOR TESTING OF THE CONTROL FLOATS.
6. ELECTRICAL CONNECTIONS MAY BE INSTALLED OUTSIDE PUMP CHAMBER IN SEPARATE HAND HOLE WITH ACCESS FRAME AND COVER TO GRADE MEETING H-20-44 LOADING REQUIREMENTS.



PUMP CHAMBER DETAIL

SCALE 1" - 4'





COUNTER WEIGHT: TANK ANTI-FLOATATION SECTIONS

SCALE 1" = 2'

ANTI-FLOATATION AREA

~~15,000 GALLON TANK (TYPE 1):~~	~~2 SIDES x 32.83' LONG X 1.00' WIDE~~	~~= 65.66 S.F.~~
~~15,000 GALLON TANK (TYPE 1):~~	~~2 SIDES x 31.83' LONG X 1.00' WIDE~~	~~= 63.66 S.F.~~
15,000 GALLON TANK (TYPE 2):	2 SIDES x 31.83' LONG X 2.00' WIDE	= 127.32 S.F.
~~8,000 GALLON TANK (TYPE 1):~~	~~2 SIDES x 19.00' LONG X 1.00' WIDE~~	~~= 38 S.F.~~
~~8,000 GALLON TANK (TYPE 2):~~	~~2 SIDES x 19.00' LONG X 2.00' WIDE~~	~~= 76 S.F.~~
~~7,500 GALLON TANK (TYPE 1):~~	~~2 SIDES x 18.00' LONG X 1.00' WIDE~~	~~= 36 S.F.~~
7,500 GALLON TANK (TYPE 2):	2 SIDES x 18.00' LONG X 2.00' WIDE	= 72 S.F.
6,000 GALLON TANK (TYPE 1):	2 SIDES x 18.00' LONG X 1.00' WIDE	= 36 S.F.
~~8,000 GALLON TANK (TYPE 2):~~	~~2 SIDES x 18.00' LONG X 2.00' WIDE~~	~~= 72 S.F.~~
PUMP CHAMBER (TYPE 1):	2 SIDES x 8.00' LONG X 1.00' WIDE	= 16 S.F.
~~PUMP CHAMBER (TYPE 2):~~	~~2 SIDES x 8.00' LONG X 2.00' WIDE~~	~~= 32 S.F.~~

ANTI-FLOATATION VOLUMES

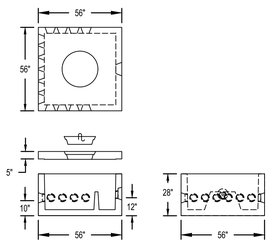
~~15,000 GALLON TANK (TYPE 1):~~	~~65.66 S.F. X 2.00' HIGH~~	~~= 131.32 C.F.~~
~~15,000 GALLON TANK (TYPE 1):~~	~~63.66 S.F. X 2.00' HIGH~~	~~= 127.32 C.F.~~
15,000 GALLON TANK (TYPE 2):	127.32 S.F. X 2.00' HIGH	= 254.64 C.F.
~~8,000 GALLON TANK (TYPE 1):~~	~~38 S.F. X 2.00' HIGH~~	~~= 76 C.F.~~
~~8,000 GALLON TANK (TYPE 2):~~	~~76 S.F. X 2.00' HIGH~~	~~= 152 C.F.~~
~~7,500 GALLON TANK (TYPE 1):~~	~~36 S.F. X 2.00' HIGH~~	~~= 72 C.F.~~
7,500 GALLON TANK (TYPE 2):	72 S.F. X 2.00' HIGH	= 144 C.F.
6,000 GALLON TANK (TYPE 1):	36 S.F. X 2.00' HIGH	= 72 C.F.
~~6,000 GALLON TANK (TYPE 2):~~	~~72 S.F. X 2.00' HIGH~~	~~= 144 C.F.~~
PUMP CHAMBER (TYPE 1):	16 S.F. X 2.00' HIGH	= 32 C.F.
~~PUMP CHAMBER (TYPE 2):~~	~~32 S.F. X 2.00' HIGH~~	~~= 64 C.F.~~

CONSTANTS (WEIGHTS)

CONCRETE:	150 POUNDS/C.F.
WATER:	62.4 POUNDS/C.F.
SUBMERGED CONCRETE:	87.6 POUNDS/C.F.

WEIGHT OF ANTI-FLOATATION IN PLACE

~~15,000 GALLON TANK (TYPE 1):~~	~~131.32 C.F. X 87.6 POUNDS/C.F.~~	~~= 11,503.6 POUNDS~~
~~15,000 GALLON TANK (TYPE 1):~~	~~127.32 C.F. X 87.6 POUNDS/C.F.~~	~~= 11,153.2 POUNDS~~
15,000 GALLON TANK (TYPE 2):	254.64 C.F. X 87.6 POUNDS/C.F.	= 22,306.5 POUNDS
~~8,000 GALLON TANK (TYPE 1):~~	~~76 C.F. X 87.6 POUNDS/C.F.~~	~~= 6,657.6 POUNDS~~
~~8,000 GALLON TANK (TYPE 2):~~	~~152 C.F. X 87.6 POUNDS/C.F.~~	~~= 13,315.2 POUNDS~~
~~7,500 GALLON TANK (TYPE 1):~~	~~72 C.F. X 87.6 POUNDS/C.F.~~	~~= 6,307.2 POUNDS~~
7,500 GALLON TANK (TYPE 2):	144 C.F. X 87.6 POUNDS/C.F.	= 12,614.4 POUNDS
6,000 GALLON TANK (TYPE 1):	72 C.F. X 87.6 POUNDS/C.F.	= 6,307.2 POUNDS
~~6,000 GALLON TANK (TYPE 2):~~	~~144 C.F. X 87.6 POUNDS/C.F.~~	~~= 12,614.4 POUNDS~~
PUMP CHAMBER (TYPE 1):	32 C.F. X 87.6 POUNDS/C.F.	= 2,803.2 POUNDS
~~PUMP CHAMBER (TYPE 2):~~	~~64 C.F. X 87.6 POUNDS/C.F.~~	~~= 5,606.4 POUNDS~~



DISTRIBUTION BOX WITH 14 OUTLETS

SCALE 1" - 4'

CAPUTO AND WICK LTD. - 1150 PAWTUCKET AVENUE - RUMFORD R.I. 02916

BURLINGAME STATE PARK AND CAMPGROUND

STATE OF RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
DIVISION OF PLANNING AND DEVELOPMENT

DEMOLITION AND REBUILD OF BATHHOUSES
BURLINGAME STATE PARK AND CAMPGROUND
CHARLESTOWN, RHODE ISLAND

OWTS PRECAST STRUCTURES DETAILS

Dwg:
Scale: 1" = 20'
Contract No. X
Date: FEBRUARY, 2023
C-3.1
21

OWTS SUBMISSION - FEBRUARY 16, 2023

J:\Rhodelsland\Charlestown\RIDEM - Burlingame\009 - 025 and S-4 Site Design 2023.02.10.dwg

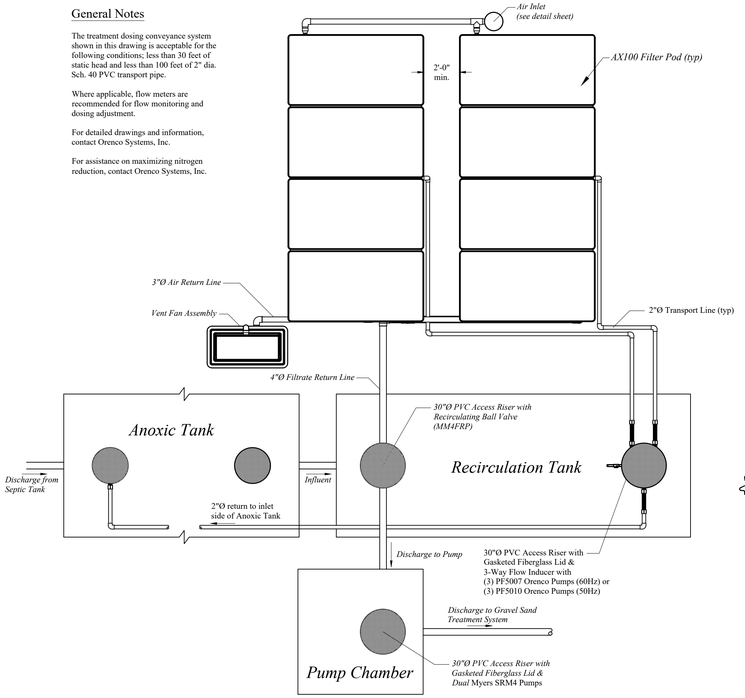
General Notes

The treatment dosing conveyance system shown in this drawing is acceptable for the following conditions; less than 30 feet of static head and less than 100 feet of 2" dia. Sch. 40 PVC transport pipe.

Where applicable, flow meters are recommended for flow monitoring and dosing adjustment.

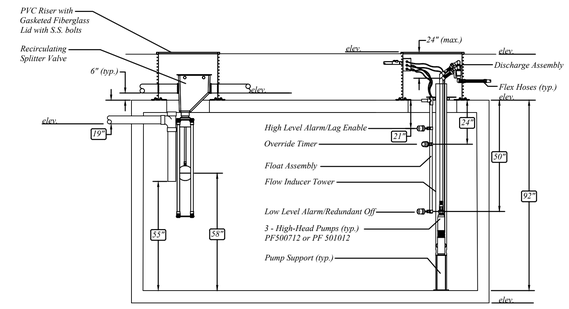
For detailed drawings and information, contact Orenco Systems, Inc.

For assistance on maximizing nitrogen reduction, contact Orenco Systems, Inc.



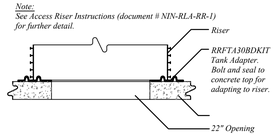
AdvanTex AX100 SYSTEM - MANIFOLDED VENT INLET
2 POD CONFIGURATION

SCALE 1" - 4'

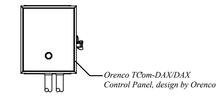


RECIRCULATION TANK FLOAT AND RSV SETTINGS

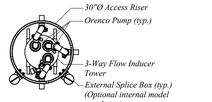
NOT TO SCALE



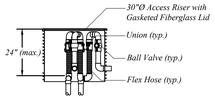
30" Riser Attachment Detail for Concrete Tank
Scale: NTS



Control Panel Detail
Not To Scale

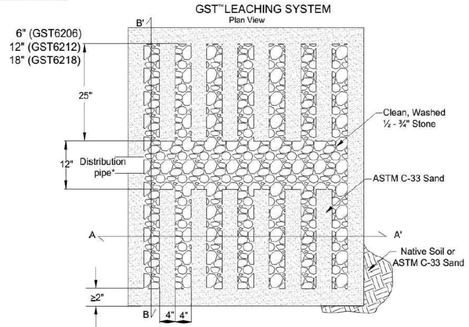


3-Way Flow Inducer
Typical Plumbing Example
Scale: 1" = 3'-0"

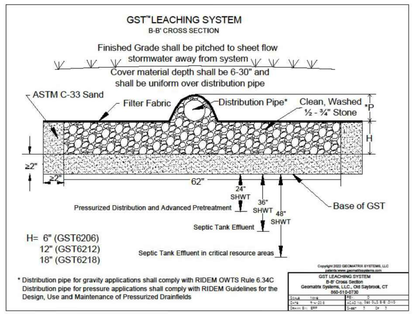


3-Way Flow Inducer
Typical Plumbing Profile
Scale: 1" = 3'-0"

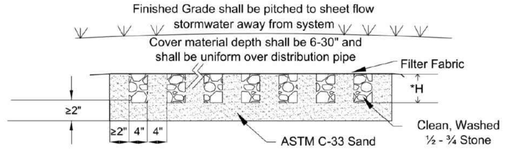
GST Schematics



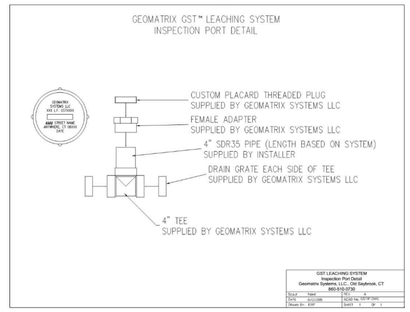
* Distribution pipe for gravity systems shall comply with RIDEM OWTS Rule 6.34C Distribution pipe for pressure applications shall comply with RIDEM Guidelines for the Design, Use and Maintenance of Pressurized Drainfields.

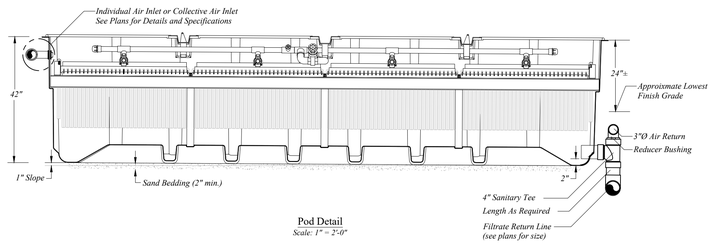


GEOMATRIX GST™ LEACHING SYSTEM
A-A' CROSS SECTION

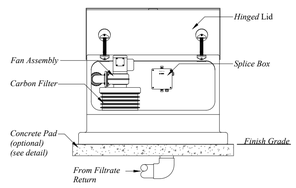


*H= 6" (GST6206)
12" (GST6212)
18" (GST6218)

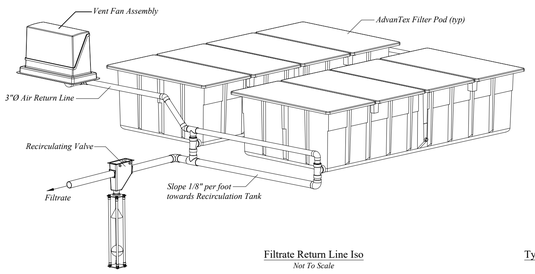




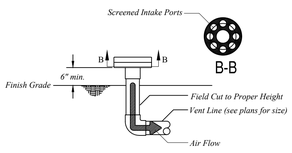
Pod Detail
Scale: 1" = 2'-0"



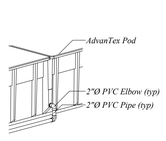
Above Ground Fan Assembly
Scale: 1" = 2'-0"



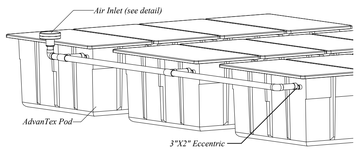
Filtrate Return Line Iso
Not To Scale



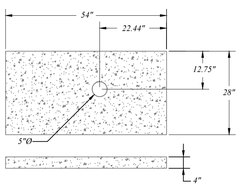
Collective Air Inlet Detail
Scale: 1" = 2'-0"



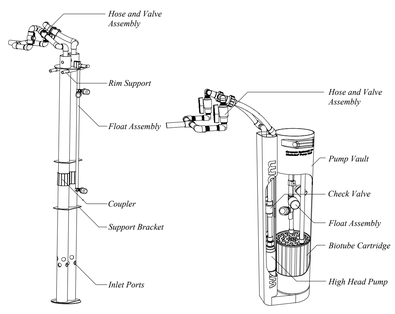
Typical Pod Inlet Connection
Not To Scale



Collective Air Inlet Option
Not To Scale

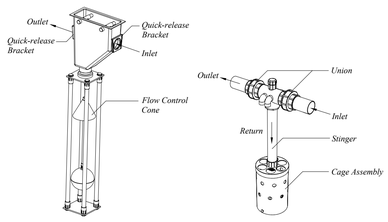


Fan Assembly Pad Detail
Scale: 1" = 2'-0"



Duplex Flow Inducer Tower Detail
Scale: NTS

Duplex Pump Vault Detail
Scale: NTS



Recirculating Ball Valve Detail
Scale: NTS

Recirculating Splitter Valve Detail
Scale: NTS

COLLECTIVE AIR INLET DETAIL

SCALE: VARIES

AdvanTex AX100 SYSTEM - MISCELLANEOUS DETAILS

SCALE: VARIES

CAPUTO AND WICK LTD. - 1150 PAWTUCKET AVENUE - RUMFORD R.I. 02916

BURLINGAME STATE PARK AND CAMPGROUND

STATE OF RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
DIVISION OF PLANNING AND DEVELOPMENT

DEMOLITION AND REBUILD OF BATHHOUSES
BURLINGAME STATE PARK AND CAMPGROUND
CHARLESTOWN, RHODE ISLAND

OWTS DETAILS

Dwg:
Scale: 1" = 20'
Contract No. x
Date: FEBRUARY, 2023

C-3.2
22

OWTS SUBMISSION - FEBRUARY 16, 2023

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STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment Systems Program

20.0179 3A, 3B
SHEET 1-2

Site Evaluation Form
Part A – Soil Profile Description **Application Number** _____

Property Owner: RHODE ISLAND STATE OF (DEM) DIVISION OF PARKS
Property Location: 1-100 BURLINGAME PARK RD, CHARLESTOWN, RI PLAT 15 LOT 10
Date of Test Hole: 8/17/21
Soil Evaluator: KAMAL HINGORANY License Number: D4005
Weather: CLOUDY Shaded: Yes ☐ No ☒ Time: 9:30 AM

TH 3A Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
Ap	0-7	C	S	2.5YR 6/3	-	-			Ls	2gbd	VFr	3
Bw	7-36	C	W	10YR 5/6	-	-			Ls	2gbd	Fr	3
C	36-120	C	S	2.5YR 7/3	-	-			Ls	2gbd	Fr	3

TH 3B Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
Ap	0-6	C	S	2.5YR 6/3	-	-			Ls	2gbd	VFr	3
Bw	7-24	C	W	10YR 5/6	-	-			Ls	2gbd	Fr	3
C_1	24-28	C	S	2.5YR 7/3	-	-			Ls	2gbd	Fr	3
C_2	28-120	-	-	2.5YR 7/3	5YR 4/4	M	M	P	Ls	2gbd	Fr	3

TH 3A Soil Class B Total Depth 120" Impervious/Limiting Layer Depth 120"(og) GW Seepage Depth - SHWT 120"(og)
TH 3B Soil Class B Total Depth 120" Impervious/Limiting Layer Depth 120"(og) GW Seepage Depth - SHWT 24"(og)

Comments: _____

Part B

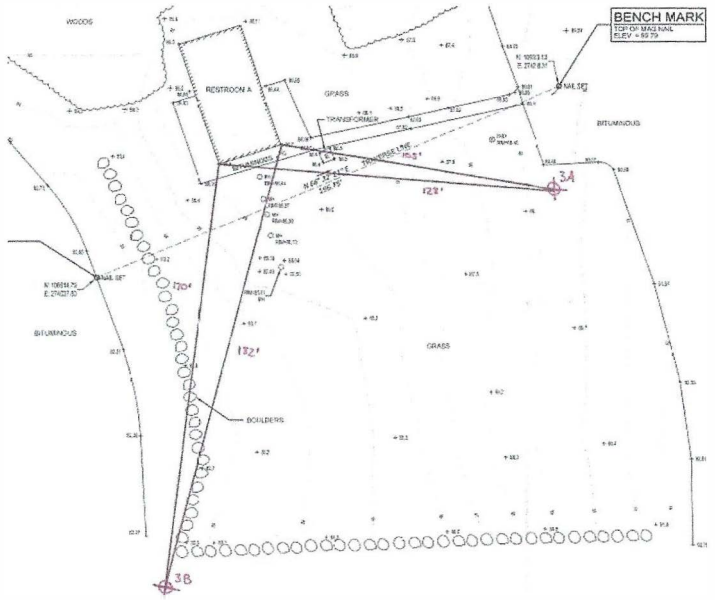
Site Evaluation – to be completed by Soil Evaluator or Class II or III Designer

20.0179 3A, 3B
SHEET 2-2

Please use the area below to locate:

1. Test holes and bedrock test holes,
2. Approximate direction of due north,
3. Offsets from all test holes to fixed points such as street, utility pole, or other permanent, marked object.*
   ***OFFSETS MUST BE SHOWN**

Key:
- Approximate location of test holes
- Approximate location of bedrock test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north



*LEACHING FIELD NOT LOCATED

N

SHWT THs	
TH	Depth
3A	120"
3B	24"

1. Relief and Slope: _____
2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes? If yes, locate on above sketch. NO ☒ YES ☐
3. Restrictive Layer or Bedrock within 4' below original ground within 25 feet of test hole? Provide all test hole locations & depths above. NO ☒ YES ☐
4. Presence of existing or proposed private drinking water wells within 200 feet of test holes? If yes, locate on above sketch. NO ☒ YES ☐
5. Public drinking water wells within 500 feet of test holes? If yes, locate on above sketch. NO ☒ YES ☐
6. Is site within the watershed of a public drinking water reservoir or other critical area defined in Rule 6.42? NO ☒ YES ☐
7. Has soil been excavated from or fill deposited on site? If yes, locate on above sketch. NO ☒ YES ☐
8. Site's potential for flooding or ponding: NONE ☒ SLIGHT ☐ MODERATE ☐ SEVERE ☐
9. Landscape position: SHOULDER
10. Vegetation: GRASS
11. Indicate approximate location of property lines and roadways.
12. Additional comments, site constraints or additional information regarding site: _____

Certification

The undersigned hereby certifies that all information on this application and accompanying forms, submittals and sketches are true and accurate and that I have been authorized by the owner(s) to conduct these necessary field investigations and submit this request.

Part A prepared by: _____ D4005 (Signature / License #)

Part B prepared by: _____ D4005 (Signature / License #)

DO NOT WRITE IN THIS SPACE

Witnessed Soil Evaluation Decision: Concur ☐ Inconclusive ☐ Disclaim ☐

Unwitnessed Soil Evaluations Decision: Accept ☐ Inconclusive ☐ Disclaim ☐

Wet Season Determination required ☐ **Additional Field Review Required** ☐

Explanation: _____

_____

_____

_____ _____

Signature Authorized Agent Date

Bathhouse “A” and System Replacement Project
Burlingame State Park and Campground
Charlestown, Rhode Island

DESIGN NARRATIVE

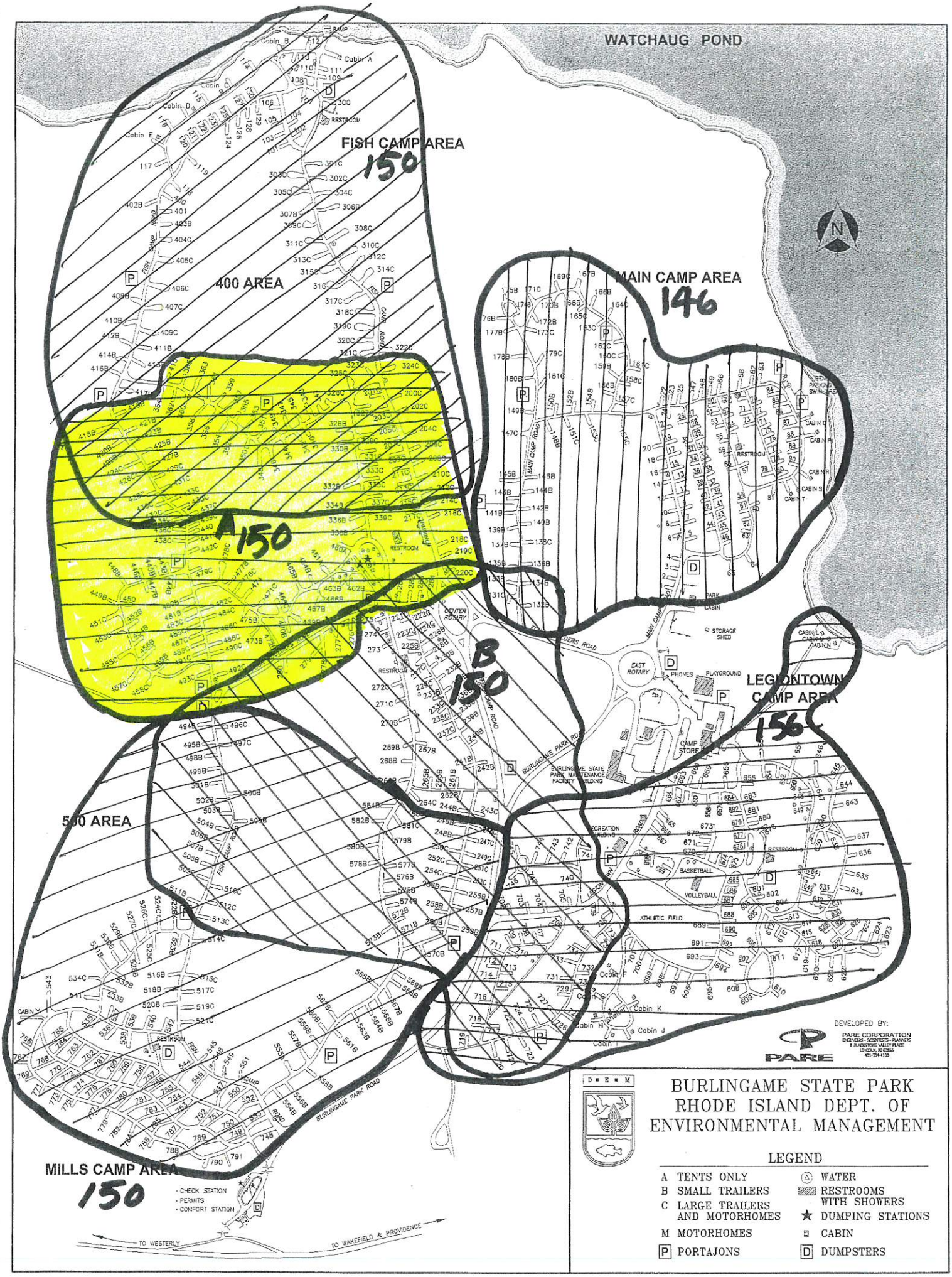
RIDEM is in the process of replacing the Bathhouse and Onsite Wastewater System (OWTS) at this location. Soil logs can be found on Sheet C-1.3 together with the proposed site layout and System Design Data and Notes. Details for the system are on Sheets C-2.3, C-3.1 and C-3.2.

Soil evaluations for this OWTS location were conducted on August 17, 2021, soils are Category 3 and the Estimated Seasonal High Water Table depth at the OWTS is 24” or at elevation 80.7±.

In total the six bathhouses for the overall campground accommodate approximately 720 campsites. Utilizing the RIDEM wastewater design flow for a campground with washroom and toilets of 50 gallons per day we determine a daily flow for the entire campground to be approximately 36,000 gallons per day (GPD). The average daily flow per acre of the campground is (36,000 GPD / 847 Acres) 42.5 GPD/Acre. The average daily flow for each bathhouse is approximately 6,000 GPD. In calculating an estimated daily flow for the Bathhouse “A” OWTS we took a conservative approach utilizing 150 campsites at 50 GPD/campsite to determine a design flow for the Bathhouse “A” to be 7,500 GPD which is greater than the 6,000 GPD average. Please see the attached campsite map which depicts the campsites (as highlighted) chosen to be included within the 150 sites utilized for sizing the OWTS. Please note that sites throughout the campground overlap to agree with the conservative estimate. The system as sized is oversized and is considered a large system. The system is used on a seasonal basis between the months of April and October.

The OWTS will utilize Two (2) Orenco AdvanTEX AX100 Pods for advanced treatment. This system is a Category 1 advanced treatment technology. The system will treat the wastewater and reduce the biochemical oxygen demand (BOD) and comply with the latest Orenco system design criteria and thus the RIDEM OWTS criteria. See attached Final Design Review Letter from Orenco.

The systems drainfield is designed as a Geomatrix Gravel Sand Treatment (GST) System. The Loading Rate for Category 1 Technology for the GST is 3.5 GPD/square feet (SF). The minimum size drainfield is 7,500 GPD/3.5 GPD/SF which equals 2,143 SF. We propose to use the GST 6212 and the minimum size drainfield requirement for this application is 123 lineal feet (LF). We propose to use the 280 lineal feet (LF) of GST 6212 which provides 17.5 S.F. per LF, which equals 4,900 SF. and is greater than 2,143 SF (minimum size). The GST system has been divided into two equal drainfields and the GST are spaced 7’6” on center. The two drainfields consist of 5 rows each 28 feet long and 62” wide with a stone depth of 12” below the 4” perforated distribution pipe. See pump selection and system specifications on Sheet C-2.3 for additional information. Please see the attached review letter from Geomatrix.



D E M

BURLINGAME STATE PARK
RHODE ISLAND DEPT. OF ENVIRONMENTAL MANAGEMENT

LEGEND

A TENTS ONLY	WATER
B SMALL TRAILERS	RESTROOMS WITH SHOWERS
C LARGE TRAILERS AND MOTORHOMES	DUMPING STATIONS
M MOTORHOMES	CABIN
P PORTAJONS	D DUMPSTERS

PROTECTING THE WORLD'S WATER

01/19/2023

Kevin Harrop
Caputo & Wick
1150 Pawtucket Ave
Rumford, RI 02916

Subject: Final Design Review of Burlingame Park/Bathhouse A

Kevin,

Orenco Systems, Inc. ("Orenco") has received the Plans with all required fields completed (attached to this letter), a copy of the plan set showing the designed site layout and configuration plans, and other documents that comprise the Final Design for the Burlingame Park project. Orenco staff reviews the Final Design of all wastewater collection and treatment systems for commercial applications to ensure that the design is compliant with the most current version of the system's applicable design criteria published by Orenco for the specified parameters provided by the system's designer in the Plans. The findings and conclusions of my review of this Final Design are as follows:

Design Basis

The system has been designed for a Type 2, Park application. Influent flow and constituent concentrations and effluent constituent concentration requirements have been provided by the system's designer on the attached Plans and were used in my review of the Final Design.

The influent flow on the Plans were not extrapolated from the metered flows from the subject site, but in our experience, they are consistent with influent flows from other, similar Type 2, Park systems that Orenco has previously observed. As such, I have no reason to doubt the accuracy of the designer's findings and assumptions as to the influent flow, and find that it was reasonable for the designer to use them as the design basis for the system.

System Design

The proposed Final Design of the system consists of a park. Influent will enter a 15,000 gallon Primary Tank, which will then flow into a 7,500 gallon Pre-Anoxic Tank. From here, flow will gravity discharge into a 6,000 gallon Recirculation Tank. The recirc-filtrate blend in this tank will pump into (2) AX100 pods and the filtrate will enter a splitter valve in the front of the Recirculation Tank where it will either be recirculated again or siphon to a drain field.

Design Criteria

The applicable design criteria for this system, which I used to conduct the review of its Final Design, is revision 8.0 of document NDA-ATX-1, titled *Orenco® AdvanTex® Design Criteria, Commercial Treatment Systems*, which was published by Orenco in October, 2020. A copy of the design criteria can be downloaded from Orenco's online document library at www.orenco.com/corporate/doclibrary.cfm.

Findings

The findings of my review as to whether the Final Design complies with Orenco's design criteria for treating wastewater to the effluent constituent concentration requirements provided in the Plans are as follows:

Primary Treatment

The Final Design specifies the use of 1 - 15,000 U.S. Gallon Primary concrete and 1 - 7,500 U.S. Gallon Primary concrete tanks in series for primary treatment. Using the flow data specified on the Plans the hydraulic retention times for grease capture and primary treatment calculate as follows:

Primary Tank(s) Hydraulic Retention Time (HRT)[1]				
Design Average Flow (gpd)	Design Maximum Day Flow (gpd)	Effective Combined Primary Tankage (gpd)	Avg HRT (days)	Max Day HRT (days)
3,500	7,500	22,500	6.4	3.0

[1] Design Max Day Flow is the maximum daily flow a facility is expected to receive no more than one day within any week's time.

The Primary Tank Sizing Recommendations states that the recommended primary tankage for a Park treatment system should be sized to at a minimum of 3 days of hydraulic retention time at the Design Max Day Flow. Therefore, the configuration and specifications of the primary treatment tanks in the Final Design satisfy Orenco's recommendation for primary tankage for this Park application. This pre-anoxic tank should be sized equal to one day at maximum day design flow and is considered part of the overall primary tank volume.

Recirculation Tank — Standard Stage

The Final Design further specifies the use of 1 - 6,000 U.S. Gallon concrete tank for recirculation and blending of the AdvanTex-treated effluent with primary tank effluent. Using the flow data specified on the Plans the tank is sized to be equal to 80% of the Maximum Day Design Flow. The recirculation tank for the standard stage should be sized at a minimum of 75% of the Maximum Day Design Flow. Therefore, the specification of the recirculation-blend tank in the Final Design satisfies Orenco's design criteria.

Hydraulic Load — Standard Stage

The Final Design specifies the use of 2 - AX100 pods, which contain a nominal surface area of 200 square feet of treatment media. Using the flow data specified on the Plans the hydraulic loading rate for the system calculates as follows:

Hydraulic Loading Rate (HLR) — Standard Stage				
Design Average Flow (gpd)	Design Maximum Day Flow (gpd)	Nominal Textile Area (sq. ft.)	Average HLR (gal. per day/sq. ft.)	Peak HLR (gal. per day/sq. ft.)
3,500	7,500	200	17.5	37.5

According to the AdvanTex System Loading Chart in the applicable design criteria, the standard AdvanTex treatment system (Stage 1) should not be hydraulically loaded more than 25 gpd/square foot at Design Average Flow or 50 gpd/square foot at Design Max Day Flow. Therefore, the specified type and number of AdvanTex pods in the Final Design satisfy Orenco's design criteria to achieve the effluent quality listed in the design criteria at a 95% confidence level for this Type 2, Park application.

Organic Load — Standard Stage

The following influent characteristics provided on the Plans were estimated and not derived from direct sampling. Even though the influent characteristics were not derived from direct sampling, the values provided are consistent with values we have seen in other, similar Type 2, Park applications.

Influent (Primary Tank Effluent) Characteristics — Loading to Textile	
Average BOD_5 (mg/L)	Average TSS (mg/L)
250	200

Based on the average influent biochemical oxygen demand (BOD_5) concentration and flow data specified on the Plans, the system will receive approximately 7.3 pounds of BOD_5 per day at Design Average Flow, and 15.6 pounds of BOD_5 per day at Maximum Day Design Flow. Using this information, the organic loading rate of the system calculates as:

Organic Loading Rate (OLR) — Standard Stage				
Average Organic Load (lbs/day)	Maximum Organic Load (lbs/day)	Nominal Treatment Area (sq. ft.)	Average OLR (lbs BOD/sq. ft./day)	Maximum OLR (lbs BOD/sq. ft./day)
7.3	15.6	200	0.04	0.08

Conclusions

I have reviewed the Final Design of the Burlingame Park wastewater treatment system, and have found that the design is compliant with the most current version of the system's applicable design criteria published by Orenco for the specified parameters provided by the system's designer in the Plans. In addition, I noted no anomalies in the site layout or configuration of the system during my review.

Compliance Table — Meets Minimum Design Standards	
	Standard Stage
Recirc Tank Size	Yes
Hydraulic Load	Yes
Organic Load	Yes

As such, the system as designed satisfactorily complies with Orenco's design criteria to meet the following effluent limits specified in the Plans at a 95% confidence level, provided that all influent flows and constituent concentrations specified in the Plans are not exceeded:

Expected Effluent Quality	
Constituent	**Average (mg/L)**
BOD_5	20
TSS	20

It is important to note that even though the AdvanTex Treatment System has the capability to meet or exceed the required treatment parameters, there is no way that Orenco can guarantee that a particular system will be operated or maintained in a manner consistent with the Final Design reviewed. Once the facility is placed into operation, the influent flows and constituent concentrations to the facility should be monitored, and if flow or any of the influent constituent concentrations exceed those listed in the Plans, measures should be taken to reduce the flow or constituent concentration to those listed. However, if additional treatment capacity becomes necessary, the system is designed to have the capability to expand to account for the new flow or constituent concentration.

Proper air ventilation is a critical feature of all commercial AdvanTex Treatment Systems, and as such, adequate active ventilation is required for all systems. In addition, please note that disposing of toxics or chemicals into the system is strictly prohibited. Examples of toxics include restaurant degreasers, cleansers, wax strippers for linoleum, carpet shampoo, waste products, or any other toxins. Furthermore, water softener brine discharge is prohibited from being discharged into the AdvanTex Treatment System. Failure to adhere to these policies will void Orenco's limited product warranties.

If you have any questions about my review process, findings, or conclusions, please feel free to call or e-mail me.

Sincerely,

Caleb Castleman
Systems Engineering
Orenco Systems Inc.
(800) 348-9843 ext. 548
ccastleman@orenco.com

Project: Burlingame State Park and Camp Ground
Location: Bathhouse "A"

Description	Input values	Units
Finish Grade	86.25	Elevation
Water Table Elevation	80.70	Elevation
Bottom of Tank Elevation	75.33	Elevation
Lowest Pipe Invert	83.00	Elevation
Counter Weight	0.00	lbs
Soil Above Tank	19.00	Inches
Length of Tank	30.83	Feet
Width of Tank	11.33	Feet
Depth of Tank	9.33	Feet
Top of Concrete Thickness	8.00	Inches
Bottom of Concrete Thickness	8.00	Inches
Sides Concrete Thickness	8.00	Inches
Two Compartment Tank		
Compartment Wall Thickness	4.00	Inches
Compartment Wall Height	87.00	Inches
	Computed Value	
Submerged Depth	5.37	Feet
Top/Bottom Surface Area of Tank	349.43	SF
Displaced Volume	1,876.46	CF
Volume of Tank Top	232.96	CF
Volume of Tank Sides	435.53	CF
Volume of Tank Bottom	232.96	CF
Volume of Baffle	24.17	CF
Weight of Tank Top	34,943.38	lbs
Weight of Tank Sides	65,330.02	lbs
Weight of Tank Bottom	34,943.38	lbs
Weight of Baffle	3,624.88	lbs
Total Weight of Tank	138,841.66	lbs
Volume of Soil	553.27	CF
Weight of Soil Above Tank	55,327.02	lbs
Uplift Created by Submerged Tank	117,091.07	lbs
Total Weight of Tank, Counter Weight and Soil	194,168.68	lbs
Exceeds Displaced Volume by	77,077.61	lbs
Buoyance Point for Empty Tank	6.37	Feet (above bottom)
Buoyance Point for Empty Tank	81.70	Elev
Buoyance Point for Tank in Place	8.90	Feet (above bottom)
Buoyance Point for Tank in Place	84.23	Elev

(Soil friction has not been taken into account)

Buoyancy Calculations | 7,500 Gallon Anoxic Tank | 3/4/2022
Rev. 2/19/2023

Project: Burlingame State Park and Camp Ground
Location: Bathhouse "A"

Description	Input values	Units
Finish Grade	86.50	Elevation
Water Table Elevation	80.70	Elevation
Bottom of Tank Elevation	75.15	Elevation
Lowest Pipe Invert	82.65	Elevation
Counter Weight	12,614.40	lbs
Soil Above Tank	26.00	Inches
Length of Tank	17.00	Feet
Width of Tank	10.00	Feet
Depth of Tank	9.17	Feet
Top of Concrete Thickness	8.00	Inches
Bottom of Concrete Thickness	6.00	Inches
Sides Concrete Thickness	6.00	Inches
Two Compartment Tank		
Compartment Wall Thickness	0.00	Inches
Compartment Wall Height	0.00	Inches
	Computed Value	
Submerged Depth	5.55	Feet
Top/Bottom Surface Area of Tank	170.00	SF
Displaced Volume	943.50	CF
Volume of Tank Top	113.33	CF
Volume of Tank Sides	208.00	CF
Volume of Tank Bottom	85.00	CF
Volume of Baffle	0.00	CF
Weight of Tank Top	17,000.00	lbs
Weight of Tank Sides	31,199.74	lbs
Weight of Tank Bottom	12,750.00	lbs
Weight of Baffle	0.00	lbs
Total Weight of Tank	60,949.74	lbs
Volume of Soil	368.33	CF
Weight of Soil Above Tank	36,833.33	lbs
Uplift Created by Submerged Tank	58,874.40	lbs
Total Weight of Tank, Counter Weight and Soil	110,397.47	lbs
Exceeds Displaced Volume by	51,523.07	lbs
Buoyance Point for Empty Tank	5.75	Feet (above bottom)
Buoyance Point for Empty Tank	80.90	Elev
Buoyance Point for Tank in Place	10.41	Feet (above bottom)
Buoyance Point for Tank in Place	85.56	Elev

(Soil friction has not been taken into account)

Buoyancy Calculations | 6,000 Gallon Recirculation Tank | 3/4/2022

Project: Burlingame State Park and Camp Ground
Location: Bathhouse "A"

Description	Input values	Units
Finish Grade	86.50	Elevation
Water Table Elevation	80.70	Elevation
Bottom of Tank Elevation	74.58	Elevation
Lowest Pipe Invert	81.33	Elevation
Counter Weight	6,307.20	lbs
Soil Above Tank	45.00	Inches
Length of Tank	17.00	Feet
Width of Tank	10.00	Feet
Depth of Tank	8.17	Feet
Top of Concrete Thickness	8.00	Inches
Bottom of Concrete Thickness	6.00	Inches
Sides Concrete Thickness	6.00	Inches
Two Compartment Tank		
Compartment Wall Thickness	0.00	Inches
Compartment Wall Height	0.00	Inches
	Computed Value	
Submerged Depth	6.12	Feet
Top/Bottom Surface Area of Tank	170.00	SF
Displaced Volume	1,040.40	CF
Volume of Tank Top	113.33	CF
Volume of Tank Sides	182.00	CF
Volume of Tank Bottom	85.00	CF
Volume of Baffle	0.00	CF
Weight of Tank Top	17,000.00	lbs
Weight of Tank Sides	27,300.13	lbs
Weight of Tank Bottom	12,750.00	lbs
Weight of Baffle	0.00	lbs
Total Weight of Tank	57,050.13	lbs
Volume of Soil	637.50	CF
Weight of Soil Above Tank	63,750.00	lbs
Uplift Created by Submerged Tank	64,920.96	lbs
Total Weight of Tank, Counter Weight and Soil	127,107.33	lbs
Exceeds Displaced Volume by	62,186.37	lbs
Buoyance Point for Empty Tank	5.38	Feet (above bottom)
Buoyance Point for Empty Tank	79.96	Elev
Buoyance Point for Tank in Place	11.98	Feet (above bottom)
Buoyance Point for Tank in Place	86.56	Elev

(Soil friction has not been taken into account)

Buoyancy Calculations | Pump Chamber | 2/19/2023
Rev.: 3/6/2023

Project: Burlingame State Park and Camp Ground
Location: Building "A"

Description	Input values	Units
Finish Grade	88.00	Elevation
Water Table Elevation	80.70	Elevation
Bottom of Chamber Elevation	76.50	Elevation
Lowest Pipe Invert	83.00	Elevation
Counter Weight	2,803.20	lbs
Soil Above Chamber	42.00	Inches
Chamber Length	7.00	Feet
Chamber Width	7.00	Feet
Diameter of Openning	2.50	Feet
Chamber Interior Height	7.00	Feet
Top of Concrete Thickness	6.00	Inches
Bottom of Concrete Thickness	6.00	Inches
Concrete Wall Thickness	6.00	Inches
	Computed Value	
Submerged Depth	4.20	Feet
Top Surface Area of Chamber	44.09	SF
Surface Area of Chamber Sides	182.00	SF
Bottom Surface Area of Chamber	49.00	SF
Displaced Volume	205.80	CF
Volume of Chamber Top	22.05	CF
Volume of Chamber Sides	91.00	CF
Volume of Chamber Bottom	24.50	CF
Weight of Chamber Top	3,306.84	lbs
Weight of Tank Side	13,650.00	lbs
Weight of Chamber Bottom	3,675.00	lbs
Total Weight of Chamber	20,631.84	lbs
Volume of Soil	154.32	CF
Weight of Soil Above Chamber	15,431.94	lbs
Uplift Created by Submerged Chamber	12,841.92	lbs
Total: Chamber, Counter Weight and Soil	38,866.99	lbs
Exceeds Displaced Volume by	26,025.07	lbs
Buoyance Point for Empty Chamber	6.75	Feet (above bottom)
Buoyance Point for Empty Chamber	83.25	Elev
Buoyance Point for Chamber in Place	12.71	Feet (above bottom)
Buoyance Point for Chamber in Place	89.21	Elev

(Soil friction has not been taken into account)

Orenco® SYSTEMS | *Technical Data Sheet*

Duplex Control Panels

Applications

Orenco Duplex Control Panels are used to control dual pumps, alarms, and other equipment as specified in pressure sewers and onsite septic systems.

Orenco® DAX2 Control Panel

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General

Orenco Duplex Control Panels are specifically engineered for pressure sewer (STEP) systems and onsite septic treatment systems that require the use of two alternating pumps. Standard features include circuit breakers, an automatic/manual/off motor control toggle for each pump, an audio/visual high level alarm, an alarm reset, and a duplex alternator. Other standard features and options are listed on page 2. Orenco panels are designed for use with mechanical and/or mercury float switches. Listed per UL 508 in the US and Canada.

Standard Models

DAX1, DAX2

Product Code Diagram

DAX ☐ ☐ ☐

Standard options (list in order):
- PT = programmable timer
- RO = redundant off relay
- CS = current sensor
- ETM = elapsed time meter
- CT = event counter
- HT = heater
- SA = surge arrestor
- PRL = pump run light
- PL = power light

Intrinsically safe relays:
- Blank = standard, no IR relays
- IR = intrinsically safe relays

Pump voltage:
- 1 = 120 VAC
- 2 = 120 VAC or 240 VAC

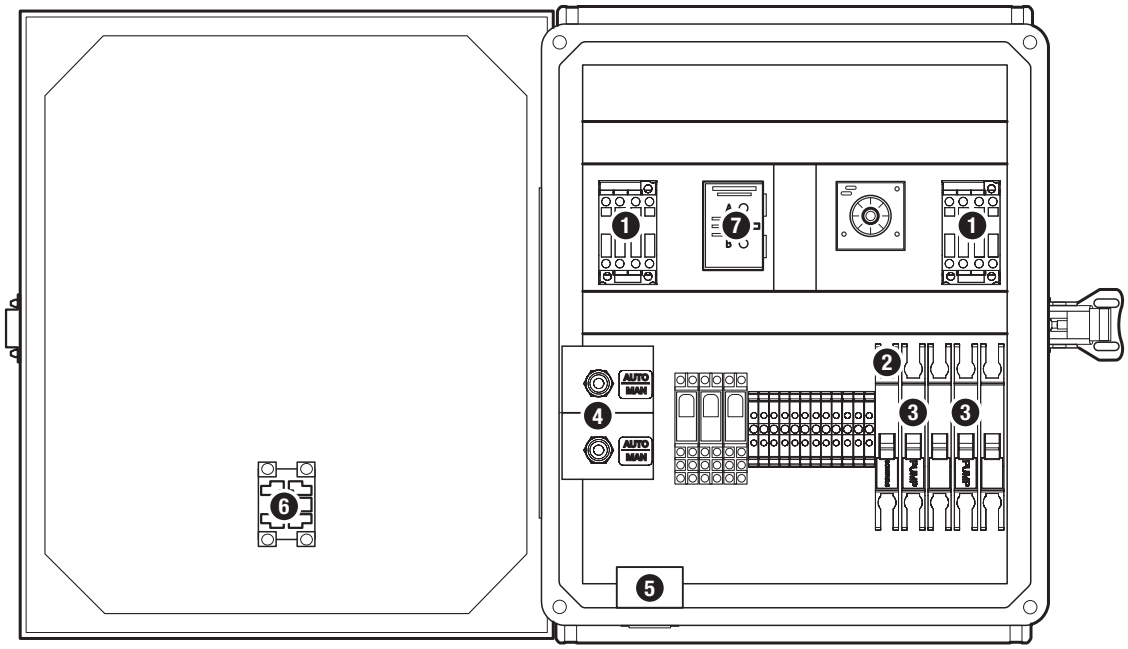
DAX series duplex control panel

Materials of Construction

Enclosure	UV-resistant fiberglass, UL Type 4X
Hinges	Stainless steel

Specifications

Panel Ratings	
DAX1:	120 V, 1 hp, 16 amps, single phase, 60 Hz.
DAX2:	240 V, 3 hp, 16 amps, single phase, 60 Hz.
Dimensions	
Height, in. (mm)	15.5 (394)
Width, in. (mm)	13.5 (343)
Depth, in. (mm)	6.7 (170)



Orenco® DAX2PTRO 240 V panel

Standard Components

Feature	Specification(s)
1. Motor-Start Contactor	120 V, 16 FLA, 1 hp (0.75 kW), 60 Hz; 2.5 million cycles at FLA (10 million at 50% of FLA). 240 V, 16 FLA, 3 hp (2.24 kW), 60 Hz; 2.5 million cycles at FLA (10 million at 50% of FLA).
2. Controls Circuit Breaker	10 A, OFF/ON switch. Single-pole 120 V. DIN rail mounting with thermal magnetic tripping characteristics.
3. Pump Circuit Breakers	20 A, OFF/ON switch. Single-pole 120 V or double-pole 240 V. DIN rail mounting with thermal magnetic tripping characteristics.
4. Toggle Switches	20 A, 1hp (0.75 kW). Single-pole, double-throw HOA switch,
5. Audible Alarm	95 dB at 24 in. (610 mm), warble-tone sound.
6. Visual Alarm	7/8-in. (22-mm) diameter red lens, "Push-to-silence." UL Type 4X rated, 1 W LED light, 120 V.
7. Duplex Alternator	120 V. Cross-wired style for independent lag pump function. Selector switch for locking one pump into lead position.
Audible Alarm Silence Relay (Not shown)	120 V. Automatic reset. DIN rail mount.

Optional Features

Feature	Specification(s)	Code Adder
Intrinsically Safe Control Relays	Listed per UL 698A, for Class 1 Div. 1, groups A, B, C, D hazardous locations (requires larger enclosure).	IR
Programmable Timer	120 V. Repeat cycle from 0.05 seconds to 30 hours. Separate variable controls for OFF & ON time periods.	PT
Redundant Off Relay	120 V. Provides a secondary off. Sounds alarm on low level condition. DIN rail mount.	RO
Elapsed Time Meter	120 V, 7-digit, non-resettable. Limit of 99,999 hours; accurate to 0.01 hours.	ETM
Event Counter	120 V, 6-digit, non-resettable.	CT
Heater	Anti-condensation heater. Self-adjusting: radiates additional wattage as temperature drops.	HT
Surge Arrestor	Status light on unit; protects incoming power supply from electrical surges.	SA
Pump Run Light	7/8-in. (22-mm) diameter green lens. UL Type 4X rated, 1 W LED light, 120 V.	PRL
Power Light	7/8-in. (22-mm) diameter green lens. UL Type 4X rated, 1 W LED light, 120 V.	PL

Orenco Systems® Inc. , 814 Airway Ave., Sutherlin, OR 97479 USA • 800-348-9843 • 541-459-4449 • www.orenco.com

Orenco SYSTEMS

Technical Data Sheet

PF-Series Submersible Effluent Pumps: 1-Phase, 60-Hz, 4-inch (100-mm)

Applications

Our PF-Series 4-inch (100-mm) Submersible Effluent Pumps are designed to transport screened effluent (with low TSS counts) from septic tanks or dosing tanks. These pumps are constructed of lightweight, corrosion-resistant stainless steel and engineered plastics, and are field-serviceable and repairable with common tools. They're also CSA- and UL-certified to U.S. and Canadian safety standards for effluent pumps.

PF-Series pumps are used in a variety of applications, including pressurized drainfields, packed-bed filters, mounds, aerobic units, effluent irrigation, liquid-only (effluent) sewers, wetlands, lagoons, and more. These pumps are designed to be used with a Biotube® pump vault or after a secondary treatment system.

C US
LR80980
LR2053896

Powered by Franklin Electric

Features/Specifications

To specify this pump for your installation, require the following:

- Minimum 24-hour run-dry capability (liquid end) with no deterioration in pump life or performance*
- 1⁄8-inch (3-mm) bypass orifice to ensure flow recirculation for motor cooling and to prevent air bind
- Liquid-end repair kits available for better long-term cost of ownership
- TRI-SEAL™ floating impeller design on 10, 20, and 30 gpm (0.6, 1.3, and 1.9 L/sec) models; floating stack design on 50 and 75 gpm (3.2 and 4.7 L/sec) models
- Franklin Electric Super Stainless motor, rated for continuous use and frequent cycling
- Type SOOW 600-V motor cable (model PF751512 uses 14 AWG, SJOOW, 300-V cord)

** Not applicable for 5-hp (3.73 kW) models*

Standard Models

See specifications chart on page 2 for a list of standard pumps. For a complete list of available pumps, call Orenco.

Product Code Diagram

PF [ ] [ ] [ ] [ ] [ ] - [ ] - [ ]

- [ ] (last): CLK = ClickTight™ compatible
- [ ]: Cord length, ft (m):‡
  Blank = 10 (3) 20 = 20 (6)
  30 = 30 (9) 50 = 50 (15)
- [ ]: Check valve:
  Blank = no internal check valve
  CV = internal check valve†
- [ ]: Voltage, nameplate:
  1 = 115* 2 = 230
- [ ]: Frequency:
  1 = single-phase 60 Hz
- [ ]: Horsepower (kW):
  05 = ½ hp (0.37) 07 = ¾ hp (0.56)
  10 = 1 hp (0.75) 15 = 1½ hp (1.11)
  20 = 2 hp (1.50) 30 = 3 hp (2.24)
  50 = 5 hp (3.73)
- [ ]: Nominal flow, gpm (L/sec):
  10 = 10 (0.6) 20 = 20 (1.3)
  30 = 30 (1.9) 50 = 50 (3.2)
  75 = 75 (4.7)
- PF: Pump, PF Series

* ½-hp (0.37 kW) only
† Available for 10 gpm (0.6 L/sec), 1/2 hp (0.37 kW)
‡ Note: 20-ft cords are available only for pumps through 1½ hp

Specifications

Pump Model	Design gpm (L/sec)	Horsepower (kW)	Phase	Nameplate voltage	Actual voltage	Design flow amps	Max amps	Discharge size and material[1]	Length in. (mm)	Min. liquid level in. (mm)	Weight lb (kg)	Rated cycles per day
PF100511 [9]	10 (0.6)	0.50 (0.37)	1	115	120	12.7	12.7	1 ¼ in. GFP	23.0 (660)	16 (406)	26 (12)	300
PF100511CV [9]	10 (0.6)	0.50 (0.37)	1	115	120	12.7	12.7	1 ¼ in. GFP	23.0 (660)	16 (406)	26 (12)	300
PF100512 [9]	10 (0.6)	0.50 (0.37)	1	230	240	6.3	6.3	1 ¼ in. GFP	23.0 (660)	16 (406)	26 (12)	300
PF100712 [4, 5, 9]	10 (0.6)	0.75 (0.56)	1	230	240	8.3	8.3	1 ¼ in. GFP	25.9 (658)	17 (432)	30 (14)	300
PF101012 [5, 6, 9]	10 (0.6)	1.00 (0.75)	1	230	240	9.6	9.6	1 ¼ in. GFP	27.9 (709)	18 (457)	33 (15)	100
PF200511 [9]	20 (1.3)	0.50 (0.37)	1	115	120	12.3	12.5	1 ¼ in. GFP	22.3 (566)	18 (457)	25 (11)	300
PF200512 [9]	20 (1.3)	0.50 (0.37)	1	230	240	6.4	6.5	1 ¼ in. GFP	22.5 (572)	18 (457)	26 (12)	300
PF201012 [4, 5, 9]	20 (1.3)	1.00 (0.75)	1	230	240	10.5	10.5	1 ¼ in. GFP	28.4 (721)	20 (508)	33 (15)	100
PF201512 [4, 5]	20 (1.3)	1.50 (1.11)	1	230	240	12.4	12.6	1 ¼ in. GFP	34.0 (864)	24 (610)	41 (19)	100
PF300511 [9]	30 (1.9)	0.50 (0.37)	1	115	120	11.8	11.8	1 ¼ in. GFP	21.3 (541)	20 (508)	28 (13)	300
PF300512 [9]	30 (1.9)	0.50 (0.37)	1	230	240	6.2	6.2	1 ¼ in. GFP	21.3 (541)	20 (508)	25 (11)	300
PF300712 [9]	30 (1.9)	0.75 (0.56)	1	230	240	8.5	8.5	1 ¼ in. GFP	24.8 (630)	21 (533)	29 (13)	300
PF301012 [4, 9]	30 (1.9)	1.00 (0.75)	1	230	240	10.4	10.4	1 ¼ in. GFP	27.0 (686)	22 (559)	32 (15)	100
PF301512 [4, 5]	30 (1.9)	1.50 (1.11)	1	230	240	12.6	12.6	1 ¼ in. GFP	32.8 (833)	24 (610)	40 (18)	100
PF302012 [5, 6, 7]	30 (1.9)	2.00 (1.49)	1	230	240	11.0	11.0	1 ¼ in. SS	35.5 (902)	26 (660)	44 (20)	100
PF303012 [5, 6, 7, 8]	30 (1.9)	3.00 (2.23)	1	230	240	16.8	16.8	1 ¼ in. SS	44.5 (1130)	33 (838)	54 (24)	100
PF305012 [5, 6, 7, 8]	30 (1.9)	5.00 (3.73)	1	230	240	25.6	25.8	1 ¼ in. SS	66.5 (1689)	53 (1346)	82 (37)	100
PF500511 [9]	50 (3.2)	0.50 (0.37)	1	115	120	12.1	12.1	2 in. SS	20.3 (516)	24 (610)	27 (12)	300
PF500512 [9]	50 (3.2)	0.50 (0.37)	1	230	240	6.2	6.2	2 in. SS	20.3 (516)	24 (610)	27 (12)	300
PF500712 [9]	50 (3.2)	0.75 (0.56)	1	230	240	8.5	8.5	2 in. SS	23.7 (602)	25 (635)	31 (14)	300
PF501012 [9]	50 (3.2)	1.00 (0.75)	1	230	240	10.1	10.1	2 in. SS	27.0 (686)	26 (660)	35 (16)	100
PF501512 [4]	50 (3.2)	1.50 (1.11)	1	230	240	12.5	12.6	2 in. SS	32.5 (826)	30 (762)	41 (19)	100
PF503012 [4, 5, 7, 8]	50 (3.2)	3.00 (2.23)	1	230	240	17.7	17.7	2 in. SS	43.0 (1092)	37 (940)	55 (25)	100
PF505012 [5, 6, 7, 8]	50 (3.2)	5.00 (3.73)	1	230	240	26.2	26.4	2 in. SS	65.4 (1661)	55 (1397)	64 (29)	100
PF751012 [9]	75 (4.7)	1.00 (0.75)	1	230	240	9.9	10.0	2 in. SS	27.0 (686)	27 (686)	34 (15)	100
PF751512	75 (4.7)	1.50 (1.11)	1	230	240	12.1	12.3	2 in. SS	33.4 (848)	30 (762)	44 (20)	100

1 GFP = glass-filled polypropylene; SS = stainless steel. The 1 ¼-in. NPT GFP discharge is 2 7⁄8 in. octagonal across flats; the 1 ¼-in. NPT SS discharge is 2 1⁄8 in. octagonal across flats; and the 2-in. NPT SS discharge is 2 7⁄8 in. hexagonal across flats. Discharge is female NPT threaded, U.S. nominal size, to accommodate Orenco® discharge hose and valve assemblies. Consult your Orenco Distributor about fittings to connect hose and valve assemblies to metric-sized piping.

2 Minimum liquid level is for single pumps when installed in an Orenco Biotube® Pump Vault or Universal Flow Inducer. In other applications, minimum liquid level should be top of pump. Consult Orenco for more information.

3 Weight includes carton and 10-ft (3-m) cord.

4 High-pressure discharge assembly required.

5 Do not use cam-lock option (Q) on discharge assembly.

6 Custom discharge assembly required for these pumps. Contact Orenco.

7 Capacitor pack (sold separately or installed in a custom control panel) required for this pump. Contact Orenco.

8 Torque locks are available for all pumps and are supplied with 3-hp and 5-hp pumps.

9 ClickTight™ compatible.

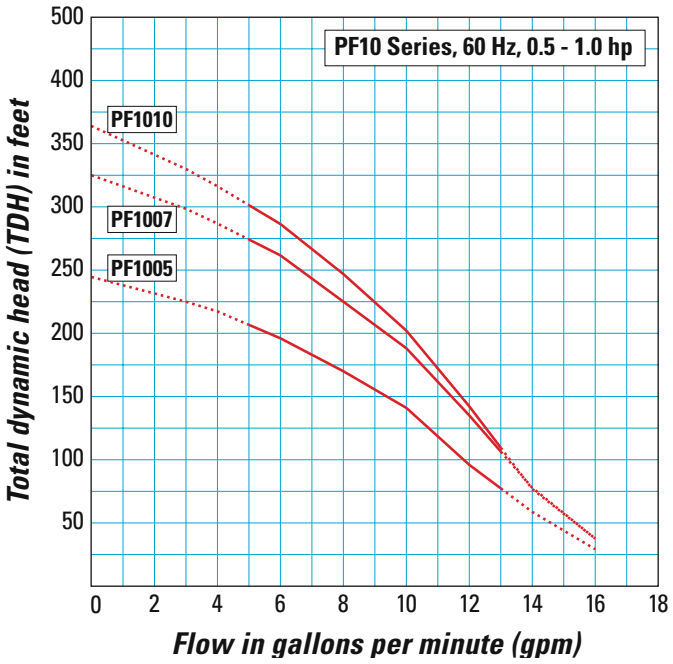
Materials of Construction

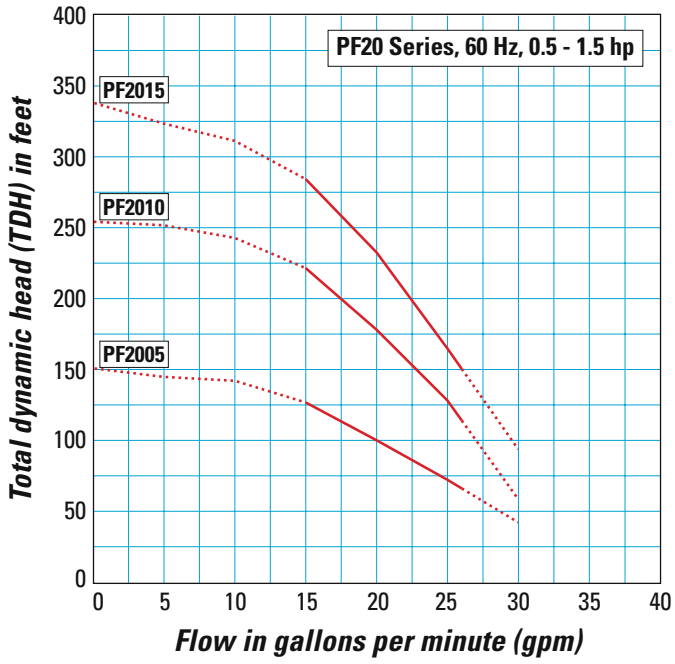
Discharge	Glass-filled polypropylene or stainless steel
Discharge bearing	Engineered thermoplastic (PEEK)
Diffusers	Glass-filled PPO (Noryl GFN3)
Impellers	Celcon® acetal copolymer on 10-, 20-, and 30-gpm models; 50-gpm impellers are Noryl GFN3
Intake screen	Polypropylene
Suction connection	Stainless steel
Drive shaft	7/16-in. hexagonal stainless steel, 300 series
Coupling	Sintered stainless steel, 300 series
Shell	Stainless steel, 300 series
Motor	Franklin motor exterior constructed of stainless steel. Motor filled with deionized water and propylene glycol for constant lubrication. Hermetically sealed motor housing ensures moisture-free windings. All thrust absorbed by Kingsbury-type thrust bearing. Rated for continuous duty. Single-phase motors are equipped with surge arrestors for added security. Single-phase motors through 1.5 hp (1.11 kW) have built-in thermal overload protection, which trips at 203-221˚ F (95-105˚ C).

Using a Pump Curve

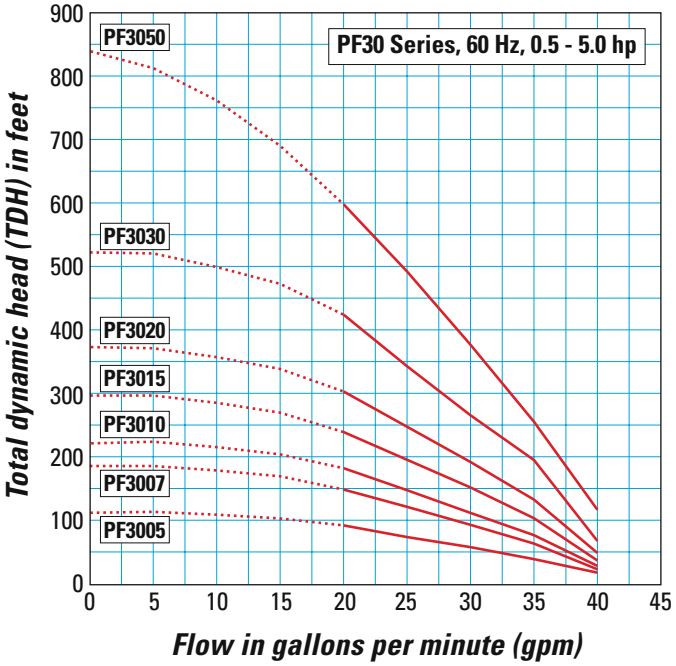
A pump curve helps you determine the best pump for your system. Pump curves show the relationship between flow and pressure (total dynamic head or "TDH"), providing a graphical representation of a pump's optimal performance range. Pumps perform best at their nominal flow rate. These graphs show optimal pump operation ranges with a solid line and show flow rates outside of these ranges with a dashed line. For the most accurate pump specification, use Orenco's PumpSelect™ software.

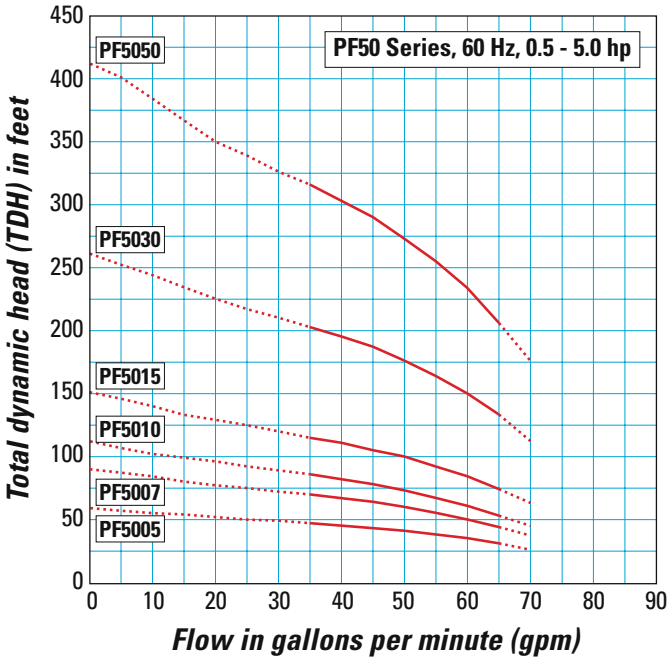
Pump Curves

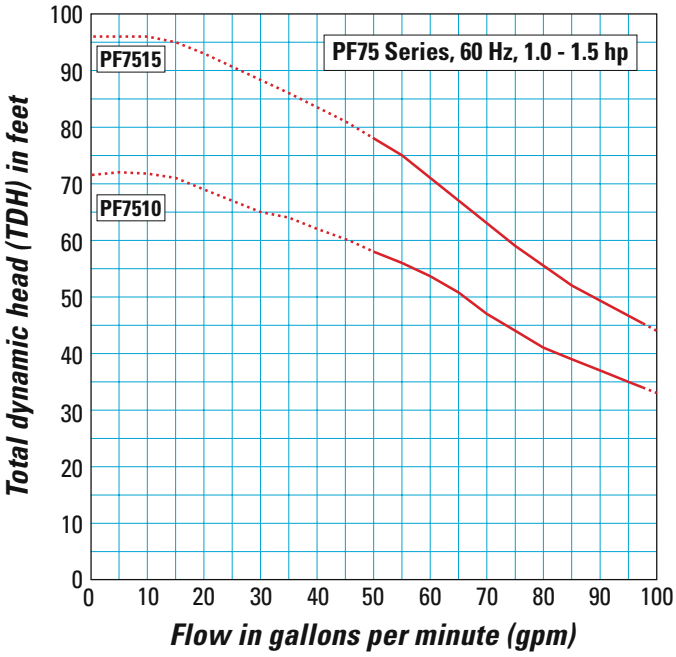




Pump Curves, cont.







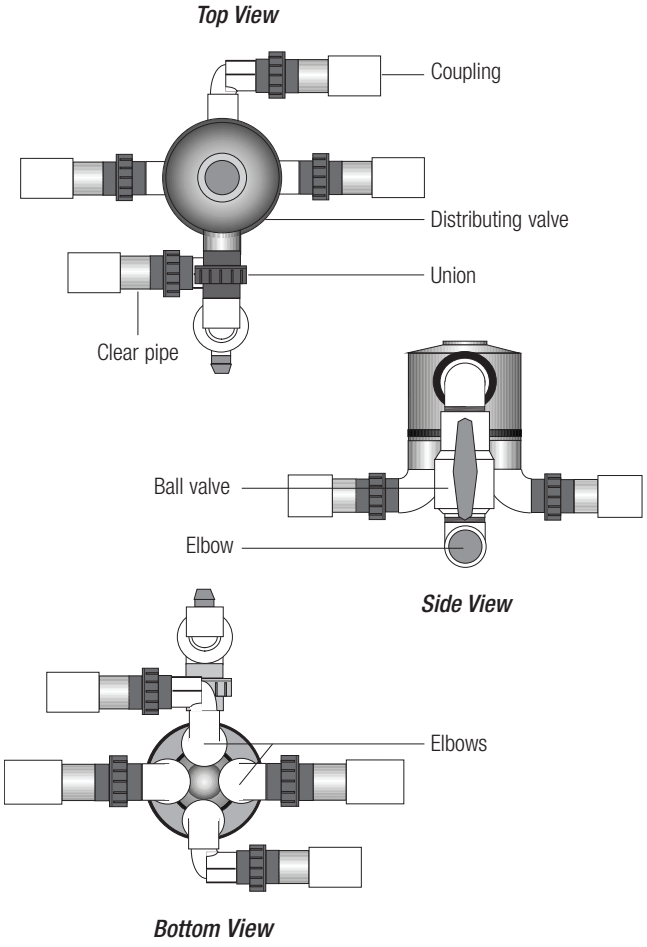
Orenco® SYSTEMS

Technical Data Sheet

Distributing Valves

Applications

Automatic Distributing Valve Assemblies are used to pressurize multiple zone distribution systems including textile filters, sand filters and drainfields.



General

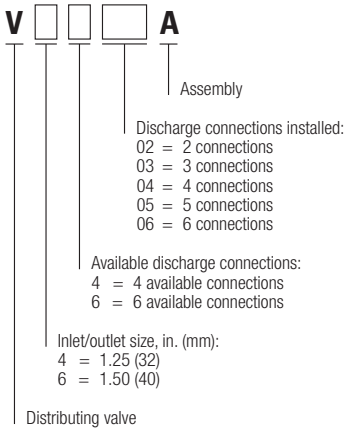
Orenco's Automatic Distributing Valve Assemblies are mechanically operated and sequentially redirect the pump's flow to multiple zones or cells in a distribution field. Valve actuation is accomplished by a combination of pressure and flow. They allow the use of smaller horsepower pumps on large sand filters and drainfields. For example, a large community drainfield requiring 300 gpm (18.90L/sec) can use a six-line valve assembly to reduce the pump flow rate requirement to only 50 gpm (3.14L/sec).

Orenco only warrants Automatic Distributing Valves when used in conjunction with High-Head Effluent Pumps with Biotube® pump vaults to provide pressure and flow requirements, and to prevent debris from fouling valve operation. An inlet ball valve, a section of clear pipe, and a union for each outlet are provided for a complete assembly that is easy to maintain and monitor. Ideal valve location is at the high point in the system. Refer to Automatic Distributing Valve Assemblies (NTP-VA-1) for more information.

Standard Models

V4402A, V4403A, V4404A, V4605A, V4606A, V6402A, V6403A, V6404A, V6605A, V6606A.

Product Code Diagram



Materials of Construction

All Fittings	Sch. 40 PVC per ASTM specification
Unions	Sch. 80 PVC per ASTM specification
Ball Valve	Sch. 40 PVC per ASTM specification
Clear Pipe	Sch. 40 PVC per ASTM specification

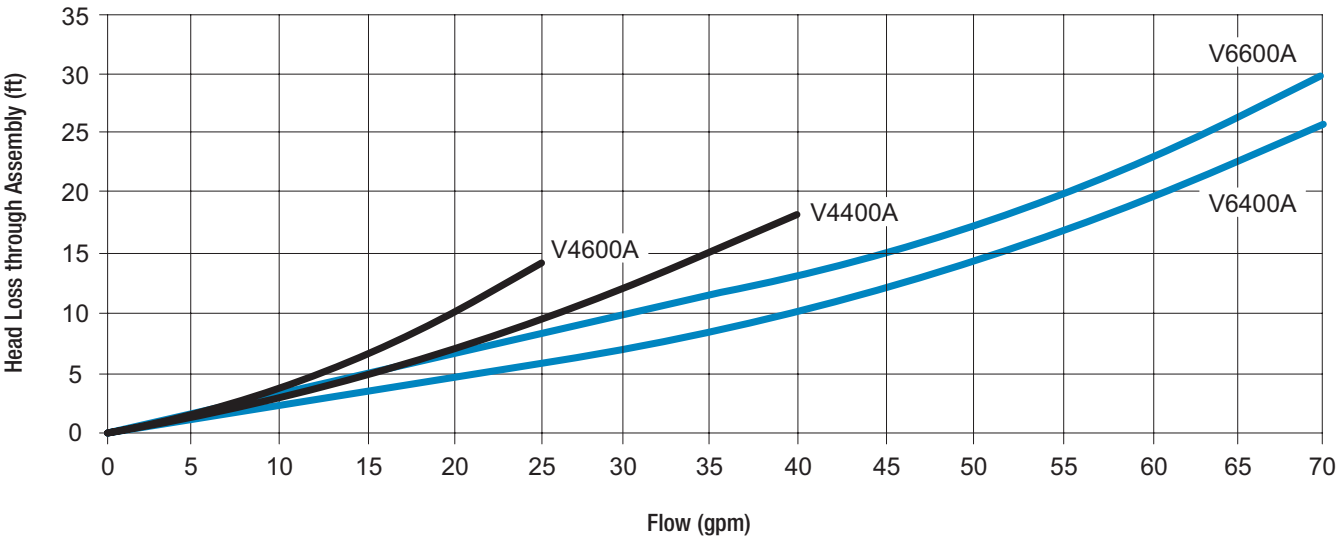
Specifications

Model	Inlet Size, in. (mm)	Outlets Size, in. (mm)	Flow Range, gpm (L/sec)	Max Head, ft (m)	Min. Enclosure*
V4402A	1.25 (32)	1.25 (32)	10 – 40 (0.63 – 2.52)	170 (51.816)	VB1217
V4403A	1.25 (32)	1.25 (32)	10 – 40 (0.63 – 2.52)	170 (51.816)	VB1217
V4404A	1.25 (32)	1.25 (32)	10 – 40 (0.63 – 2.52)	170 (51.816)	VB1217
V4605A	1.25 (32)	1.25 (32)	10 – 40 (0.63 – 2.52)	170 (51.816)	RR2418
V4606A	1.25 (32)	1.25 (32)	10 – 40 (0.63 – 2.52)	170 (51.816)	RR2418
V6402A	1.50 (38)	1.50 (38)	15 – 100 (0.95 – 6.31)	345 (105.16)	RR2418
V6403A	1.50 (38)	1.50 (38)	15 – 100 (0.95 – 6.31)	345 (105.16)	RR2418
V6404A	1.50 (38)	1.50 (38)	15 – 100 (0.95 – 6.31)	345 (105.16)	RR2418
V6605A	1.50 (38)	1.50 (38)	15 – 100 (0.95 – 6.31)	345 (105.16)	RR2418
V6606A	1.50 (38)	1.50 (38)	15 – 100 (0.95 – 6.31)	345 (105.16)	RR2418

** When using an enclosed basin, choose the next larger-sized diameter.*

Table 1. Automatic Distributing Valve Assembly Headloss Equations

Model Series	Equation	Operating Range, gpm (L/sec)
V4400A	$H_L = 0.085 \times Q^{1.45}$	10 - 40 (0.63 – 2.52)
V4600A	$H_L = 0.085 \times Q^{1.58}$	10 - 25 (0.63 – 1.57)
V6400A	$H_L = 0.0045 \times Q^2 + 3.5 \times (1 - e^{-0.060})$	15 - 70 (0.95 – 4.42)
V6600A	$H_L = 0.0049 \times Q^2 + 5.5 \times (1 - e^{-0.10})$	15 - 70 (0.95 – 4.42)



Orenco Systems® Inc. , 814 Airway Ave., Sutherlin, OR 97479 USA • 800-348-9843 • 541-459-4449 • www.orenco.com

Orenco SYSTEMS

Technical Data Sheet

AdvanTex® AX100 Textile Filter

Applications

Orenco's AdvanTex® AX100 Treatment System is an innovative technology for onsite treatment of domestic-strength wastewater. The heart of the system is the AdvanTex Filter, a sturdy, watertight fiberglass basin filled with an engineered textile material. This lightweight, highly absorbent textile material treats a tremendous amount of wastewater in a small space. AX100 Treatment Systems are ideal for:

- New construction
- System upgrades and repairs
- Small sites
- Poor soils
- Pretreatment
- Nitrogen reduction
- Price-sensitive markets

For sizing, see AdvanTex® Design Criteria (NDA-ATX-COMM-1-PKG).

The heart of the AdvanTex® AX100 Treatment System is this sturdy, watertight fiberglass basin filled with an engineered textile material.

Features/Specifications

To specify this product, require the following:

- Wastewater treatment to better than secondary treatment standards
- Consistent treatment, even during peak flows
- Timer operation for flow monitoring, flow modulation, and surge control
- Fixed-film, engineered textile media, operated in an unsaturated condition
- Consistent media quality
- Low energy consumption
- Low maintenance requirements
- Complete pre-manufactured package, ready to install
- Watertight construction, corrosion-proof materials, and components
- Foam-core lid provides insulation value of R-6 (RSI-1.1)
- Quiet operation

Standard Model

AX100

Specifications**

Length, in. (mm)	191 (4851)
Width, in. (mm)	94 (2388)
Height, in. (mm)	42 (1067)
Area (footprint), ft^2 (m^2)	128 (11.9)
Dry Weight, lb (kg)	1616 (733)

* *Covered by U.S. patent numbers 6,540,920; 6,372,137; 5,531,894; 5,480,561; 5,360,556*

** *Nominal values provided. See AdvanTex® Treatment System drawings for exact dimensions.*

AdvanTex® Vent Fan Assembly

Orenco Systems® Incorporated
800-348-9843

Applications

Orenco's AdvanTex® Vent Fan Assembly consists of a water-proof fiberglass enclosure with equipment for venting onsite wastewater treatment systems. One enclosure can hold a vent fan with carbon filter and an optional heater.

The vent fan is used in commercial-sized AdvanTex Treatment Systems to gently pull air through the textile media, ensuring that adequate oxygen is available for biological treatment. The carbon filter scrubs the air that the system exhausts. An optional heater can be added where climate requires heating of the air that enters the AdvanTex textile filter pods.

Standard Models

AXVFACF — AX above ground Vent Fan Assembly with LMF-3 Fan

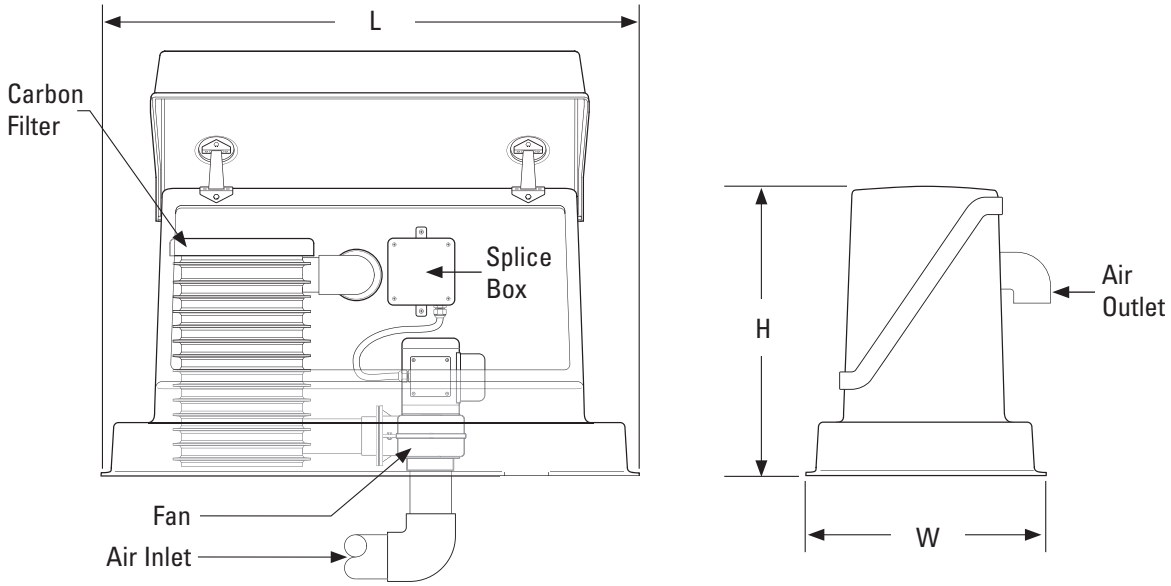
AXVFACF-HT — AX above ground Vent Fan Assembly with LMF-3 Fan and HT10 Heater

Enclosure

Physical Specifications

Materials of Construction	
Shell	Fiberglass-reinforced polyester (FRP)
Hardware	Stainless steel
Exterior finish	Green, textured, UV resistant
Straps	Nylon

Dimensions	
Length (L)	50 in. (1270 mm)
Width (W)	24 in. (610 mm)
Height (H)	30 in. (762 mm)
Volume	15.1 ft^3 (0.43 m^3)
Area (footprint)	8.3 ft^2 (0.77 m^2)



AdvanTex® Vent Fan Assembly (continued)

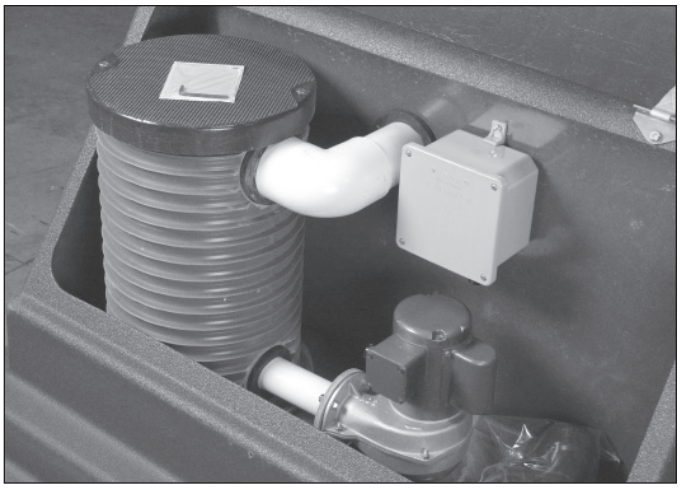
Fan

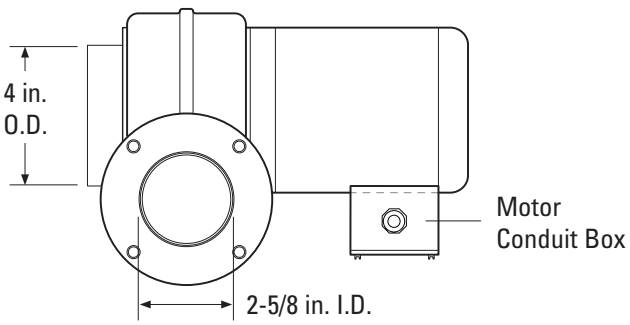
Physical Specifications

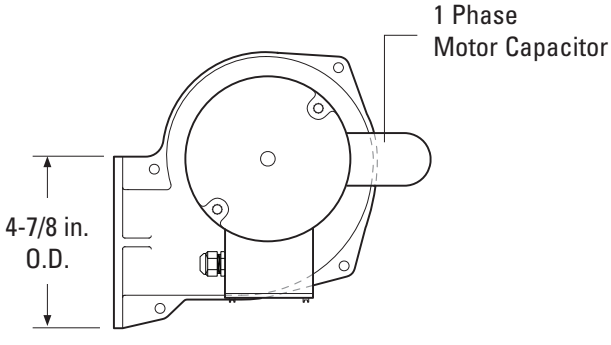
Dimensions	
Inlet O.D.	4 in. (100 mm)
Inlet nominal pipe size	4 in. (100 mm)
Outlet I.D.	2-5/8 in. (67 mm)
Outlet Flange O.D.	4-7/8 in. (124 mm)

Materials of Construction	
Housing	Aluminum
Wheel	Steel

Performance Data	60 Hz	50 Hz
Horsepower (kW)	0.08 (0.06 kW)	0.08 (0.06 kW)
Phase	1 phase	1 phase
Volts	115/230	110/220
Amperage	1.4 A/0.7 A	1.8 A/0.9 A
RPM	3400	2900
CFM at 0" H_2O static pressure	245	205
CFM at 0.4" H_2O static pressure	220	170
CFM at 0.8" H_2O static pressure	190	130
CFM at 1.5" H_2O static pressure	120	N/A

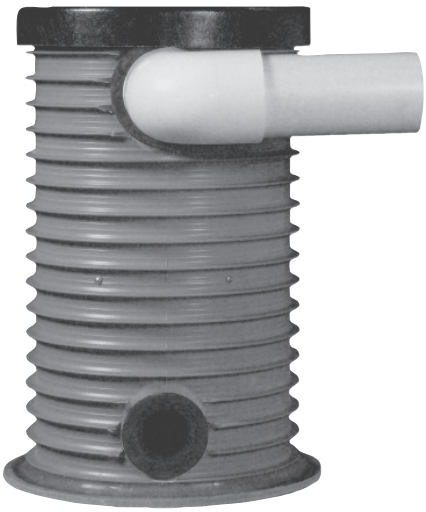






AdvanTex® Vent Fan Assembly (continued)

Carbon Filter Basin

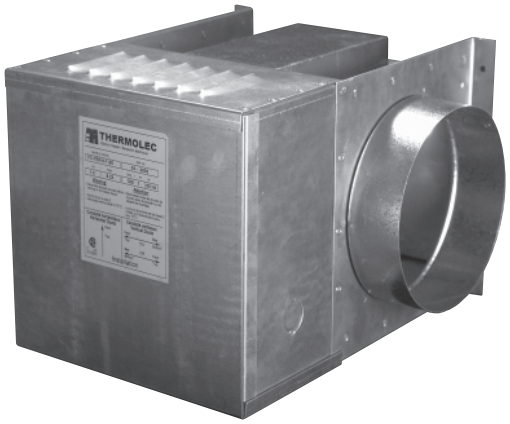


Physical Specifications

Dimensions	
Outlet diameter	Accepts nominal 3-in. PVC pipe
Inlet diameter	Accepts nominal 2-in. PVC pipe
Height	21.5 in. (546 mm)
Diameter	12 in. (305 mm)

Materials of Construction	
Housing	PVC
Bottom	Fiberglass-reinforced polyester (FRP)
Interior supports	Polypropylene grid and polyethylene screen
Support rings	PVC
Lid	Fiberglass
Fill material	Activated carbon

Heater (Optional)



Physical Specifications

Dimensions	
Outlet diameter	Fits nominal 3-in. Class 125 PVC pipe
Length (inlet to outlet)	11.75 in. (297 mm)
Width	11.25 in. (286 mm)
Depth	8.25 in. (210 mm)

Performance Data

Watts	1000
Volts	120
Amps	8.3