

- NOTES**
- Airline piping to FAST@ may not exceed 100 FT [30m] total length and have a maximum of 4 elbows in the piping system. For distances greater than 100 FT [30m] consult factory. Blower must be located above flood levels on a concrete base 26" X 20" X 2" [65 X 50 X 5cm] min.
 - Vent to desired location and cover opening with a vent grate with at least 7 sq in [45 sq cm] open surface area. Secure with stainless steel screws. Vent piping must not allow condensate build up or create back pressure. Vent must be above finished grade or higher (see sheet 4 of 4).
 - All appurtenances to FAST@ (e.g. tanks, access ports, electrical, etc.) must conform to all applicable country, state, province, and local plumbing and electrical codes. Pump out access shall be adequate to thoroughly clean out both zones.
 - All inspection, viewing and pump out ports must be secured to prevent accidental or unauthorized access.
 - Tank, piping, conduit, etc. are provided by others. Blower control system by Bio-Microbics, Inc. See Installation Manual.
 - If less than the specified minimums are considered necessary, consult factory for guidance.
 - All piping and ancillary equipment installed after FAST must not impede or restrict free flow of effluent.
 - The tank(s) shall be designed to prevent air passage between the settling zone/tank and the treatment zone and preventing an air lock. Examples include a baffle wall sealed to the lid or treatment zone inlet line with a pipe cap. Consult factory for guidance.
 - Installations using a FAST@system lid are capable of withstanding AASHTO H-10 equivalent loads. Any installation in which a FAST lid is buried deeper than 3 feet, or where additional loading conditions may occur, a professional engineer should be consulted. FAST@ with feet option should be considered. Refer to Installation Manual for more details.
 - Specialized treatment levels may require specific features to be incorporated into the design. Consult factory for guidance.

UNLESS NOTED DIMENSIONS ARE IN INCHES [CENTIMETERS] TOLERANCES ± 0.02 IN/IN [± 0.05 CM/CM]

BIO MICROBICS
BETTER WATER. BETTER WORLD.

MicroFAST 0.50 FAST Unit
BIO-MICROBICS ©2014

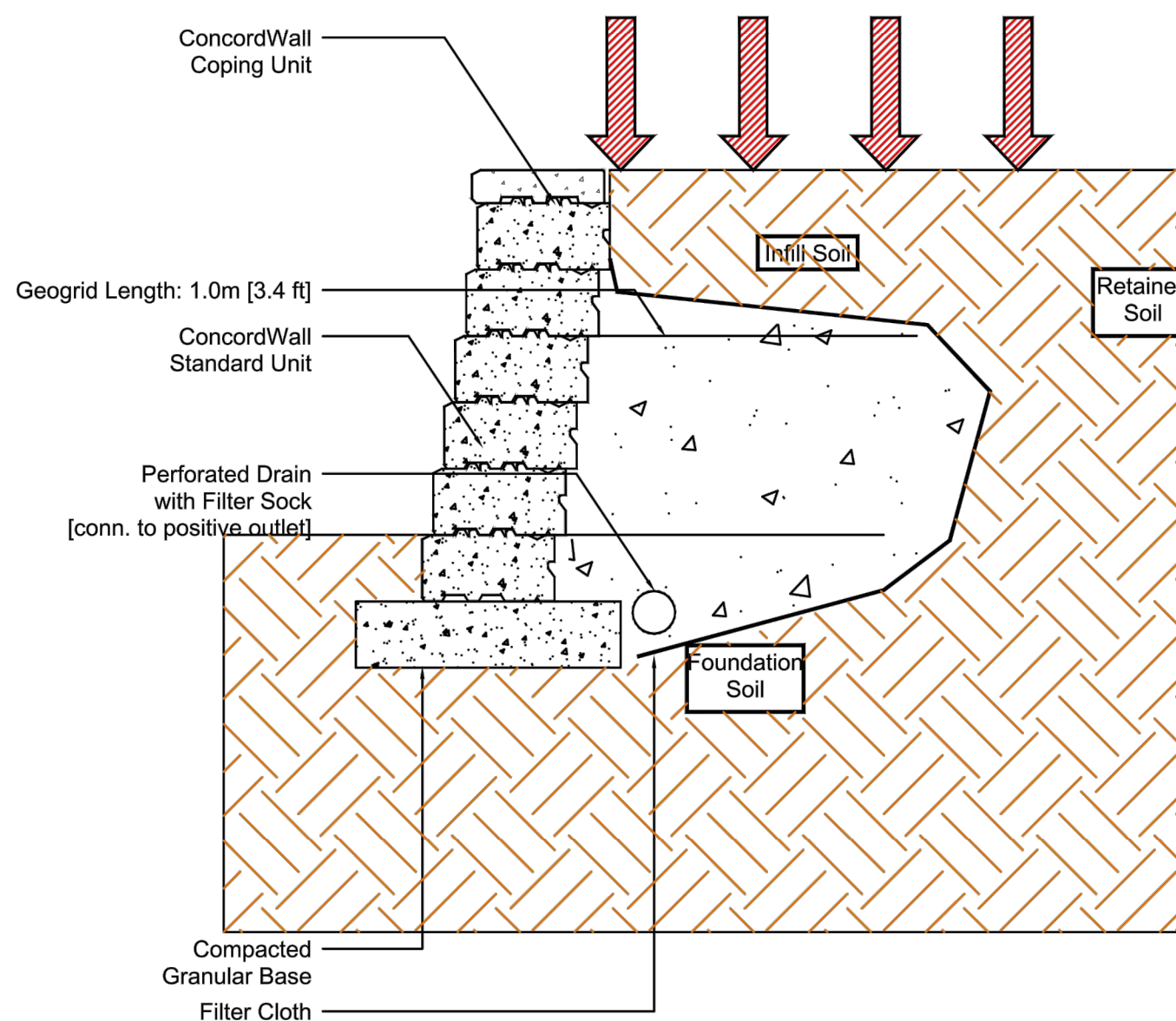
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF BIO-MICROBICS, INC. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BIO-MICROBICS, INC. IS PROHIBITED. DESIGN AND INVENTION RIGHTS ARE RESERVED. IN THE INTEREST OF TECHNOLOGICAL ADVANCEMENT, ALL PRODUCTS ARE SUBJECT TO DESIGN AND OR MATERIAL CHANGE WITHOUT NOTICE.

Specifications for MicroFAST 0.50 Wastewater Treatment System

- GENERAL**
The contractor shall furnish and install (1) MicroFAST@0.50 treatment system as manufactured by Bio-Microbics, Inc. The treatment system shall be complete with all needed equipment as shown on the drawings and specified herein.
The principal items of equipment shall include the FAST@system insert, blower assembly, blower controls and leg extensions or lid. All other items will be provided by others. The MicroFAST 0.50 unit shall be situated within a 450 Gallon [1700L] minimum compartment as shown on the drawings. Suggested maximum settling zone is (1) X the daily flow. Tank must provide adequate pump out access and conform to local, state, and all other applicable codes. The contractor shall coordinate the proper fabrication of the tank between the FAST system and tank supplier with regard to fabrication of the tank, installation of the FAST unit, and delivery to the job site.
- OPERATING CONDITIONS**
The MicroFAST 0.50 treatment system shall be capable of treating the wastewater produced by typical family activities (bath, laundry, kitchen, etc.) ranging from (1) one to (8) eight people and not to exceed 500 US Gallons per day (1800 LPD) provided the waste contains nothing that will interfere with biological treatment. The FAST system is a biological treatment system not meant for non-biodegradable or industrial wastewater.
- MEDIA**
The FAST@media shall be manufactured of rigid PVC, polyethylene, or polypropylene and it shall be supported by the polyethylene insert. The media shall be fixed in position and contain no moving or wearing parts and shall not corrode. The media shall be designed and installed to ensure that sloughed solids descend through the media to the bottom of the septic tank.
- BLOWER**
The MicroFAST 0.50 unit shall come equipped with a regenerative type blower capable of delivering 17-25 CFM [31-46 m³/hr]. The blower assembly shall include an inlet filter with metal filter element. The blower shall be mounted outside the tank on a contractor supplied concrete base. Blower piping to the tank shall use non-corrosive material (PVC, Galvanized, or stainless Steel). Do not run galvanized pipe inside the treatment tank. Refer to Installation Manual for further details.
- REMOTE MOUNTED BLOWER**
The blower shall be placed on a contractor supplied concrete base. The blower must not sit in standing water and its elevation must be higher than the tank and normal flood level. A two-piece, rectangular housing shall be provided. The discharge air line from the blower to the MicroFAST@system shall be provided and installed by the contractor.
- ELECTRICAL**
The electrical source should be within 150 feet [45 meters] of the blower consult local codes for longer wiring distances. All wiring must conform to all applicable codes (IEC, NEC, etc.). Wiring distances must prevent significant voltage loss. Input power to electrical systems 110/220VAC, 1Ø, 35/1.7 FLA, on 50 electrical systems 220VAC, 1Ø, 1.9 FLA. Other voltages and phase are also available. Actual power consumption varies with site conditions. All conduit and wiring shall be supplied by contractor.
- CONTROLS**
The control panel provides power to the blower and contains an alarm system consisting of a visual and audible alarm capable of signaling blower circuit failure and high water conditions. The control panel is equipped with SFR@ (Sequencing Fixed Reactor) timed control feature. A manual alarm silence button is included.
- INSTALLATION AND OPERATING INSTRUCTIONS**
All work must be done in accordance with local codes and regulations. Installation of the FAST 0.50 shall be done in accordance with the written instructions provided by the manufacturer. Manuals shall be furnished, which will include a description of system installation, operation, and maintenance procedures.
- FLOW AND DOSING**
FAST@systems have been successfully designed, tested and certified receiving gravity, demand-based influent flow. When influent flow is controlled by pump or other means to help with highly variable flow conditions, then multiple dosing events should be used to maximize performance. The flow rate shall not exceed 5 gpm (19 Lpm) with a maximum hourly flow not to exceed 10% of the design daily flow (50 gph (190 LPH)).
- WARRANTY**
Bio-Microbics, Inc. warrants all new residential FAST@models (MicroFAST@0.50, 0.625, 0.75, 0.90, and 1.5) against defects in materials and workmanship for a period of two years after installation or three years from date of shipment which ever occurs first. All other FAST@system models are warranted for a period of one year after installation or eighteen months from date of shipment, whichever occurs first. All are subject to the following terms and conditions below:
During the warranty period, if any part is defective or fails to perform as specified when operating at design conditions, and if the equipment has been installed and is being operated and maintained in accordance with the written instructions provided by Bio-Microbics, Inc., Bio-Microbics, Inc. will repair or replace at its discretion such defective parts free of charge. Defective parts must be returned by owner to Bio-Microbics, Inc.'s factory postage paid, if so requested. The cost of labor and all other expenses resulting from replacement of the defective parts and from installation of parts furnished under this warranty and regular maintenance items such as filters or bulbs shall be borne by the owner. This warranty does not cover general system misuse, aerator components which have been damaged by flooding or any components that have been disassembled by unauthorized persons, improperly installed or damaged due to altered or improper wiring or overload protection. This warranty applies only to the treatment plant and does not include any of the structure wiring, plumbing, drainage, septic tank or disposal system. Bio-Microbics, Inc. reserves the right to revise, change or modify the construction and/or design of the FAST system or any component part or parts thereof, without incurring any obligation to make such changes or modifications in present equipment. Bio-Microbics, Inc. is not responsible for consequential or incidental damages of any nature resulting from such things as, but not limited to, defect in design, material, or workmanship, or delays in delivery, replacements or repairs.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED. BIO-MICROBICS SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NO REPRESENTATIVE OR PERSON IS AUTHORIZED TO GIVE ANY OTHER WARRANTY OR TO ASSUME FOR BIO-MICROBICS, INC. ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF ITS PRODUCTS. Contact your local distributor for parts and service.

TYPICAL SECTION - NOT FOR CONSTRUCTION



Design Specific Geometric Information

Retaining Wall System	ConcordWall w/Geogrid	Geogrid Type and Manufacturer	See Notes
Maximum Height mm (in)	990 (38)	Minimum Geogrid LTDS kN/m (lbf/ft)	See Notes
Maximum Slope Above Wall	Horizontal	Maximum Slope Below Wall	None
Max. Surcharge Above Wall kPa (lb/sq.ft)	Traffic Surcharge 12 kPa (250 lb/sq.ft)	Depth of Embedment mm (in)	153 (6)
Batter of Wall	9.5 °	Compacted Base Dimension mm (in)	610 x 153 (24 x 6)

Design Specific Soil Information

Description (by USCS)	Soil Region				Drainage
	Infill	Retained	Foundation	Base	
GW Well graded, free draining Granular	CL Inorganic Clays Low Plasticity	CL Inorganic Clays Low Plasticity	GW Well graded, free draining Granular	see infill	
Effective Internal Friction Angle	35	28	39	NR	
Moist Unit Weight kN/cu.m (lbf/cu.ft)	22 (140)	20 (127)	20 (127)	22 (140)	
Effective Cohesion kPa (lb/sq.ft)	NR	NR	NR	NR	
Soil Notes	Placed in 150mm (6") lifts and compacted to 95% SPD.	Undisturbed dense soil or well compacted Eng. fill.	Allowable bearing cap must exceed 50kPa (1050 psf).	Crushed Gravel (free draining) compacted to 98% SPD.	

- NR - Not Required
- Notes:
- This design meets or exceeds the minimum factors of safety required by Risi Stone Systems based on the design parameters listed above. The analysis was performed as outlined in the National Concrete Masonry Association Design Manual for Segmental Retaining Walls, Third Edition. This is a typical, non site-specific Design.
 - No analysis of global stability, total or differential settlement, or seismic effects has been performed.
 - This design is only provided to illustrate the general arrangement of the SRW structure for preliminary costing and feasibility purposes only. This drawing is not for construction. A qualified Engineer must be retained to provide the Final Design prior to construction.
 - Structures such as handrails, guardrails, fences, terraces, and site conditions such as water applications, drainage and soil conditions, additional live and dead loads, etc., have significant effects on the wall design and have not been taken into account in this typical section. When accounted for in the Final Design, other conditions and elements may result in additional design measures (geogrid, drainage, etc) and cost.
 - For geogrid reinforced structures, a minimum Long Term Allowable Design Strength of 14 kN/m was assumed. Contact your manufacturer or Risi Stone Systems for a list of approved geogrid reinforcements.

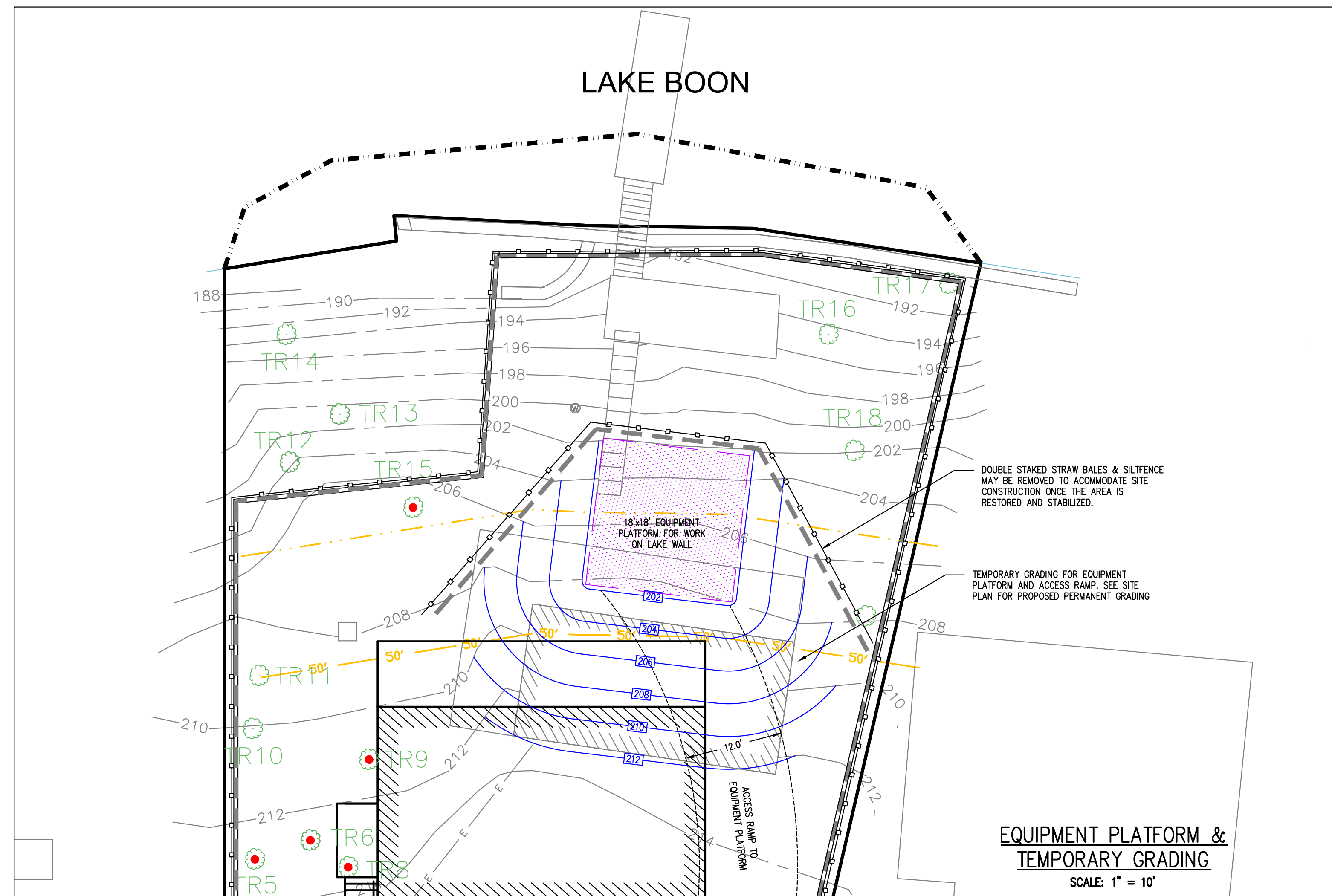
LAKE BOON RETAINING WALL
SCALE: NTS



www.risistone.com
1-800-626-9255

ConcordWall®
Retaining Wall
Geogrid Section
990mm (3.25ft)
Site: Surcharge - Clays
Infill: Granular
CW1RBQAI099

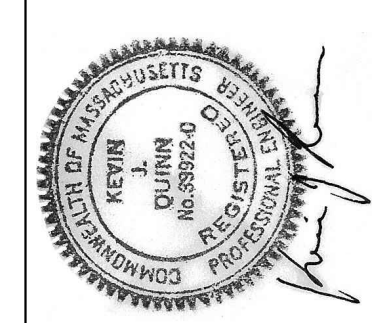
LAKE BOON



EQUIPMENT PLATFORM & TEMPORARY GRADING
SCALE: 1" = 10'



NO.	REVISION	DATE
3	REVISED PER CON COM & BOH	11/17/20
2	REVISED PER CON COM & BOH	11/12/20
1	REVISED PER BOH & ZBA	8/24/20



OWNER: MARY JANE CRAMER
52 FLINT DRIVE
MARLBORO MA, 01528

APPLICANT: FRANK & MARY JANE CRAMER
MARLBORO MA, 01528

KEVIN J. QUINN CIVIL #33922

PROPOSED SITE PLAN
IN STOW, MA
44 PINE POINT ROAD

QUINN ENGINEERING, INC.
P.O. Box 107
Paxton, Massachusetts 01612
(508)753-7999 Fax: (508)795-0939

DATE: FEBRUARY 7, 2020
SEPTIC DETAILS
44 POINT POINT ROAD
SHEET 4 OF 5