

**MAIN OFFICE:**

49 Herring Pond Road  
Buzzards Bay, MA 02532  
TEL: (508) 833-0070  
FAX: (508) 833-2282



**NANTUCKET OFFICE:**

19 Old South Road  
Nantucket, MA 02554  
TEL: (508) 325-0044  
[www.brackeneng.com](http://www.brackeneng.com)

January 11, 2023

**RECEIVED**

By Bourne Health Department at 9:43 am, Jan 12, 2023

Bourne Board of Health  
Terri Guarino, RS, CHO  
24 Perry Avenue  
Bourne, MA 02532

**RE: Septic Upgrade  
2 Jefferson Road (Map 23.4, Parcel 9)**

Dear Members of the Board:

On behalf of the Applicant, Arthur R. Hallam, III, please accept this re-submittal of a Variance Request to the Town of Bourne's Board of Health Regulations for the above referenced project. The applicant initially submitted a request in 2018 and the Board approved and issued the variance at the September 12, 2018 meeting. Due to COVID and Mr. Hallam's recent health concerns the work was not started before the approved variance expired. The applicant continues to propose the construction a new sewage disposal system with advanced denitrification treatment in association with the razing and reconstruction of a cottage and renovations to an existing single-family dwelling at 2 Jefferson Road in Gray Gables. The parcel is currently occupied by a 3-bedroom dwelling and 2-bedroom guest cottage. There will be no increase in flow to the new system and the number of bedrooms will remain the same in both the dwelling and cottage.

The following variances from the Board of Health regulations were requested and approved:

- Reduction in setback distance for the proposed soil absorption system area to a non-water dependent coastal bank from 150' to 21' (129' variance).
- Reduction in setback distance for the proposed soil absorption system area to a salt marsh from 150' to 120' (30' variance).
- Reduction in setback distance for the proposed soil absorption system area to a salt marsh from 150' to 135' (15' variance).

The subject coastal bank is a non-eroding/non-water dependent resource area regulated under the Massachusetts Wetland Protection Act as a flood prevention control measure. The closest water dependent resource area is the abutting salt marsh located to the north of the existing dwelling.

The proposed soil absorption system will be comprised of the MicroFAST de-nitrification unit and will provide pressure distribution to a BioDiffuser High Capacity Chamber soil absorption field.

The attached nitrogen loading calculations indicate there will be a decrease in nitrogen loading from 9.92 ppm to 6.30 ppm, with the use of the I/A system.

Enclosed are six (6) copies of the Variance Application, Nitrogen Loading Calculations, current and proposed floor plans, Subsurface Sewage Disposal Plan dated 06/06/2018 and \$125.00 for the Public Hearing Fee.

Thank you for your time and consideration on this matter. We look forward to reviewing this project with the Board of Health at the next scheduled Public Hearing. Should you have any questions regarding this project or require any further information please contact the undersigned at either 508-833-0070 or [zac@brackeneng.com](mailto:zac@brackeneng.com).

Sincerely,

**BRACKEN ENGINEERING, INC.**

A handwritten signature in black ink, appearing to read 'Zachary L. Basinski', is written over a horizontal line.

Zachary L. Basinski, P.E., C.F.M.  
Project Manager



## Bourne Board of Health Application for Septic Variance Requests



In accordance with the established procedures of the Bourne Board of Health, this application for septic variances and waivers is relevant to requests for relief which have not been approved administratively and require approval at a public meeting. Please use the following application form for guidance on how to apply for variances and waivers which serve new construction, changes in use, or increases in flow to on-site sewage disposal systems with design flows of less than 10,000 gallons/ day.

1. Facility Name and Address:

Owner's Name            Arthur R. Hallam III & Katherine A. Hallam

Facility's Street Address    2 Jefferson Road

Owner's Telephone Number   337-502-1333

Owner's E-mail Address       ahallam@lakecharlespilots.com

Owner's Mailing Address     2 Jefferson Road, Bourne, MA 02532

2. Applicant or Preparer's Name and Address (if different from above):

Preparer's Name           Zachary L. Basinski, PE and Alan M. Grady, PLS

Company                     Bracken Engineering, Inc.

Telephone Number         508-833-0070

E-mail Address             zac@brackeneng.com

Mailing Address            49 Herring Pond Road, Buzzards Bay

State/ Zip Code             MA / 02532

3. Type of Facility (check all that apply):

Residential     Commercial     Institutional     School     Industrial

4. Describe Facility (i.e. single-family dwelling, 45 seat restaurant): \_\_\_\_\_  
Single-family residence and cottage

5. Type of System Proposed (check all that apply):         Conventional Title 5         I/A System

Pumped System     Gravity System     Pressure Dosed     Other



6. Describe the proposed septic system components: Thirty (30) 16" Biodiffuser High Capacity Leaching Chambers. 1500 gal septic tank - MicroFast 0.9 unit, 1000 gal pump chamber

7. Design Flow per 310 CMR 15.203 (in gallons/ day):

Design flow of proposed system: 550 GPD

Total design flow of facility: 656 GPD


8. Enclose a letter of request for variances which makes reference to the specific provisions of Title 5 and the Board Bourne of Health Regulations for which a variance is sought. Please use this opportunity to demonstrate compliance with 310 CMR 15.410, and to justify the relevant facts and circumstances of the individual case. Note that with regard to variances for new construction, enforcement of the provision from which a variance is sought must be shown to deprive the applicant of substantially all beneficial use of the subject property in order to be manifestly unjust. Be sure to explain why full compliance with the applicable regulations is not feasible, and how a level of environmental protection that is at least equivalent to that provided under Title 5 and the Board of Health Regulations can be achieved without strict application of the regulations.

9. In order for this Application to be deemed complete, it must be accompanied by all of the following:

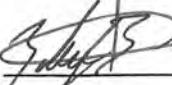
- Application Fees paid to the Town of Bourne.
- Letter of request (see samples)
- Six sets of complete plans and specifications. One with original stamp of design engineer.
- Nitrogen Loading Calculation Sheet(s)
- If abutter notification is required, one of each of the following must be submitted:
  - A copy of the certified list of abutters from the Assessor's Department
  - Sample letter for abutter notification postmarked 10 days prior to meeting date
  - Proof of certified mailing (receipts) meeting requirements of 310 CMR 15.405(2)
- Proposals for installation of Innovative/ Alternative systems must be accompanied by:
  - A copy of the Certification for Use including technology specific conditions
  - Draft disclosure notice for the I/A technology to be recorded in the deed
- Hydrogeologic data for all leaching facilities proposed within 100ft of a wetland/ watercourse
- Percentage of Increase Worksheet is required for waivers or increases in flow

10. Certification:

"I certify under penalty of law that this document and all attachments, to the best of my knowledge and belief, are true, accurate, and complete. I am aware that there may be significant consequences for submitting false information, including, but not limited to, penalties or fine and/or imprisonment for deliberate violations."

Facility Owner's Signature  BRACCO ENGINEERING, INC - Agent Date 1/10/2023

Print Name BRACCO ENGINEERING, INC

Signature of Preparer  BRACCO ENGINEERING, INC Date 1/10/2023

Print Name BRACCO ENGINEERING, INC

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For Office Use Only

Completed Application Received: \_\_\_\_\_

Reviewed By: \_\_\_\_\_

Hearing Date: \_\_\_\_\_

Permit #: \_\_\_\_\_

Circle all that apply:

Approved

Continued

Disapproved

Other

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



COMMONWEALTH OF MASSACHUSETTS

Board of Health, Bourne, MA.

APPLICATION FOR DISPOSAL SYSTEM CONSTRUCTION PERMIT

Application for a Permit to Construct ( ) Repair ( ) Upgrade ( ) Abandon ( ) - [X] Complete System [ ] Individual Components

Table with 2 columns: Applicant/Location info and Designer/Address info. Includes fields for Location, Map/Parcel#, Lot#, Installer's Name, Address, Telephone#, Owner's Name, and Designer's Name.

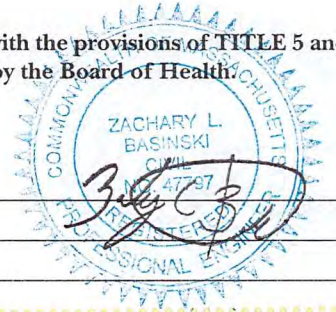
Type of Building: Single-family dwelling & Cottage. Lot Size: 28,430+/- sq. ft. Dwelling - No. of Bedrooms: 5 total (3 Main / 2 Cottage). Design Flow: 110 gpd. Calculated design flow: 550 GPD. Design flow provided: 656 gpd. Plan Date: June 6, 2018. Number of sheets: 2. Revision Date: \_\_\_\_\_.

DESCRIPTION OF REPAIRS OR ALTERATIONS: Installation of a new 1,500 gallon MicroFast 0.9 septic tank, MicroFast Blower Unit, 1,000 gallon pump chamber, and SAS to consist of thirty (30) 16" BioDiffuser HIGH Capacity Leaching Chambers

The undersigned agrees to install the above described Individual Sewage Disposal System in accordance with the provisions of TITLE 5 and further agrees to not to place the system in operation until a Certificate of Compliance has been issued by the Board of Health.

Signed \_\_\_\_\_ Date \_\_\_\_\_

Inspections \_\_\_\_\_



COMMONWEALTH OF MASSACHUSETTS

Board of Health, \_\_\_\_\_, MA.

CERTIFICATE OF COMPLIANCE

Description of Work: [ ] Individual Component(s) [X] Complete System

The undersigned hereby certify that the Sewage Disposal System; Constructed ( ), Repaired ( ), Upgraded ( ), Abandoned ( )

by: \_\_\_\_\_ at \_\_\_\_\_

has been installed in accordance with the provisions of 310 CMR 15.00 (Title 5) and the approved design plans/as-built plans relating to application No. \_\_\_\_\_, dated \_\_\_\_\_, Approved Design Flow \_\_\_\_\_ (gpd)

Installer: \_\_\_\_\_

Designer: \_\_\_\_\_ Inspector: \_\_\_\_\_ Date: \_\_\_\_\_

The issuance of this permit shall not be construed as a guarantee that the system will function as designed.

COMMONWEALTH OF MASSACHUSETTS

Board of Health, \_\_\_\_\_, MA.

DISPOSAL SYSTEM CONSTRUCTION PERMIT

Permission is hereby granted to; Construct ( ) Repair ( ) Upgrade ( ) Abandon ( ) an individual sewage disposal system at \_\_\_\_\_ as described in the application for Disposal System Construction Permit No. \_\_\_\_\_, dated \_\_\_\_\_.

Provided: Construction shall be completed within three years of the date of this permit. All local conditions must be met.



# Town of Bourne - Water Resources Nitrogen Loading and Mitigation Worksheet

See Cape Cod Commission Technical Bulletin 91-001 for further details: [https://capecodcommission.org/resource-library/file/?url=/dept/commission/team/Website\\_Resources/regulatory/NitrogenLoadTechbulletin.pdf](https://capecodcommission.org/resource-library/file/?url=/dept/commission/team/Website_Resources/regulatory/NitrogenLoadTechbulletin.pdf)

Facility Address: 2 Jefferson Road  
 Preparer's Name: Bracken Engineering, Inc.  
 Date: 1/9/2023  
 Watershed: None

Project Nitrogen Load	Proposed Wastewater	New Construction/ Raze & Rebuild, Increases in Flow, or Repairs/ Upgrades	Existing Conditions
1.	Project Title-5 wastewater flows: <input type="text" value="550.0"/> gpd (a) Actual wastewater flows: <input type="text" value="137.5"/> * (b) Average wastewater flows: <input type="text" value="343.8"/> gpd (a)+(b) +2= (A)	* Title-5 flows prescribed by TB91-001 for commercial uses	Calculate (A') through (P') as w/ (A) through (P): Title-5 wastewater flows: <input type="text" value="550.0"/> gpd Actual wastewater flows: <input type="text" value="137.5"/> * Avg. wastewater flows: <input type="text" value="343.8"/> gpd (A')
	Place <input checked="" type="checkbox"/> in applicable box: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Will the project be connected to sewer ? <input type="checkbox"/> <input checked="" type="checkbox"/> Is project Title-5 wastewater flow 10,000 gpd or greater ?		Place <input checked="" type="checkbox"/> in applicable box: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is existing development on sewer ? (If 'Yes', then go to line 2.)
	Place <input checked="" type="checkbox"/> in applicable box and multiply unsewered wastewater flow by applicable conversion factor: <input type="checkbox"/> Standard Title-5 System (35-ppm-N) x 0.048359 <input type="checkbox"/> DEP-approved I/A System (25-ppm-N) x 0.034542 <input checked="" type="checkbox"/> DEP-approved I/A System (19-ppm-N) x 0.026252 } Type of system: _ MicroFast <input type="checkbox"/> DEP-approved Enhanced I/A (12-ppm-N) x 0.016580		<input checked="" type="checkbox"/> Standard Title-5 System <input type="checkbox"/> DEP-approved I/A System (commercial) <input type="checkbox"/> DEP-approved I/A System (residential) <input type="checkbox"/> DEP-approved enhanced I/A
	Wastewater nitrogen load (Title-5 flows) = <input type="text" value="14.44"/> kg-N/yr (B) Wastewater nitrogen load (Actual flows) = <input type="text" value="3.61"/> kg-N/yr (C)		<input type="text" value="26.60"/> kg-N/yr (B') <input type="text" value="6.65"/> kg-N/yr (C') wastewater offsets
	<b>Stormwater Runoff</b> Town of Bourne Recharge rate for Bourne (inches; for natural areas from Technical Bulletin 91-001): <input type="text" value="21"/> (RECH)		
	Project site area: <input type="text" value="0.637"/> acres (D) Project site wetland area: <input type="text" value="0.000"/> acres (E) Project site upland area: <input type="text" value="0.637"/> acres (F) Pervious unpaved upland: <input type="text" value="0.562"/> acres (G)		Project site area: <input type="text" value="0.637"/> acres (D) Project site wetland area: <input type="text" value="0.000"/> acres (E) Project site upland area: <input type="text" value="0.637"/> acres (F) Pervious unpaved upland: <input type="text" value="0.570"/> acres (G')
	<input type="text" value="0"/> % using LID Paved area: <input type="text" value="567"/> s.f. (H) Factor may be adjusted for employment of LID → x 1.4158E-04 = <input type="text" value="0.08027813"/> kg-N/yr (I) LID = low impact development		Paved area: <input type="text" value="567"/> s.f. (H') Paving runoff offset: <input type="text" value="0.0803"/> kg-N/yr (I')
	Roof area: <input type="text" value="2,709"/> s.f. (J) x 7.0792E-05 = <input type="text" value="0.1918"/> kg-N/yr (K)		Roof area: <input type="text" value="2,347"/> s.f. (J') Roof runoff offset: <input type="text" value="0.1661"/> kg-N/yr (K')
	<b>Fertilizer</b> Previous unpaved upland - roof area = Managed turf/ lawn area <input type="text" value="11,200"/> s.f. x 3.4019E-04 = <input type="text" value="3.810"/> kg-N/yr (L)		Managed Turf/ lawn area: <input type="text" value="11,200"/> s.f. Fertilizer offset: <input type="text" value="3.810"/> kg-N/yr (L')
	<b>Total Nitrogen Load</b> Total project nitrogen load (Title-5 flows): <input type="text" value="18.52"/> kg-N/yr (M)= (B)+(I)+(K)+(L) Total project nitrogen load (Actual flows): <input type="text" value="7.69"/> kg-N/yr (N)= (C)+(I)+(K)+(L) Nitrogen load per acre (Average): <input type="text" value="20.57"/> kg-N/yr/acre (O)= (M)+(N) +2 +(F)		Existing nitrogen load (Title-5 flows): <input type="text" value="30.65"/> kg-N/yr (M') Existing nitrogen load (Actual flows): <input type="text" value="10.71"/> kg-N/yr (N') Nitrogen offset per acre: <input type="text" value="32.45"/> kg-N/yr/acre (O')
	<b>Proposed Nitrogen Loading Concentration</b> Project nitrogen loading concentration (Title-5 flows): <input type="text" value="8.11"/> ppm-N (P)= (a)+723.76 + (G)x(RECH)+9.7286 + (H)+10,594 + (K)+0.75 Project nitrogen loading concentration (Actual flows): <input type="text" value="4.49"/> ppm-N (Q)= (b)+723.76 + (G)x(RECH)+9.7286 + (H)+10,594 + (K)+0.75 Project nitrogen loading concentration (Average): <input type="text" value="6.30"/> ppm-N (R)= (P)+(Q) +2		<b>Existing nitrogen loading concentrations:</b> Title-5 flows <input type="text" value="13.53"/> ppm-N (P') Actual flows <input type="text" value="6.31"/> ppm-N (Q') Average <input type="text" value="9.92"/> ppm-N (R')

Resource/ Impact Based Criteria

Marine Water Recharge Areas / Coastal Embayments

2.  Yes  No  
Is the project located in any of the following watersheds: **Buttermilk Bay Basins, Phinneys Harbor / Back River / Eel Pond, Pocasset River Basin, Pocasset Harbor / Hen Cove / Red Brook Harbor, Megansett / Squeteague Harbors\*\* ?**  
(If 'No', then go to line 3.)

Name of Watershed

(from Regional Policy Plan Data Viewer): \_\_\_\_\_

Critical Nitrogen-loading limit\*\* :  kg-N/year/acre (S)

Does project's nitrogen load (O) exceed the existing load (O') AND the critical nitrogen load (S) ?  
(If 'No', then go to line 3.)

Excess project nitrogen load to be mitigated:  kg-N/yr (T)= LESSER OF (O)-(S) x(F) AND (O)-(O') x(F)

\*\* When a nitrogen-loading limit has been determined through either a Total Maximum Daily Load (TMDL), a Massachusetts Estuaries Project-accepted technical report, or specified by a Commission-approved comprehensive wastewater management plan pursuant to Objective WR3, or if impaired water quality has been documented for the receiving coastal waters, the nitrogen loading limit shall be 0 kg-N/yr per acre pursuant to Objective WR3.

Groundwater Quality

3.  Yes  No  
Does the project's nitrogen loading concentration in groundwater (R) exceed the greater of 5 ppm or the existing concentration (R') ?  
(If 'Yes', the project will need to provide an alternative strategy for meeting these thresholds by using another worksheet)

Potential Public Water Supply Areas

4.  Yes  No  
Is project in a Potential Public Water Supply Area (PPWSA) ?  
(If 'No', then go to line 5.)

Does the project's nitrogen loading concentration (R) exceed the greater of 1 ppm or the existing concentration (R') ?  
(If 'Yes', the project must provide an alternative strategy for meeting Objective WR1)

Does the project use, treat, generate, store or dispose of hazardous materials in excess of the greater of a) household quantities or b) existing quantities ?  
(If 'Yes', the project must provide an alternative strategy for meeting Objective WR1)

Wellhead Protection Areas

5.  Yes  No  
Is project in a Wellhead Protection Area (WHPA) ?

Does the project's nitrogen loading concentration (R) exceed the greater of 5 ppm or the existing concentration (R') ?  
(If 'Yes', the project must provide an alternative strategy for meeting Objective WR1)

Does the project use, treat, generate, store or dispose of hazardous materials in excess of the greater of a) household quantities or b) existing quantities ?  
(If 'Yes', the project must provide an alternative strategy for meeting Objective WR1)

Fresh Water Recharge Areas

6.  Yes  No  
Is project wastewater disposed of within 300 feet of a stream or fresh surface water body?  
(If 'No', then go to line 7.)

Is the project located in a freshwater recharge area (FWRA) hydraulically upgradient of a stream or fresh surface water body?  
(If 'Yes', the project must provide an alternative strategy for meeting Objective WR2)

Other Potential Impacts

7.  Yes  No  
Will the project withdraw more than 20,000 gallons of water per day ?  
(If 'Yes', then the project must provide documentation demonstrating that there will not be significant impacts to water levels, surface waters and wetlands)

8. The project must demonstrate compliance with Objective WR4, including use of Low Impact Development to mitigate impacts of stormwater runoff and O & M plans for maintaining stormwater infrastructure and landscaping.

**Notice of Alternative Sewage Disposal System**  
M.G.L. c. 21A, § 13 and 310 CMR 15.0287(10)

**ADDRESS OF PROPERTY SERVED BY ALTERNATIVE SYSTEM:**

**2 Jefferson Road, Bourne, MA**

**TITLE REFERENCE FOR PROPERTY SERVED BY ALTERNATIVE SYSTEM:**

**Deed recorded with the Barnstable Registry of Deeds in Book 21486, Page 213**

**NAME(S) AND ADDRESS OF OWNER OF PROPERTY SERVED BY ALTERNATIVE SYSTEM:**

**Arthur R. Hallam III and Katherine A. Hallam  
2 Jefferson Road  
Bourne, MA 02532**

WHEREAS, Section 15.280 of Title 5 of the State Environmental Code (“Approval of Alternative Systems”), provides for the Massachusetts Department of Environmental Protection (the “Department”) to approve or certify, as appropriate, all proposals to construct, upgrade or replace on-site sewage disposal systems using alternative systems;

WHEREAS, owners and/or operators of approved or certified alternative systems are subject to general conditions, as specified in Section 15.287 of Title 5 of the State Environmental Code, 310 CMR 15.287, and may be subject to special conditions, as specified in the Department’s approvals or certifications; such general and special conditions potentially including, without limitation, requirements relating to the use of trained operators, periodic inspections, maintenance, sampling, reporting and/or recordkeeping;

WHEREAS, the owners and/or operators this alternative system acknowledges and agrees to comply with the provisions of all of the Bourne Board of Health Alternative Septic System Regulations and any other conditions for the existence of the system;

WHEREAS, Section 15.287(10) of Title 5 of the State Environmental Code, 310 CMR 15.287(10), requires that “prior to obtaining a Certificate of Compliance for installation of a new or upgraded system, the system owner shall record in the chain of title for the property served by the alternative system in the Registry of Deeds and/or Land Registration Office, as applicable, a Notice disclosing both the existence of the alternative on-site system and the Department’s approval of the system. The system owner shall also provide evidence of such recording to the Bourne Board of Health, and

WHEREAS, the Property is served by an alternative sewage disposal system.

NOW, THEREFORE, Notice of an alternative sewage disposal system is hereby given for the above-referenced Property, as follows:

**1. Existence.** An alternative system has been installed as a new or upgraded alternative sewage disposal system, on or adjacent to the Property, and serves the Property. The trade name and model number(s) of the alternative system are as follows:

<b>Trade name of technology:</b>	MicroFast
<b>Manufacturer Name:</b>	BioMicrobics, Inc.
<b>Model number(s):</b>	0.9 DeNitrification Unit



**2. Approval/Certification.** On June 16, 2006 (modified January 23, 2008), revised 11/05/2015, the Department, pursuant to its authority under the section of Title 5 as specified below, approved or certified the technology used in the above referenced alternative system, under MassDEP Transmittal Number W 072367.

X Approved for remedial use under 310 CMR 15.284

A copy of the Department's Approval/Certification is available from the Department in person or online at the Department's website: <http://www.mass.gov/dep> .

**\*\*This Notice of Alternative Sewage Disposal System must be submitted to the Bourne Board of Health\*\***

WITNESS the execution hereof under seal this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, made by the above-named Alternative System Owner(s).

\_\_\_\_\_

Print Name(s): \_\_\_\_\_

COMMONWEALTH OF MASSACHUSETTS

\_\_\_\_\_, ss

On this \_\_\_\_ day of \_\_\_\_\_, 20\_\_, before me, the undersigned notary public, personally appeared \_\_\_\_\_, proved to me through satisfactory evidence of identification, which were \_\_\_\_\_, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that (he) (she) signed it voluntarily for its stated purpose.

\_\_\_\_\_  
(official signature and seal of notary)

WITNESS the execution hereof under seal this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, made by the above-named Alternative System Owner(s).

\_\_\_\_\_

Print Name(s): \_\_\_\_\_

COMMONWEALTH OF MASSACHUSETTS

\_\_\_\_\_, ss

On this \_\_\_\_ day of \_\_\_\_\_, 20\_\_, before me, the undersigned notary public, personally appeared \_\_\_\_\_, proved to me through satisfactory evidence of identification, which were \_\_\_\_\_, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that (he) (she) signed it voluntarily for its stated purpose.

\_\_\_\_\_  
(official signature and seal of notary)

Approved and Accepted By:

\_\_\_\_\_ Date: \_\_\_\_\_  
Agent of the Board of Health  
Health Department  
Town of Bourne

ATTACHMENT:

TOWN OF BOURNE | BOARD OF HEALTH | VARIANCE APPROVAL NOTICE

# GRANT OF TITLE 5 BEDROOM COUNT DEED RESTRICTION

This Grant of Title 5 Bedroom Count Deed Restriction is made as of \_\_\_\_\_ by Arthur R. Hallam, III and Katherine A. Hallam (“Grantors”), of 2 Jefferson Road, Bourne, MA 02532, Barnstable County, MA, pursuant to M.G.L. c. 21A, §13 and 310 CMR 15.000 (collectively, “Title 5”).

WITNESSETH

WHEREAS, Grantor, being the owner(s) in fee simple of that certain parcel of land located in Bourne, Barnstable County, Massachusetts, with the buildings and improvements thereon, pursuant to a deed from Peter G. Richter to Grantor, dated October 31, 2006, and recorded with Barnstable County Registry of Deeds in Book 21486, Page 213, said parcel of land being shown on a plan entitled, “Plan of Lot A to be Conveyed by Ernest R. and Doris M. Schofield in Gray Gables, Bourne, MA”, dated April 22, 1971, prepared by Newell B. Snow, recorded with Barnstable County Registry of Deeds in Plan Book 247, Page 72 (“Property”); and

WHEREAS, Grantor desires to restrict the number of bedrooms, as the term bedroom is defined at 310 CMR 15.002 (“Bedroom”) and the Board of Health regulation dated effective April 24, 1992 and amended on September 22, 2022, regarding bedroom definition, through the granting of this Title 5 Bedroom Count Deed Restriction;

NOW, THEREFORE, Grantor does hereby GRANT to the Town of Bourne of Barnstable County, Massachusetts, a municipal corporation located in Barnstable County, having a mailing address of 24 Perry Avenue, Buzzards Bay, Massachusetts, and acting by and through its Board of Health (“Local Approving Authority”), for nominal and nonmonetary consideration, the sufficiency and receipt of which are hereby acknowledged, with QUITCLAIM COVENANTS, a TITLE 5 BEDROOM COUNT DEED RESTRICTION (“Restriction”) in, on, upon, through, over and under the Property.

Said Restriction operates to restrict the Property as follows:

**1. Restriction.** Grantor hereby restricts the total number of Bedrooms in, on, upon, through, over and under the Property to **Five Bedrooms**, such that at no time shall there exist more than **Five Bedrooms** in, on, upon, through, over and under said Property.

**2. Severability.** Grantor hereby agrees that, in the event that a court or other tribunal determines that any provision of this instrument is invalid or unenforceable:

- (i) That such provision shall be deemed automatically modified to conform to the requirements for validity and enforceability as determined by such court or tribunal; or
- (ii) That any such provision, by its nature, cannot be so modified, shall be deemed deleted from this instrument as though it had never been included herein.

In either case, the remaining provisions of this instrument shall remain in full force and effect.

**3. Enforcement.** Grantor expressly acknowledges that a violation of the terms of this Restriction could result in the following:

- (i) upon determination by a court of competent jurisdiction, in the issuance of criminal and civil penalties, and/or equitable remedies, including, but not limited to, injunctive relief, such injunctive relief could include



the issuance of an order to modify or remove any improvements constructed upon the Property in violation of the terms of this Restriction; and

(ii) in the initiation of an enforcement action and/or assessment of penalties by the Bourne Board of Health and/or the Massachusetts Department of Environmental Protection, a duly constituted agency with a principal office located at One Winter Street, Boston, MA 02108 (DEP), to enforce the terms of this Restriction pursuant to Title 5; M.G.L. c.111, §§ 2C, 17, 31, 122, 123, 125, 127A-O, inclusive, and 129; and M.G.L. c. 83, §11.

**4. Provisions to Run with the Land.** The rights, liabilities, agreements and obligations created under this Restriction shall run with the Property and any portion thereof for the term of this Restriction. Grantor hereby covenants for [himself/herself/itself] and [his/her/its] executors, administrators, heirs, successors and assigns, to stand seized and to hold title to the Property and any portion thereof subject to this Restriction.

The rights granted to the Bourne Board of Health, its successors and assigns, do not provide, however, that a violation of this Restriction shall result in a forfeiture or reversion of Grantor's title to the Property.

**5. Concurrence Presumed.** It is agreed that:

(i) Grantor and all parties claiming by, through, or under Grantor agree to and shall be subject to the provisions of this Restriction; and

(ii) Grantor and all parties claiming by, through, or under Grantor, and their respective agents, contractors, sub-contractors and employees, agree that the Restriction herein established shall be adhered to and shall not be violated, and that their respective interests in the Property shall be subject to the provisions herein set forth.

**6. Incorporation into Deeds, Mortgages, Leases, and Instruments of Transfer.** Grantor hereby agrees to incorporate this Restriction, in full or by reference, into all deeds, easements, mortgages, leases, licenses, occupancy agreements or any other instrument of transfer by which an interest and/or a right to use the Property, or any portion thereof, is conveyed.

**7. Recordation.** Grantor shall record and/or register this Restriction with the appropriate Registry of Deeds and/or Land Registration Office within 30 days of receiving the approved Restriction from the Local Approving Authority. Grantor shall file with the Bourne Board of Health and the DEP a certified Registry copy of this Restriction as recorded and/or registered within 30 days of its date of recordation and/or registration.

**8. Amendment and Release.** This Restriction may be amended only upon the approval and acceptance of such amendment by the Local Approving Authority. Release of this Restriction shall be granted by the Local Approving Authority upon (i) Grantor's request of such release; and (ii) the Property being connected to a municipal sewer system and the septic system serving the Property being abandoned in accordance with 310 CMR 15.354. Any such amendment or release shall be recorded and/or registered with the appropriate Registry of Deeds and/or Land Registration Office and a certified Registry copy of said amendment or release shall be filed with the Bourne Board of Health and the DEP within 30 days of its date of recordation and/or registration.

**9. Term.** This Restriction shall run in perpetuity and is intended to conform to M.G.L. c.184, §26, as amended.

**10. Rights Reserved.** This Restriction is granted to the Bourne Board of Health. It is expressly agreed that acceptance of this Restriction by the Bourne Board of Health shall not operate to bar, diminish, or in any way

affect any legal or equitable right of the Bourne Board of Health or of DEP to issue any future order with respect to the Property or in any way affect any other claim, action, suit, cause of action, or demand which the Bourne Board of Health or DEP may have with respect thereto. Nor shall acceptance of the Restriction serve to impose any obligations, liabilities, or any other duties upon the Bourne Board of Health.

**11. Effective Date.** This Restriction shall become effective upon its recordation and/or registration with the appropriate Registry of Deeds and/or Land Registration Office.

**12. No construction permits shall be issued for the Property until a certified Registry copy is submitted to the office of the Bourne Board of Health unless written approval is otherwise granted by the Board of Health.**

WITNESS the execution hereof under seal this \_\_\_\_\_ day of \_\_\_\_\_, 2023.

\_\_\_\_\_  
Grantor

COMMONWEALTH OF MASSACHUSETTS

\_\_\_\_\_, ss \_\_\_\_\_, 2023

Then personally appeared the above-named \_\_\_\_\_ and acknowledged the foregoing instrument to be his/her free act and deed before me.

\_\_\_\_\_  
Notary Public:

My commission expires:

Approved and Accepted By:

\_\_\_\_\_  
Terri A. Guarino, RS, CHO  
Health Director  
Town of Bourne

Date: \_\_\_\_\_



## Department of Environmental Protection

One Winter Street Boston, MA 02108 • 617-292-5500

DEVAL L. PATRICK  
Governor

TIMOTHY P. MURRAY  
Lieutenant Governor

RICHARD K. SULLIVAN JR.  
Secretary

KENNETH L. KIMMELL  
Commissioner

### REVISION OF APPROVAL FOR REMEDIAL USE

Pursuant to Title 5, 310 CMR 15.00

Name and Address of Applicant:

Bio-Microbics, Inc.  
8450 Cole Parkway  
Shawnee, KS 66227

Trade name of technology and models: MicroFAST® Treatment System Models *MicroFAST® 0.5, 0.75, 0.9, 1.5, 3.0, 4.5 and 9.0*; HighStrengthFAST® Treatment System Models *HighStrength FAST® 1.0, 1.5, 3.0, 4.5 and 9.0* and NitriFAST® Treatment System Models *NitriFAST® 0.5, 0.75, 1.0, 1.5, 3.0, 4.5 and 9.0* (hereinafter called the "System"). Schematic Drawings illustrating each System, a design and installation manual, an owner's manual, an operation and maintenance manual, and an inspection checklist are part of this Approval.

Transmittal Number: W 072367  
Date of Issuance: June 16, 2006 (modified January 23, 2008)  
Revision date: November 05, 2012

### Authority for Issuance

Pursuant to Title 5 of the State Environmental Code, 310 CMR 15.000, the Department of Environmental, Protection hereby issues this Approval for Remedial Use to: Bio-Microbics, Inc., 8450 Cole Parkway, Shawnee, KS 66227, (hereinafter "the Company"), approving the System described herein for Remedial Use in the Commonwealth of Massachusetts. The sale, design, installation, and use of the System are conditioned on compliance by the Company, the Designer, the Installer, the Service Contractor, and the System Owner with the terms and conditions set forth below. Any noncompliance with the terms or conditions of this Approval constitutes a violation of 310 CMR 15.000.

David Ferris, Director  
Wastewater Management Program,  
Bureau of Resource Protection

November 05, 2012

Date



## **Technology Description**

The System is a Secondary Treatment Unit (STU). The Systems, MicroFAST® 0.5, 0.75, 0.9, 1.5, 3.0, 4.5 and 9.0, and HighStrengthFAST® 1.0, 1.5, 3.0, 4.5 and 9.0, and, NitriFAST® 0.5, 0.75, 0.9, 1.5, 3.0, 4.5 and 9.0 units are installed in a tank or tanks having a primary settling zone and an aerobic biological zone. Solids settle in the primary settling zone that is quiescent. In the aerobic zone, the sewage is continually agitated and aerated. Bacteria in the sewage attach to the surface of a submerged plastic media; they reproduce by consuming the organic material in the sewage.

## **Conditions of Approval**

The term “System” refers to the STU in combination with the other components of an on-site treatment and disposal system that may be required to serve a facility in accordance with 310 CMR 15.000.

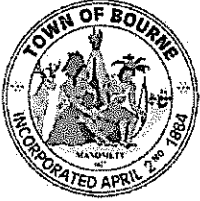
The term “Approval” refers to the technology-specific Special Conditions, the conditions applicable to all STU’s with Remedial Use Approval, the General Conditions of 310 CMR 15.287, and any Attachments.

For Secondary Treatment Units that have been issued Remedial Use Approval for the upgrade or replacement of an existing failed or nonconforming system., the Department authorizes reductions in the effective leaching area (310 CMR 15.242), the depth to groundwater (310 CMR 15.212), and/or the depth of naturally occurring pervious material (310 CMR 15.240(1)) subject to the conditions that apply to all Secondary Treatment Units Approved for Remedial Use and subject to the Special Conditions applicable to the Technology.

## **Special Conditions**

1. The System is Secondary Treatment Unit Approved for Remedial Use. In addition to the Special Conditions contained in this Approval, the System shall comply with all the “Standard Conditions for Secondary Treatment Units Approved for Remedial Use”, except where stated otherwise in these Special Conditions.
2. The System is approved for facilities where the local approving authority finds that:
  - a) there is no increase in the actual or proposed design flow;
  - b) the System is for the upgrade of a failed, failing or nonconforming system; and
  - c) a conventional system with a reserve area, designed in accordance with the standards of 310 CMR 15.100 through 15.255, cannot feasibly be built on-site.

3. The MicroFAST® 0.5, 0.75 and 0.9, HighStrengthFAST® 1.0 and NitriFAST® 0.5, 0.75 and 0.9 are installed in the second compartment of a two-compartment tank with a total liquid capacity of at least 1,500 gallons constructed in accordance with 310 CMR 15.226.
4. The MicroFAST®, HighStrengthFAST® and NitriFAST® 1.5 are installed in the second compartment of a two compartment 3,000-gallon tank constructed in accordance with 310 CMR 15.226.
5. The MicroFAST®, HighStrengthFAST® and NitriFAST® 3.0, 4.5, and 9.0 units are installed in a separate tank constructed in accordance with 310 CMR 15.226. The units are located between a standard Title 5 septic tank, designed in accordance with 310 CMR 15.223 and 15.224, and the soil adsorption system (SAS).
6. Access shall be provided to all tanks in the primary settling and aerobic biological zones in accordance with 310 CMR 15.228 (2). The primary settling tank shall have at least three manholes with readily removable impermeable covers of durable material provided at grade. Two manholes, over the inlet and outlet of the primary settling tank, shall have a minimum opening of 20 inches. All access ports and manhole covers shall be installed and maintained at grade to allow for maintenance of the System.



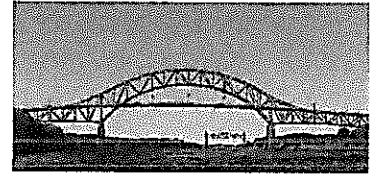
## **TOWN OF BOURNE**

**Board of Assessors**

**24 Perry Avenue**

**Buzzards Bay, MA 02532**

**(508) 759-0600 Ext. 1510 ♦ Fax (508) 759-8026**



Michael Leitzel, Chairperson  
Ellen Doyle Sullivan, Clerk  
Donna Barakauskas, Member

Rui Pereira, MAA  
Director of Assessing

December 19, 2022

Arthur R. Hallam III etux  
c/o Bracken Engineering, Inc.  
49 Herring Pond Rd.  
Buzzards Bay, MA 02532

Re: Abutters List for Map 23.4 Parcel 9  
Property address: 2 Jefferson Road

As required by the Bourne Board of Health, pursuant with section 310 CMR 15.411(1), this is to certify that the attached list of names and addresses constitutes all of the parties in interest as shown on the most recent tax list of the Town of Bourne.

Abutting properties are: Map 23.4 Parcels 8 & 10; Map 26.2 Parcel 44.

Your payment of \$10.00 has been received by the Bourne Assessor's Office.

**Please be advised that this abutters list is only good for 30 days from the date on this letter. Expired abutters list can be recertified for an additional filing fee.**

See enclosed for abutters mailing addresses.

Board of Assessors

*Ellen Doyle Sullivan -  
Donna Barakauskas  
Michael Leitzel*



Extract: ABUTTERS LIST  
 Database: LIVE  
 Filter: Key IN 4811,4813,5463  
 Sort:

Report #24: Owner Listing Report  
 Fiscal Year 2023

Bourne MA

Key	Parcel ID	Owner	Location	LC/CI	Bk-Pg(Cert) /Dt	Mailing Street	Mailing City	ST	Zip Cd/County
4811	23.4-8-0	SCHOFIELD ALLEN W TR 12 BELL ROAD NOMINEE TR	12 BELL RD	N 1090	26014/316 3/3/2014	5 SCHOFIELD RD	HOPKINTON	MA	01748
4813	23.4-10-0	SOARES JOSEPH M JR & ELIZABETH L TRS SOARES FAMILY TRUST	6 JEFFERSON RD	N 1010	26138/22 3/7/2012	6 JEFFERSON RD	BOURNE	MA	02532
5463	26.2-44-0	COCUZZO JOSEPH D TR OF THE COCUZZO FAMILY RLTY TRUST	78 THORNE RD	N 1010	15329/60.62 7/2/2002	24 CASTANO CT	NEEDHAM	MA	02494

Total Records 3

**MAIN OFFICE:**  
49 Herring Pond Road  
Buzzards Bay, MA 02532  
TEL: (508) 833-0070  
FAX: (508) 833-2282



**NANTUCKET OFFICE:**  
19 Old South Road  
Nantucket, MA 02554  
TEL: (508) 325-0044  
[www.brackeneng.com](http://www.brackeneng.com)

January XX, 2023

**CERTIFIED MAIL**

RE : Notice of Public Hearing

Dear Abutter:

In accordance with the State Environmental Code, Title 5: 310 CMR 15.00, you are hereby notified that **Arthur & Katherine Hallum** have requested a hearing before the Bourne Board of Health for relief from the Bourne Board of Health Regulations for the installation of an upgraded Septic System. The location of the property for which approval is sought is **2 Jefferson Road (Map 23.4, Parcel 9), Pocasset** where you are listed as an abutter. At said hearing the Board will discuss and possibly vote on:

- **Reduction in setback distance for the proposed soil absorption system area to a non-water dependent coastal bank from 150' to 21' (129' variance).**
- **Reduction in setback distance for the proposed soil absorption system area to a salt marsh from 150' to 120' (30' variance).**
- **Reduction in setback distance for the proposed soil absorption system area to a salt marsh from 150' to 135' (15' variance)**

This hearing is tentatively scheduled for Wednesday, **February XXth** at **5:30 p.m.** in Conference Room #2 at the Bourne Veteran's Memorial Community Building, 239 Main Street, Buzzards Bay. Information regarding the hearing may be available for your review one week prior to the meeting by contacting the Bourne Health Department at 508-790-0600, Ext. 1513, Monday through Friday from 8:30 a.m. until 4:30 p.m.

Meeting agendas are posted on the Town of Bourne website, [www.townofbourne.com/health](http://www.townofbourne.com/health) no less than 48 hours in advance of the hearing. *Please confirm the date, time, and location of the meeting with the Town, in case of any changes.* Should you have any questions or concerns, please do not hesitate to contact the undersigned at [zac@brackeneng.com](mailto:zac@brackeneng.com) or the Bourne Health Department at 508-790-0600, Ext. 1513.

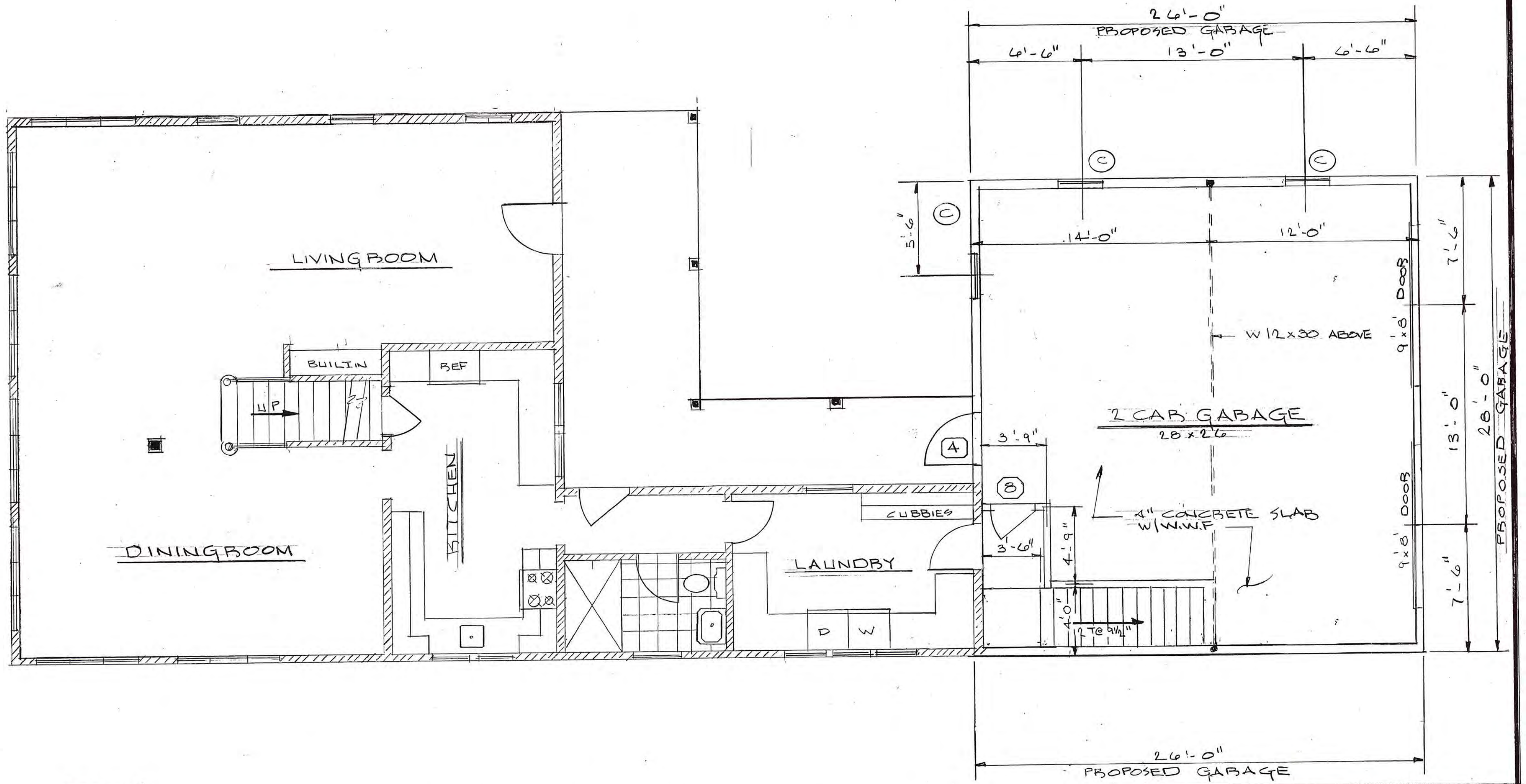
Sincerely,

**BRACKEN ENGINEERING INC.**

A handwritten signature in black ink, appearing to read 'Zachary L. Basinski', written over a horizontal line.

Zachary L. Basinski, PE, C.F.M  
Project Manager  
Agent for the Applicant





NOTES

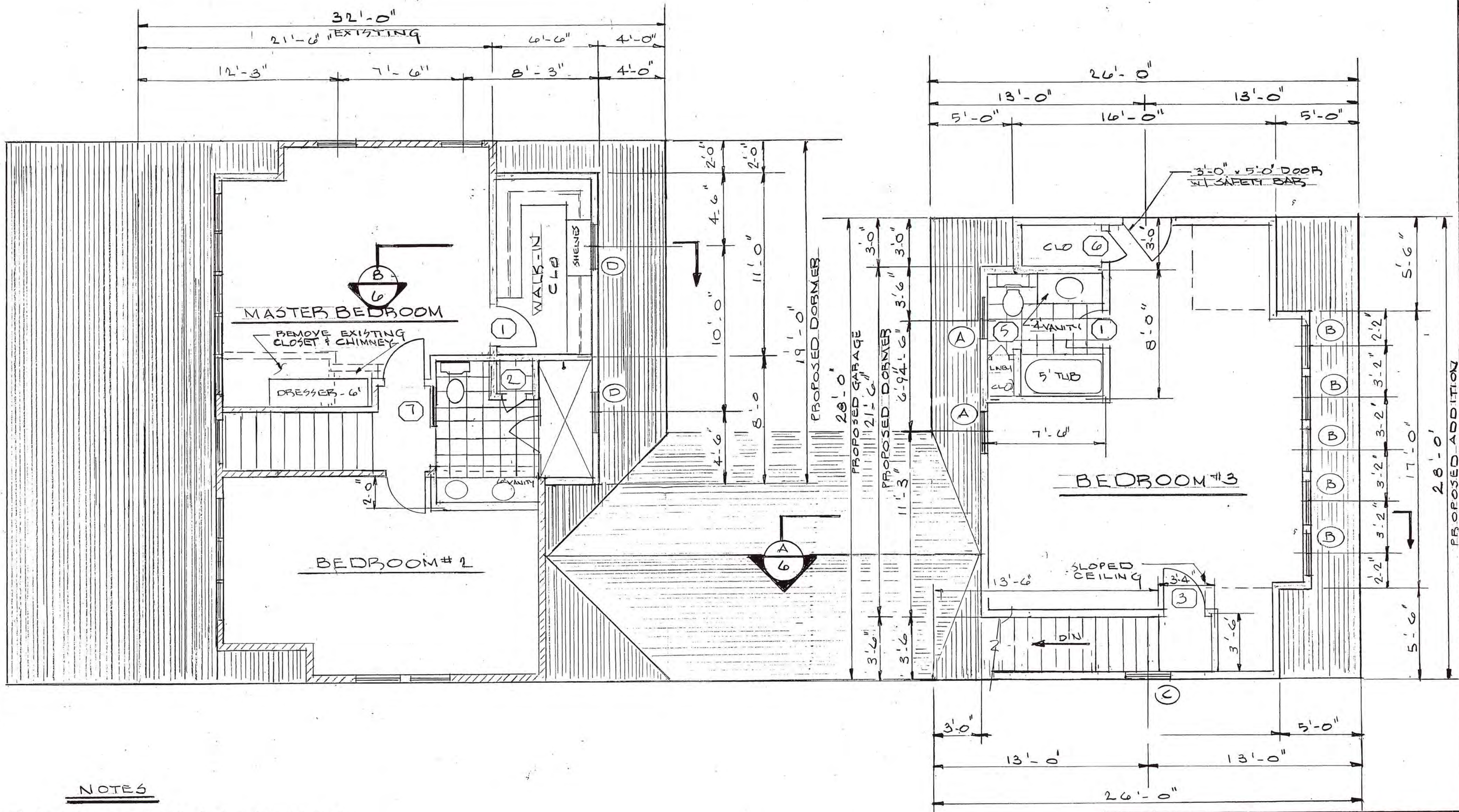
1. ALL CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE MASSACHUSETTS STATE BUILDING CODE AND ALL LOCAL TOWN CODES
2. ALL DIMENSIONS SHALL BE VERIFIED BY THE OWNERS AND THE GENERAL CONTRACTOR PRIOR TO THE START OF CONSTRUCTION
3. INDICATES EXISTING  
 INDICATES NEW CONSTRUCTION

FIRST FLOOR PLAN

SCALE 1/4" = 1'-0"

PROPOSED ADDITION TO THE HALLAM RESIDENCE 2 JEFFERSON ROAD BOURNE, MASSACHUSETTS	
<b>FIRST FLOOR PLAN</b>	
DRAWN BY A.M. MICHNIEWICZ	DWG. NO. 3
DATE 9-2016	





NOTES

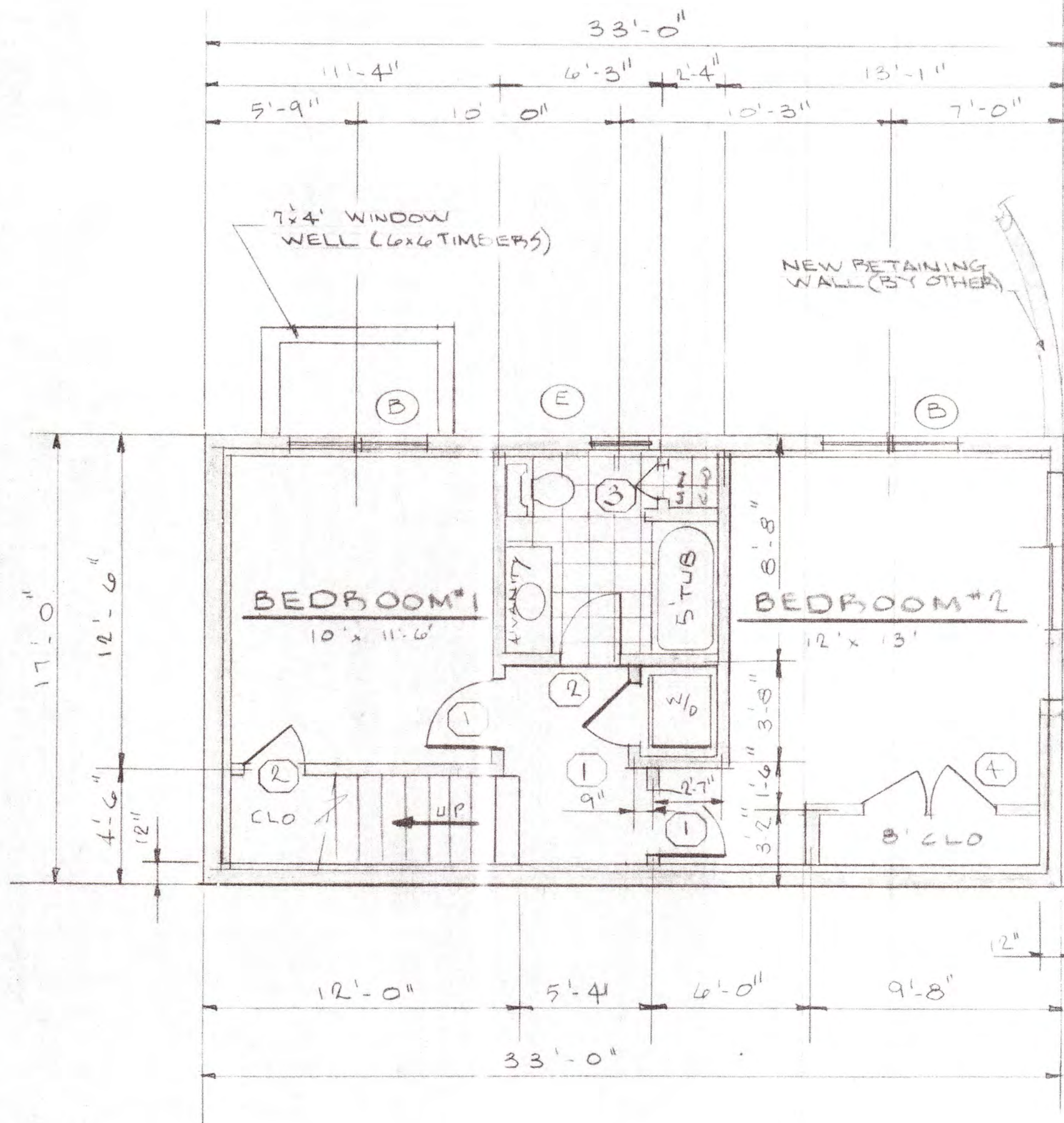
1. ALL CONSTRUCTION SHALL BE IN CONFORMANCE W/ THE MASSACHUSETTS STATE BUILDING CODE AND ALL LOCAL TOWN CODES.
2. ALL DIMENSIONS SHALL BE VERIFIED BY THE OWNERS AND THE GENERAL CONTRACTOR, PRIOR TO THE START OF CONSTRUCTION.
3. INDICATES EXISTING  
 INDICATES NEW CONSTRUCTION

**SECOND FLOOR PLAN**

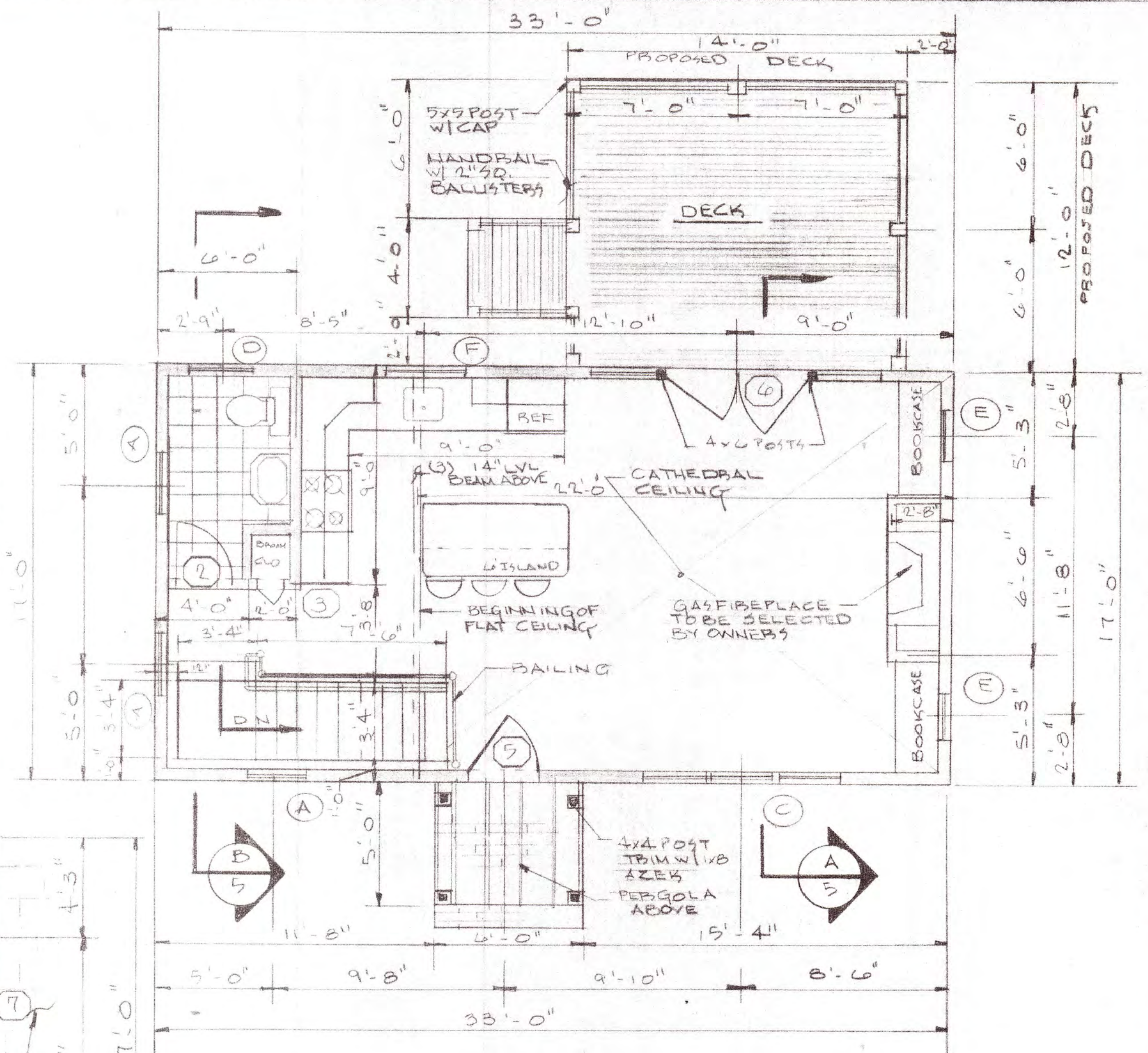
SCALE 1/4" = 1'-0"

PROPOSED ADDITIONS TO THE HALLAM RESIDENCE 2 JEFFERSON ROAD BOURNE, MASSACHUSETTS	
SECOND FLOOR PLAN	
DRAWN BY A.M. MICHNIEWICZ	DWG. NO. 4
DATE 9.2015	





**BASEMENT PLAN**  
SCALE 1/4" = 1'-0"



**FIRST FLOOR PLAN**  
SCALE 1/4" = 1'-0"

**NOTES**

1. ALL CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE MASSACHUSETTS STATE BUILDING CODE AND ALL LOCAL TOWN CODES
2. ALL DIMENSIONS SHALL BE VERIFIED BY THE OWNERS & THE GENERAL CONTRACTOR PRIOR TO THE START OF CONSTRUCTION

PROPOSED REBUILDING OF  
HALLAM COTTAGE  
2 JEFFERSON ROAD  
BOURNE, MASSACHUSETTS

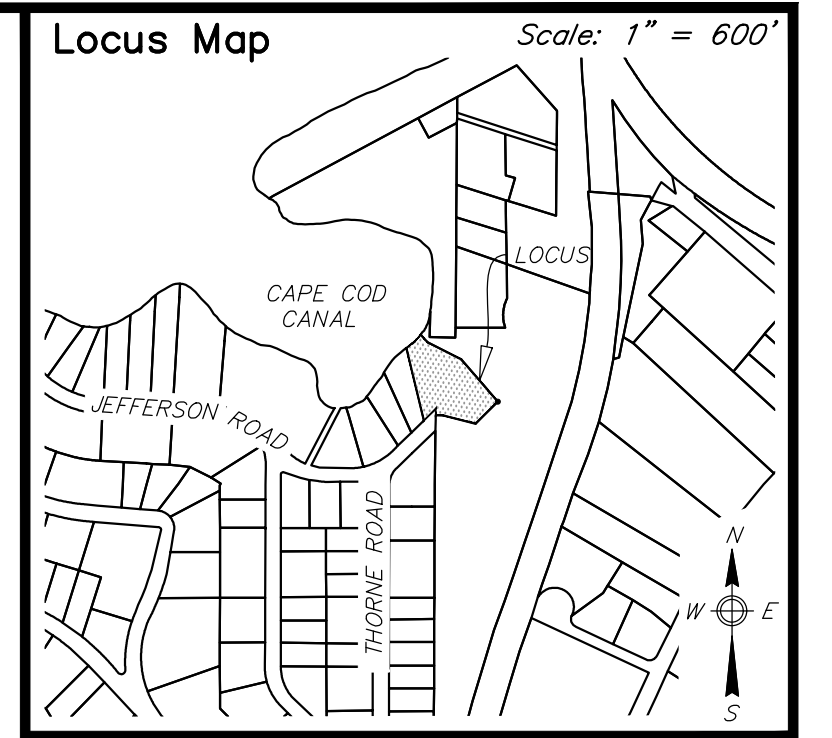
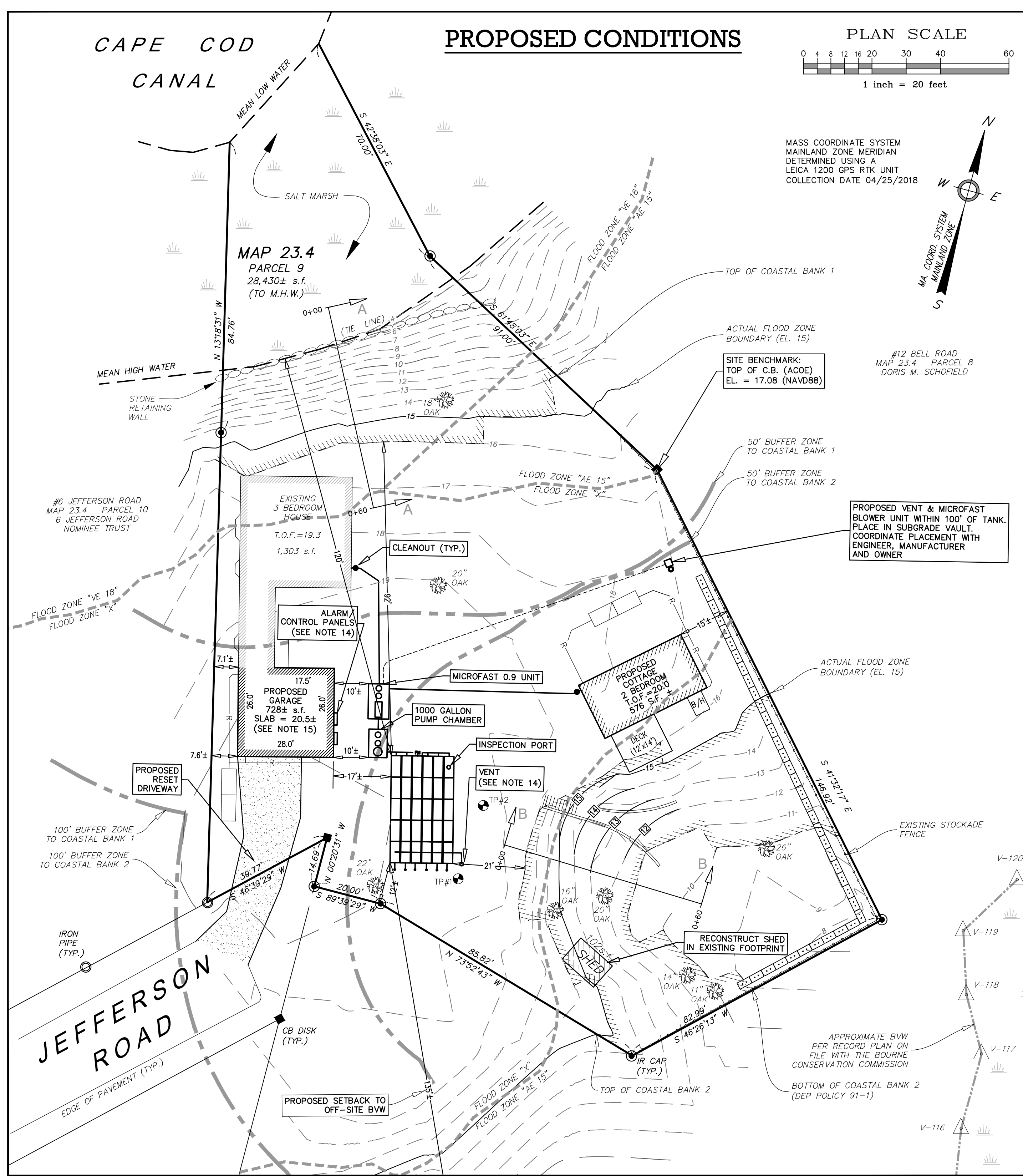
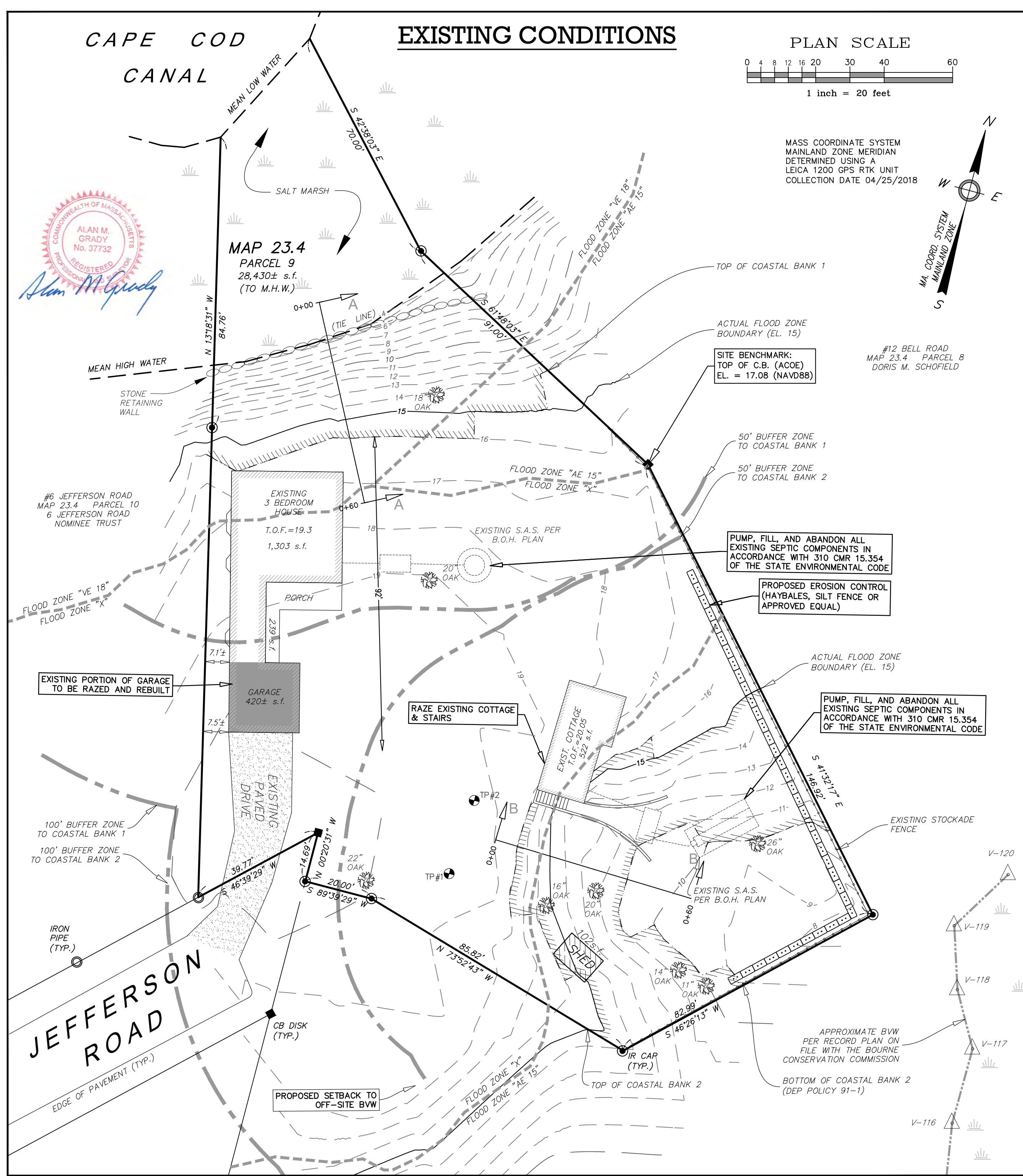
**FLOOR PLANS**

DRAWN BY  
A.M. MICHNIEWICZ

DWG NO  
3

DATE  
9.2014





- ### Notes
- LOCUS: #2 JEFFERSON ROAD MAP 23.4 PARCEL 9
  - OWNER: ARTHUR R. HALLAM, III & KATHERINE A. HALLAM #101 INVERNESS DRIVE LAKE CHARLES, LA 70605
  - DEED REF: Bk:21486 Pg:213
  - PLAN REF: Bk:247 Pg:72
  - BENCHMARK: ELEVATION = 17.08 (NAVD88) TOP OF CONCRETE BOUNDARY (ACOE)
  - LOCUS PARTIALLY FALLS WITHIN FLOOD HAZARD ZONE "AE(EL15)" AND "VE(EL18)" AS SHOWN ON FEMA FLOOD INSURANCE RATE MAP No. 25001C-0501-J dated 07/16/2014.
  - LOCUS DOES NOT FALL WITHIN THE NATURAL HERITAGE AND ENDANGERED SPECIES PROGRAM (NHESP) AREAS OF ESTIMATED HABITATS OF RARE WILDLIFE OR PRIORITY HABITATS OF RARE SPECIES.
  - ALL EXISTING UTILITY LOCATIONS ARE APPROXIMATE ONLY. CONTRACTOR TO CONTACT DIG-SAFE TO HAVE UTILITIES MARKED PRIOR TO CONSTRUCTION.
  - EXISTING CONDITIONS BASED ON FIELD SURVEY CONDUCTED BY THIS FIRM BETWEEN 09/2014 and 04/2018.
  - CONTRACTOR IS RESPONSIBLE TO REVIEW AND MAINTAIN A COPY OF ALL PERMITS ON SITE.
  - ALL ROOF RUNOFF TO BE CONVEYED TO DRYWELLS. CONTRACTOR TO VERIFY LOCATION IN FIELD.
  - CONTRACTOR TO STORE AND MAINTAIN AN ADDITIONAL 10% OF EROSION CONTROL BARRIER ON SITE FOR REPAIRS.
  - CONTRACTOR TO DISPOSE OF ALL CONSTRUCTION DEBRIS IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS.
  - CONTRACTOR TO COORDINATE FINAL VENT LOCATION WITH OWNER.
  - CONTRACTOR TO COORDINATE FINAL MICROFAST & PUMP CHAMBER CONTROL/ALARM PANEL LOCATIONS WITH ENGINEER & OWNER PRIOR TO PLACEMENT.
  - SEE ZBA SPECIAL PERMIT REGARDING APPROVED SETBACK.

### PROPOSED SETBACKS

TANK	SOIL ABSORPTION SYSTEM
COASTAL BANK #1:	70'±
COASTAL BANK #2:	53'±
B.V.W.:	180'±
SALT MARSH:	98'±

### NON-CONFORMING PRE-EXISTING

ZONE: R-40

REQUIRED	EXISTING	PROPOSED
LOT AREA:	40,000 s.f.	28,430± s.f.
FRONT YARD:	20'	18.7'
SIDE/REAR YARD:	12'	20.9'
MAX. GROSS FLOOR AREA TO LOT AREA	20% (5,666 s.f. max.)	23.6% (2802 s.f.)
MAX. LOT COVERAGE:	20% (5,666 s.f. max.)	9.1% (2,388 s.f.)
BUILDING HEIGHT:	35'	<35'

Notes:  
(a) SEE TABLE 2456 FOR NON-CONFORMING LOTS IN BOURNE ZONING BY LAWS.  
(b) AVERAGE EXISTING GRADE LINE CALCULATE AS: EL. 18.2 (EX. HOUSE) EL. 16.7 (EX. COTTAGE)

Prepared By:

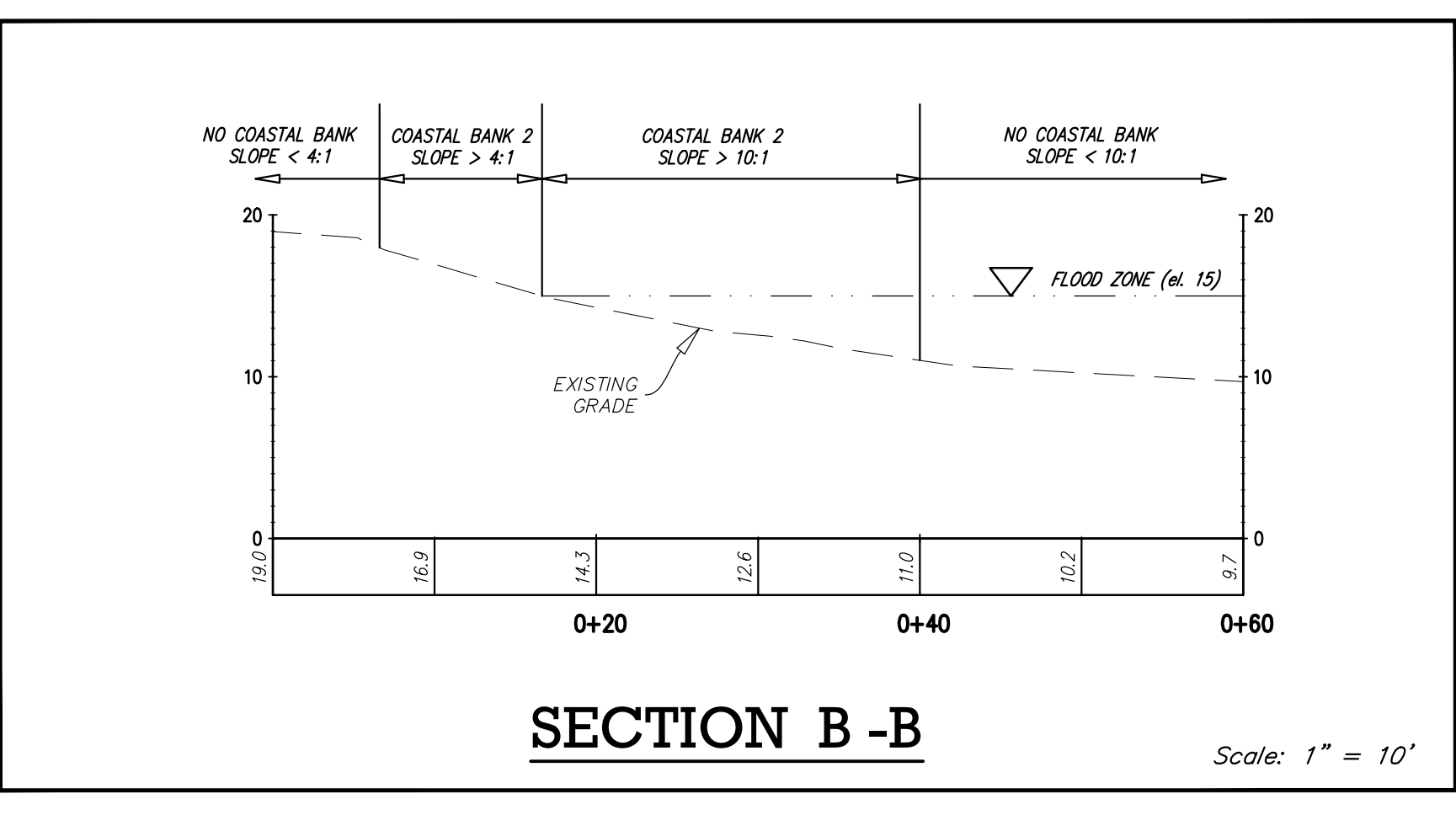
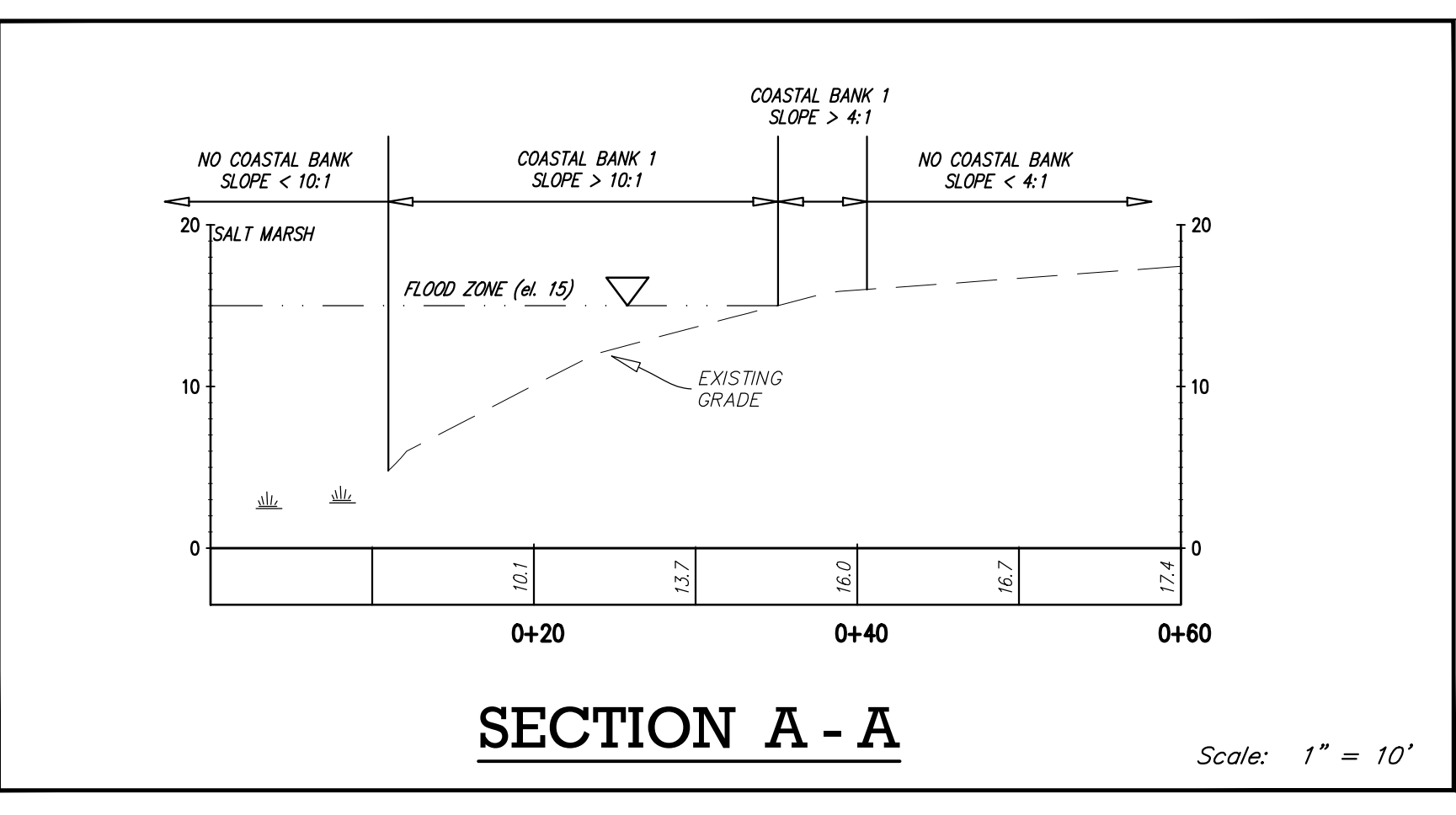
## BRACKEN ENGINEERING, INC.

49 HERRING POND ROAD BUZZARDS BAY, MA 02532  
(tel) 508.833.0070 (fax) 508.833.2282

19 OLD SOUTH ROAD NANTUCKET, MA 02554  
(tel) 508.325.0444 (www.brackeneng.com)

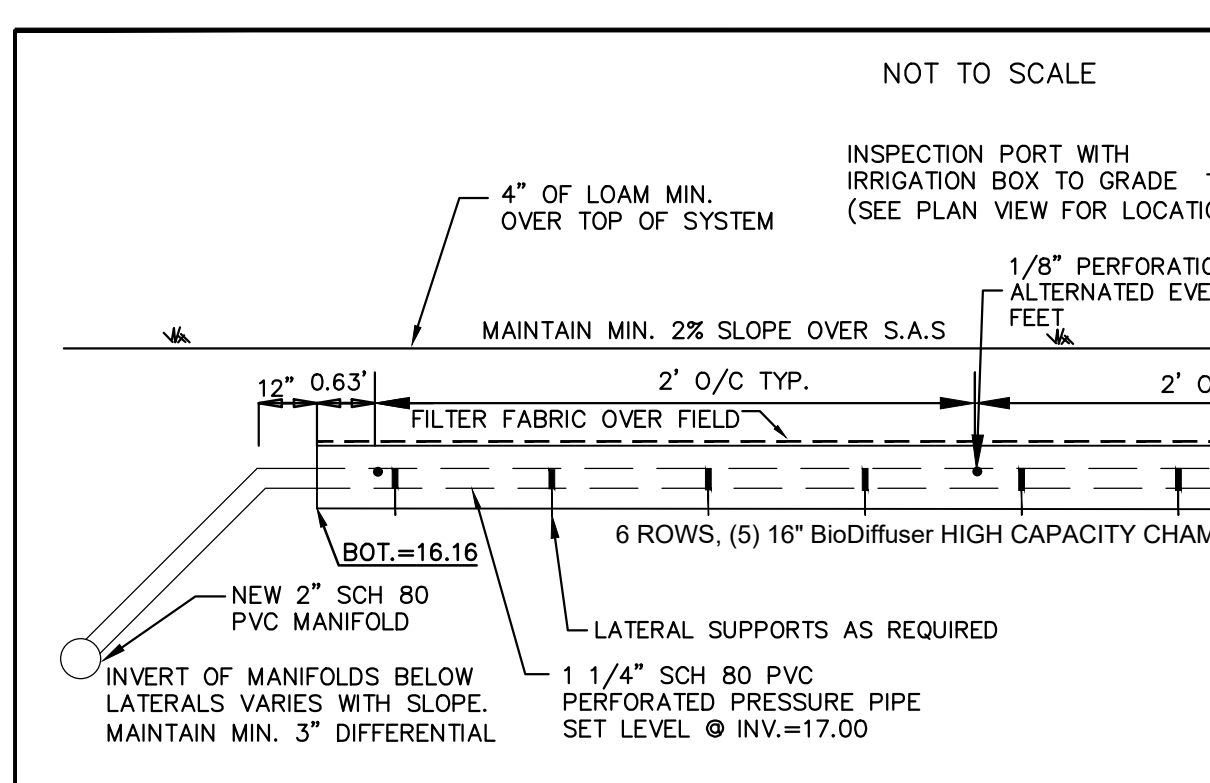
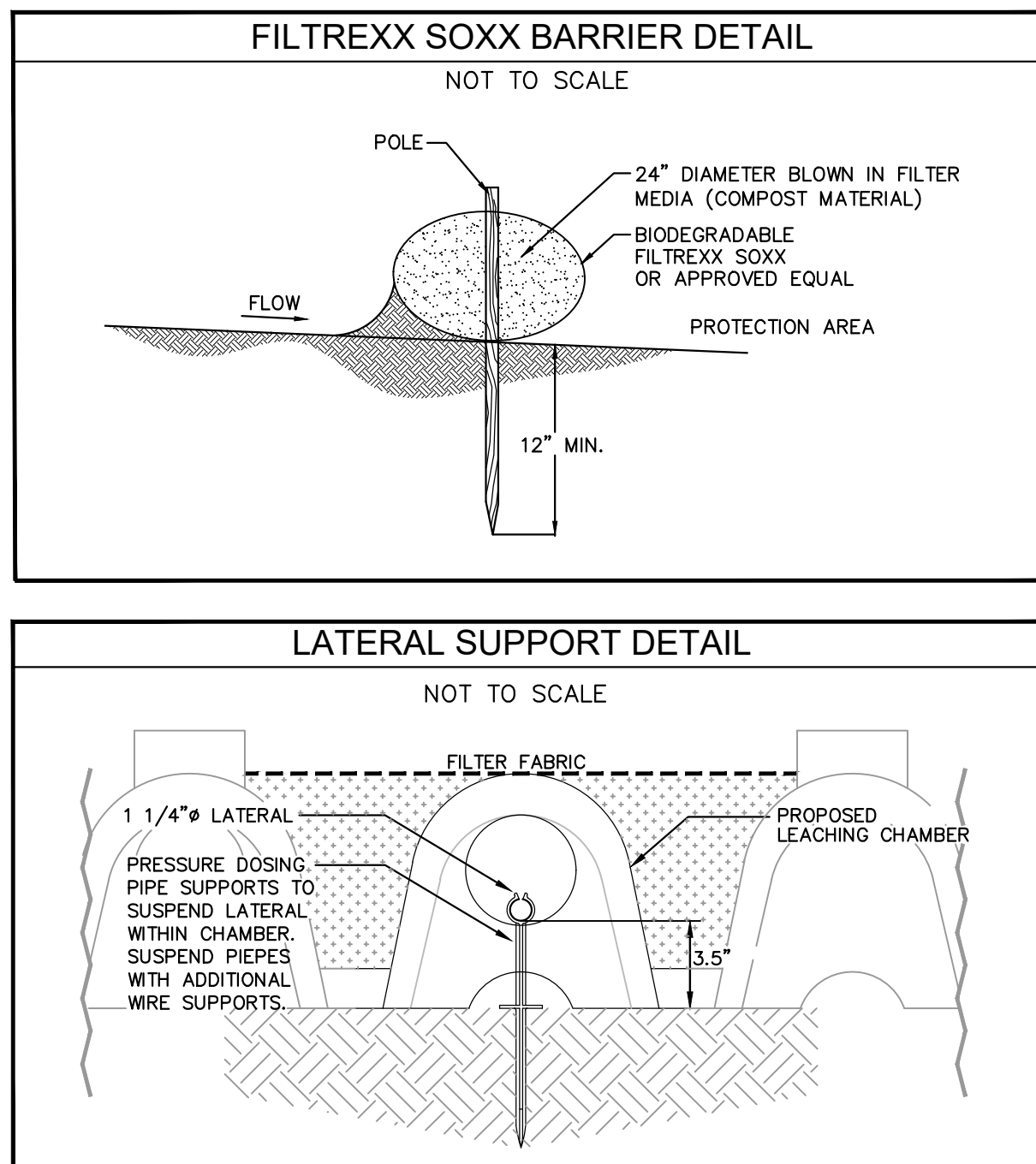
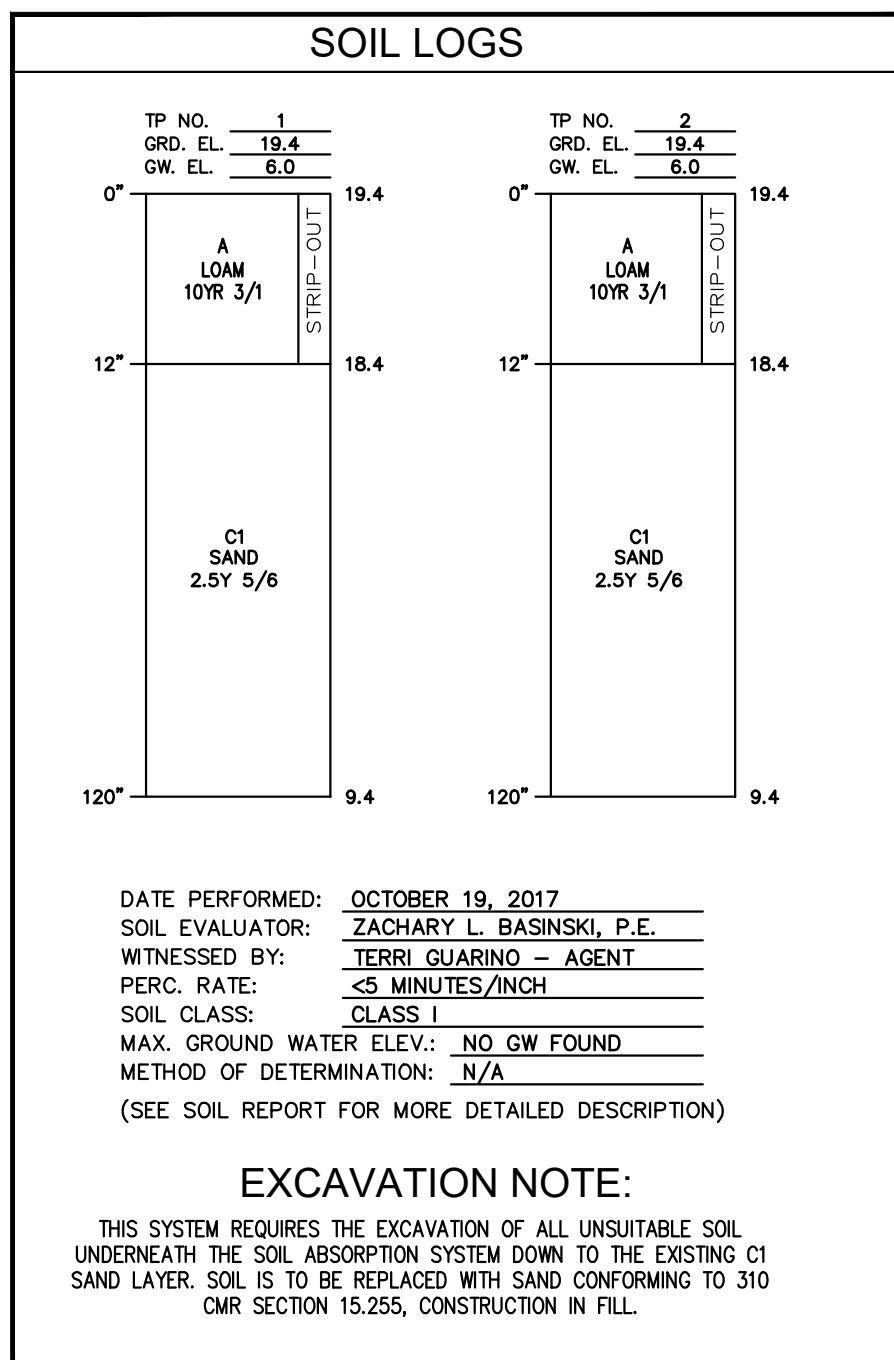
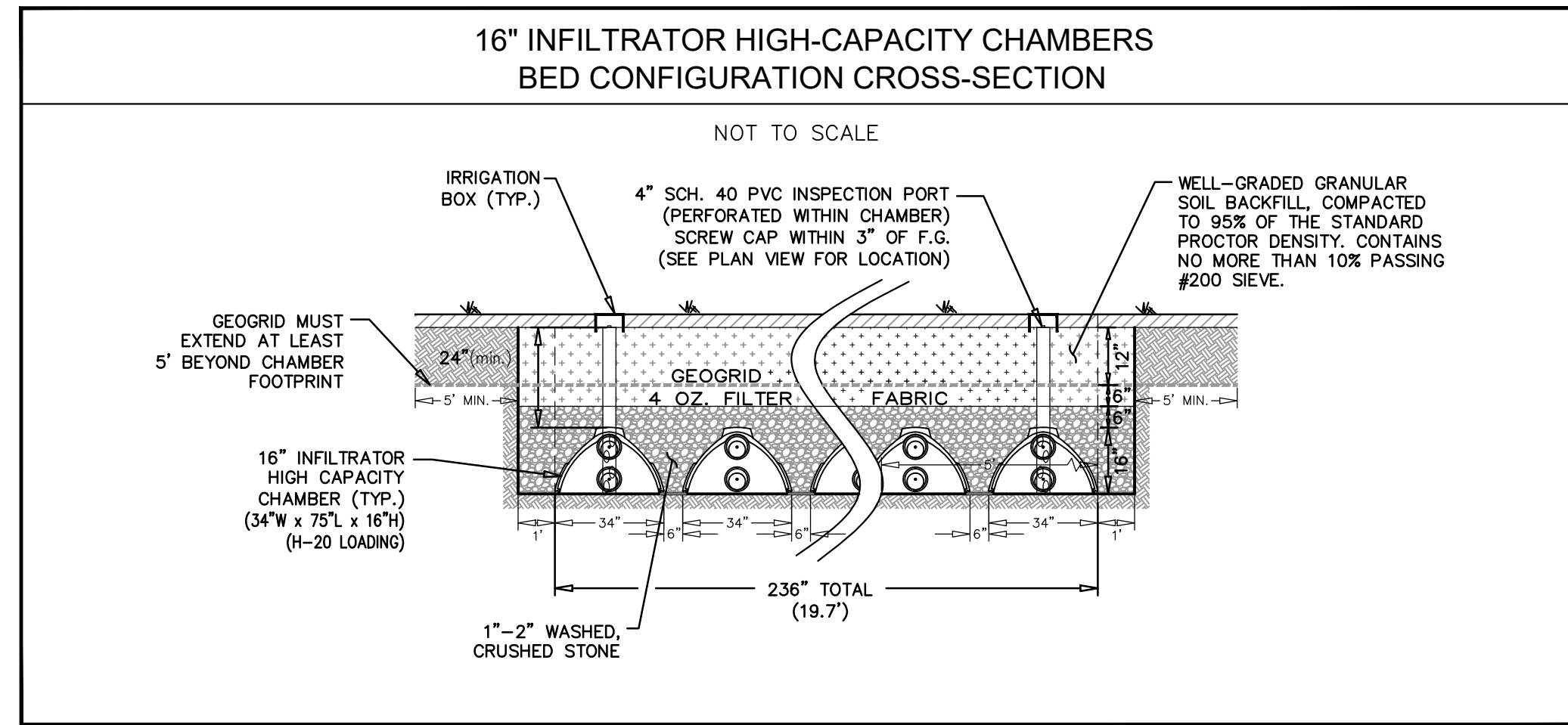
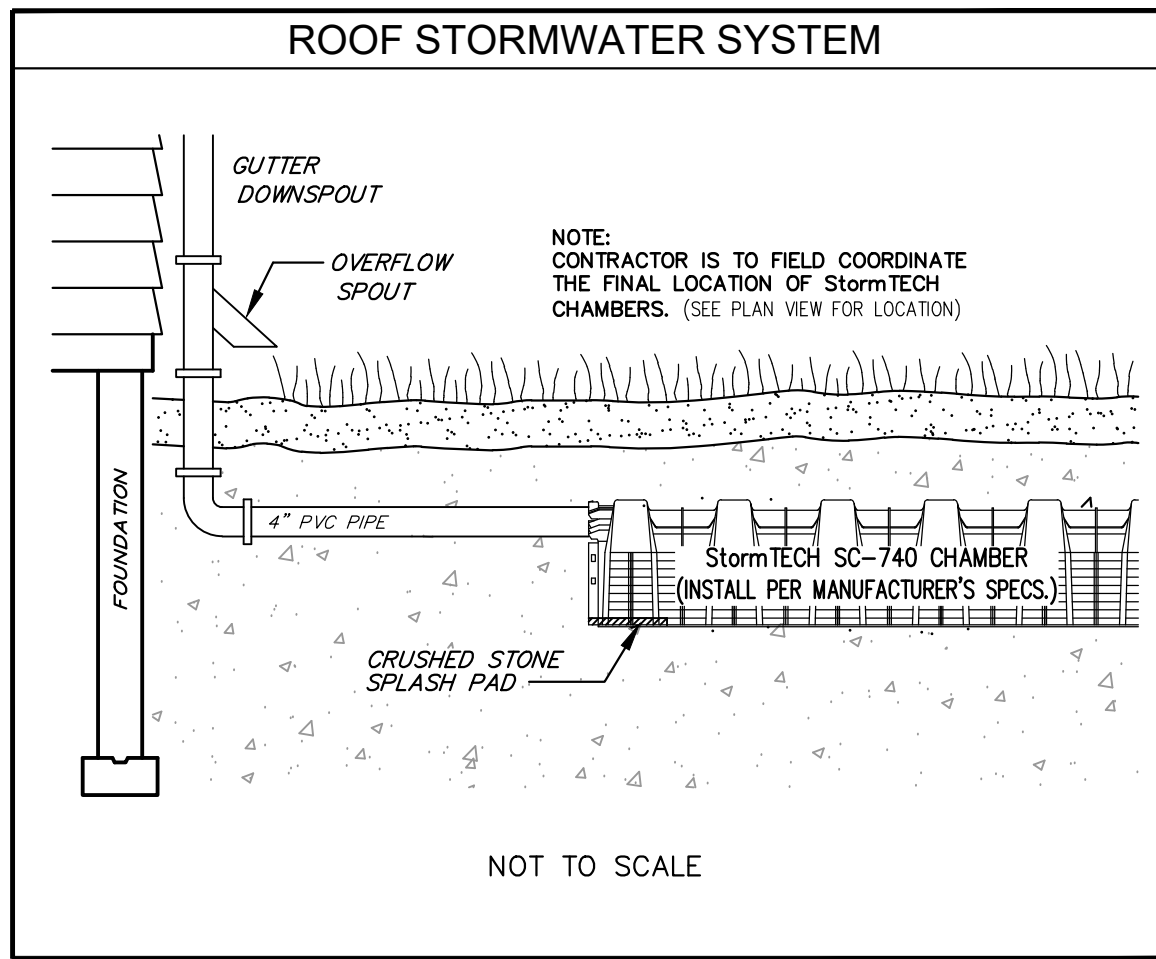
### PROPOSED SITE PLAN IN BOURNE, MASSACHUSETTS

Prepared For:  
**ARTHUR HALLAM**  
#2 JEFFERSON ROAD  
MAP 23.4 PARCEL 9



MECHANICAL PHOTO COPYING, RECORDING OR OTHERWISE WITHOUT THE EXPRESS WRITTEN CONSENT OF BRACKEN ENGINEERING, INC. SHALL RENDER IT INVALID AND UNLAWFUL. ANY INFORMATION MADE TO THIS DOCUMENT WITHOUT THE WRITTEN PERMISSION OF BRACKEN ENGINEERING, INC. SHALL RENDER IT INVALID AND UNLAWFUL.





### EXCAVATION NOTE:

THIS SYSTEM REQUIRES THE EXCAVATION OF ALL UNSUITABLE SOIL UNDERNEATH THE SOIL ABSORPTION SYSTEM DOWN TO THE EXISTING C1 SAND LAYER. SOIL IS TO BE REPLACED WITH SAND CONFORMING TO 310 CMR SECTION 15.255. CONSTRUCTION IN FILL.

### DESIGN CALCULATIONS

SOIL TEXTURAL CLASS: CLASS 1  
PERC. RATE: < 2 MINUTES/INCH  
NO. OF BEDROOMS: 5  
DESIGN FLOW REQUIRED: 550 GPD  
SEPTIC TANK REQUIRED: 1500 GALLONS  
SEPTIC TANK PROVIDED: MicroFAST 0.9 unit

### LEACHING SYSTEM:

AGGREGATE FREE LEACHING BED:  
(30) 16" BioDiffuser HIGH-CAPACITY LEACHING CHAMBERS

EFFECTIVE LEACHING: (BASED ON GENERAL USE APPROVAL)

(30 UNITS)(6.25 L.F./UNIT) = 187.5 L.F.  
(4.73 S.F./L.F.)(187.5 L.F.) = 886 S.F.  
EFFECTIVE LEACHING RATE = 0.74 GPD/SF  
FLOW PROVIDED: 656 GPD > 550 GPD

### PUMP DOSING CALCULATIONS:

1. DETERMINE VOLUME OF EFFLUENT TO BE PUMPED TO WASTEWATER DRIFTLINES  
DAILY FLOW = 550 GALLONS  
NUMBER OF DOSES PER DAY = 8  
NUMBER OF GALLONS = 550/8 = 68.7 GALLONS  
DRAIN BACK VOLUME  
20 L.F. 2" FORCE MAIN= 3.3 GALLONS  
187 L.F. 1-1/4" LATERALS= 11.9 GALLONS  
PUMPING VOLUME = DOSING VOLUME + DRAIN BACK VOLUME  
83.9 GALS. = 68.7 GALS. + 15.2 GALS.

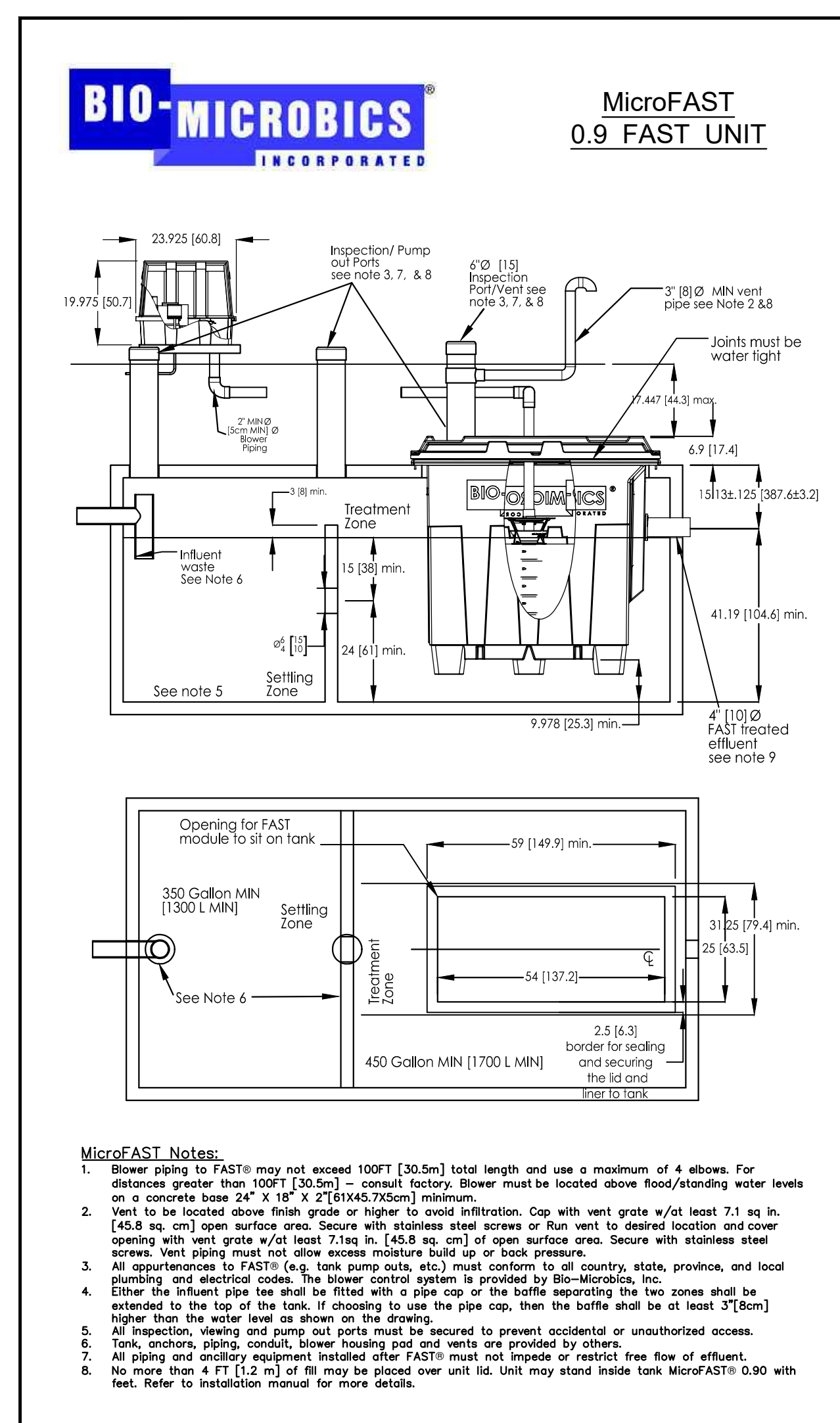
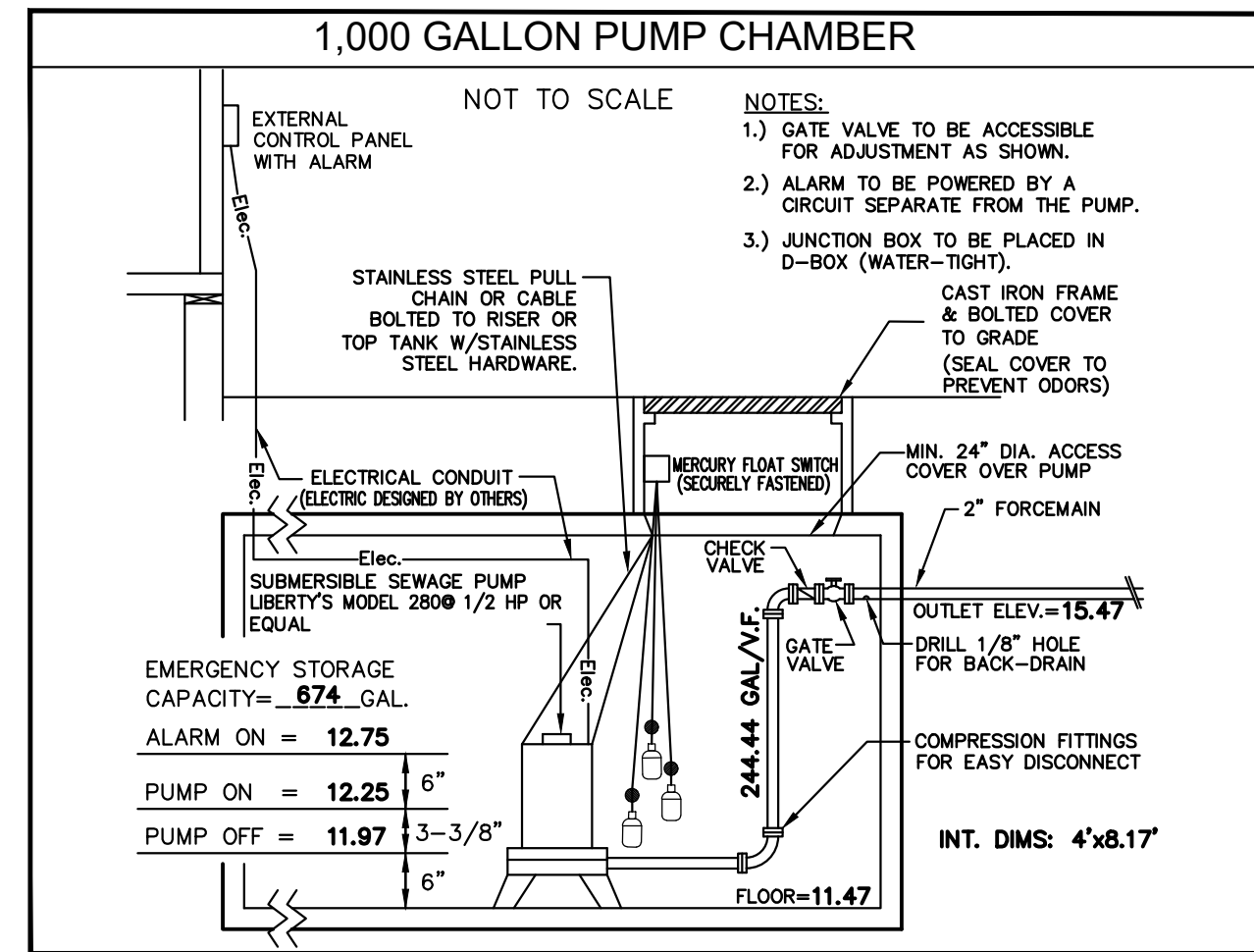
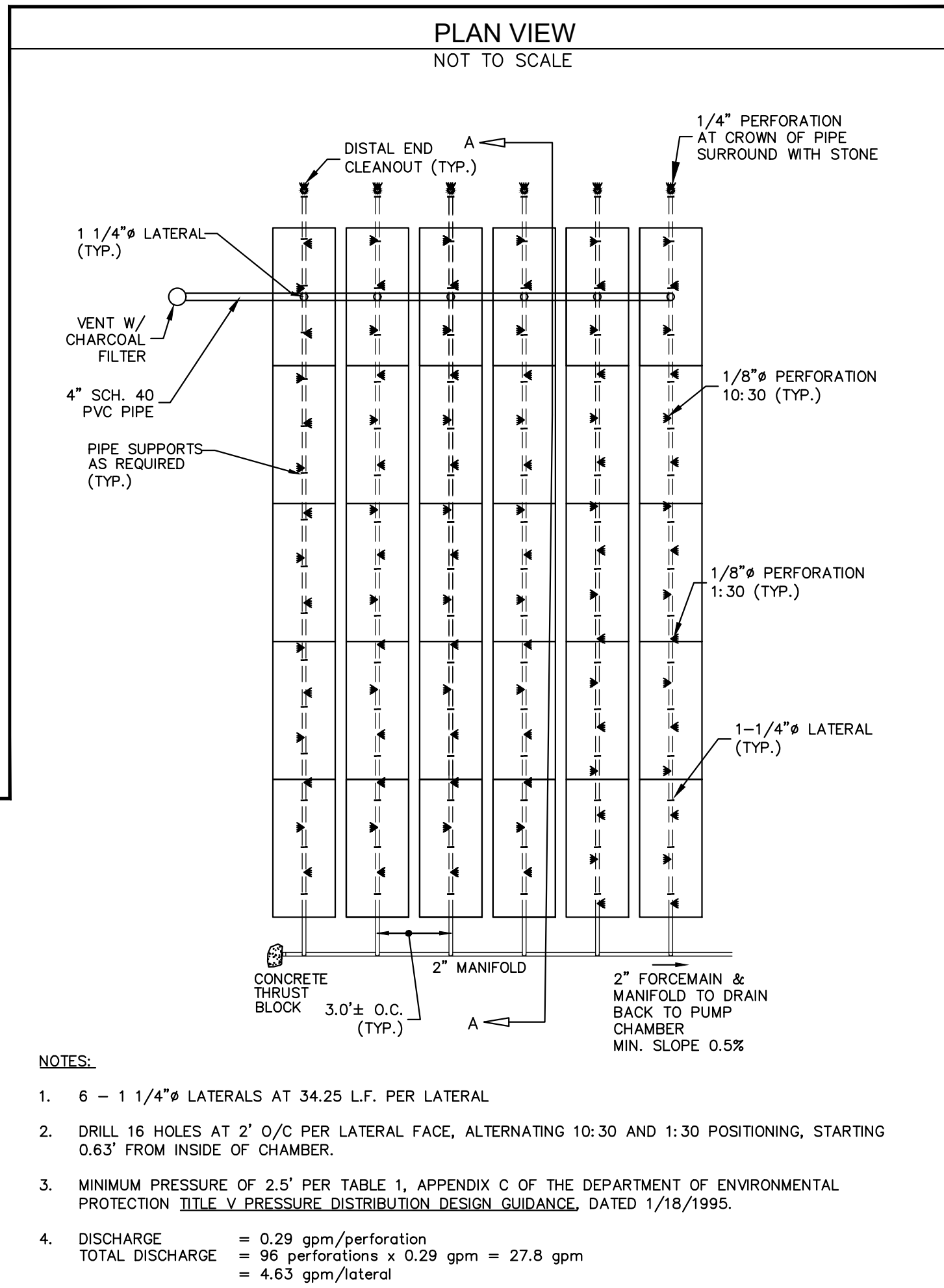
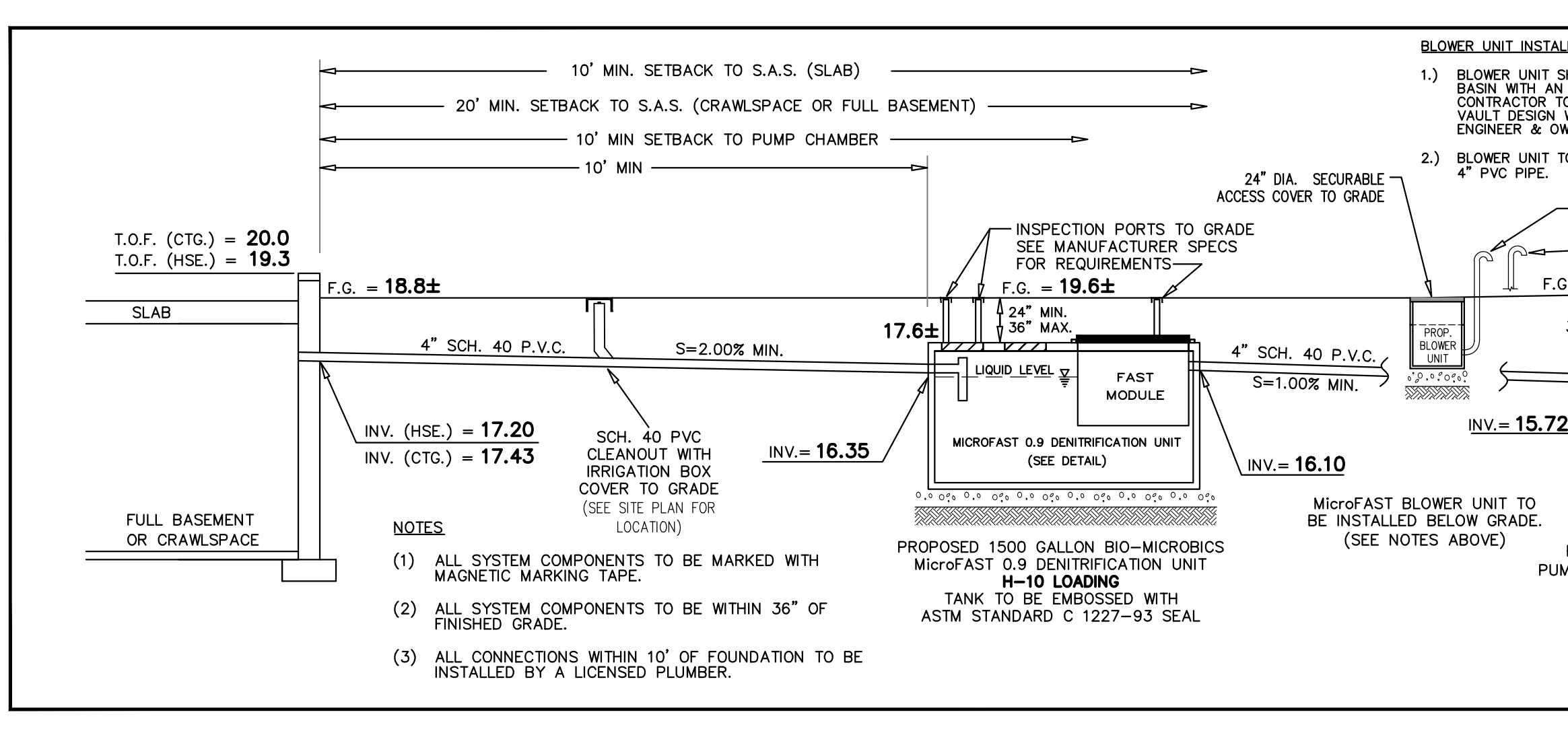
2. DISCHARGE RATE  
96 PERFORATIONS X 0.29 GPM/PERF @ 2.5' HEAD = 27.8 GPM

3. TOTAL ON/OFF TIME BETWEEN DOSES  
24 HOURS/8 DOSES = 180 MINUTES

4. DOSAGE TIME  
83.9 GALLONS/27.8 GPM = 3 MINUTES 1 SECOND

5. TIMER SETTINGS  
ON: 3 MINUTES 1 SECOND  
OFF: 176 MINUTES 59 SECONDS

NOTE: ACTUAL DOSING TIME TO BE DETERMINED FROM ACTUAL TIME PUMP TAKES TO FILL LATERALS.



### GENERAL NOTES

1. BENCHMARK: ELEVATION = 17.08 (NAVD88) TOP OF CONCRETE BOUND (ACOE)

2. ALL CONSTRUCTION METHODS AND MATERIALS TO CONFORM TO TITLE V AND THE TOWN OF BOURNE BOARD OF HEALTH REGULATIONS.

3. ALL SYSTEM COMPONENTS SHALL BE MARKED WITH MAGNETIC TAPE OR A COMPARABLE MEANS IN ORDER TO LOCATE THEM ONCE BURIED.

4. NO FIELD MODIFICATION TO THE SYSTEM SHALL BE MADE WITHOUT PRIOR WRITTEN APPROVAL OF THE DESIGN ENGINEER AND BOARD OF HEALTH.

5. ALL JOINTS AND COVERS TO BE WATER-TIGHT.

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ACTUAL LOCATION OF ANY EXISTING UTILITIES.

7. A CERTIFICATE OF COMPLIANCE MUST BE OBTAINED PRIOR TO BACKFILLING THE SYSTEM.

8. THE DESIGN IS INTENDED TO MEET TITLE V AND OTHER APPLICABLE REQUIREMENTS. THIS PLAN DOES NOT GUARANTEE THAT THE SYSTEM WILL BE INSTALLED AS DESIGNED, NOR DOES THIS PLAN GUARANTEE THE OPERATION OF THE SYSTEM.

9. THIS SYSTEM IS NOT DESIGNED NOR INTENDED FOR USE WITH A GARBAGE GRINDER.

10. THE SYSTEM OWNER SHALL BE RESPONSIBLE TO PUMP THE SEPTIC TANK AT LEAST ONCE EVERY THREE YEARS.

11. CONTRACTOR TO REFER TO ALL MANUFACTURER'S REQUIREMENTS AND SPECIFICATIONS FOR INSTALLATION OF THE MicroFAST 0.9 UNIT.

12. THE RECORD PROPERTY OWNER IS TO FILE A NOTICE OF DEED RESTRICTION AT THE BARNSTABLE COUNTY REGISTRY OF DEEDS PRIOR TO THE INSTALLATION OF THE SYSTEM, INDICATING THE USE OF AN INNOVATIVE/ALTERNATIVE SEPTIC SYSTEM ON THE PROPERTY.

13. HOMEOWNER IS TO ESTABLISH AN OPERATION & MAINTENANCE PLAN WITH A COMPANY CERTIFIED SYSTEM OPERATOR FOR THE MicroFAST SYSTEM. ALL SYSTEM TESTING, MONITORING & REPORTING IS TO BE CONDUCTED IN ACCORDANCE TO THE MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP) GENERAL USE PERMITS.

14. CONTRACTOR TO COORDINATE PLACEMENT OF ALL ALARM PANELS, VENTS AND THE MicroFAST BLOWER UNIT WITH THE HOMEOWNER & SYSTEM MANUFACTURERS PRIOR TO INSTALLATION.

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### PROPOSED SITE PLAN IN BOURNE, MASSACHUSETTS

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MAP 23.4 PARCEL 9

No.	Date	Revision	Description	By

Drawn: RED/BCM/BEI  
Checked: ZLB/AMG  
Date: JUNE 6, 2018  
Sheet: 2 of 2