

**RECEIVED**

By Bourne Health Department at 2:39 pm, Apr 18, 2024

# Bourne Board of Health Application for Septic Variance or Waiver Requests



In accordance with the established procedures of the Bourne Board of Health, this application is for septic variances and waivers 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, increases in flow, or repairs and upgrades to on-site sewage disposal systems with design flows of less than 10,000 gallons/ day.

### 1. Facility Name and Address:

Owner's Name

Karen West

Facility's Street Address

26 Massasoit Avenue

Owner's Telephone Number

508.566.0913

Owner's E-mail Address

karenwestcapecod@aol.com

Owner's Mailing Address

649 TAMIAMI TRAIL, APT. 314 VENICE, FL 34285

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

Preparer's Name

Erica Borselli

Company

Falmouth Engineering, Inc.

Telephone Number

508.495.1225

E-mail Address

erica@falmouthengineering.com

Mailing Address

17 Academy lane, Ste. 200 Falmouth, MA 02540

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

Residential    Commercial    Institutional    School    Industrial    Mixed Use

### 4. Describe Facility (i.e. single-family dwelling, 45 seat restaurant):

Single family dwelling

### 5. Type of System Proposed (check all that apply):

Conventional Title 5    I/A System

Pumped System    Gravity System    Pressure Dosed    Tight Tank    Other

6. Describe the existing and proposed septic system components: Existing system to be pumped dry and filled with sand.  
Proposed 2000 gallon tight tank.

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

Tight Tank	EXISTING	PROPOSED
Design flow of system:	330 GPD	330 GPD
Total design flow of facility: <i>(if more than one system on subject property)</i>	2000 GPD	2000 GPD

8. Enclose a **letter of request for variances/waivers** which makes reference to the specific provisions of Title 5 and/ or 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 said regulations.

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

- \$125 filing fee + any other applicable permit application fees paid to the Town of Bourne.
- Application for a Disposal System Construction Permit (may be filled out by installer).
- Six copies of Letter of Request describing nature of variances.
- Six sets of complete engineered plans and specifications, one with original stamp of design engineer; plus, one electronic copy. All variances/ waivers must also be listed on the plans per 310 CMR 15.220(4).
- Six sets of floor plans, existing and proposed.
- Six copies of [Nitrogen Loading Calculation Worksheet](#) \*required for all applications.
- 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 septic 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 may be required for new leaching facilities proposed within 100ft of a wetland/watercourse.
- [Percentage of Increase Worksheet](#) may be 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 Karen West Date 04/18/2024

Print Name Karen West

Signature of Preparer Michael J. Borselli Date 04/18/2024

Print Name Michael J. Borselli



**Falmouth Engineering, Inc.**  
17 Academy Lane, Suite 200  
Falmouth, MA  
02540

April 18, 2024

Bourne Board of Health  
24 Perry Avenue  
Buzzards Bay, MA 02532  
Hand Delivered

Subject Property: 26 Massasoit Avenue  
Property Owner: Karen West  
Owner Mailing Address:  
649 Tamiami Trail, Apt. 314  
Venice, FL 34285

Dear Members:

Please accept this letter as a request for approval to install a tight tank as shown on the attached plan.

Also included with this application:

- 6 copies of the project plans by Falmouth Engineering, Inc.
- 6 copies of existing floor plans
- 6 copies of the Nitrogen Loading Calculation worksheet (existing & proposed)
- 1 copy of the Certified Abutters List
- Copy of Certified mail receipts showing abutter notifications mailed on April 18, 2024
- 1 copy of the letter that was mailed to abutters
- \$125.00 filing fee

We understand that a hearing will be held on May 8, 2024 to review this application. Affected abutters have been notified of this date and the approval requested 10 business days prior to the scheduled hearing as required.

We will review the project and present the proposed plans at the public hearing.

If you have any questions with regard to this application, please feel free to contact me.

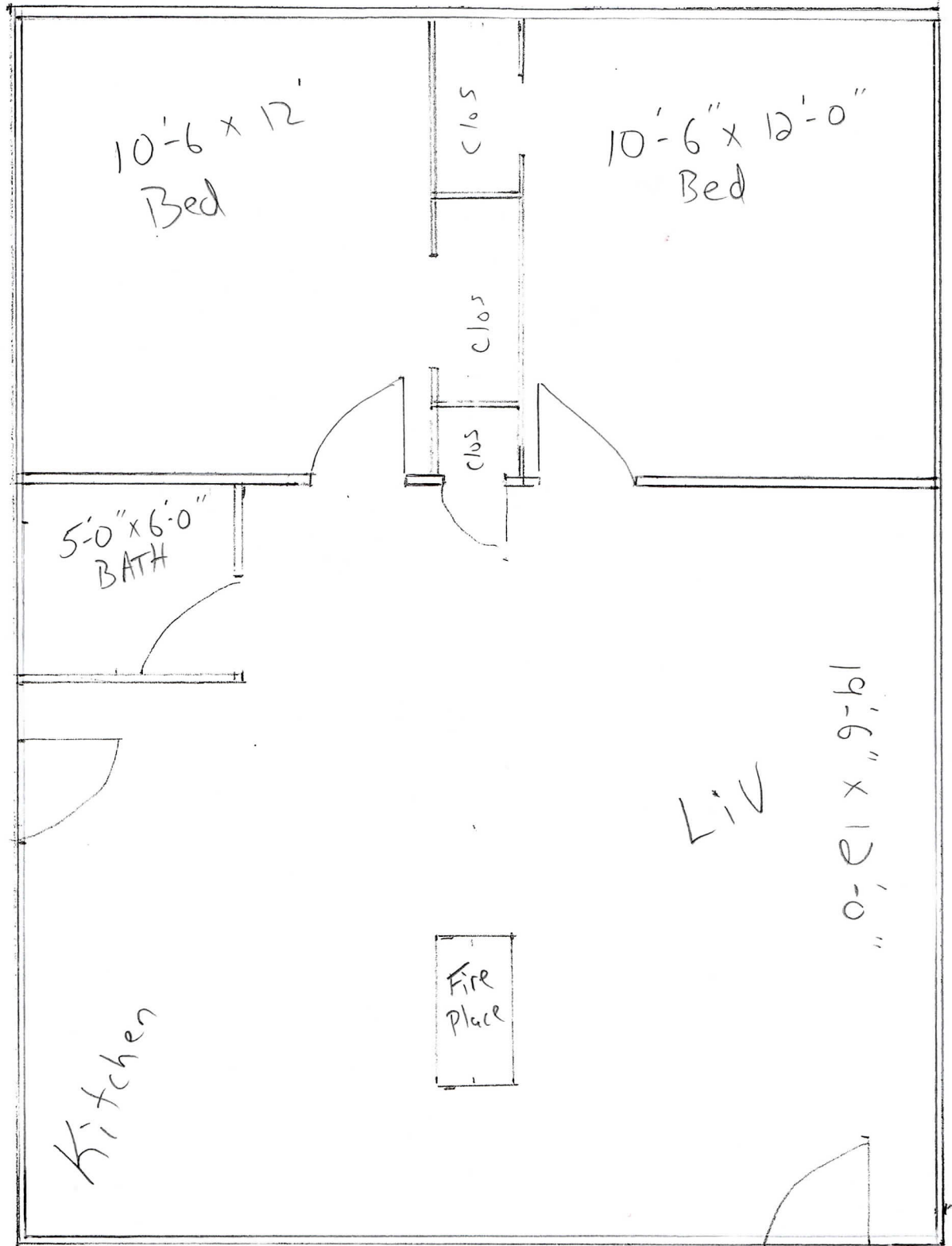
Sincerely,

*Michael J. Borselli*

Michael J. Borselli, P.E.  
President, Falmouth Engineering, Inc.

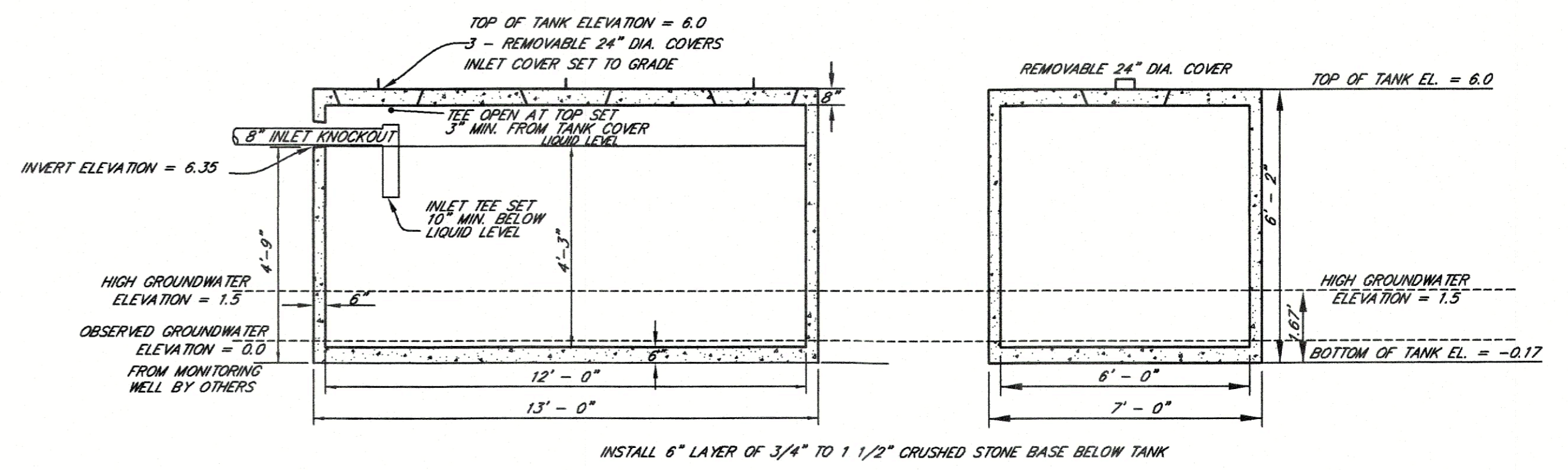
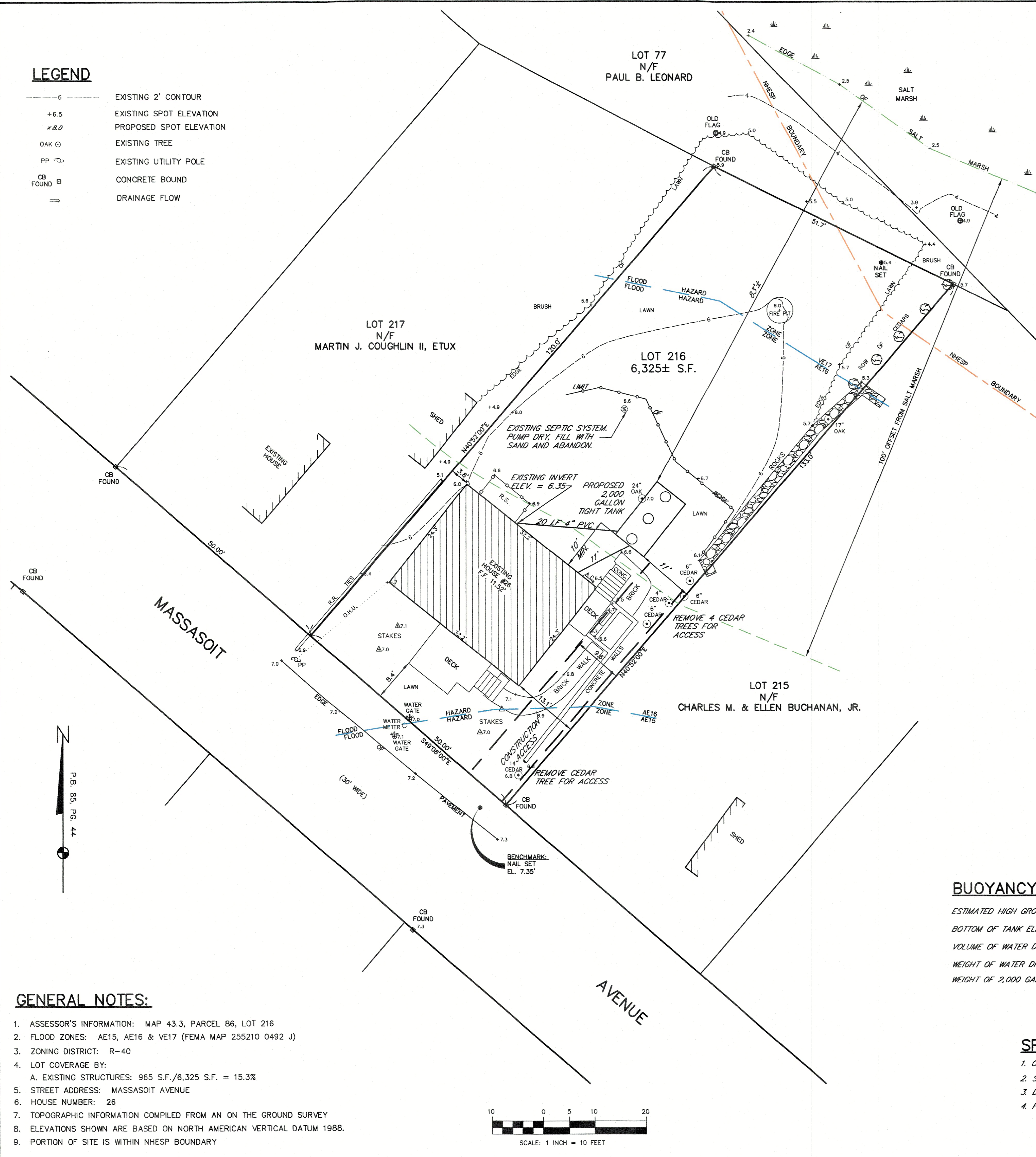
# 26 Massasoit Ave

1/4" = 1'-0"



**LEGEND**

- 6--- EXISTING 2' CONTOUR
- +6.5 EXISTING SPOT ELEVATION
- x.8.0 PROPOSED SPOT ELEVATION
- OAK ⊙ EXISTING TREE
- PP ⊕ EXISTING UTILITY POLE
- CB FOUND ⊠ CONCRETE BOUND
- ⇒ DRAINAGE FLOW



**2,000 GALLON TIGHT TANK (H-20 LOADING)**

NOT TO SCALE  
ACME - SHOREY ITEM #ST 202LP TANK OR APPROVED EQUAL

**CONSTRUCTION NOTES:**

1. INSTALLATION OF THE PROPOSED TIGHT TANK SHALL BE IN ACCORDANCE WITH TITLE 5 AND THE BOARD OF HEALTH REGULATIONS.
2. A COPY OF THE PLANS SHALL BE AVAILABLE ON SITE FOR REFERENCE AT ALL TIMES DURING THE INSTALLATION OF THE TIGHT TANK.
3. NO CHANGES TO THE DESIGN SHALL BE PERFORMED WITHOUT THE APPROVAL OF BOTH FALMOUTH ENGINEERING, INC. AND THE BOARD OF HEALTH.
4. THE TIGHT TANK IS SUBJECT TO INSPECTION BY FALMOUTH ENGINEERING, INC. AND THE BOARD OF HEALTH.
5. THE CONTRACTOR SHALL NOTIFY FALMOUTH ENGINEERING, INC. AND THE BOARD OF HEALTH TO INSPECT THE TIGHT TANK PRIOR TO BACKFILL. IN SOME INSTANCES, MORE THAN ONE INSPECTION MAY BE NEEDED. THE CONTRACTOR SHALL ONLY BACKFILL THE PORTIONS OF THE SYSTEM THAT HAVE BEEN INSPECTED AND APPROVED BY FALMOUTH ENGINEERING, INC. AND THE BOARD OF HEALTH.
6. IF THE CONTRACTOR ENCOUNTERS ANY VARIATIONS IN SITE CONDITIONS, SUCH AS DIFFERING SOILS, TOPOGRAPHY, GROUNDWATER ELEVATIONS OR OTHER CONDITIONS THAT MAY REQUIRE RE-EVAL THE DESIGN, THE CONTRACTOR SHALL IMMEDIATELY CONTACT FALMOUTH ENGINEERING, INC.

**TIGHT TANK NOTES:**

1. PROVIDE AUDIO/VISUAL ALARM LOCATED IN A CLEARLY VISIBLE LOCATION. ALARM SHALL ACTIVATE AT 3/5 TANK CAPACITY.
2. PROVIDE AT LEAST ONE 24" DIAMETER ACCESS COVER FOR PUMPING AND MAINTENANCE.
3. THE ACCESS COVERS SHALL BE FITTED WITH WATERPROOF AND WATERTIGHT GASKET SEALS TO PREVENT ENTRANCE OF SURFACE WATER.
4. CONTENTS ENTERING TANK SHALL BE DOMESTIC WASTE ONLY.
5. THE TANK SHALL BE CERTIFIED WATERPROOF AND WATERTIGHT. CERTIFICATION SHALL BE IN WRITING FROM THE MANUFACTURER.
6. THE CONTENTS SHALL BE HAULED TO AND DISPOSED OF AT AN APPROVED FACILITY.
7. THE ALARM SYSTEM SHALL BE TESTED AND INSPECTED ON A SEMI-ANNUAL BASIS.
8. MINIMUM TANK CAPACITY = 330 GPD X 5 OR 2,000 GALLONS.  
330 GPD X 5 = 1,650 GALLONS. 1,650 GALLONS < 2,000 GALLONS. USE 2,000 GALLON TANK

**BUOYANCY CALCULATIONS:**

ESTIMATED HIGH GROUNDWATER ELEVATION = 1.5

BOTTOM OF TANK ELEVATION = -0.17

VOLUME OF WATER DISPLACED = 7' X 13' X 1.67' = 152 CUBIC FEET

WEIGHT OF WATER DISPLACED = 152 CUBIC FEET X 62.4 LBS./CUBIC FEET = 9,484 LBS.

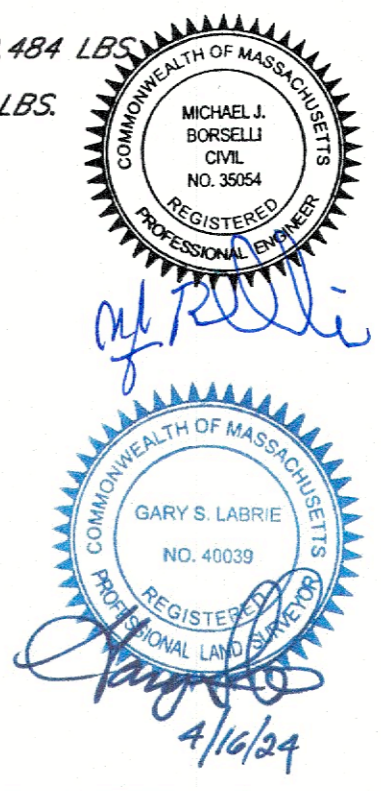
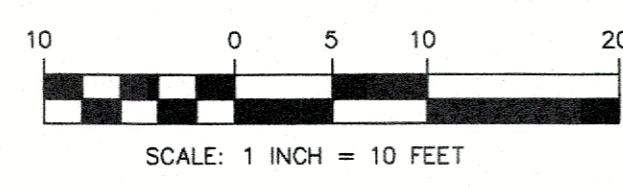
WEIGHT OF 2,000 GALLON TANK FROM MANUFACTURER = 31,250 LBS. > 9,484 LBS.

**SPECIFICATIONS**

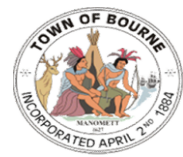
1. CONCRETE MINIMUM STRENGTH: 5,000 PSI @ 28 DAYS.
2. STEEL REINFORCEMENT: ASTM A-615-68, GRADE 60
3. DESIGN LOADING: AASHTO-H-20
4. PRODUCT WEIGHT: 31,250 LBS.

**GENERAL NOTES:**

1. ASSESSOR'S INFORMATION: MAP 43.3, PARCEL B6, LOT 216
2. FLOOD ZONES: AE15, AE16 & VE17 (FEMA MAP 255210 0492 J)
3. ZONING DISTRICT: R-40
4. LOT COVERAGE BY:
  - A. EXISTING STRUCTURES: 965 S.F./6,325 S.F. = 15.3%
5. STREET ADDRESS: MASSASOIT AVENUE
6. HOUSE NUMBER: 26
7. TOPOGRAPHIC INFORMATION COMPILED FROM AN ON THE GROUND SURVEY
8. ELEVATIONS SHOWN ARE BASED ON NORTH AMERICAN VERTICAL DATUM 1988.
9. PORTION OF SITE IS WITHIN NHESP BOUNDARY



11/3/23	REVISE NOTES AND SPECIFICATIONS
DATE	REVISION
<b>SITE PLAN - PROPOSED TIGHT TANK</b> FOR #26 MASSASOIT AVENUE PREPARED FOR <b>KAREN WEST</b> IN BOURNE MA	
PLAN DATE: OCTOBER 27, 2023	PLAN SCALE: 1" = 10'
CIVIL ENGINEERING	WETLANDS PERMITTING
WASTEWATER DESIGN	COASTAL ENGINEERING
TITLE 5 PLOT PLANS	PIERS AND DOCKS
LAND USE PLANNING	COMMERCIAL/RESIDENTIAL
 Serving Cape Cod and Southeastern Massachusetts	
17 ACADEMY LANE, SUITE 200 - FALMOUTH, MA - 02540 - 508.495.1225	
PROJECT NUMBER: 22079	CAD FILE NAME: 22079SP
DRAWN BY: L.M./M.B.	SHEET 1 OF 1



# 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: 26 Massasoit Ave.

Preparer's Name: Michael Borselli

Date:

Watershed:

## Project Nitrogen Load

### Proposed Wastewater

### New Construction/ Increases in Flow, Raze & Rebuild, or Repairs/ Upgrades

1. Project Title-5 wastewater flows:  gpd (a)

Actual wastewater flows:  \* (b)

Average wastewater flows:  gpd (a)+(b) ÷ 2= (A)

Place ✓ in applicable box:

- Yes  No  Will the project be connected to sewer ?
- Is project Title-5 wastewater flow 10,000 gpd or greater ?

\* Actual water use flows per unit in Bourne

Place ✓ 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 | } Type of system: _____ |
| <input type="checkbox"/> | DEP-approved I/A System (25-ppm-N)   | x | 0.034542 |                         |
| <input type="checkbox"/> | DEP-approved I/A System (19-ppm-N)   | x | 0.026252 |                         |
| <input type="checkbox"/> | DEP-approved Enhanced I/A (12-ppm-N) | x | 0.016580 |                         |

Wastewater nitrogen load (Title-5 flows) =  kg-N/yr (B)

Wastewater nitrogen load (Actual flows) =  kg-N/yr (C)

### Stormwater Runoff

Town of Bourne

Recharge rate for Bourne (inches; for natural areas from Technical Bulletin 91-001):  (RECH)

Project site area:  acres (D)

Project site wetland area:  acres (E)

Project site upland area:  acres (F)

Pervious unpaved upland:  acres (G)

% using LID Paved area:  s.f. (H)

Factor may be adjusted for employment of LID → x 1.4158E-04 =  kg-N/yr (I)

LID = low impact development

Roof area:  s.f. (J)

x 7.0792E-05 =  kg-N/yr (K)

### Fertilizer

Previous unpaved upland - roof area =

Managed turf/ lawn area:  s.f. x 3.4019E-04 =  kg-N/yr (L)

### Total Nitrogen Load

Total project nitrogen load (Title-5 flows):  kg-N/yr (M)= (B)+(I)+(K)+(L)

### Existing Conditions

Calculate (A') through (P') as w/ (A) through (P):

Title-5 wastewater flows:  gpd

Actual wastewater flows:  \*

Avg. wastewater flows:  gpd (A')

Place ✓ in applicable box:

- Yes  No  Is existing development on sewer ? (If 'Yes', then go to line 2.)

- Standard Title-5 System
- DEP-approved I/A System (commercial)
- DEP-approved I/A System (residential)
- DEP-approved enhanced I/A

kg-N/yr (B')

kg-N/yr (C') wastewater offsets

Project site area:  acres (D')

Project site wetland area:  acres (E')

Project site upland area:  acres (F')

Pervious unpaved upland:  acres (G')

Paved area:  s.f. (H')

Paving runoff offset:  kg-N/yr (I')

Roof area:  s.f. (J')

Roof runoff offset:  kg-N/yr (K')

Managed Turf/ lawn area:  s.f.

Fertilizer offset:  kg-N/yr (L')

Existing nitrogen load (Title-5 flows):  kg-N/yr (M')

Total project nitrogen load (Actual flows):  kg-N/yr (N)= (C)+(I)+(K)+(L)

Existing nitrogen load (Actual flows):  kg-N/yr (N')

Nitrogen load per acre (Average):  kg-N/yr/acre (O)= (M)+(N) ÷2 ÷(D)

Nitrogen offset per acre:  kg-N/yr/acre (O')

**Proposed Nitrogen Loading Concentration**

Project nitrogen loading concentration (Title-5 flows):  ppm-N (P)=  $(a) \div 723.76 + (G) \times (\text{RECH}) \div 9.7286 + (H) \div 10,594 + (K) \div 0.75$

Project nitrogen loading concentration (Actual flows):  ppm-N (Q)=  $(b) \div 723.76 + (G) \times (\text{RECH}) \div 9.7286 + (H) \div 10,594 + (K) \div 0.75$

Project nitrogen loading concentration (Average):  ppm-N (R)= (P)+(Q) ÷2

**Existing nitrogen loading concentrations:**

Title-5 flows  ppm-N (P')

Actual flows  ppm-N (Q')

Average  ppm-N (R')

next page -->

**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)

Yes  No 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.)

Yes  No 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)

Yes  No 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) ?

Yes  No  
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)*

Yes  No  
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.)*

Yes  No  
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.**

# Town of Bourne

## CONSERVATION COMMISSION

PROPOSED TIGHT TANK

### Nitrogen Loading Calculation Sheet for Residential Housing

The following calculation sheet is based upon Technical Bulletin 91-001 issued by the Cape Cod Commission and deals with nitrate nitrogen (NO<sub>3</sub>-N). Use the information from your PLAN OF RECORD to provide the following:

Number of bedrooms (Title 5 definition) = 0 bedrooms  
 Lot size (in square feet) = 6,325 sq. ft.  
 Impervious surfaces; \*\*Roof area = 965 sq. ft.    \*\*Paved area = 120 sq. ft.  
 Natural Area = lot area minus all impervious surfaces = 5,240 sq. ft.  
 Lawn area in sq. ft. = 4,400 sq. ft.

TITLE 5 FLOW = 110 GAL. / DAY PER BEDROOM  
 WASTEWATER FLOWS (NITROGEN LOAD & WATER LOAD)

Nitrogen from Title 5 design = 14,572 mg NO<sub>3</sub>-N / day / bedroom  
 Water from Title 5 design = 416.3 L H<sub>2</sub>O / day / bedroom  
 1a) Number of bedrooms = 0 X 14,572 = 0 mg. NO<sub>3</sub>-N / day  
 1b) Number of bedrooms = 0 X 416 = 0 L H<sub>2</sub>O / day

Actual Nitrogen load = 6071.5 mg NO<sub>3</sub>-N / day / bedroom  
 Actual Water load = 173.5 L H<sub>2</sub>O / day / bedroom

\*Note: This assumes 2.5 people / unit average occupancy within the Town.

2a) Number of bedrooms = 0 X 6071.5 = 0 mg. NO<sub>3</sub>-N / day  
 2b) Number of bedrooms = 0 X 173.5 = 0 L H<sub>2</sub>O / day

IMPERVIOUS SURFACES (NITROGEN LOAD & WATER LOAD)

NO<sub>3</sub>-N load number sq. ft. of roof surface X 0.19395 mg NO<sub>3</sub>-N / sq. ft.  
 H<sub>2</sub>O load number sq. ft. of roof surface X 0.2586 L / sq. ft.

3a) Roof surface = 965 sq. ft. X 0.19395 = 187.2 mg NO<sub>3</sub>-N  
 3b) Roof surface = 965 sq. ft. X 0.2586 = 249.5 L H<sub>2</sub>O

NO<sub>3</sub>-N load number sq. ft. of paved surface X 0.388 mg / sq. ft.  
 H<sub>2</sub>O load number sq. ft. of paved surface X 0.2586 L / sq. ft.

4a) NO<sub>3</sub>-N = 120 sq. ft. paved surface X 0.388 mg / sq. ft. = 46.6 mg NO<sub>3</sub>-N  
 4b) H<sub>2</sub>O = 120 sq. ft. paved surface X 0.2586 L / sq. ft. = 31.0 L H<sub>2</sub>O

LAWN NITROGEN LOAD = 0.933 mg / sq. ft. lawn surface

5) sq. ft. of lawn = 4,400 X 0.933 = 4,105.2 mg

NATURAL AREA WATER LOADING

Natural area = lot size - impervious surface = 5,240 sq.ft.

6) Natural area = 5,240 X water recharge factor = 711.6 L  
(0.1358 L / sq. ft. for Bourne)<sup>1</sup>

### SUMMARY OF NITROGEN LOADING

#### Estimated Title 5 Nitrogen & Water Loading

7a) ADD the above NO<sub>3</sub>N load:

1a + 3a + 4a + 5  
0 + 187.2 + 46.6 + 4,105.2 = 4,339.0 mg NO<sub>3</sub>-N / day

7b) ADD the above water (H<sub>2</sub>O) load:

1b + 3b + 4b + 6  
0 + 249.5 + 31.0 + 711.6 = 992.1 L H<sub>2</sub>O / day

7c) DIVIDE 7a by 7b = 4.4 ppm NO<sub>3</sub>-N\*\*\*\*\*

#### Actual Nitrogen & Water Loading

8a) ADD the above NO<sub>3</sub>N load:

2a + 3a + 4a + 5  
0 + 187.2 + 46.6 + 4,105.2 = 4,339.0 mg NO<sub>3</sub>-N / day

8b) ADD the above water (H<sub>2</sub>O) load:

2b + 3b + 4b + 6  
0 + 249.5 + 31.0 + 711.6 = 992.1 L H<sub>2</sub>O / day

8c) DIVIDE 8a by 8b = 4.4 ppm NO<sub>3</sub>-N\*\*\*\*\*

FINAL CALCULATION ADD 7c & 8c (ppm) = 8.8 divide by 2 = 4.4 ppm NO<sub>3</sub>-N

This is the actual nitrate nitrogen load for the project as designed. The target for coastal areas is 5 ppm nitrate nitrogen. Certain critical embayments may require a LOWER figure to prevent degradation.

\*\*\*\*\*If your nitrate nitrogen load exceeds the target limit USE A SECOND CALCULATION SHEET TO SHOW ALTERNATIVES IN TRYING TO ACHIEVE THE 5 PPM NITRATE NITROGEN LEVEL\*\*\*\*\*

<sup>1</sup>Water recharge factors for data line 6: @21' / yr. use 0.1358 in Bourne and Falmouth; @ 19" / yr. use 0.1228 for Mashpee & Sandwich; @ 18" / yr. 0.1164 for Barnstable, Dennis & Yarmouth; @ 17" / yr. use 0.1101 for Brewster & Harwich; @ 16" / yr. use 0.1031 for Chatham, Eastham, Orleans, Provincetown, Truro & Wellfleet.

# Town of Bourne

## CONSERVATION COMMISSION

### EXISTING CONDITIONS

## Nitrogen Loading Calculation Sheet for Residential Housing

The following calculation sheet is based upon Technical Bulletin 91-001 issued by the Cape Cod Commission and deals with nitrate nitrogen (NO<sub>3</sub>-N). Use the information from your PLAN OF RECORD to provide the following:

Number of bedrooms (Title 5 definition)	=	<u>2</u>		bedrooms
Lot size (in square feet)	=	<u>6,325</u>		sq. ft.
Impervious surfaces; **Roof area = <u>965</u> sq. ft.	=	<u>120</u>		sq. ft.
Natural Area = lot area minus all impervious surfaces	=	<u>5,240</u>		sq. ft.
Lawn area in sq. ft.	=	<u>4,400</u>		sq. ft.

TITLE 5 FLOW = 110 GAL. / DAY PER BEDROOM  
 WASTEWATER FLOWS (NITROGEN LOAD & WATER LOAD)

Nitrogen from Title 5 design = 14,572 mg NO<sub>3</sub>-N / day / bedroom

Water from Title 5 design = 416.3 L H<sub>2</sub>O / day / bedroom

1a) Number of bedrooms = 2 X 14,572 = 29,144 mg. NO<sub>3</sub>-N / day

1b) Number of bedrooms = 2 X 416 = 832 L H<sub>2</sub>O / day

Actual Nitrogen load = 6071.5 mg NO<sub>3</sub>-N / day / bedroom

Actual Water load = 173.5 L H<sub>2</sub>O / day / bedroom

\*Note: This assumes 2.5 people / unit average occupancy within the Town.

2a) Number of bedrooms = 2 X 6071.5 = 12,143 mg. NO<sub>3</sub>-N / day

2b) Number of bedrooms = 2 X 173.5 = 347 L H<sub>2</sub>O / day

IMPERVIOUS SURFACES (NITROGEN LOAD & WATER LOAD)

NO<sub>3</sub>-N load number sq. ft. of roof surface X 0.19395 mg NO<sub>3</sub>-N / sq. ft.

H<sub>2</sub>O load number sq. ft. of roof surface X 0.2586 L / sq. ft.

3a) Roof surface = 965 sq. ft. X 0.19395 = 187.2 mg NO<sub>3</sub>-N

3b) Roof surface = 965 sq. ft. X 0.2586 = ~~350~~ 249.5 L H<sub>2</sub>O

NO<sub>3</sub>-N load number sq. ft. of paved surface X 0.388 mg / sq. ft.

H<sub>2</sub>O load number sq. ft. of paved surface X 0.2586 L / sq. ft.

4a) NO<sub>3</sub>-N = 120 sq. ft. paved surface X 0.388 mg / sq. ft. = 46.6 mg NO<sub>3</sub>-N

4b) H<sub>2</sub>O = 120 sq. ft. paved surface X 0.2586 L / sq. ft. = 31.0 L H<sub>2</sub>O

LAWN NITROGEN LOAD = 0.933 mg / sq. ft. lawn surface

5) sq. ft. of lawn = 4,400 X 0.933 = 4,105.2 mg

NATURAL AREA WATER LOADING

Natural area = lot size - impervious surface = 5,240 sq.ft.

6) Natural area = 5,240 X water recharge factor = 711.6 L  
(0.1358 L / sq. ft. for Bourne)<sup>1</sup>

SUMMARY OF NITROGEN LOADING

Estimated Title 5 Nitrogen & Water Loading

7a) ADD the above NO<sub>3</sub>N load:

29,144 + 187.2 + 46.6 + 4,105.2 = 33,483.0 mg NO<sub>3</sub>-N / day

7b) ADD the above water (H<sub>2</sub>O) load:

832 + ~~31.0~~ 249.5 + 31.0 + 711.6 = 1,824.1 L H<sub>2</sub>O / day

7c) DIVIDE 7a by 7b = 18.4 ppm NO<sub>3</sub>-N\*\*\*\*\*

Actual Nitrogen & Water Loading

3a) ADD the above NO<sub>3</sub>N load:

12,143 + 187.2 + 46.6 + 4,105.2 = 16,482.0 mg NO<sub>3</sub>-N / day

3b) ADD the above water (H<sub>2</sub>O) load:

347 + 249.5 + 31.0 + 711.6 = 1,339.1 L H<sub>2</sub>O / day

8c) DIVIDE 8a by 8b = 12.3 ppm NO<sub>3</sub>-N\*\*\*\*\*

FINAL CALCULATION ADD 7c & 8c (ppm) = 30.7 divide by 2 = 15.4 ppm NO<sub>3</sub>-N

This is the actual nitrate nitrogen load for the project as designed. The target for coastal areas is 5 ppm nitrate nitrogen. Certain critical embayments may require a LOWER figure to prevent degradation.

\*\*\*\*\*If your nitrate nitrogen load exceeds the target limit USE A SECOND CALCULATION SHEET TO SHOW ALTERNATIVES IN TRYING TO ACHIEVE THE 5 PPM NITRATE NITROGEN LEVEL\*\*\*\*\*

<sup>1</sup>Water recharge factors for data line 6: @21' / yr. use 0.1358 in Bourne and Falmouth; @ 19" / yr. use 0.1228 for Mashpee & Sandwich; @ 18" / yr. 0.1164 for Barnstable, Dennis & Yarmouth; @ 17" / yr. use 0.1101 for Brewster & Harwich; @ 16" / yr. use 0.1031 for Chatham, Eastham, Orleans, Provincetown, Truro & Wellfleet.



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

**TOWN OF BOURNE**  
**Board of Assessors**  
**24 Perry Avenue**  
**Buzzards Bay, MA 02532**  
**(508) 759-0600 Ext. 1510**



Rui Pereira, MAA  
Director of Assessing

April 11, 2024

Falmouth Engineering, Inc.  
17 Academy Lane, Ste. 200  
Falmouth, MA 02540

Re: Abutters List for Map 43.3 Parcel 86  
Property address: 26 Massasoit Avenue

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 43.3 Parcels 77, 85, 87, 87.01 & 95.

Your filing fee of \$25.00 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 9371,9375,9377,9378,9386  
 Sort:

Report #24: Owner Listing Report  
 Fiscal Year 2025

Bourne MA

Key	Parcel ID	Owner	Location	LC/CI	Bk-Pg(Cert) /Dt	Mailing Street	Mailing City	ST	Zip Cd/County
9371	43.3-77-0	LEONARD PAUL V	0 MASSASOIT AVE	N	28596/312	225 SHAW AVE	ABINGTON	MA	02351
			1320		12/24/2014				
9375	43.3-85-0	TOWER ERIKA	30 MASSASOIT AVE	N	35355/144	24A PRESCOTT ST	ARLINGTON	MA	02474
			1010		9/9/2022				
9377	43.3-87-0	BUCHANAN CHARLES M JR & ELLEN BUCHANAN FAMILY TRUST	24 MASSASOIT AVE	N	30772/18	4 HOWARD STREET	MILTON	MA	02186
			1060		9/19/2017				
9378	43.3-87-1	BUCHANAN CHARLES M JR & ELLEN BUCHANAN FAMILY TRUST	33 MASSASOIT AVE	N	30772/18	4 HOWARD STREET	MILTON	MA	02186
			1010		9/19/2017				
9386	43.3-95-0	EGAN KIMBERLY	340 CIRCUIT AVE	N	35751/246	825 16TH STREET APT A	SANTA MONICA	CA	90403
			1010		4/27/2023				

Total Records 5



April 9, 2024

**Falmouth Engineering, Inc.**  
17 Academy Lane, Suite 200  
Falmouth, MA  
02540

**RE: Notice of Public Hearing, 26 Massasoit Avenue, Bourne MA**

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Dear Abutter,

In accordance with Title 5, 310 CMR 15.411, you are hereby notified that Karen West has requested a hearing before the Bourne Board of Health for the property location of 26 Massasoit Avenue. At said hearing, the Board will discuss and possibly vote to approve installation of a proposed tight tank.

The hearing is tentatively scheduled for Wednesday, May 8, 2024 at 5:30 p.m. and will be held at the Bourne Veterans Community Building at 239 Main St. Buzzards Bay. There also may be access to this meeting using Zoom virtual meeting software. Please contact the Bourne Health Department at 508-759-0600 ext. 1513 to obtain further details.

Information regarding the hearing may be available for your review one week prior to the meeting at the Bourne Health Department, 24 Perry Avenue, Buzzards Bay, Monday through Friday from 8:30 AM to 4:30 PM. 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 place of the hearing with the Town, in case of any changes.

Should you have any questions or concerns, please do not hesitate to contact us or the Bourne Health Department at 508-759-0600 ext. 1513.

Sincerely,

*Michael J. Borselli*

Michael J. Borselli, P.E.  
President, Falmouth Engineering, Inc.



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