OWT 100: Conventional Onsite Wastewater Treatment Basics for Installers

DEM OWTS Installer License Exam Preparation

NEOWTP

DEM
RHODE ISLAND

Brian Lafaille, PE, MBA
Principal Sanitary Engineer

Onsite Wastewater Treatment Systems Program
235 Promenade Street
Providence, RI 02908
Tel. (401) 222-3961
Email: brian.lafaille@dem.ri.gov

www.dem.ri.gov/septic

OWTS Permitting Program Overview

DEM Provides Regulatory Oversight in Three Areas

- **Site Suitability**: A preliminary stage which assesses the suitability of a parcel of land for on-site sewage treatment

- **Treatment System Design Review**: To review and approve a design's compliance with the OWTS Rules

- **System Installation**: Field inspections are conducted by DEM staff during the key stages of system siting and installation

Septic / OWTS Program

Angelone, Thomas Senior Environmental Scientist, Permitting & Subdivision Suitability Determinations	222-3961 ext. 7607
DeRiso, Andrew Senior Environmental Scientist, Field Inspections & System Repair Permitting	222-3961 ext. 7704
Duranleau, David Environmental Scientist, Field Inspections & System Repair Permitting	222-3961 ext. 7711
Ferreira, Kyle Senior Environmental Scientist, Permitting & System Suitability Determinations	222-3961 ext. 7709
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Mayberry, Katelyn Senior Environmental Scientist, Permitting	222-3961 ext. 7720
O'Rourke, Peter Senior Environmental Scientist, Field Inspections & System Repair Permitting	222-3961 ext. 7714
Pittman, Alan Senior Environmental Scientist, Field Inspections & System Repair Permitting	222-3961 ext. 7716

DEM OWTS Program Contacts

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Phone: (401) 222 - 3961

Sorensen, Karen Information Service Tech, OWTS Administrative Support	222-3961 ext. 7050
Tedesco, Jacqueline Sanitary Engineer, Permitting	222-3961 ext. 7606
Washington, Linda Chief Implementation Aide, Adminstrative Support Services Manager	222-3961 ext. 7718

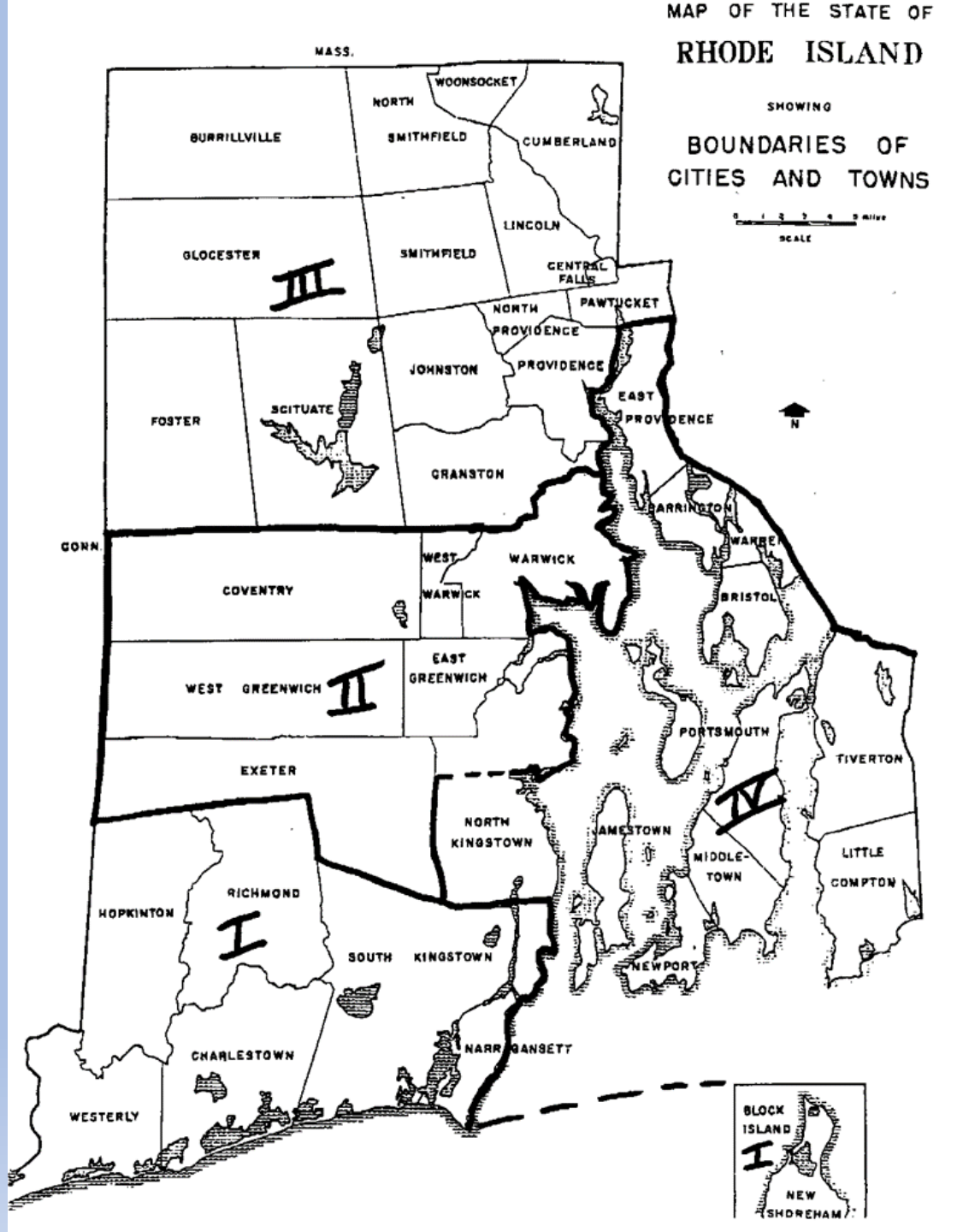
Field Inspection Districts

District I - Peter O’Rourke – ext. 7714

District II – David Duranleau – ext. 7711

District III – Alan Pittman – ext. 7716

District IV – Andy DeRiso – ext. 7704



- The OWTS Rules Establish Standards for Locating, Designing, Construction and Maintenance of Septic Systems in RI

- Be familiar with these for the exam!

- Available on web: www.dem.ri.gov/septic

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
Office of Water Resources

Rules Establishing Minimum Standards Relating to

Location, Design, Construction and Maintenance of Onsite Wastewater

Treatment Systems

November 25, 2018

OWTS Construction Permit Application Types

- **New Building Construction** (New Construction/ Adding 2 or More Bedrooms to Existing Home/ >25% Increase in Flow for Commercial)
- **Alteration** (Adding 1 Bedroom to Existing Home/≤25% Increase in Flow for Commercial)
- **Repair** (No Change of Use/Design Flow)
- **Suitability Determination** (Evaluation of Existing OWTS)
- **Subdivision Suitability** (Needed for Subdivision Approval by Cities and Towns)

OWTS Construction Design and Installation Permitting Process

DEM Approved OWTS Construction Permit Application

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

FOR RIDEM USE ONLY

APPLICATION No. 1911-0536 DATE RECEIVED 5/3/19 AMOUNT RECEIVED $ 180.00 CHECK # 4479 NOTE 014

TYPE OF APPLICATION (CHECK ALL THAT APPLY)

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

SITE INFORMATION

121 WIDOW SWEETS RD. EXETER 49
NO. STREET CITY/TOWN POLE #

PLAT NUMBER 9-1 LOT NUMBER 8 SUBDIVISION LOT NUMBER –

LOT SIZE 4.5 SF/ACRES

SUBDIVISION NAME –

SUBDIVISION SITE SUITABILITY CERTIFICATION # –

OWNER INFORMATION

GRANN JOHN W.
LAST NAME FIRST NAME M.I.

121 WIDOW SWEETS RD. EXETER 02822
NO. STREET CITY/TOWN ZIP CODE

RIDEM APPLICATION HISTORY

PREVIOUS SITE TESTING ☒ YES ☐ NO APPLICATION # 7611-063

DEPTH TO APPROVED WATER TABLE 5.5' HOW DETERMINED SEV

TEST HOLE # 1 DATE EXCAVATED 4/17/19 WETLANDS within 200' OF OWTS ☐ YES ☐ NO

WETLAND DETERMINATION ☐ YES ☒ NO RIDEM FILE # – DATE –/–/–

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

DESIGN INFORMATION

BUILDING USE: ☒ Residential ☐ Commercial ____ ☐ Other ____

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

MAY 3 2019

OF DESIGN UNITS 2-BR

UNIT DESIGN FLOW 115 gallons per BR (unit) TOTAL DAILY FLOW 230 gallons

TANK SIZE 1000 gallons DESIGN LOADING RATE 0.52 gpd/sf

MINIMUM REQUIRED LEACHFIELD AREA 442.3 square feet

LEACHFIELD TYPE ELJEN INDRAIN

TOTAL AREA OF LEACHFIELD PROVIDED 448 square feet

CERTIFICATION

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

Designer's Signature Glen Skurka License # D-1159

Designer's Email GLEN@D-AMBRA.COM Phone # 486-7463

Business/Company Name T.H. SKURKA

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

Owner's Phone Number 401 556 9897 401 523-5181

Owner's Email lgrann@cox.net

Owner(s) Signature Lawrence A. Grann

PERMIT APPROVAL SECTION: DO NOT WRITE BELOW THIS LINE

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

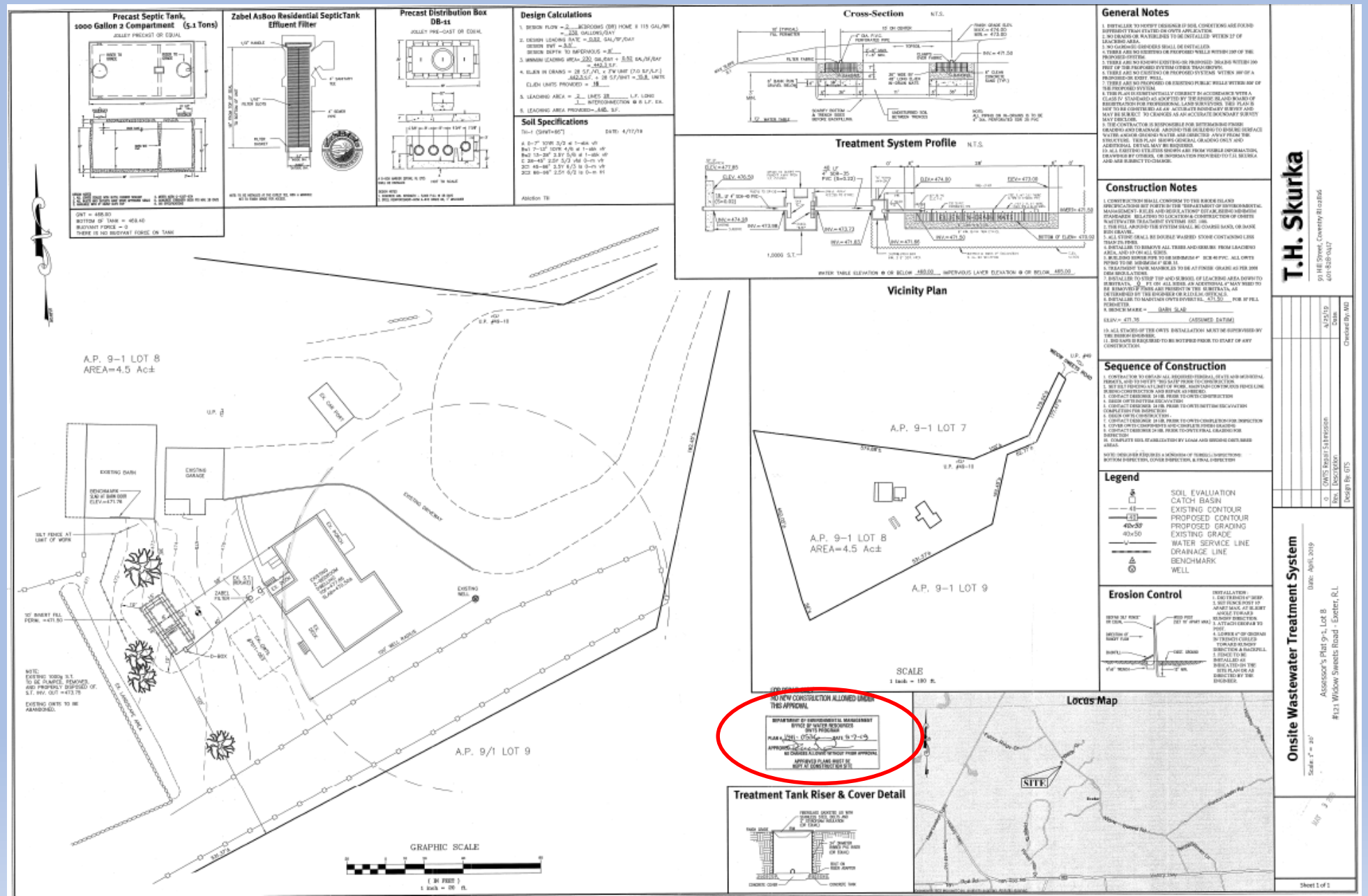
IMPORTANT: Additional terms of approval as circled.

- A. Bottom of leaching area excavation must be inspected by the RIDEM prior to placement of any gravel or stone.
- B. System installation must be inspected by RIDEM prior to covering any component of the system with backfill.
- C. Applicant shall comply with all requirements, conditions and stipulations of variance(s) approved on ____
- D. Joint Permit: Designer of record must contact RIDEM prior to start of any site construction.
- E. A/E Technology: additional installation, operation or maintenance requirements may apply (see A/E Technology Certification.)
- F. Copy of this form and Operation/Maintenance contract must be filed in land evidence records prior to conformance.
- G. Proposed construction falls within "Coastal Zone". Contact Rhode Island Coastal Resources Management Council.
- H. Proper erosion and sedimentation controls must be installed prior to start of construction.
- I. Transfer: See original permit for all applicable conditions.
- J. Other Vent req'd when cover exceeds 18"

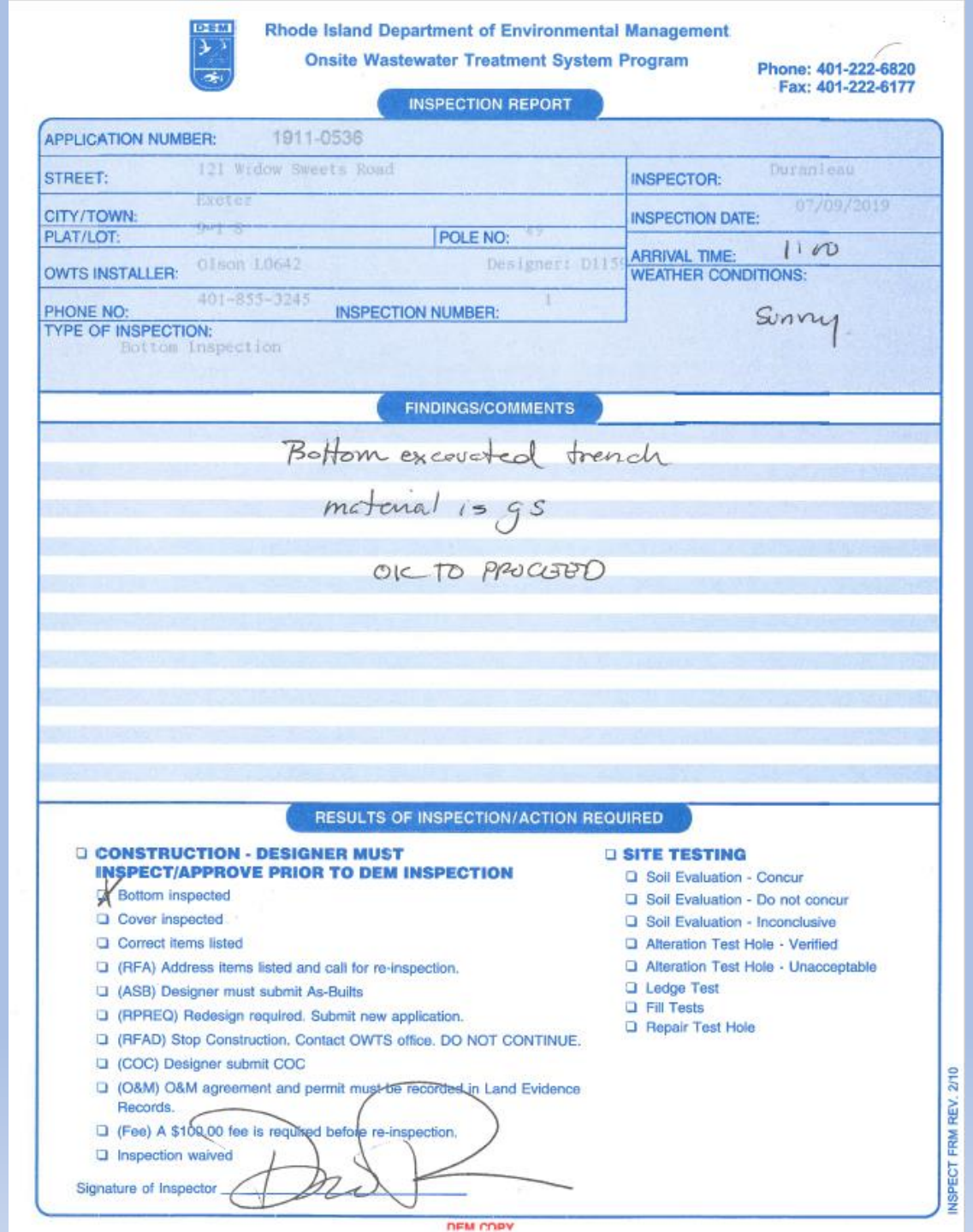
Signature of RIDEM Official	Date of Approval	Date of Expiration
	5-7-19	5-7-20

DEM SEE INTRUCTIONS ON REVERSE SIDE

DEM Approved Design Plan and Details



Licensed Designer Notifies DEM of Start of Construction



Rhode Island Department of Environmental Management
Onsite Wastewater Treatment System Program

Phone: 401-222-6820
Fax: 401-222-6177

INSPECTION REPORT

APPLICATION NUMBER: 1911-0536

STREET: 121 Widow Sweets Road
INSPECTOR: Duranleau

CITY/TOWN: Exeter
INSPECTION DATE: 07/09/2019

PLAT/LOT: 9-1-8
POLE NO: 49

ARRIVAL TIME: 1100

OWTS INSTALLER: Olson L0642 Designer: D1159

WEATHER CONDITIONS: Sunny

PHONE NO: 401-855-3245
INSPECTION NUMBER: 1

TYPE OF INSPECTION: Bottom Inspection

FINDINGS/COMMENTS

Bottom excavated trench
material is gs
OK TO PROCEED

RESULTS OF INSPECTION/ACTION REQUIRED

- ☐ **CONSTRUCTION - DESIGNER MUST INSPECT/APPROVE PRIOR TO DEM INSPECTION**
  - ☒ Bottom inspected
  - ☐ Cover inspected
  - ☐ Correct items listed
  - ☐ (RFA) Address items listed and call for re-inspection.
  - ☐ (ASB) Designer must submit As-Builts
  - ☐ (RPREQ) Redesign required. Submit new application.
  - ☐ (RFAD) Stop Construction. Contact OWTS office. DO NOT CONTINUE.
  - ☐ (COC) Designer submit COC
  - ☐ (O&M) O&M agreement and permit must be recorded in Land Evidence Records.
  - ☐ (Fee) A $100.00 fee is required before re-inspection.
  - ☐ Inspection waived

Signature of Inspector

- ☐ **SITE TESTING**
  - ☐ Soil Evaluation - Concur
  - ☐ Soil Evaluation - Do not concur
  - ☐ Soil Evaluation - Inconclusive
  - ☐ Alteration Test Hole - Verified
  - ☐ Alteration Test Hole - Unacceptable
  - ☐ Ledge Test
  - ☐ Fill Tests
  - ☐ Repair Test Hole

INSPECT FRM REV. 2/10

DEM COPY

Designer Calls to Schedule DEM “Bottom Inspection”

Designer Calls to Schedule DEM "Cover Inspection"

Rhode Island Department of Environmental Management
Onsite Wastewater Treatment System Program

Phone: 401-222-6820
Fax: 401-222-6177

INSPECTION REPORT

APPLICATION NUMBER: 1911-0536

STREET: 121 Widow Sweets Road

CITY/TOWN: Exeter

PLAT/LOT: 9-1 8 POLE NO: 49

OWTS INSTALLER: Olson L0642 Designer: D115

PHONE NO: 401-855-3245 INSPECTION NUMBER: 2

TYPE OF INSPECTION: Cover Inspection

INSPECTOR: Duranleau

INSPECTION DATE: 07/11/2019

ARRIVAL TIME: 1:00

WEATHER CONDITIONS: pc

FINDINGS/COMMENTS

- Outlet tee w/ filter installed in tank
- D-box & field installed per plan
- Maintain max cover 30" over system, may need to cut down bank near d-box
- Vent installed

OK TO COVER

RESULTS OF INSPECTION/ACTION REQUIRED

- ☐ **CONSTRUCTION - DESIGNER MUST INSPECT/APPROVE PRIOR TO DEM INSPECTION**
  - ☐ Bottom inspected
  - ☒ Cover inspected
  - ☐ Correct items listed
  - ☐ (RFA) Address items listed and call for re-inspection.
  - ☐ (ASB) Designer must submit As-Builts
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  - ☐ Soil Evaluation - Concur
  - ☐ Soil Evaluation - Do not concur
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  - ☐ Ledge Test
  - ☐ Fill Tests
  - ☐ Repair Test Hole

Signature of Inspector

INSPECT FRM REV. 2/10

DEM COPY

Designer's Certificate of Construction

- Designer is responsible for overseeing the construction of the OWTS and serves as the system inspector
- Designer certifies that the system was installed in accordance with the approved plan
- This is the last step in the construction process

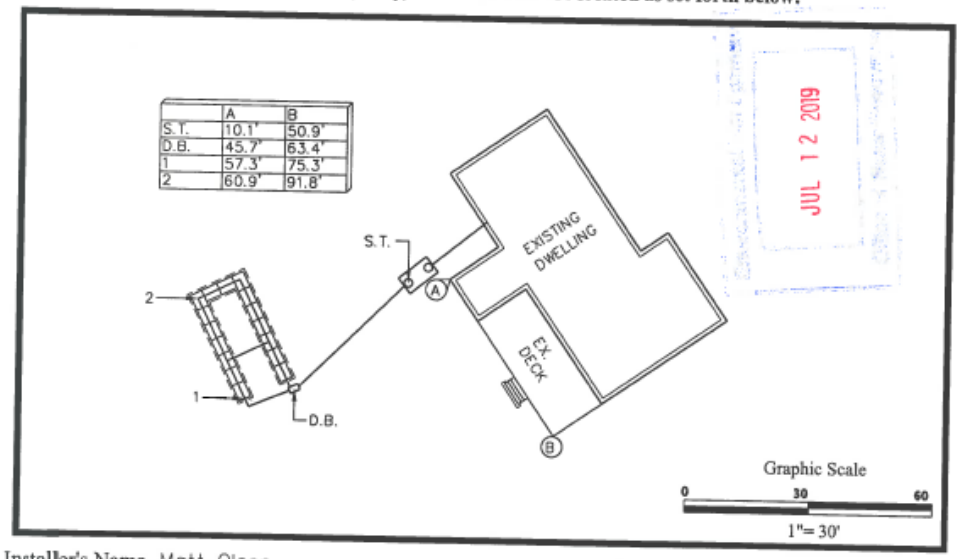
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
PERMITTING SECTION
Onsite Wastewater Treatment SYSTEMS (OWTS) PROGRAM

DESIGNER'S CERTIFICATE OF CONSTRUCTION FOR OWTS

Permit No. 1911-0536

I, Glen Skurka, as the designer of record for the OWTS installation located at (Street) 121 Widow Sweets Rd. in the City or Town of Exeter, R.I. hereby certify that the installation of the OWTS was performed by the installer named below, and to the best of my information, knowledge and belief, was witnessed and inspected in accordance with RIDEM/OWTS Rules, and that, in my professional opinion, the installation of the OWTS conforms with the plans, specifications, applicable statutes, regulations, and construction tolerances as approved by the Director of the Rhode Island Department of Environmental Management. I further certify that I have documented the installation in accordance with RIDEM/OWTS Rules. This certification is effective as of (date): July 12, 2019

The septic tank, D-box (if any) and leach field are located as set forth below:



JUL 12 2019

Installer's Name Matt Olson License No. L-0642
Designer's Name Glen Skurka License No. D-1159
Designer's Signature Glen Skurka Date Signed 7/12/19
Designer Request of Change (DROC) Approval Date(s)

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES PERMITTING SECTION
235 PROMENADE STREET
PROVIDENCE, RI 02908

July 15, 2019

TO: John W Grann
1221 Widow Sweets Road
Exeter, RI 02822

SITE INFORMATION:
Application No.: 1911-0536
Street: 121 Widow Sweets Road
Town: Exeter
Plat: 9-1
Lot: 8
Subdivision:
Subdivision Lot No:

CERTIFICATE OF CONFORMANCE

This Certificate of Conformance means that the Onsite Wastewater Treatment System (OWTS), which has been installed under the above application number, appears to substantially conform with the design requirements and other requirements as indicated on the application, and associated plans and specifications. **PERMISSION IS THEREFORE GRANTED FOR UTILIZATION OF THE SEWAGE DISPOSAL SYSTEM.** A copy of this certificate has been forwarded to the building official of the municipality having jurisdiction over the subject site; he/she may issue a Certificate of Occupancy for the building provided all other local requirements have been met. The building official must receive a copy of the Certificate of Conformance prior to his or her issuing any required certificate of occupancy for the building or facility to be served by the OWTS.

This Certificate is based upon the representations of the Owner and his/her agents, who are responsible for the proper installation of this system. This Department has approved the OWTS installation in reliance upon those representations and is not responsible for any of the construction, design details, specifications, distances or elevations indicated on the application, plan or specifications. This approval is subject to future suspension and revocation in the event that: subsequent examination reveals that any of the data indicated on the application, plan or specifications is incorrect or not in compliance with applicable regulations; or the OWTS system discharges sewage to the surface of the ground or to any watercourse, fails to otherwise operate satisfactorily or is altered in a manner which deviates from the terms of the approved application.

Authorized Agent: Mohamed J. Freij, PE, PLS, Supervising Sanitary Engineer

ONSITE WASTEWATER TREATMENT SYSTEM PROGRAM

SEE REVERSE SIDE FOR IMPORTANT INFORMATION ON CARE AND MAINTENANCE

Certificate of Conformance

- Issued by DEM when all paper work is in, including (Certificate of Construction, Recorded Deed Restrictions, Recorded A/E Technology O&M Contracts, etc.)
- Required for Certificate of Occupancy
- Final Step in the OWTS Permitting Process

OWTS Installer Requirements

- OWTS Installers Must Be Licensed in RI
- Licenses Are In Effect for 3 Years
- Licenses May Be Denied, Suspended, or Revoked for Non-Compliance with OWTS Rules
- Installers Are Professionally Liable For Poor Workmanship.
- Be Honest, Treat People Right, Success Will Follow

Licensed Installers Must:

(1) Perform all work in compliance with approved plans and specifications only.

(2) Report any discrepancies on an approved plan, which he or she may note during construction to the Designer.

(3) Utilize only quality grade construction materials approved by the DEM.

(4) Use only the best construction techniques to provide for the best possible installations.

(5) Work only under valid plans approved by the DEM with the approval stamp clearly indicated, and commence work only after completely reviewing the entire approval including the application, the layout plans, all typical specification sheets, and other attachments.

(6) Adhere to each and every term of approval as stipulated by the DEM

Penalties for Non-Compliance

The penalties for noncompliance are as follows: any person who knowingly and willfully violates any rule or regulation adopted pursuant to authority granted to the DEM, upon conviction, shall be punished by a fine of not more than five hundred dollars ($500), or by imprisonment for not more than thirty (30) days, or both, for each offense or violation, and each day's failure to comply with any rule or regulation shall constitute a separate offense.

Common Non-Compliance Issues During Installation

-Designer of record fails to call DEM 24 hrs prior to the start of construction (OWTS Rule 6.47.E)

-System design changes are authorized by the designer and completed without DEM notification/approval (OWTS Rule 6.47.G).

-Designer missing installation deficiencies during inspections, for example:

Dirty Stone

Smeared Bottom

Incorrect Leachfield Location or Elevation

-DEM not called to request bottom or cover inspection as required by permit conditions.

-Installer starting work without designer authorization.

-Installer calling DEM for notice of start of construction

Exam Preparation

Exam Specifics

- Closed Book (No Books, Notes, Documents Allowed)
- 3-Part Exam (50% Fundamentals & Regulations, 30% Plan Interpretation, 20% Surveyor’s Level Transit Questions)
- 110 Multiple Choice Questions
- Time Limit= 2 ½ Hours
- Bring driver’s license (photo ID needed) and simple calculator with you (can’t use cell phone)
- DEM provides pencils and scrap paper
- Passing Score= 70%
- Exam Results Mailed in 6-8 Weeks

Topics You Will Not See on the Installers Exam

- Pumps
- Commercial systems

Examples of Topics You Will See on the Installers Exam

- Design and Function of Septic System Components
- Required Separation Distances to SHWT and Restrictive Layer/Bedrock
- Minimum Setback Distances
- Definitions
- Know the difference between an OWTS and a Cesspool
- OWTS Permitting Process
- Firm Understanding of the OWTS Rules
- Section 6.47 of OWTS Rules – OWTS Installation

Sample Exam Question 1

A leach field must be at least _____ feet from the water supply line.

A) 10

B) 15

C) 25

D) 50

Answer 1:

C -25ft.

OWTS Rule 6.23.B – Minimum Setback Distances - General

B. Minimum Setback Distances – General

	Building Sewer, Grease Tank, Distribution Box, Pump Tank, Septic Tank, Septic Tank Effluent Pipe (ft) (Note 12)		Leachfield (ft) (Note 12)	
Well Serving Non-potable Uses (Note 13)	25		50	
Water Supply Line	10 (Note 1)		25	
Property Line	10 (Note 2)		Design Flow (gpd)	(ft)
			0-2000	10
			>2000-5000 Note (3)	50
			> 5000 Note (4)	min. 50 (Note 5)
Foundation	5 (Not applicable to building sewer)		25 (Note 6)	
Subsurface drains, foundation drains , or storm drains (see also Tables 22.2 and 22.3): -- Upgradient and side gradient of the OWTS: -- Downgradient of the OWTS:	15 (Note 7) 25 (Note 7)		25 (Note 8) 50 (Note 9)	
Edge of any land at a level lower than the invert of the distribution line	10		10	
Stormwater Infiltration System	25 (Note 10)		25 (Note 10)	
Swimming Pools: In-ground: Above ground:	10 10		25 10	
	Design Flow <5000 gpd	Design Flow ≥5000 gpd (Note 4)	Design Flow <5000 gpd	Design Flow ≥5000 gpd (Note 4)

Sample Exam Question 2

2) A restrictive layer within a soil profile can be:

A) Rotten Rock

B) Decomposed Shale

C) Ledge

D) All of the Above

E) None of the Above

Answer 2: D – All of the Above – All Three Are Considered Restrictive Layers: Ledge, Rotten Rock, Decomposed Shale

OWTS Rule 6.8 – Definitions

9. "Bedrock" means rock, commonly called ledge, that forms the earth's crust. Bedrock includes rotten rock

66. "Rotten rock" means any decomposed but still coherent rock. Rotten rock is greater than fifty percent (50%) coherent rock and lies above equal or more coherent rock.

Answer 2: Soil Cat. 10

OWTS Rule 6.8 – Definitions

65. "Restrictive layer" means a soil horizon that is assigned to a soil category 10 as defined in § 6.16(L) of this Part.

OWTS Rule 6.16.L

Soil Category 10

L. Soil Category

Soil Category	Loading Rate (gals/sq ft/day) Pursuant to Rule 32.2 Starred items (*) are for soils with coarse fragment modifiers	Soil Texture	Soil Structure	Soil Consistence		Typical Soil Class
				Consistence In-Hand Using Soil Clods	Excavation Difficulty	
1	.70 .61*	cos, s, lcos, ls, cosl, fs	structureless- single grain subangular blocky	loose friable	N/A	Outwash (Class C), ice contact (Class D) and coarse ablation till (Class B) deposits
2	.61	vfs, lvfs	structureless- single grain	loose	N/A	Outwash (Class C) and ice contact (Class D) deposits
3	.70	ls, sl, l	granular, subangular blocky	very friable to friable	low	Lodgement Till (Class A), Ablation Till (Class B), Outwash (Class C), or Ice Contact (Class D)
4	.61 .70*	lfs, lvfs, fsl, vfs	granular, subangular blocky	very friable to friable	low	Lodgement Till (Class A), Ablation Till (Class B), Outwash (Class C), or Ice Contact (Class D)
5	.52	sil, si, vfsl	subangular blocky	very friable to friable	low	Typically Eolian deposits (Class G)
6	.61 .70*	lcos, cosl, lfs, ls, sl, l,	structureless massive	very friable to friable	low	Ablation till (Class B)
7	.52 .61*	fsl, vfsl, sil, si, vfs	structureless- massive	very friable to friable	low to moderate	Ablation till (Class B)
8	.46 .48*	all textures	structureless-massive	firm to very firm	moderate	Lodgement till (Class A)
9	.40 .43*	all textures	platy, structureless-massive	firm to very firm	high	Lodgement till (Class A)
10	Not Allowed (impervious)	all textures	platy, structureless-massive	extremely firm	very high to extremely high	Lodgement till (Class A)

OWTS Rule 6.16.L - Soil Category 10

L. Soil Category

Soil Category	Loading Rate (gals/sq ft/day) Pursuant to Rule 32.2 Starred items (*) are for soils with coarse fragment modifiers	Soil Texture	Soil Structure	Soil Consistence		Typical Soil Class
				Consistence In-Hand Using Soil Clods	Excavation Difficulty	
10	Not Allowed (Impervious)	all textures	platy, structureless-massive	extremely firm	very high to extremely high	Lodgement till (Class A)

Sample Exam Question 3

3) A repair permit is valid for:

A) 2 years

B) 5 years

C) 1 year

D) Depends on if water supply is public or a well

E) None of the above

Answer 3: C - 1 Year

OWTS Rule 6.46.C – Permit Expiration

C. Expiration of Permits for OWTS Repairs - All permits for repairs to OWTSs issued in accordance with § 6.18(G) of this Part shall expire as follows:

1. Where a permit for OWTS repair is issued following the property owner's receipt of a Notice of Violation issued by the Department, all repair work must be completed within the time periods set forth in the Notice of Violation; and

2. In all other cases, permits for OWTS repair shall expire as specified in the permit itself. In no case shall any permit for a repair to an OWTS be valid for more than one (1) year from the date of issuance of the permit.

Plan Interpretation

Key System Components

Installation Notes

Invert Elevations

Areas of Cuts and Fill

Size of Leaching Area

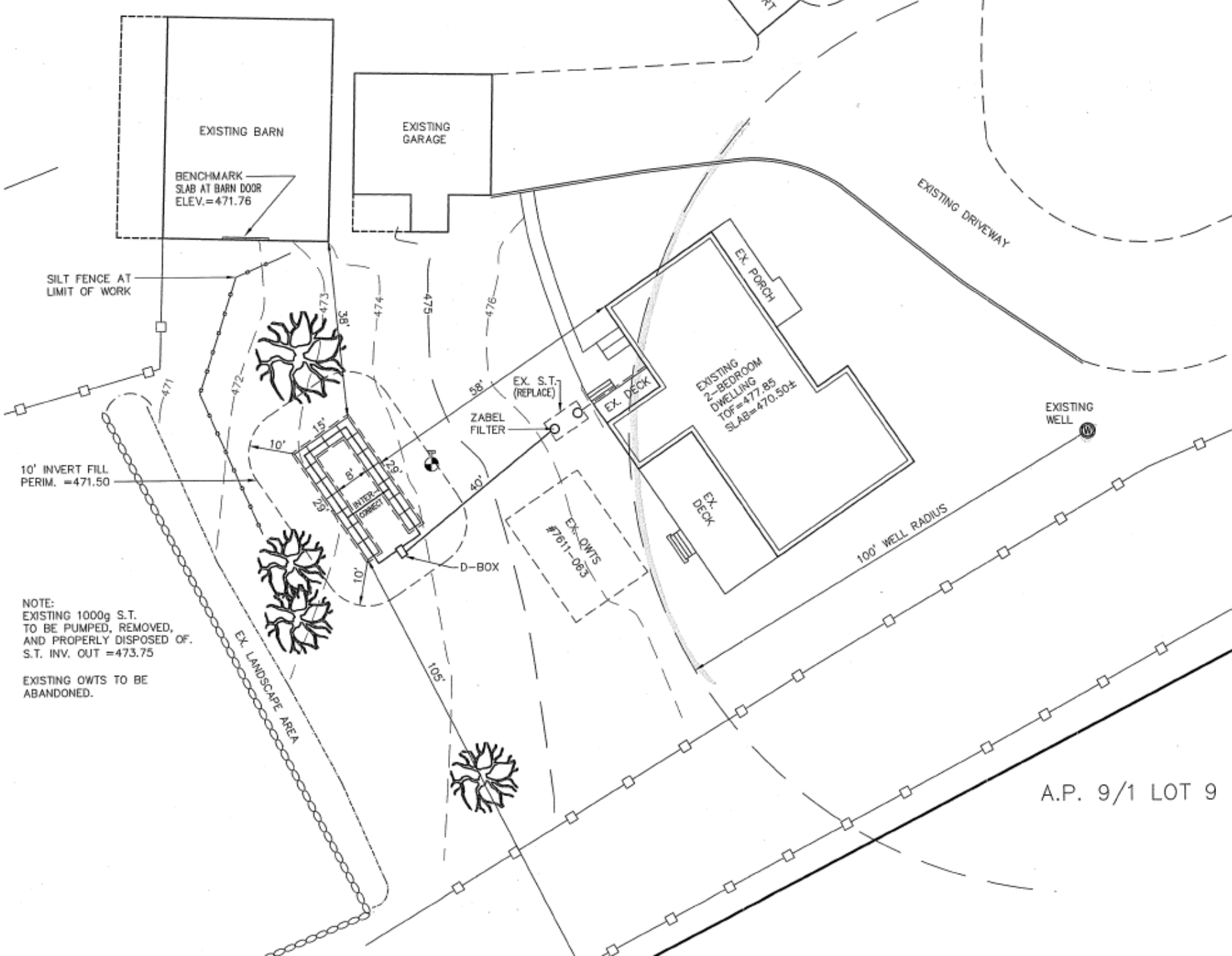
Depth of Stone/Sand

Depth of Cover

Plan Scale

Offset Distances

Fill Perimeter Elevation



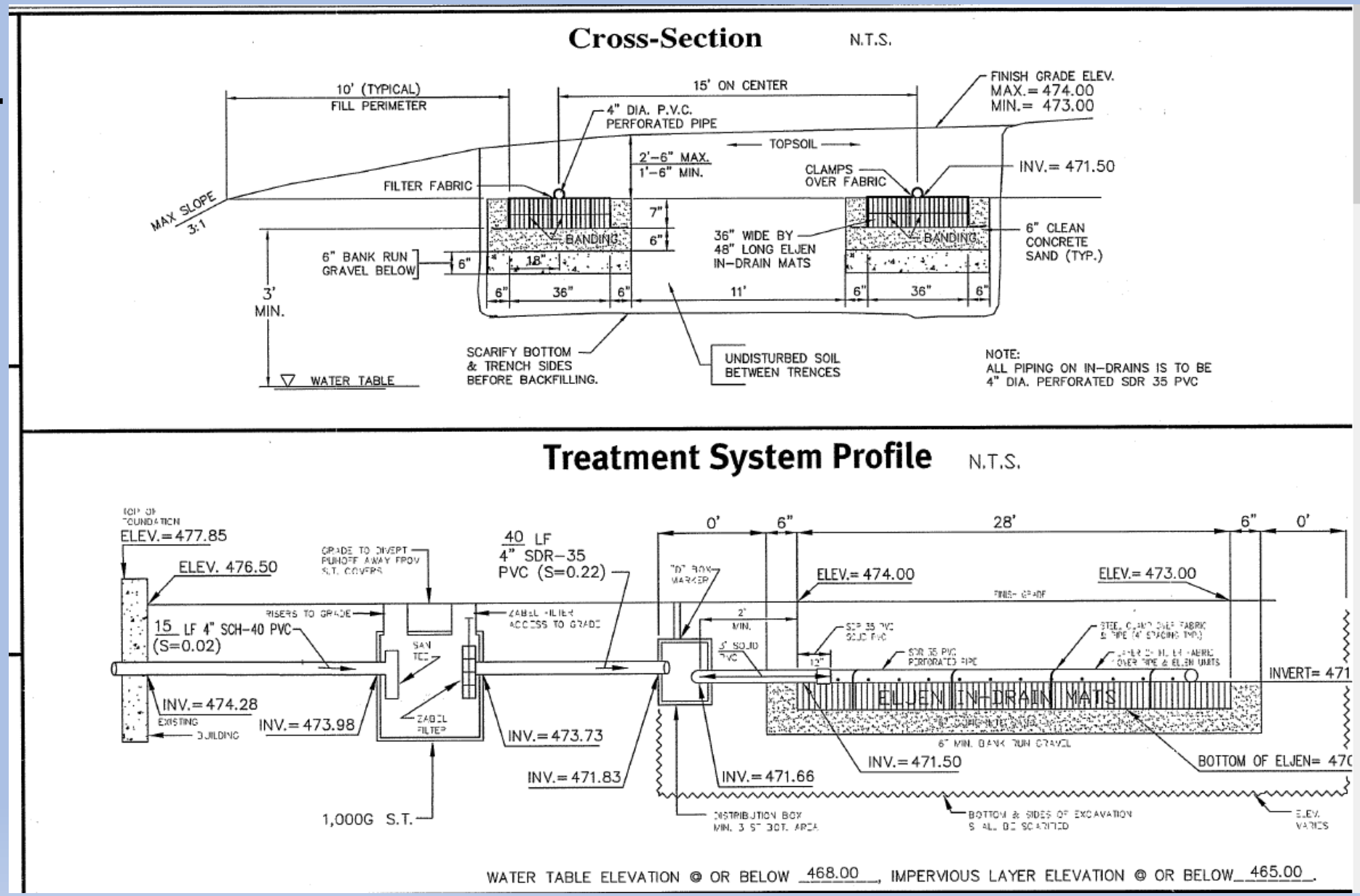
Plan Interpretation

Calculating Pipe Slope

Material Elevations/Types/Depths

Pipe Sizes/Type

Separation to SHWT/Impervious Layer



Questions on Installer Licensing and Exam Logistics

Contact: Linda Washington at RIDEM

linda.washington@dem.ri.gov

401 -222 - 3961 EXT. 7718