

Why We Inspect Septic Systems



Regulatory and practical requirements for inspecting newly constructed subsurface sewage disposal systems in Connecticut

*Jeff Polhemus, RS - Instructor/President
Environmental Health Institute of Connecticut
September 20, 2023*

Septic System Inspectors in CT

- What are the regulatory requirements for septic system inspections in Connecticut?
- What are the goals and objectives of septic system inspections performed by certified public health officials in Connecticut?
- What skills must an inspector possess to conduct effective inspections?
- What training is available for public health officials inspecting septic systems in Connecticut?

Septic Systems Requiring Inspections in CT:

Inspections required for all newly constructed, altered, repaired or extended septic systems



Inspections are not required for existing septic systems

(Real estate sales inspections are not regulated)



The Rule Book



CONNECTICUT PUBLIC HEALTH CODE

On-site Sewage Disposal Regulations and Technical Standards for Subsurface Sewage Disposal Systems

PHC Section 19-13-B100a (Building Conversions, Changes in Use, Building Additions)

Effective August 3, 1998

PHC Sections 19-13-B103a through 19-13-B103f (Design Flows 5,000 Gallons per Day or Less*)

Effective August 16, 1982

Technical Standards for Subsurface Sewage Disposal Systems

Effective August 16, 1982

Revised January 1, 2023

PHC Sections 19-13-B104a through 19-13-B104d (Design Flows Greater than 5,000 Gallons per Day*)

Effective August 16, 1982

*Note: The 5,000 gallons per day jurisdictional design flow was increased to 7,500 gallons per day by Public Act No. 17-146, Section 30 effective July 1, 2017, which revised CT General Statute Section 22a-430 (g).

State of Connecticut
Department of Public Health
Environmental Engineering Program
410 Capitol Avenue - MS #12SEW
P.O. Box 340308
Hartford, Connecticut 06134
(860) 509-7296

Email: DPH.EnvironEng@ct.gov

www.ct.gov/dph/subsurfacesewage

January 2023

CONNECTICUT PUBLIC HEALTH CODE B103 REGULATIONS

- The local director of health shall: (A) Assure the accuracy of the findings of **soil tests and deep observation pits**.
- Upon determination that the **subsurface sewage disposal system has been designed** in compliance with the requirements of Section 19-13-B103d of these regulations, the local director of health shall issue an approval to construct.
- **Inspection.** (1) The local director of health shall **inspect** all subsurface sewage disposal systems for compliance with Subsection 19-13-B103d and the approved plans for construction prior to covering and at such other times as deemed necessary. – *PHC Sec. 19-13-B103e. (g)*

Septic System Construction Goals :

- 1. System must comply with Codes and Technical Standards.**
- 2. System must comply with the approved design plan.**
3. System must “provide for the preservation and improvement of public health.” - *CT PHC Statement of Purpose.*
4. System must function mechanically, without failure – day after day – for years and years.

The Septic System Inspection Goals are to verify that the Construction Goals are met.

Septic System Inspection Objectives

- Confirm proper materials and components were used – per code and approved plan.
 - Component sizes, manufacturer's specifications, material specifications
- Confirm proper arrangement of component parts.
 - Tight fittings and seals, pipe slopes, stable and level structures, pipe bedding
 - Pumps, float switches, safety devices, etc.
- Confirm proper component location and elevation.
 - Vertical and horizontal separating distances.
- Create a clear record of the inspection.
- Ensure and document that any construction errors are corrected.

Component verification



Arrangement of Component Parts



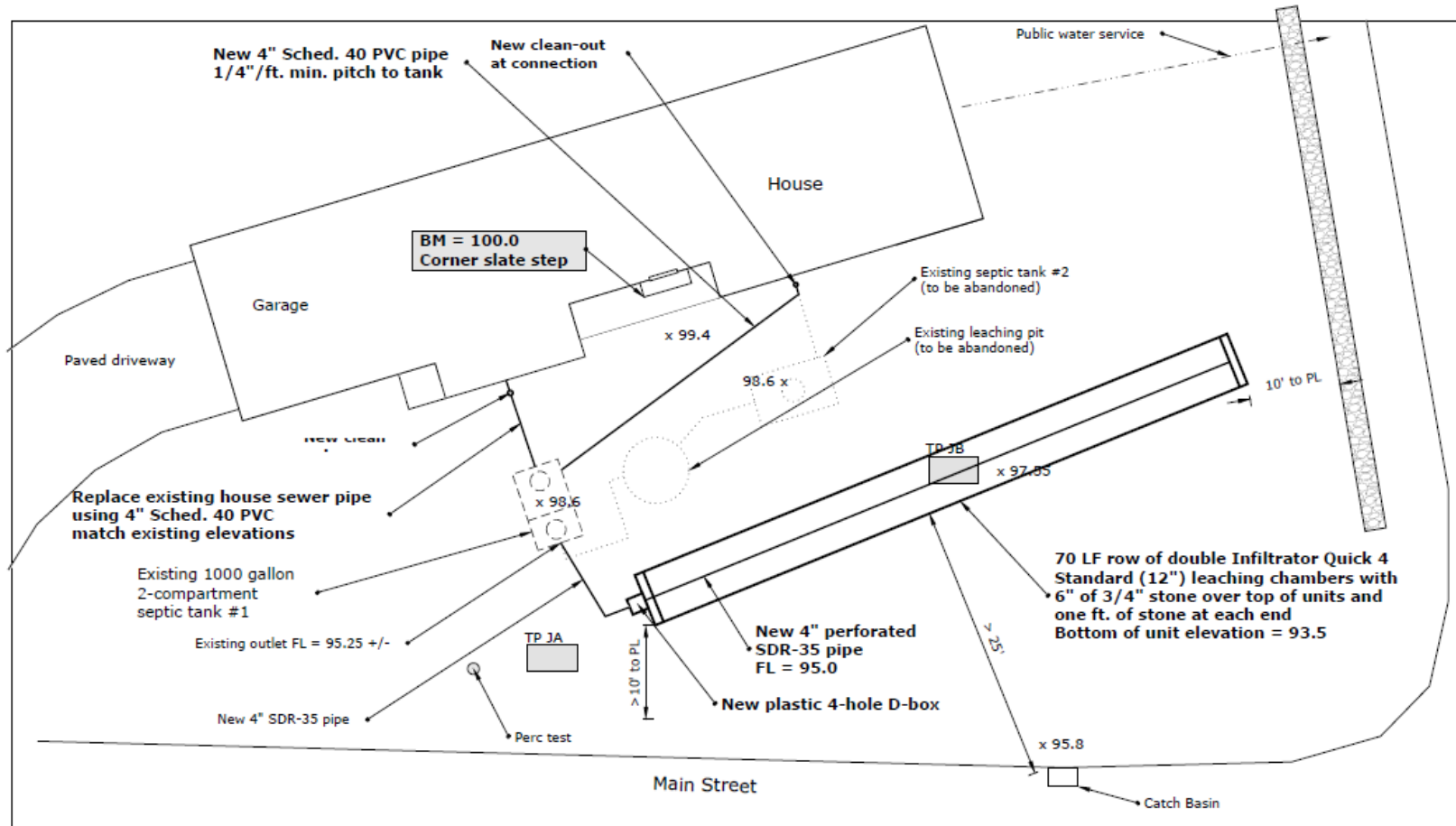
Critical Inspector Skills

- Knowledge of Codes and Technical Standards
- Organization and Preparation
- Soils evaluation
- Design plan interpretation
- Vertical measurements and calculations
- Understanding the relationship between soil conditions, the system design and the constructed system
- Product identification
- Use of inspection tools
- Communication

Soils Evaluation



Design Plan Interpretation



555 Main Street, Mapleville, CT

Dated: 8/5/21

Drawn by JP - ABC Installers

Septic system repair Design Criteria:

3-Bedroom house
1-10 min./in. perc rate. 495 SQ FT ELA Required
No soil restriction to bottom of test pits.
RS: >60"
MLSS: NA

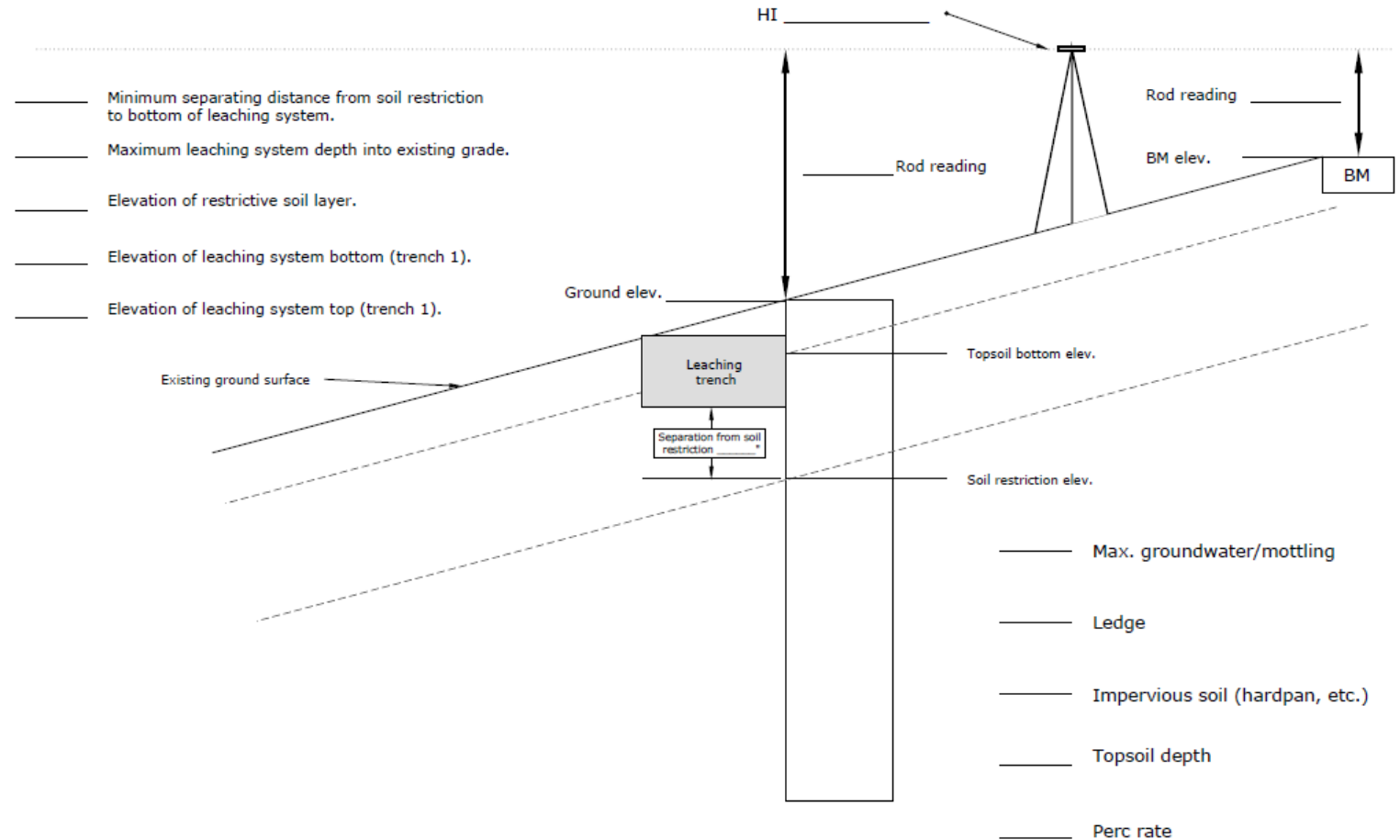
Proposed:

- * Pump, crush and fill or remove existing septic tank #2.
- * Connect Tank #2 house sewer to existing tank#1 using 4" Sched. 40 PVC pipe. Replace existing tank#1 house sewer using 4" Sched. 40 PVC pipe.
- * Connect existing tank #1 to new leaching system using 4" SDR-35 PVC pipe.

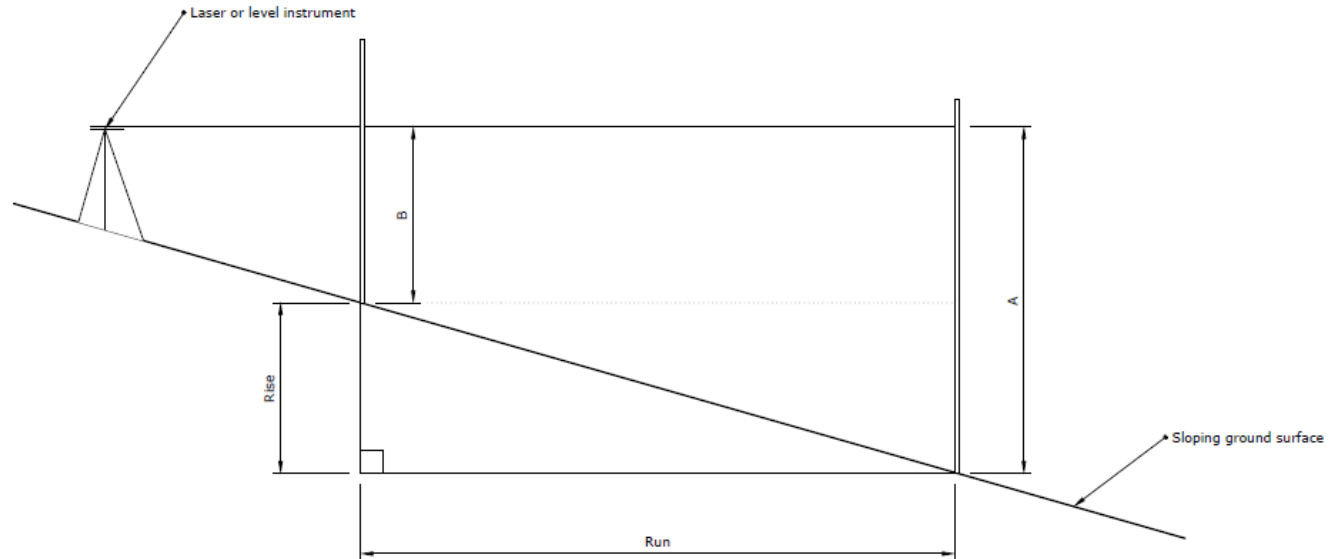
- * Install one 70 ft. row of Infiltrator Quick 4 Standard units with end caps and 6" of 3/4" stone over units. Add 1 ft. of stone at each end of row. Install 4" SDR-35 perforated pipe on top of stone, cover with approved filter fabric. (18" gallery equivalent with distribution pipe on top = 7.0 ELA rating)
- * 72 LF x 7.0 SF/LF ELA rating = 504 SQ FT ELA provided.
- * Bottom of leaching chambers to be set 48" min. above bottom of TP 1A.
- * Verify trench elevations at time of system staking inspection.

Vertical Measurements and Calculations

Leaching system elevations



Vertical Measurements and Calculations



Rise = vertical change = A-B

Run = horizontal distance

Rise/Run x 100 = % slope

Example:

Rod reading A = 10.75 feet

Rod reading B = 6.30 feet

Run = 33 feet

A - B = 10.75 - 6.30 = 4.45 feet

Rise/Run x 100 = (4.45/33) x 100 = 13.48% slope

Soil Conditions – Design - Construction

- The soil conditions observed and recorded during the initial site evaluation inspection will often dictate the leaching system depth into the existing grade where high groundwater conditions, ledge or compact soils pose a design depth restriction.
- The system design plan must incorporate these vertical restrictions into the design specifications along with the other dimensional requirements and restrictions.
- The constructed system must be built/installed to maintain the proper system depth into grade based on the design elevations and field conditions confirmed at the time of construction.
- The inspector is required to verify the accuracy of the soil conditions, the accuracy of the plan and the accuracy of the built system.

Product Identification

Plastic Leaching Chambers Backfilled with Approved Aggregate: For the products listed below and corresponding minimum C to C spacing

Product Name	Dimensions (W x H)
Cultec - Contactor EZ-24	16" x 12"
Cultec - Contactor EZ-24 (PDS)	16" x 12"
Cultec - Contactor 100	36" x 12.5"
Cultec - Contactor 100 (PDS)	36" x 12.5"
Cultec - Recharger 180	36" x 20.5"
Cultec - Recharger 180 (PDS)	
Cultec - Recharger 280	
Cultec - Recharger 280 (PDS)	
Cultec - Recharger 330XLHD	
Infiltrator Quick4 Equalizer 24	
Infiltrator Quick4 Equalizer 36	
Infiltrator Quick4 Standard	
Infiltrator Quick4 High Capacity	
Infiltrator Arc 36	
Infiltrator Arc 36HC	
Infiltrator Quick4 Plus Equalizer 36 Low Profile	
Infiltrator Quick4 Plus Standard Low Profile	
Infiltrator Quick4 Plus Standard	
Infiltrator Quick4 Plus High Capacity	
Infiltrator Arc 24	
Infiltrator Arc 36 LP	

Table 2-A
Approved Effluent Distribution Pipe

PIPE DESCRIPTION	TYPE OF JOINT
*PVC ASTM D 3034, SDR 35 *PVC ASTM F 789, PS-46 *PVC ASTM F 891, PS-50 or PS-100 *PVC ASTM F1760, SDR35	*Rubber compression gasket, or solvent weld couplings/fittings w/ 2-step PVC solvent solution procedure. Bell and spigot with no gasket
PVC ASTM D 2729 - only 3" diameter pipe (see remarks for use of 4" pipe)	Bell and spigot, no gaskets
PE ASTM F 810 (Perf. Spec.), SDR 38/ ASTM D 3350 - only 3" diameter pipe (see remarks for use of 4" pipe)	Bell and spigot, no gaskets

APPENDIX B: APPROVED SEPTIC TANK EFFLUENT FILTERS

MANUFACTURER	MODEL
BEAR ONSITE	ML2-416, ML2-920, ML3-910, ML3-916, ML3-925, ML3-932
BIO-MICROBICS	SANITEE Series: ST 416, ST 418, ST 818, ST 838, ST 1618, ST 1638
BOWCO INDUSTRIES	EF-235
GAG-SIMTECH	STF-110, STF-110-7R, STF-110-6W, STF-110-8B
CO STEMS	BIO-KINETIC BK2000
	FT0444-36, FT0854-36, FT1254-36, FT1554-36, FTJ0418 PSCS0621-18, PSCW0621-18, PSCPS0621-18, PSCPW0621-18
OK	PL-68, PL-122, PL-250, PL-525, PL-625, GF10-8, GF10-16
TECH	EFT-080
STICS	45 – CLIK N' STICK
TE	EF-4, EF-6
	A100, A300, A1800, A1801, A100-HIP, A300-HIP A1800-HIP, A1801-HIP, A600-12, A600-8
ARUS	WW1 (170-0078), WW4 (5000-0007)

Training Requirements and Resources

- Connecticut Public Health Code:
- A local director of health shall authorize only persons approved by the Commissioner of Public Health to investigate, inspect and approve plans relating to subsurface sewage disposal systems.
- The Commissioner of Public Health shall approve agents of the local director of health whose qualifications to investigate, inspect and approve plans relating to subsurface sewage disposal systems have been established by attending training courses and passing examinations given by the Department of Public Health...

Training for Certification as a Septic System Inspector does not Currently Include:

Soils evaluation training

Training for field Inspection of constructed systems

Soils Evaluation Training Resources

- Connecticut DPH and Connecticut Environmental Health Association (CEHA) have jointly offered optional soils training programs for certified inspectors, professional engineers and licensed installers.
- Soils field training is most often provided to new inspectors by experienced co-workers and supervisors at local health departments and districts in Connecticut.
- Professional soil scientists and licensed professional engineers with soils experience are also valuable training resources for public health inspectors during site evaluations.

Field Inspection Training Resources

- Post-certification on-the-job field training by experienced co-workers and supervisors at local health departments is currently the most common approach to providing septic system inspection training for new inspectors in Connecticut.
- The Environmental Health Institute of Connecticut now provides Final Inspection Field Training for certified septic system inspectors in Connecticut at our Septic System Field Training facility in Ellington Connecticut.

EHICT – The Environmental Health Institute of Connecticut

- EHICT is a state-of-the-art facility established in 2021 in the town of Ellington, CT displaying a variety of complete septic systems and septic system components in their properly installed state, ready for inspection.
- EHICT offers field inspection training programs for Connecticut Certified Inspectors of subsurface sewage disposal systems.
- Offering full-day and half-day training courses, a team of experienced local health department/district inspectors and state health department officials provide instruction in five areas of field inspection techniques and methodologies for conducting thorough code-compliance inspections of newly installed septic systems.

The Environmental Health Institute of Connecticut - EHICT



EHICT Septic System Field Training Facility

41 Courtney Drive, Ellington, CT



The future of field training in Connecticut...

Where do we go from here?

Q and A

Thank you!

Jeff Polhemus, R.S.

Email Address: jeff@ehict.org