

## **SUPPLEMENTARY REGULATIONS FOR SEWAGE DISPOSAL SYSTEMS TOWN OF CARLISLE, MA – EFFECTIVE JUNE 1, 2024**

In accordance with its authority under M.G.L. c. 111, Section 31 and M.G.L. c. 21A, section 13 and 310 CMR 15.003(3) the Board of Health of the Town of Carlisle enacts the following supplementary regulations.

### **JUSTIFICATIONS**

Title 5 of the State Environmental Code sets minimum requirements for the disposal of sewage in unsewered areas. Proper treatment of human waste is essential to the protection of public health and the safety of the environment.

- The Carlisle Board of Health feels the long-term health interests in our town can only be served by adopting certain regulations which are stricter than Title 5, which was written as a minimum protection standard in 1977 (latest revision date of July 7, 2023) and was designed to all towns in Massachusetts utilizing subsurface disposal systems.
- Carlisle geographically is an area of extensive wetland, high water table, and extensive ledge. Safeguards in the original septic system installations are necessary because alternative repair locations are often unavailable.<sup>1</sup>
- Carlisle presently has no municipal sewerage to hook up to in cases of system failure.
- Carlisle has no town water backup. Unlike a number of Massachusetts towns covered by Title 5, if a residence or a business loses a well to pollution, there is no town water which can be brought in, nor any town wells at all.
- Per Title 5, Carlisle parcels are considered nitrogen sensitive areas due to the use of both on-site systems and private wells that are not regulated as public water supplies<sup>2</sup>.

Nitrate is an acute contaminant, meaning that one exposure can affect a person's health. Too much nitrate in your body makes it harder for red blood cells to carry oxygen. While most people recover quickly, this can be very dangerous for infants and some adults. Infants exposed to high amounts of nitrate may develop "blue baby syndrome."<sup>3</sup>

- Current estimates indicate that the distance viruses and bacteria travel is much greater than previously estimated. In Carlisle, where groundwater travels some distance

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<sup>1</sup> Horsley Witten Group, Inc. (March 14, 2016) Board of Health Regulations – Septic Systems and Protection of Drinking Water Prepared for the Carlisle Board of Health pg. 1.

<sup>2</sup> 310 CMR 15.214.

<sup>3</sup> "Frequently Asked Questions About Nitrates in Drinking Water" EPA October 2012

through bedrock crevices, pollution may not be adequately filtered in gravel or sand with Title 5 percolation rates used for design.<sup>4</sup>

- Carlisle’s Supplementary Regulations safeguard public health and the environment by ensuring that onsite sewage disposal systems are properly designed, built, operated and maintained in a manner compatible with local geological conditions.<sup>5</sup>
- An onsite sewage disposal system is more environmentally sustainable and cost effective than a municipal sewer system if it is properly operated and maintained<sup>6</sup>.
- These Supplementary Regulations will enable the Town to increase and diversify housing as stipulated in the Carlisle Master Plan, 2022, by safeguarding the existing environmental characteristics of Carlisle thereby avoiding the need for a town drinking water and/or sewer system.

These Supplementary Regulations support the Master Plan’s goal of Environmental Stewardship by preserving and protecting Carlisle’s natural resources.

The following supplementary regulations for the Town of Carlisle are keyed to Title 5 requirements (310 CMR 15.00):

## **SUBPART A: GENERAL PROVISIONS**

### **15.002: Definitions**

Definitions must be considered in addition to the definitions contained in 310 CMR 15.002<sup>7</sup> and any other applicable law or regulation as determined by the Board of Health.

Acre - is defined as 40,000 sf<sup>8</sup>

Board - means Carlisle Board of Health

Dwelling Unit - means a structure that is used, intended, or designed to be built, used, rented, leased, let or hired out to be occupied, or that are occupied for living purposes.<sup>9</sup>

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<sup>4</sup> EPA Groundwater Issue “Movement and Longevity of Viruses in the Subsurface” 2003

<sup>5</sup> <https://stacks.cdc.gov/view/cdc/151514> “Local Board of Health Guide to On-Site Wastewater Treatment Systems” Published Date : 01/01/2006

<sup>6</sup> <https://www.epa.gov/septic/epas-decentralized-wastewater-partnership> - “Decentralized Wastewater Treatment Can Be Green And Sustainable”

<sup>7</sup> <https://www.mass.gov/info-details/septic-systemstitle-5-glossary>

<sup>8</sup> 310 CMR 15.002 (Title 5)

<sup>9</sup> 780 CMR 9<sup>th</sup> Edition (State Building Code)

- Single Dwelling Unit - means a room or group of rooms used or intended for use by an individual, family, or household for living, sleeping, cooking, and eating, and other areas of which the occupant has exclusive use.
- Multi-dwelling Unit<sup>10</sup> - means more than one dwelling unit in a single building or several buildings. Includes condominiums and accessory apartments.

New Construction - The construction of a new building for which an occupancy permit is required or an increase in the actual or design flow to any system or an increase in the actual or design flow to any nonconforming system or an increase in the design flow to any system above the existing approved capacity. New construction shall not include replacement or repair of a building in existence as of March 31, 1995, that has been totally or partially destroyed or demolished, provided there is no increase in design flow, no increase in design flow above the existing approved capacity to any system, no increase in the number of dwellings or dwelling units or no increase in the number of bedrooms in any dwelling or dwelling unit.

Nitrogen Loading - is limited to 440 GPD (gallons of design flow per day) per acre in accordance with 310 CMR 15.214. Nitrogen loading limitations only apply to septic systems for new construction or when adding capacity to an existing system.

Nitrogen Sensitive Area - Any areas where there is use of both on-site systems and wells that are not regulated as public water supplies under 310 CMR 22.00: Drinking Water serve facilities. 310 CMR 15.214(1)(a)(2).

Room Count - does not include bathrooms, hallways, unfinished cellars and unheated storage areas. Four season sunrooms are included in the total room count.

Soil Absorption System - is defined the same as in Title 5, synonymous with leaching area, and includes Innovative-Alternative Technologies (310 CMR 15.281(3)).

Title 5 - means Title 5 of the State Environmental Code, 310 CMR 15.00

Wetland - includes all areas defined as wetlands by Title 5, the Wetland Protection Act (310 CMR 10.00) and the Carlisle Wetland Bylaw.

### **15.019: Disposal System Installer's Permit**

The Board of Health will administer a written examination. Installers seeking permits are required to take and pass an initial examination. An annual renewal permit will be issued as long as the installer has worked in Carlisle during the previous twenty-four months and the work has been satisfactory. An application fee is required for taking the examination and renewing a permit. A list of permitted installers will be maintained at the Board of Health office.

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<sup>10</sup> 105 CMR 410.000 Minimum Standards of Fitness for Human Habitation (State Sanitary Code)

The Board reserves the right to require new or additional examinations to be administered to any installer at any time.

**15.020: Disposal System Construction Permit**

Application: A completed application must consist of the following:

1. DEP Transmittal Form for a Disposal System Construction Permit (DSCP)
2. Letter of Explanation prepared by design engineer
3. Two paper copies and an electronic copy (PDF) emailed to the Health Agent
4. PDF of DEP Approval and Standard Conditions if an I/A System is proposed.
5. Five paper copies and a PDF when the design is at the final approval stage or prior to release of the construction permit if there are pending conditions
6. For upgrade of failed septic system, a Title 5 Inspection Report documenting the failure
7. Fee
8. Floor plans of the house for system upgrades

Redesign: A redesign of an already approved plan is not considered a new application and the original expiration date applies. A resubmittal of an expired plan is considered a new application.

Fees: The application fee for a disposal works construction permit must be paid at the time the plans are submitted. Revised plans requiring an additional engineering review will be charged a fee. No additional fee is required for revised plans with minor changes that do not require an engineering review. The amount of the fee will be adjusted from time to time by the Board of Health.

Letter of Approval: A letter will be issued listing standard and special conditions. Approval of the plan does not constitute a construction permit. A Disposal System Construction Permit (DSCP) will be issued when all conditions of the approval have been satisfied.

**15.021: Certificate of Compliance**

Only DEP approved forms shall be used. The Certificate of Compliance will not be released without the signature of the design engineer and installer on the DEP approved form.

Inspections and Engineered As Builts: An agent designated by the Board of Health will inspect the sewage disposal system at three phases of its construction:

1. After excavation is complete including a sample of the fill to be used and sieve analysis<sup>11</sup>; If both Title 5 sand and ASTM C-33 sand are required for the design, then

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<sup>11</sup> For a system in fill installer may request an additional inspection of the fill material prior to placement and following placement of sand (if deemed necessary by the inspector at the time of the excavation inspection).

both sieve analyses must be provided with samples of each fill at the time of the first inspection.

2. After all components are installed but before any component is covered, at which time two (2) copies of an installation as built survey performed by the design engineer must be submitted and the system must not be backfilled until the designer has submitted at least the following: plan of the as built showing the horizontal location of all the system components in relation to the intended design, a table of elevations comparing the installed elevations to the design elevations and a written, signed and stamped certification by the designer that the system has been installed as per his/her design and within standard and customary engineering tolerances.
3. After the system has been covered and final grading completed, the Engineer must determine final grades and verify on the as-built plan, the depth of cover over the system components (see Attachment A for As-Built requirements). Final grades (spot grade and/or contour lines) must be superimposed over the proposed design grading for comparison.

Inspections are to be scheduled (usually for Wednesdays) by contacting the Health Office.

The Board of Health will not waive any required inspections. In the event that severe weather is imminent, such as freezing temperatures, snow or rain, the installer must contact the Board to arrange a non-scheduled inspection so that the system can be backfilled before being negatively impacted by weather conditions.

#### **15.024: Violations of 310 CMR 15.000 and Carlisle Supplementary Sewage Disposal Regulations**

Any person who violates any provision of this Regulation may be punished by a fine of not more than Three Hundred Dollars (\$300.00) per offense. Each day or portion thereof during which a violation continues shall constitute a separate offense, and each provision of the Regulation violated shall constitute a separate offense.

Any permitted installer found to be in violation of either 310 CMR 15.00 or the Town of Carlisle Supplementary Sewage Disposal Regulations shall be subject to the following and shall have the right to a hearing before the Board:

1. First violation - a written warning.
2. Second violation within a twelve-month period - for the following calendar year, and upon successful completion of the installer's examination, the Board will issue a permit limited to the six-month period from July 1 through December 31 prior to which no installation work or Board of Health related activities can be conducted.
3. Subsequent violations - within the same twelve-month period the penalty will incur a fee of up to \$100 per day for each violation and each day will be considered a separate violation.

**15.027: Septic System Additives**

Only approved Title 5 additives may be used and only with prior approval from the Board of Health.

**15.030: Records**

All percolation and deep observation hole test results presented on a DEP Soil Suitability Assessment for On-Site Sewage Disposal (Soil Log) must be submitted to the Board of Health within 60 days of the test date.

The Soil Log must include the following criteria:

1. Title block including Owner's name, address and phone, date, engineering consultant, name soil evaluator, lot number(s) and book and page.
2. Lot lines, pertinent or outstanding site features (ledge outcrop, stone walls existing buildings etc.), north arrow, adjacent street names. Test locations must be shown with taped distances from such features.
3. Scale drawings are not necessary, however sufficient information and dimensioning must be shown so that tests can, if necessary, be located in the field. Two copies are required.

**SUBPART B: SITING OF SYSTEMS**

**15.100: General Provisions**

An agent of the Board of Health will witness all deep observation holes and percolation tests. Witnessing of tests will be scheduled (usually on Wednesdays) upon advance application and payment of the required fee to the Board. The Owner(s) of the lot, or Owner's agent, is responsible for the payment of the fee. Fees for soil testing will be adjusted from time to time by the Board of Health. Testing which is canceled after 3:00 pm the day before must incur an additional fee unless waived by the Health Department.

It shall be the responsibility of the design engineer to notify and receive approval from the Conservation Commission prior to gaining access to sites through environmentally sensitive areas. If it is found that access has been gained and testing performed without this approval, this testing shall become void.

A Pre-existing Non-Conforming System shall not be used to support the construction of a new dwelling or the rebuilding of a demolished dwelling in a new or the same location until the system is brought into full compliance with Title 5 and local regulations.

In accordance with 310 CMR 15.002 an On-Site Disposal System must consist of a single system or series of systems.

For Systems having a cumulative project flow of 2000 gallons per day or greater, a hydrogeological evaluation utilizing a three-dimensional model such as ModFlow must be performed by a qualified engineer or geologist, at the expense of the applicant, to be reviewed and approved by the Board of Health prior to the issuance of a DSCP. Models must predict no rise in groundwater elevation and no greater than 5 mg/L of total nitrogen at the perimeter boundary.

Monitoring wells used for the hydrogeological study must remain in place unless their removal or capping is authorized by the Board of Health. The Board of Health reserves the right to maintain the wells and continue monitoring as it deems appropriate. System Owners are required to test available monitoring wells for fecal coliform, TSS, BOD and Total Nitrogen and submit the results to the Board of Health at least once every three years and in conjunction with the required Title 5 inspections.

#### **15.103: High Groundwater Elevations**

New construction includes but is not limited to voluntary upgrades and repairs of failed systems with an increase in flow. High groundwater elevation must be determined in accordance with the methods described in Title 5 CMR 15.103(3).

#### **15.104: Percolation Tests**

No test shall be discontinued if it is within thirty (30) feet of the field area. The slowest rate obtained within 30 feet of a leaching facility design location must be utilized as the design application rate.

Acceptance of percolation tests done in a different area is not automatic. When percolation tests are done at a time other than the high-water tests, an additional deep hole test may be required at the discretion of the approving authority and must be dug to a depth of four (4) feet below the elevation of the proposed percolation test to verify the soil consistency. Percolation tests must be conducted no more than twenty (20) feet or less than ten (10) feet from its accompanying deep observation hole.

### **SUBPART C: DESIGN, CONSTRUCTION, REPAIR AND REPLACEMENT OF ON-SITE SEWAGE DISPOSAL SYSTEMS**

For new construction, a minimum of two (2) deep observation holes and two (2) percolation tests are required in the primary and reserve leaching areas.

#### **15.203: System Sewage Flow Design Criteria**

The Town of Carlisle requires additional septic design flow per bedroom. According to a report "Board of Health – Septic Regulations and Protection of Drinking Water, Prepared for the Carlisle Board of Health" by the Horsely Witten Group in 2016, this provides two benefits:

a) By increasing the footprint of septic systems by 50% (165 gallons/day-bedroom compared to 110 gallon/day-bedroom) this provides for a 50% increase in dilution from overlying recharge. This is because rainfall (and subsequent recharge) occurs over a greater surface area. Since the recharge rates that are representative of Carlisle (9 inches/year) are considerably less than the default value used by Mass DEP in its nitrogen loading guidelines (18 inches/year), this higher SAS design value partially compensates for the lower recharge rates found in Carlisle.

b) It also provides a reduced loading rate (per unit surface area at the leachfield) and a longer contact time for the wastewater to be processed within the biofilm that underlies the SAS. Denitrification, the removal of harmful nitrates, is directly correlated with contact/reaction time. Thus, an expanded SAS system will provide opportunities for enhanced removal of pollutants (including nitrogen).

**Design Flow Requirements for Single Dwelling Units:**

| No. of Bedrooms | Total GPD* required per Bedroom | Total GPD**     |
|-----------------|---------------------------------|-----------------|
| Three           | 165                             | 495             |
| Four            | 150                             | 600             |
| Five            | 125                             | 625             |
| Six             | 110                             | 660             |
| >Six            | 110                             | 110 per bedroom |

**Design Flow Requirements for Multi-dwelling Units:**

| Unit Type                | Total GPD required per Bedroom |
|--------------------------|--------------------------------|
| New construction         | 165 GPD                        |
| Housing for the Elderly  | 110 GPD                        |
| Accessory Apartment      |                                |
| Primary Unit Existing    | Existing Title 5 Flows         |
| Primary Unit New Constr. | See Above Table                |
| Apartment                | 165 GPD                        |

\* GPD is Gallons Per Day

\*\* The Minimum Design Flow requirement is 495 gpd.

**Performance Standards for Multi-dwelling Units under 2000 GPD:**

1. Annual compliance registration and fee as determined by the Board of Health.
2. Annual septic tank pump out.
3. A water meter must be installed in each unit and read once a year, and a report filed with the Board of Health.

4. New Construction requires full Compliance with 310 CMR 15.00 and these regulations
5. Conversion of a Single Dwelling Unit to a Multi-dwelling Unit using an existing system:
  - a. Title 5 Inspection Report within six (6) months of the date of application and prior to the issuance of a building permit.
  - b. Documentation that the existing septic system has sufficient capacity for the additional design flows. The Board will accept a valid Sewage Disposal System Plan showing the recalculations for the increase or decrease in the system, which is certified for its adequacy by a registered professional engineer or other authorized person.
  - c. If the existing septic system does not have sufficient capacity to support the conversion, additional capacity must be provided in accordance with New Construction requirements. Issuance of an Occupancy Permit is contingent upon issuance of a Certificate of Compliance for the new system(s).

### **15.211: Distances**

The minimum setback distance between a leaching area and wetlands is one hundred (100) feet. Depending on specific site conditions, it is possible that some designs which fail to meet the 100' set back may be allowed if the Board finds that the waiver will provide an environmental benefit. The burden of proof is on the applicant with documented testimony. Such approvals are dependent on the Board's review of soil conditions, topography, site development impacts, mitigation of environmental impacts and whether an alternative technology approved for nitrogen reduction is proposed [See Attachment B]. All other setbacks must comply with Title 5 Minimum Setback Distances. The Board may table action on a waiver if it decides to seek input from other town boards or departments. For any variance to this setback, the applicant must show that a primary system inclusive of required soil testing can be installed on the lot without the granting of a waiver. This waiver request requires a public hearing and may also require permits from other town boards, commissions, or department for soil testing and/or design approval.

The minimum setback distance between a system 2000 GPD or larger to a well is 150'.

The Board will consider requests for the installation of post holes (sonotubes) within the 10 feet setback between a cellar wall and a septic tank or within 20 feet between a cellar wall and a leaching area as long as the post holes are hand dug and no closer than 5 feet to the septic component.

### **15.220: Preparation of Plans and Specifications**

#### **Title Block**

1. Street address
2. Assessor's Map No. and Lot No. for which the design is prepared
3. Professional seal and signature of designer
4. If revision plan, revision number, description of revision, and revision date

5. Address including street number and telephone number of Owner(s) and design engineer.

### **Plan View**

The following additional requirements must be shown on the plan:

1. Every plan for a system must be at a scale of one inch = 20 feet.
2. Lot Lines and locus map. If a system is close to or within the minimum setback distance from a lot line (10 feet), the design engineer must verify the accuracy of the lot line. A professional survey or other evidence of lot line verification must be submitted. The Board will not accept disclaimer notes from engineers preparing plans based on other engineering plans regarding lot line.
3. Pertinent topographic features.
4. All ledge outcropping and ledge encountered in exploratory digging.
5. All structures and accessory structures such as but not limited to, outbuildings, barns, sheds, and play areas.
6. Results, conditions, and locations of all (previous and current) deep hole and percolation tests within 50' of the design areas (passed as well as failed). These must be used in the design calculations.
7. Wetland zoning district boundaries on the lot(s) or within 100 feet of the proposed leaching facility even if not on the same lot(s).
8. Federal Emergency Management Agency (FEMA) flood plain boundaries on the lot(s) or within 100 feet of the leaching facility even if not on the same lot(s). Design engineer must verify that the flood plain boundary conforms to the Federal Insurance Rate Map (FIRM), if applicable.
9. Existing or proposed well location, 100 foot well radius and waterline to the building.
10. Location and radius of all wells within 200 feet of the proposed leaching facility even if not on the same lot.
11. Proposed and existing sewage disposal systems within one hundred (100) feet of the proposed system on abutting lots.
12. Location and grading for all existing or proposed driveways and other impervious surfaces on the lot(s).
13. Drain lines, culverts, curtain drains, dry wells and non-potable irrigation wells on the lot or within 100 feet of the proposed leaching facility even if not on the same lot(s).
14. Details of septic tank, distribution box, and leaching system including dimensions, materials, inverts, and a scaled profile of the system. For pumped systems, the inside dimensions of the pump chamber and the gallons per one foot of depth must be shown. The length and slopes of all pipes must be shown. The minimum slope from 10 feet out from the foundation to septic tank must be 2%.
15. Invert elevation at both ends of all pipes and at changes in grade.
16. Elevation of foundation, basement, and first floor of proposed or existing buildings.
17. Number of bedrooms for proposed design flow capacity.
18. Zoning District in which the lot(s) is located.
19. Special topographical conditions outside of the property boundaries which may impact the siting of a septic system in compliance with Title 5 and these regulations for 100' beyond the property lines such as flood hazard zone and wetlands to the best of the

applicant's ability including the use of available maps and/or field survey with appropriate permission of landowners.

### **Plan Notes**

1. The first 2 feet of pipe from the distribution box must be set level.
2. All top and subsoil over the leaching area and between trenches and for a distance of 5 feet extending around the leaching area in all directions must be removed and stockpiled before the bottom of bed or trench is excavated, and the 5' excavation must be shown on the plan.
3. Finished grade over the leaching area must have a minimum slope of 2%.
4. Retaining walls must not exceed five (5) feet in height (reveal).
5. Manholes must be minimum 24-inch diameter, medium-duty cast iron frame and covers brought to within 6-inches of finished grade. If the manhole is over a pump or effluent tee filter, it must be brought to finished grade. Manholes over filters must be labeled "Tee Filter" in permanent paint or equivalent. Plastic risers and covers are prohibited. All manholes brought to finished grade must be secured against unauthorized access.
6. DEP Approval Transmittal Number, Date and Category if an I/A System is proposed.

All most recent soils tests performed on the lot by the design engineer must be submitted to the Board of Health on the appropriate DEP forms whether or not a design plan is submitted.

All revised plans must be accompanied by a letter from the designer which details in an itemized form how each of the items in the Board's engineering consultant's review letter were addressed and/or mitigated on the revised plan. Additionally, any issues discussed at a Board meeting and directed by the Board to be incorporated into the revised plan must be explained in the letter.

For a new lot which is not part of a subdivision, the applicant must provide recording information to show that the sewage disposal system is on a legally created lot prior to approval of the design. Evidence of the recording of all easements is required before Board approval.

**The Board of Health reserves the right to revoke an approval that is found to be based on a material misrepresentation of fact**

### **15.221: General Construction Requirements for All System Components**

Garbage grinders are not allowed in any soil absorption system constructed in Carlisle. This is based on the fact that use of a garbage grinder adds considerable solids and may shorten the life of a system<sup>12</sup>. As a result, systems with garbage grinders require additional land area and more frequent pumping. Alternative locations for siting compliant systems are often

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<sup>12</sup> <https://www.mass.gov/guides/caring-for-your-septic-system>

unavailable on properties and the use of garbage grinders compromises the availability of already limited area for repairs or upgrade.

**15.223: Septic Tanks and Pump Chambers**

New soil absorption systems and upgrades constructed in Carlisle shall require a dual compartment septic tank or two tanks in series.

An Electrical Permit from the Town is required for wiring the pump chamber. A licensed electrician must verify that the alarm is on a separate circuit from the pump prior to issuance of a Certificate of Compliance.

**15.240: Soil Absorption Systems**

Leaching pits are not allowed for new or replacement systems in Carlisle.<sup>13</sup>

**15.251: Leaching Trenches**

Specifications - There must be at least three (3) trenches.

Stone - The stone must extend not less than twelve (12) inches deep beneath the bottom of the distribution pipe. All stone must be double washed.

Cover - Planting of any vegetation other than grass is prohibited. Soil placed as backfill over the soil absorption system must be a minimum of twelve inches, including topsoil, in areas intended for the grazing of livestock.

**15.252: Beds or Fields**

Specifications - The minimum number of required lines per field is three (3).

Stone - The stone must extend not less than twelve (12) inches deep beneath the bottom of the distribution pipes.

Cover - Planting of any vegetation other than grass is prohibited. Soil placed as backfill over the soil absorption system must be a minimum of twelve inches, including topsoil.

**15.280-289: Innovative-Alternative (I/A) Technologies**

The Carlisle Board of Health supports and encourages the use of alternative technology for required or voluntary upgrades and new construction.

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<sup>13</sup> 310 CMR 15.240 - Absorption trenches should be used whenever possible.

Onsite wastewater systems utilizing I/A technologies must comply with MassDEP I/A Approval Certification and Standard Conditions for Alternative Soil Absorption Systems with General Use Certification and/or Approved for Remedial Use.

I/A Systems used for enhanced nutrient removal in systems serving new construction must utilize Best Available Nitrogen Reducing Technology in accordance 310 CMR 15.002.

### **Approval of I/A Septic Systems:**<sup>14</sup>

#### **Purpose:**

In certain situations, I/A systems, when properly designed, constructed, operated, and maintained, may provide enhanced protection of the public health and the environment. Notwithstanding the sound technical basis of many alternative technologies, the Carlisle Board of Health seeks, through these regulations, to ensure that alternative on-site septic systems installed within its jurisdiction are operated in compliance with the appropriate Commonwealth of Massachusetts approvals for those technologies. In addition, by ensuring the completion of all required monitoring, the Board of Health seeks to gain information on the efficacy of such technologies and modify its approval process accordingly.

#### **Definitions:**

Innovative /Alternative Onsite Septic Systems / Enhanced Nitrogen Removal Systems.

Systems designed to provide or enhance on-site sewage disposal that either do not contain all of the components of an on-site disposal system constructed in accordance with 310 CMR 15.100 through 15.255, or that contain components in addition to those specified in 310 CMR 15.100 through 15.255 and which are proposed to the Carlisle Board of Health and/or the MassDEP, or an agent authorized by the MassDEP, for Remedial, Pilot, Provisional, or General Use approval pursuant to 310 CMR 15.280 through 15.289.

#### **Requirements:**

1. Application:
  - a. All applications for disposal system construction permits involving the use of I/A septic system components purporting enhanced treatment must be submitted to the Board of Health, which must hold a hearing to consider their approval. No abutter notification shall be required for this approval except as otherwise required. The Board of Health may deny the use of an I/A septic system if, in its opinion, the installation of said system is not in the interest of public health.
  - b. All applications for I/A septic systems must be accompanied by a PDF copy of the MassDEP Approval Letter appropriate for the technology indicating the level of approval (General Use, Remedial Use, Provisional Use, Piloting Use, or Site-Specific Pilot Approval).

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<sup>14</sup> <https://www.falmouthma.gov/DocumentCenter/View/15993/Local-Septic-Regulations-FHR-150--Supplement-to-Title-5>

2. Use and Registration of I/A Systems:

Onsite wastewater systems which include I/A technology, installed pursuant to 310 CMR 15.280-289 in Carlisle must be registered with the Board of Health. Each registrant shall be required to provide the Board with the following:

- a. The name, address, phone number, and emergency contact information for the owner and operations and maintenance service provider.
- b. Registration fee as set by the Board of Health
- c. A copy of the current operations and maintenance contract between the owner and the operations and maintenance service provider. Each contract must be valid for no less than two (2) years and must be renewed a minimum of sixty (60) days prior to expiration. A copy of the current contract must be submitted to the Board of Health within thirty (30) days of any change in ownership, contract terms, or in the event of renewal.
- d. Any other relevant information required by the Board of Health or its Agent.
- e. Full compliance with Alternative Technology Certification
- f. Notification of equipment failure or sampling exceedances within 48 hours of identification
- g. For an I/A system that has any regular inspection or service requirement under the MassDEP Approval Letter, a deed notice must be filed indicating the presence of an I/A septic system and the requirement for a service contract for the life of the system. No certificate of compliance will be issued until the deed notice is in place.

Onsite wastewater systems utilizing I/A technologies, solely for effluent disposal in the soil absorption system, installed pursuant to 310 CMR 15.280-289, are not subject to the requirements above if the technology approval letter issued by the Massachusetts Department of Environmental Protection does not require an operation, maintenance, or inspection contract.

3. Individuals and Entities Employed to Maintain I/A Septic Systems for Enhanced Nitrogen Removal Systems in the Town Of Carlisle:

- a. No individuals or entities hired for the purpose of operating and/or maintaining I/A onsite septic systems within the Town of Carlisle may not do so without first obtaining a permit from the Board of Health. All individuals or entities contracted to operate and/or maintain I/A onsite septic systems as defined must provide proof of appropriate qualifications to operate/maintain the range of systems under their oversight prior to being issued a permit by the Board of Health. Prior to being permitted to operate any I/A system in the Town of Carlisle, the operator or representative of any entity must certify their commitment to adhere to Carlisle's Supplementary Sewage Disposal System Regulations and appropriate standards and requirements as stated on the MassDEP Letters of Approval.

- b. Any operator of I/A systems in the Town of Carlisle found to be operating/maintaining or monitoring at variance with the requirements stated in the approvals of the Commonwealth of Massachusetts or conditions set forth by the Town of Carlisle during the approval process may be subject to punitive actions, including the imposition of fines or a revocation of the permit to operate within the Town. Said punitive actions may be taken after a show-cause hearing before the Board of Health following an examination of the facts.

4. Monitoring I/A Septic Systems/Enhanced Nitrogen Removal Systems:

The following monitoring requirements shall apply to the Town of Carlisle and must follow all the requirements set forth by MassDEP and the Town of Carlisle. The following requirements are in addition to those stated in the MassDEP Approval Letter for specific technologies:

- a. Every I/A system installed under this Regulation that reduces the separation to groundwaters must have a Title 5 Inspection every five years and a report filed with the Board of Health.
- b. The system effluent of all I/A septic systems installed for the purpose of nitrogen reduction must undergo an initial probationary period of two years, during which the system must be sampled and analyzed quarterly for parameters indicated by the Board of Health.
- c. Excluding the first quarter of the probationary period, if at any time thereafter a value exceeds the permitted level of any contaminant by greater than 25%, the maintenance contractor must:
  - I. Notify the property owner, the Board of Health, within 48 hours of receipt of the laboratory results.
  - II. Provide and initiate a documented plan for corrective actions and additional sampling within 30 days. Reported results of corrective actions must include the results of all follow-up samples taken and must be submitted within 60 days of the initial non-compliant value.
  - III. Board of Health approval of the corrective actions is required. The Board has the right to request additional information and impose additional conditions necessary to protect public health.

5. Reporting for I/A Septic Systems/Enhanced Nitrogen Removal Systems:

Any person or entity that owns an I/A on-site septic system in Carlisle must submit the results of all monitoring and inspections to the Carlisle Board of Health. All reports regarding maintenance, monitoring, or inspections of I/A septic systems must be submitted within thirty (30) days of the time when the maintenance, inspection, or monitoring was performed.

6. Actions Following Determination of System Failure of an I/A Septic Systems/ Enhanced Nitrogen Removal System:

If the Board of Health determines that a system is in failure it may, at its discretion, mandate corrective actions and may additionally include system upgrades or replacement. The system will be considered in failure if, at the end of the probationary period or following a reduced schedule of testing, the concentrations of the permitted parameters repeatedly fail to meet the system requirements through standard sampling results.

### **15.290 - 15.293: Shared Systems, Condominiums and Systems over 2000 GPD**

#### **Definitions:**

- a. Shared Systems as defined in accordance with 310 CMR 15.290
- b. Multi-dwelling Unit as defined in these regulations
- c. Condominium as defined in MGL Chapter 183A, Section 1

These regulations are concerned with addressing the potential environmental impacts of Multi Dwelling Unit developments and in particular the management and protection of water resources since the Town is 100% dependent on groundwater as the primary drinking water source for all households.

1. The Board of Health will set the amount of the application fee from time to time.
2. A Septic System Escrow Agreement must be executed in order to guarantee the long-term operation, maintenance and eventual replacement of the system. Funding of the Septic System Escrow Agreement must be in accordance with the Town of Carlisle Septic System Escrow Agreement policy (Attachment C) attached or as determined by the Board of Health.
3. The land in which the system is located must be permanently set aside by deed as commonly owned land. The deed must accurately locate the boundaries of the septic system, including the septic tank(s), distribution box(s), and leaching field(s). The deed must permanently prohibit construction of any building or structure above or below ground, grazing of any livestock above the field or tank, planting of any vegetation above the system other than grass, use of the site for disposal of rubbish or other debris, and must in general prohibit any use above or below the system not specifically approved by the Board of Health.
4. These same prohibitions must apply to the designated reserve area.
5. Systems defined above and systems with cumulative project design flows of 2000 gpd or greater must meet a minimum design flow requirement of 165 gpd per bedroom and meet the Title 5 requirements for groundwater mounding analysis and pressure distribution (15.254(1)(a) and (2)(a) and 15.212(2), respectively. Monitoring wells used for the hydrogeological study must remain in place unless their removal or capping is authorized by the Board of Health. The Board of Health reserves the right to maintain the wells and continue monitoring as it deems appropriate. System Owners are required to test available monitoring wells for fecal coliform, TSS, BOD and Total Nitrogen and submit the results to the Board of Health at least once every three years and in conjunction with the required Title 5 inspections.

6. The Board of Health will require a peer review of the hydrogeological study. The peer reviewer will be mutually agreed upon by the Board of Health and applicant. The applicant is responsible for paying for the peer review study.
7. Garbage grinders are prohibited in all housing units sharing any septic system components and a deed restriction must be recorded on the Master Deed.
8. Septic systems must be pumped annually.
9. A cumulative water meter must be installed to determine the flows to each system by a common meter or a meter in each dwelling unit and read once a year, tabulated per system and a report filed with the Board of Health.
10. An authorized representative must be appointed by the Homeowners Association to be the liaison with the Board of Health and in the event of an identified septic system failure must be authorized to proceed with the necessary repairs.
11. The authorized representative must submit an annual SDSR to the Board of Health which report must include:
  - a. Report of annual pumping
  - b. Certified inspection report (extent of inspection to be determined by the Board)
  - c. Updated replacement cost of the system
  - d. Copy of current replacement provision policy, bond or another financial instrument
  - e. Annual water usage per dwelling unit.

The Board of Health reserves the right to waive or add to any of the above requirements depending upon the number of residential units proposed and size and configuration of the septic system.

## **SUBPART D. INSPECTION AND MAINTENANCE OF SYSTEMS**

### **15.300 System Inspection - Inspector**

No person shall conduct an inspection of an onsite wastewater system pursuant to 310 CMR 15.301 within the Town of Carlisle unless:

- Certified and in good standing as a System Inspector pursuant to 310 CMR 15.340 and
- Registered as an Onsite Wastewater System Inspector with the Carlisle Board of Health.

The Inspector must complete every applicable section of the most recent version of the "Title 5 Official Inspection Form – Subsurface Sewage Disposal System Form – Not for Voluntary Assessments," supplied by the Massachusetts Department of Environmental Protection, or such subsequent form published by the same.

The Carlisle Board of Health may revoke or suspend the registration and/or listing of an Onsite Wastewater System Inspector after opportunity for a hearing is conducted pursuant to MGL c. 30A and after the Board of Health determines that the Inspector has:

- falsified an inspection report and/or
- fraudulently altered an inspection report and/or

- failed to properly inspect a system as required in 310 CMR 15.302 and/or
- failed to meet any provisions contained within this regulation

## **ADDITIONAL TOWN REGULATIONS**

### **Building Permit Applications – Title 5 Review:<sup>15</sup>**

Property owners shall not apply for building permits for interior renovations, footprint and/or roofline expansions, new construction, or changes in use until after the Board of Health reviews the proposed plans.

For residential structures, the Board of Health or its Agent will review documentation provided by the applicant and compare it to information on file, for a determination if any change in room count will result in a calculated increase in bedrooms, pursuant to 310 CMR 15.002(2). Existing and proposed floor plans must be submitted as a PDF along with a site plan showing the location of all septic system components (septic tank(s), leaching area and well). The Owner can prepare the floor plans if building plans are unavailable, but they need to be clear, legible and include room size dimensions. Septic System plans on file with the Board of Health may be used for the site plan.

For non-residential structures, the Board of Health will review the submitted documentation and compare it to information on file to determine if the proposal constitutes a change in use or expansion of use that will result in an increase in design flow as defined in 310 CMR 15.203.

For all structures where a footprint alteration is proposed, the Board of Health will apply the most recent applicable setbacks in 310 CMR 15.211.

### **Deed Restrictions:**

Under its authority as established in 310 CMR 15.00 (Title 5) and the Town of Carlisle General Bylaws, section 3.24.3, the Board of Health is authorized to accept from a property Owner(s) a deed restriction for the following purposes:

1. Garbage Grinder Deed Restriction - The Board of Health will consider whether a system has permit approved additional capacity that could be used for a proposed addition.
2. Bedroom Deed Restriction – In place of upgrading a septic system for a proposed addition, the Board will consider the size of the addition, usage, age and functioning of the system and whether the system could be upgraded in full compliance with Title 5 and the Carlisle Supplementary Sewage Disposal Regulations. The definition of a bedroom and a determination of room count can be found in Title 5 (Definition - 15.002).

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<sup>15</sup> <https://concordma.gov/DocumentCenter/View/1947/Concord-Board-of-Health-Local-Regulations-PDF?bidId=>

Bedroom Deed Restrictions will not be considered for new construction or existing dwellings utilizing septic systems that are more than ten (10) years old.<sup>16</sup>

Bedroom Deed Restrictions will not be considered for a dwelling with an existing septic system that are not in full compliance.

Replacement of a Deed Restricted System requires full compliance with 15.203: System Sewage Flow Design Criteria in accordance with this regulation.

Deed Restrictions may not exceed the Required Design Flows for an additional one-bedroom septic capacity (total two rooms) over the existing capacity. Any room count that is two or more bedrooms higher than the existing design flow is deemed to have "insufficient leaching capacity."

**Information Required to Apply for a Garbage Grinder Deed Restriction:**

1. Certified Septic Plan and Permit noting septic capacity.
2. Approval by the Board of Health.
3. Floor plan of existing rooms.
4. Removal and verification of removal of any installed grinder.
5. Proof of recording of the Deed Restriction.

**Information Required to Apply for a Bedroom Deed Restriction:**

1. A floor plan of the existing dwelling noting the total square footage of the dwelling, room dimensions and labels. The Owner can prepare this if building plans are unavailable, but they need to be clear, legible and include room size dimensions.
2. A floor plan of the proposed addition noting the total square footage being added, room dimensions and labels.
3. A current Title 5 Inspection within two years or a current Certificate of Compliance for a new installation within two years.
4. Septic Plan listing the existing capacity and installation date. If there is no septic plan on file, an engineered As Built of the system must be provided showing the location of the system, estimating system capacity and ability to upgrade in full compliance with state and local regulations.
5. Engineered Survey Plan showing the location of the new foundation and the setbacks to the septic system, well, reserve area and any wetlands. The survey plan must verify that the new foundation does not infringe on the setbacks to the existing system or the ability to upgrade the system in full compliance with Title 5 and the Carlisle Supplementary Sewage Disposal Regulations when the system is replaced.
6. If there are no changes to the foundation, an approved septic plan, which includes a reserve area, will be sufficient.
7. If there is a question that the property may not be able to upgrade in full compliance, an engineered "conceptual" sewage disposal plan for a replacement system is required.

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<sup>16</sup> EPA FAQs about Septic System <https://www.epa.gov/septic/frequent-questions-septic-systems>

8. If there is no septic plan available and it is not possible to estimate system capacity, location, or ability to upgrade, the system does not qualify for a deed restriction and must be upgraded for the purposes of the addition.

A PDF of all plans and documentation submitted is required.

**Conditions of Approval:**

1. Recording of the deed restriction at the Northern Middlesex Registry of Deeds and proof of recording submitted to the Board prior to issuance of a Building Permit.
2. Garbage grinders will not be permitted. A Garbage Grinder Restriction must be recorded at the Northern Middlesex Registry of Deeds and proof of recording submitted to the Board. The Board requires verification that the disposal has been removed from the property.
3. The Board of Health may require regular Title 5 Inspections of the System and/or annual pumping of the Septic Tank.
4. If the system fails the Title 5 Inspection, the system must be upgraded to reflect the actual room count and design flow criteria in accordance with the current 310 CMR 15.00.

Applicants are advised that the above criteria are minimum requirements to be used as a guideline for the Board in making its decisions. Granting of a Deed Restriction in lieu of upgrading the septic system is a discretionary approval from the Board of Health. The Board has the right to request additional information and impose additional conditions necessary to protect public health. Any application that the Board deems inappropriate for a deed restriction will be denied.

**Interceptor Drains**

Interceptor drains (curtain drains) may be employed to route the flow of groundwater away from a proposed septic system. Such interceptor systems must be gravity flow only. No pumped interceptor system may be relied upon to protect a sewage disposal system. Interceptor outfalls must be confined to the particular lot and must not affect adjoining lots. In a case where the percolation rate is slower than twenty (20) minutes per inch the design engineer must provide calculations demonstrating the adequacy of the interceptor drain. In Class I soils (sands), such calculations are not required.

Connection of interceptor drains into town catch basins or manholes will be permitted subject to the approval of the Board of Selectmen in each case. The Selectmen will require, as a minimum, a notarized statement from the Owner(s) to be recorded with the deed stating that the Town will be held harmless in the event of system failure.

**Failure of a Septic System**

If the Board of Health is advised of a failure, the Board may require its consultant to visit the site at the Owners expense. Repairs must be carried out in the same manner as new construction. All other design plan preparation requirements apply.

### **Maximum Feasible Compliance**

If a failed on-site system cannot be fully upgraded to full compliance with Title 5, the Local Board of Health is authorized to approve an upgrade to bring the system as close to compliance as possible. (310 CMR 15.404)

### **Procedures for Repairs**

1. Distribution Box Replacement - Replacement of a distribution box requires a permit from the Board and an inspection by the Board's agent prior to covering. Inspection will include observed location and water test to determine equal flow distribution to the lines. Work must be done by a permitted Installer.
2. Septic Tank Replacement- Submittal of three copies of a septic tank replacement plan and a PDF along with a letter of explanation; construction permit from the Board of Health; engineered as-built showing tank location and invert elevations; approval of as-built and inspection by the Board's agent prior to backfilling and final grading. Septic Tank Replacements should take into account the total room count for the house in case the leach field needs to be replaced and resized in the future.
3. Fees for the above will be adjusted from time to time by the Board.
4. The Board allows minor adjustments to a system following a Title 5 Inspection such as replacing covers, bringing manhole covers to within 6" of grade, non-chemical cleaning of lines, replacing broken straight-line pipes less than 20' in length either from the house to the septic tank or tank to the distribution box. If the installer is uncertain, he must check with the Board.

### **Voluntary Upgrade**

Owners who are concerned about a potential failure may install a new system based on the actual number of rooms existing in the dwelling. All septic components must be upgraded to current regulations. If a voluntary upgrade cannot be fully upgraded to full compliance with Title 5, the Local Board of Health is authorized to approve an upgrade to bring the system as close to compliance as possible under Maximum Feasible Compliance.

### **Timetable for Installing Septic Systems**

Installations must be completed within ninety (90) days from excavation to final grading and final inspection. Extensions may be granted at the discretion of the Board of Health or its agent. The Certificate of Compliance must be signed by the installer and design engineer within 30 days of completion of the work.

Installation of septic systems is prohibited during the months of December, January and February. Any system already in progress prior to December 1 must have all work including all inspections, final grading, loaming and seeding completed prior to the winter cutoff date of November 30. No system installation can begin after November 1 unless approved by the Board's agent as authorized by the Board of Health. If circumstances such as freezing temperatures do not permit the application of loam and seed, the installer must stabilize all sloped areas susceptible to soil erosion using either hay, anchored filter fabric or jute mesh.

If final grading over the leaching area and system components is in place prior to the winter cut-off date, submittal and approval of the final grade as-built can occur after November 30th and a Certificate of Compliance issued if appropriate.

### **Construction Site Toilet Facilities**

Construction sites must provide toilet facilities for workers either in the existing residence or by use of commercially available portable chemical toilets.

## **SUBPART E: PROCEDURES FOR SEEKING AND RECEIVING LOCAL UPGRADE APPROVALS AND VARIANCES FROM THE PROVISIONS OF SUBPARTS B AND C OF 310 CMR 15.000**

### **15.401: Waivers and Variances**

The Board of Health requires full compliance for new construction and maximum feasible compliance for voluntary upgrades and repairs.

Any request for a waiver from these Supplementary Regulations, a Title 5 variance, or a waiver under the Local Upgrade Approval requires a public hearing before the Board of Health. Requests must be submitted to the Board of Health in a separate cover letter which must accompany the plans for the proposed system. In addition, all variances and waivers must be listed on the plan. The request must clearly state the variances or waivers sought and the reasons. Past practices are not necessarily adequate reasons for granting variances or waivers.

No waiver or variance shall be granted except after the applicant has notified all required abutters by certified mail at the applicant's own expense or by hand with proof of receipt at least ten (10) days before the Board of Health meeting at which the waiver request will be on the agenda. The notification must state the specific waiver sought and the reasons, therefore.

### **SEVERABILITY**

So far as the Board of Health may provide, each section of these supplemental regulations shall be construed as separate to the end that if any section, item, sentence, clause or phrase shall be held invalid for any reason, the remainder of these rules and regulations shall continue in full force and effect.

Adopted December 1, 1983

Amended October 20, 1987 (Additional design requirements)

Effective December 1, 1987

Amended December 13, 1989 (Accessory apartment)

Effective January 15, 1990

Amended November 30, 1993 (Engineered As-builts, Installations)  
Effective January 1, 1994  
Amended February 28, 1995 (1995 Title 5)  
Effective March 31, 1995  
Amended March 14, 1995 (Plan note 3)  
Effective April 8, 1995  
Amended July 23, 1996 (As-Built, Testing, Reserve Areas, Shared Systems)  
Effective September 15, 1996  
Amended May 26, 1998 (Barriers, Anticipating Failures, Violations, Testing for Repairs)  
Effective July 1, 1998  
Amended March 25, 2008 (Design flows, Large Systems, Minimum Setback Distances, Title 5  
Rev 4/21/06) [correction 9/15/09]  
Effective April 4, 2008  
Amended January 15, 2019  
Effective: January 15, 2019  
Amended: May 8, 2024 (Multi-Dwelling Units, Design Flow Criteria, Deed Restrictions, I/A  
Systems)  
Effective: June 1, 2024

**BOARD OF HEALTH**

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Patrick J. Collins, Chairperson

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Tony Mariano, Vice-Chairperson

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Catherine J. Galligan, Treasurer

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David Erickson, Board of Health Member

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Jennifer Wall, R.N. Board of Health Member

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

## **ATTACHMENT A: Survey As-Built Requirements for Sewage Disposal Systems**

### **Elevations and Survey Location**

1. Invert out of foundation
2. Invert in septic tank
3. Invert out of septic tank
4. Invert in D-box
5. Invert out of D-Box. All pipes must be level for 2 feet minimum.
6. Invert in pit or
7. Invert high end of all leaching lines
8. Invert of bends and changes in direction
9. Invert in and out of pump chamber, grease trap
10. Measure spacing between float switches
11. Bottom of leaching area(s)
12. A minimum of five (5) spot grades must be taken over the leaching area; one (1) in each corner and one (1) in the middle. Two (2) spot grades each (at either end) must be taken over the septic tank and pump chamber, and one (1) over the d-box to determine the depth of final grades. Final grades (spot and/or contour lines) must be superimposed over the proposed design grading for comparison. The engineer must state on the as-built whether or not topsoil has been added to the rough final grade and whether excessive or insufficient amounts of cover have been placed, in conformance with 310 CMR 15.221(7).

### **Survey Location**

1. Corners of foundation nearest to system
2. TBM's
3. Well
4. Leaching area inspection ports

### **Taping**

1. Septic tank manhole, pump chamber manhole and d-box to foundation corners
2. Outside dimensions of leaching area
3. Pipe lengths
4. Foundation to septic tank and pump chamber (if approaching minimum offset)
5. System to well if close to minimum.
6. Edge of leaching area to nearest property line (if approaching minimum offset)

### **Miscellaneous**

1. Verify depth of stone under leaching lines
2. Repairs: If a driveway has been rerouted over any system component, or if the proposed repair called for any system component to be located under the existing driveway, the new driveway, or existing driveway location must be located during the final grade as-built and shown on the as-built plan. New Construction: If the new driveway is not constructed in the proposed location and is constructed over any system component, or

if the proposed plan called for any system component to be located under the proposed driveway, the driveway location must be located during the final grade as-built and shown on the as-built plan.

### Pipe Slopes

1. Foundation to tank: 0.02 Minimum
2. Tank to D-box: 0.01 minimum. If greater than 0.08 check for Inlet Tee
3. Leaching lines: 0.005

### Plan Presentation

1. The as-built layout of the installed system must be drawn over the design original so that any variation from the original intent is evident.
2. An "As-Built Table of Elevations" must be shown on the as-built drawing which compares the design elevations with the as-built elevations, and which shows any difference between the two.
3. Two paper copies and a PDF of the as-built drawing, stamped, signed and dated by a registered engineer with the engineer's certification (typically a paragraph stating that the system has been installed in conformance with all state and local codes and within allowable tolerances) must be submitted to the Board of Health. Engineer must attest that they have the requisite training for the IA system.

### ATTACHMENT B: Additional Technical Information in Support of Waiver Request

1. **Soil Conditions:** All results of soils tests must be shown on the plan and located in Plan View. All reasonable areas on the site for locating an SAS must be tested and deemed suitable or eliminated due to, but not limited to, ledge, exceptionally high ground water, etc. The applicant must make a reasonable effort in investigating all alternative locations that could eliminate or minimize the setback reduction requested before the final location is chosen. Each location must be explained in detail.
2. **Topography:** The plan must clearly and completely show the extents of all pertinent grading which may require delineation beyond the property line(s). In conjunction with this, all wetland delineation must not terminate before there is no question whether extending the wetland line in any direction would or would not impact any proposed setback distances.
3. **Site Development Impacts:** The applicant must demonstrate that no site development feature or activity, such as but not limited to moving a property line, reconfiguring site geometry, eliminating an area of the site which may be suitable for an SAS, placing a permanent structure, etc., has created the need for the requested setback reduction variance.
4. **Mitigation:** The applicant must demonstrate that the requested setback variance will not result in any adverse environmental impacts. Explain how each relevant design choice is able to accomplish this, such as the technology chosen. If an I/A system is utilized, provide data showing nitrogen reduction (if applicable) or any other relevant constituent reduction. Reasons for elevation and horizontal locations of components,

etc., and the preservation of well, wetland, and ground water quality must be explained in detail.

### **ATTACHMENT C: Financial Escrow Agreement Policy**

The Board of Health requires a Financial Assurance for all Shared Systems, Multi-D dwelling Units, Condominiums and Systems over 2000 GPD in order to guarantee the long-term operations and maintenance of the system and eventual replacement cost. Updated replacement costs and current balance must be submitted to the Board annually.

#### **Model Agreement<sup>17</sup>**

1. Owner(s) must establish an Operations and Maintenance Fund to be held by the Owner(s) for the normal annual maintenance of the Septic System in an amount that will be established each year as part of the condominium budget, in such an annual amount as the Owner(s) thereof deem appropriate from time to time, which must be used solely for such maintenance and operations.
2. Owner(s) must establish a Working Capital Fund, to be held by the Owner(s), for the current and future replacement and/or repair expenses of the Septic System representing 25% of the replacement cost of the Septic System. This fund must be used solely for the immediate replacement and/or repair of any failing component of the Septic System. Owner(s) must replenish the fund in full within two years after any disbursement, unless otherwise agreed to by the Owner(s) and the Town, and must, within sixty (60) days after December 31 of each year, provide the Board of Health with a statement or other evidence acceptable to the Board which demonstrates that the required amount of funds are on deposit in the Working Capital Fund. The amount of the Initial Deposit must be reviewed every five (5) years to ensure that it continues to represent 25% of the replacement cost of the septic system. Owner(s) must at each five-year interval provide supporting documentation to the Board of Health regarding the then-current replacement cost of the system, and the Board may order such adjustment to the funding as may be necessary to provide that the amount on deposit in the Working Capital Fund reflects the requisite 25% funding level.
3. Owner(s) must also establish and maintain a Reserve Fund, to be held by the Town, in order to accumulate sufficient capital to replace the System and related equipment at the end of the estimated useful life of the System, which is twenty (20) years. The amount of Financial Assurance was projected based upon input from Owner(s)'s engineering consultant, the Board's engineering consultant, as well as input from the Board.
  - a. The Year 1 deposit to the Reserve Fund must occur one year after the commencement date of System operations. Such reserve, which must

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<sup>17</sup> Draft Agreements must be prepared by the developer and approved by the Board of Health and Carlisle Finance Director.

cumulatively be equivalent to a sum equal to 75% of the replacement cost of the Septic System, must be provided by means of deposits into an interest bearing account no less than one deposit per year, or some other financial security mechanism, and be in a form satisfactory to the Board of Health or its legal counsel. The Owner(s) must maintain the funding of such account for as long as the Project is served by the Septic System. The principal and interest of said account must be used exclusively for the replacement of the Septic System, and related infrastructure. This provision is intended to ensure that the development will have available to it sufficient financial resources to replace the Septic System, provided however that the minimum endowment of the fund must be 75% of the replacement cost of the Septic System, prorated over the 20-year period. Accordingly, within sixty (60) days after December 31 of each year, the Owner(s) must provide the Board with a statement or other evidence acceptable to the Board which demonstrates that the required amount of funds have been deposited in the Reserve Fund account in accordance with the following payment terms.

- b. Any deviations from this condition will be considered a violation.
  - c. The Reserve Fund is intended to provide that adequate funds will be available to the development to replace the septic system; nothing contained herein must be construed so as to create any obligation on the part of the Town to perform, or arrange for the performance of, any work relating to said septic system, or otherwise provide any funding for such work.
  - d. The amount of the Reserve Fund must be reviewed every five (5) years to ensure that it continues to represent 75% of the replacement cost of the septic system. The Owner(s) must at each five year interval provide supporting documentation to the Board of Health regarding the then-current replacement cost of the system, and the Board may order such adjustment to the funding schedule described above as may be necessary to provide that the amount on deposit in the Reserve Fund will reflect the requisite 75% funding level.
  - e. If at the end of Year 20, the Reserve Fund plus the accumulated funds in the account collectively are in excess of the projected replacement cost of the system as determined by the Owner(s) and agreed by the Board (the "Excess Reserve"), then the Board agrees to release the Excess Reserve to the Owner(s) forthwith. If at the end of Year 20 the Reserve Fund plus accumulated funds in the account collectively do not equal 75% of the projected replacement cost of the system, the Owner(s) must within sixty days make such additional deposits as needed to raise the total amount to the requisite level.
4. All funds held by the Town under this Agreement must be held in interest bearing accounts that are fully insured by the FDIC or other government agency, with all interest to accumulate to the respective funds and not to the benefit of the Town.

5. Upon the use of some or all of the Working Capital Fund and/or the Reserve Fund to provide for a replacement septic system as contemplated herein, the Owner(s) must replenish the Working Capital Fund up to an amount equal to 25% of the replacement cost of a new system within one year and replenish the Reserve Fund to an amount equal to 75% of the replacement cost pursuant to a twenty-year funding schedule consistent with that described above.

## **ATTACHMENT D - ADDITIONAL JUSTIFICATIONS**

### **Nitrates and Nitrites in Drinking Water**

Nitrate in Carlisle's groundwater drinking water systems is of concern because private wells which draw from groundwater are not federally or state regulated. It is the owner's responsibility to test and treat their own well for nitrate and other pollutants. According to the EPA, nitrates in the water may also indicate the possible presence of other more serious residential or agricultural contaminants such as bacteria or pesticides. For public water supplies, Federal law requires that systems reduce certain contaminants in order to protect human health. Per this law, EPA has set an enforceable standard called a maximum contaminant level (MCL) in water for nitrates at 10 parts per million (ppm) (10 mg/L) and for nitrites at 1 ppm (1 mg/L).<sup>18</sup>

"When drinking water contains high levels of nitrate or nitrite, it can harm certain people, including babies, pregnant and nursing women, and older adults. The major problem is "blue baby syndrome" in which blood cannot bring enough oxygen to body cells and tissue. This can affect babies in the womb and then later, if breast feeding. Older adults may also be at greater risk."

"Some people who ate food or drank fluids that contained unusually high levels of nitrite experienced methemoglobinemia (decreased ability of the blood to carry oxygen to tissues). This was also seen in young infants (<6 months of age) who drank formula made with water having higher than recommended nitrate at levels. Symptoms people experienced included decreased blood pressure, increased heart rate, headaches, abdominal cramps, and vomiting; some people died."<sup>19</sup>

### **Design Life of a Soil Absorption System**

Estimated length of time before a system will have to be replaced or rehabilitated. Septic systems have a design life of 20-30 years, given proper siting, construction, and maintenance.<sup>20</sup>

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<sup>18</sup> EPA presentation on Safe Drinking Water Act

<sup>19</sup> <https://web.uri.edu/wp-content/uploads/sites/61/TipSheetC11-NitrateNitrite.pdf>

<sup>20</sup> <https://www.mass.gov/info-details/septic-systemstitle-5-glossary>

**EPA recommendation:** If your septic system is more than 25 to 30 years old, start planning for an upgrade before you are in an emergency situation. It is likely your system is close to its useful lifespan and Carlisle's own data showing an average pass rate of only 67% for Title 5 inspections in the 5-year period 2019-2023, the BOH has a duty to use this information to protect the public. In this case, the plausible risk of contaminating private wells, Carlisle's sole supply of drinking water, informs the regulation. The local regulation's 10-year age of a septic system represents 33% - 40% of a system's expected useful lifespan to protect against system failure for an adequate period of time after approval of a deed restriction.

EPA reference: <https://www.epa.gov/septic/frequent-questions-septic-systems>

**Website** - links may change. It is recommended to do a Google Search on the title.

**Resource Manual** – Copies of reference materials are available at the Health Department.