(3) the collection sewer is encased in concrete or DIP for a minimum of five feet on either side of the crossing.

(o) Collection sewers shall not cross under a stream, except as follows:

(1) a minimum of 36 inches of separation from the stream bottom is maintained;

(2) the collection sewer is constructed of DIP with mechanical joints or restrained push-on joints equal to water main standards; or

(3) the collection sewer is encased in concrete or DIP for a minimum of 10 feet on either side of the crossing and protected against the normal range of high and low water conditions, including the 100-year flood or wave action.

(p) Collection sewer aerial crossings shall be constructed of DIP with mechanical joints or restrained push-on joints equal to water main standards and freeze protected. Pipe shall be anchored for a minimum of 10 feet on either side of the crossing.

(q) If septic tanks, pump tanks, grease tanks, raw sewage lift stations, wastewater treatment plants, sand filters, and other advanced pretreatment systems are located in areas subject to flooding at a frequency greater than a 10-year storm, they shall be designed and installed to be watertight and to remain operable during all flooding events.

History Note: *Authority G.S. 130A-334; 130A-335(e) and (f); S.L. 2019-215, s.2.*

15A NCAC 18E .0602 APPLICABILITY OF SETBACKS

(a) The minimum setback requirements in Table IX of Rule .0601(a) of this Section for SA waters, basements, property lines, and cuts of two feet or more vertical height, shall not apply to the installation of a single wastewater system serving a single-family residence with a maximum DDF of 480 gpd on a lot or tract of land that meets the following requirements:

(1) on July 1, 1977, is described in a deed, contract, other instrument conveying fee title, or in a recorded plat;

(2) is of insufficient size to satisfy the minimum setback requirements in Table IX of Rule .0601(a) of this Section for SA waters, basements, property lines, and cuts of two feet or more vertical height of this Section on July 1, 1977; and

(3) cannot be served by a community or public sewerage system on the date system construction is proposed to begin.

(b) For those lots or tracts of land described in Paragraph (a) of this Rule, the maximum feasible setback shall be required, but shall not be less than the minimum setbacks in Table XIII.

TABLE XIII. Minimum setbacks from wastewater systems to specific site features on lots described in this Rule

Feature	Minimum setback in feet
SA waters from mean high-water mark	50
Basement	8
Property line	5
Cuts of two feet or more vertical height	5

(c) For wastewater systems installed in Group I soils on lots or tracts of land that meet the requirements of Paragraph (a) of this Rule, the wastewater system shall be located the maximum feasible distance but no less than 10 feet from any other wastewater system.

(d) For wastewater systems installed on lots or tracts of land which, on July 1, 1982, are specifically described in a deed or recorded plat, and the wastewater system cannot meet the minimum setbacks in Table IX of Rule .0601(a) of this Section for groundwater lowering systems, the wastewater system shall be located the maximum feasible horizontal distance but no less than 10 feet from the groundwater lowering system.

(e) Any local board of health ordinances in effect on June 30, 1977, which establish greater minimum setback requirements than those provided for in this Section, shall remain in effect and shall apply to a lot or tract of land to which Table IX of Rule .0601(a) of this Section does not apply.

History Note: *Authority G.S. 130A-335(e).*

SECTION .0700 – COLLECTION SEWERS, RAW SEWAGE LIFT STATIONS, SEPTIC TANK EFFLUENT PUMP SYSTEMS, AND PIPE MATERIALS

15A NCAC 18E .0701 COLLECTION SEWERS

(a) Collection sewers shall be designed and constructed in accordance with the following criteria:

(1) Building drains and building sewers shall be in accordance with the North Carolina Plumbing Code and approved by the local building inspector.

(2) Pipe material shall be specified to comply with the applicable ASTM standards based on pipe material.

(3) Gravity sewers shall be designed to maintain minimum scour velocities of two feet per second with the pipe half full and one foot per second at the peak projected instantaneous flow rate. Force mains shall be sized to obtain a minimum two-foot per second scour velocity at the projected pump operating flow rate.

(4) Infiltration and exfiltration shall not exceed 100 gpd per inch diameter per mile of gravity sewer pipe or 20 gpd per inch diameter per mile of pressure pipe in force mains and supply lines.

(5) Collection sewers shall be buried three feet deep, except as provided for in Rule .0601(h)(4) of this Subchapter.

(6) Ferrous material pipe or other pipe designed and bedded for traffic-bearing loads shall be provided where collection sewers are subject to vehicular traffic.
(7) Manholes shall be used for gravity collection sewers at any bend, junction, and a maximum of every 425 feet along the collection sewer. Drop manholes shall be required where the inlet to outlet elevation difference exceeds two and one half feet. Manhole lids shall be watertight if located below the 100-year flood elevation, within 100 feet of any public water system source, or within 50 feet of any private water system source or any surface waters classified WS-I, WS-II, WS-III, SA, SB, or B.
(8) Cleanouts may be used instead of manholes for four-inch and six-inch sewers serving one or two design units, or as otherwise allowed by the North Carolina Plumbing Code. Cleanouts shall be required a maximum of every 100 feet for four or six-inch sewers and at all junctions and bends which exceed 45 degrees, unless otherwise allowed by the North Carolina Plumbing Code.
(9) Air relief valves shall be provided as needed for force mains when the length exceeds 1,000 feet or for intermediate high points that exceed five feet.
(10) Collection sewers may require additional ventilation provisions, such as a stand pipe, based on length, size, and location.

(b) STEP systems may be used as an alternative to gravity collection sewers.

History Note: *Authority G.S. 130A-335(e), (f), and (f1).*

15A NCAC 18E .0702 RAW SEWAGE LIFT STATIONS

(a) Raw sewage lift stations permitted by the LHD shall meet all setbacks for wastewater systems in accordance with Table IX of Rule .0601(a) of this Subchapter.

(b) Raw sewage lift stations shall meet the following design and construction standards:
(1) dual pumps shall be provided for stations serving two or more buildings or for a facility with more than six water closets;
(2) pumps shall be listed by a third-party electrical testing and listing agency, such as Underwriter's Laboratories;
(3) pumps shall be grinder pumps or solids-handling pumps capable of handling a minimum of three-inch spheres. If the raw sewage lift station serves no more than a single water closet, lavatory, and shower, two-inch solids handling pumps shall be acceptable;
(4) minimum pump capacity shall be two and one half times the average daily flow;
(5) raw sewage lift stations serving single buildings shall be designed for pump run times between three to 10 minutes at average daily flow;
(6) pump station emergency storage capacity and total liquid capacity shall be determined in accordance with Rule .0802 of this Subchapter except for a sealed, watertight chamber serving an individual building, in which case a minimum storage capacity of eight hours shall be required; and
(7) all applicable requirements for pump tanks and dosing systems as set forth in Rule .0802 and Section .1100 of this Subchapter shall apply to raw sewage lift stations.

(c) A raw sewage lift station that is a sealed, watertight chamber shall meet the setback requirements for collection sewers in Rule .0601(k) of this Subchapter. Sealed, watertight chambers shall be a single prefabricated unit with a sealed top lid, and preformed inlet and outlet pipe openings connected with solvent welds, O-ring seals, rubber boots, stainless steel straps, or equivalent.

History Note: *Authority G.S. 130A-335(e), (f), and (f1).*

15A NCAC 18E .0703 PIPE MATERIALS

(a) The gravity pipe between a septic tank, gravity distribution device, and the dispersal field shall be a minimum of three-inch Schedule 40 PVC, Schedule 40 polyethylene, or Schedule 40 ABS.

(b) Three-inch or greater non-perforated polyethylene corrugated tubing, PVC SDR 21 and SDR 26 pressure rated at 160 psi or greater and labeled as compliant with ASTM D2241, PVC SDR 35 gravity sewer pipe rated as compliant with ASTM D3034, or alternative non-perforated pipe materials described in Paragraph (d) of this Rule, may be substituted for Schedule 40 between the distribution device and the dispersal field when the following minimum installation criteria are met:
(1) the pipe is placed on a compacted, smooth surface free of indentations or clods at a uniform grade, and with an excavation width of one foot;
(2) the pipe is placed in the middle of the excavation with three inches of clearance between the pipe and the walls;
(3) a washed gravel or crushed stone envelope is placed in the excavation on both sides of the pipe and to a point two inches above the top of the pipe;
(4) six inches of soil is placed and compacted over the stone or gravel envelope; and
(5) earthen dams consisting of two feet of undisturbed or compacted soil are located at both ends of the excavation separating the trench from the distribution device.

(c) All pipe joints from the septic tank to the dispersal field shall be watertight. Solvent cement-joints shall be made in a two-step process with primer manufactured for thermoplastic piping systems and solvent cement conforming to ASTM D2564.

(d) Pipe used for gravity distribution laterals shall be corrugated plastic tubing complying with ASTM F667 or smooth-wall plastic pipe complying with ASTM D2729 or ASTM F810. The pipe shall be marked as complying with ASTM standards. The corrugated tubing or smooth-wall pipe shall have three rows of holes, each hole between one-half inch and three-fourths inches in diameter and spaced longitudinally approximately four inches on centers. The rows of holes may be equally spaced 120 degrees on centers around the pipe periphery, or three rows may be located in the lower portion of the tubing, the outside rows being approximately on 120-degree centers. The holes may be located in the same corrugation or staggered in adjacent corrugations. Other types of pipe may be used for laterals provided the pipe satisfies the requirements of this Rule and is approved by the Department.
(e) Pump discharge piping, including the force main to the next component in the wastewater system, shall be of Schedule 40 PVC or stronger material and pressure rated for water service at a minimum of 160 psi or two times the maximum operating pressure, whichever is greater. The pipe shall meet ASTM D1784, ASTM D1785, and ASTM D2466.
(f) Pipe materials other than those identified in this Rule may be proposed when designed and certified by a PE, including any installation and testing procedures. Gravity pipe materials shall be shown to comply with the requirements of Paragraphs (a), (b), and (c) of this Rule. Alternative pressure rated pipe materials shall be constructed of PVC, polyethylene, or other pressure rated pipe and conform to applicable ASTM standards for pipe material and methods of joining. The proposed pipe shall be installed per ASTM D2774. Installation testing shall include a hydrostatic pressure test similar to pressure testing required for water mains for any line exceeding 500 feet in length and shall comply with the requirements of Rule .0701(a)(4) of this Section.

History Note: *Authority G.S. 130A-335(e), (f), and (f1).*

SECTION .0800 – TANK CAPACITY, LEAK TESTING, AND INSTALLATION REQUIREMENTS

15A NCAC 18E .0801 SEPTIC TANK CAPACITY REQUIREMENTS[15]

(a) Minimum liquid capacities for septic tanks shall be in accordance with the following:
(1) The minimum capacity of any septic tank shall be 1,000 gallons unless otherwise provided for in this Rule.
(2) The minimum capacity of any septic tank serving an individual dwelling unit with five bedrooms or less shall be sized as set forth in Table XIV.

TABLE XIV. Minimum septic tank liquid capacity for dwelling units

Number of bedrooms	Minimum liquid capacity in gallons
4 or less	1,000
5	1,250

(3) Septic tanks for dwelling units greater than five bedrooms, ~~multiple dwelling units,~~ places of business, or places of public assembly shall be sized in accordance with Table XV.
(4) The minimum septic tank capacity serving two or more dwelling units shall be ~~1,500 gallons.~~ based on the DDF of 120 gpd per bedroom or 60 gpd per person.

TABLE XV. Septic tank capacity for facilities not listed in Table XIV

Design daily flow in gpd (Q)	Minimum septic tank liquid capacity (V) calculation in gallons
$Q \leq 600$	$V = 2Q$
$600 < Q < 1,500$	$V = 1.17Q + 500$
$1,500 \leq Q \leq 4,500$	$V = 0.75Q + 1,125$
$Q > 4,500$	$V = Q$

(5) Septic tanks for RWTS and PIA Systems shall be sized in accordance with the RWTS or PIA Approval, pursuant to Sections .1500 and .1700 of this Subchapter.
(b) The minimum liquid capacity requirements of Paragraph (a) of this Rule shall be met by use of a single two compartment tank or by two tanks installed in series. The tanks in series may be constructed with or without a baffle wall. Each tank shall have a minimum liquid capacity of 1,000 gallons.
(c) When a grinder pump or sewage lift pump is installed prior to the septic tank, the required septic tank liquid capacity as set forth in this Rule shall be doubled. The minimum liquid capacity may be met by installing two or more septic tanks in series, each tank containing two compartments. The minimum liquid capacity of each tank shall be 1,000 gallons.
(d) The Department shall review other septic tanks designed to receive wastewater from grinder pumps or sewage lift pumps if designed by a PE to ensure that effluent discharged from the septic tank meets DSE as set forth in Table III of Rule .0402(a) of this Subchapter.

[15] Changed by S.L. 2023-77, Section 14