

**15A NCAC 02T .0305 DESIGN CRITERIA**

(a) Sewer and sewer extensions shall not be constructed in the following areas:

- (1) a natural area designated on the State Registry of Natural Heritage Areas by a protection agreement between the owner and the Secretary, unless no prudent, feasible, or technologically possible alternative exists; or,
- (2) a natural area dedicated as a North Carolina Nature Preserve by mutual agreement between the owner and State of North Carolina represented by the Governor and Council of State, unless the Governor and Council of State agree that no prudent, feasible, or technologically possible alternative exists;

(b) Engineering design documents. The following documents shall be prepared prior to submitting a permit application to the Division. If submittal of such documents is not requested in the permitting process (i.e., fast-track), they shall be available upon request by the Division. If required by G.S. 89C, a professional engineer shall prepare these documents:

[Note: The North Carolina Board of Examiners for Engineers and Surveyors has determined, via letter dated December 1, 2005, that preparation of engineering design documents pursuant to this Paragraph constitutes practicing engineering under G.S. 89C.]

- (1) a plan and profile of sewers, showing their proximity to other utilities and natural features such as water supply lines, water lines, wells, storm drains, surface waters, wetlands, roads and other trafficked areas;
- (2) design calculations, including pipe and pump sizing, velocity, pump cycle times and level control settings, pump station buoyancy, wet well storage, surge protection, detention time in the wet well and force main, ability to flush low points in force mains with a pump cycle, and downstream sewer capacity analysis; and
- (3) sewer system specifications describing all materials to be used, methods of construction, and means for assuring the quality and integrity of the finished project.

(c) All deeds, easements, and encroachment agreements necessary for installation, operation, and maintenance of the system shall be obtained prior to operation of the system.

(d) There shall be no by-pass or overflow lines designed in any new sewer system except for valved piping and appurtenances intended for emergency pumping operations.

(e) Two feet protection from a 100-year flood shall be provided unless there is a water-tight seal on all station hatches and manholes, with control panels and vents extending two feet above the 100-year flood elevation.

(f) The following separations shall be provided from the sewer system to the listed feature except as allowed by Paragraph (g) of this Rule:

Storm sewers and other utilities not listed below (vertical)	18 inches
Water mains (vertical-water over sewer including in benched trenches) or (horizontal)	18 inches 10 feet
Reclaimed water lines (vertical – reclaimed over sewer) or (horizontal)	18 inches 2 feet
Any private or public water supply source consisting of wells, WS-I waters, Class I, Class II, or Class III reservoirs used as a source of drinking water	100 feet
Waters classified WS-II, WS-III, WS-IV, B, SA, ORW, HQW, or SB from normal high water or tide elevation, wetlands that are directly abutting these waters, and wetlands classified as UWL or SWL	50 feet
Any other stream, lake, impoundment, wetlands classified as WL, waters classified as C, SC, or WS-V, or ground water lowering and surface drainage ditches	10 feet
Any building foundation	5 feet
Any basement	10 feet
Top slope of embankment or cuts of 2 feet or more vertical height	10 feet
Drainage systems and interceptor drains	5 feet
Any swimming pool	10 feet
Final earth grade (vertical)	36 inches

(g) The following separations shall be permitted if separations in Paragraph (f) of this Rule cannot be achieved, provided that nothing in this Paragraph shall supersede the allowable alternatives provided in the Commission for Public Health Public Water Supply Rules (15A NCAC 18C), Commission for Public Health Sanitation Rules (15A NCAC 18A) or the Groundwater Protection Rules (15A NCAC 02L and 15A NCAC 02C) that pertain to the separation of sewer systems from water mains or public or private wells:

- (1) for storm sewers, engineering solutions such as ductile iron pipe or structural bridging to prevent crushing the underlying pipe;
  - (2) for public or private wells, piping materials, testing methods, and acceptability standards meeting water main standards shall be used where these separations cannot be maintained. All appurtenances shall be outside the 100-foot radius of the well. The separation shall however not be less than 25 feet from a private well or 50 feet from a public well;
  - (3) for public water main horizontal or vertical separations, alternatives as described in 15A NCAC 18C .0906;
  - (4) for less than 36-inches cover from final earth grade, ductile iron pipe shall be required in any alternative. Ductile iron pipe or other pipe with proper bedding to develop design supporting strength shall be provided where sewers are subject to traffic bearing loads; and
  - (5) for all other separations, materials, testing methods, and acceptability standards meeting water main standards (15A NCAC 18C) shall be required in any alternative.
- (h) The following criteria shall be met for all pumping stations and force mains:
- (1) Pump Station Reliability:
    - (A) Pump stations shall be designed with multiple pumps such that peak flow can be pumped with the largest pump out of service. Simplex pump stations, which are pump stations with only one pump, shall serve only a single building with an average daily design flow less than or equal to 600 gallons per day as calculated using Rule .0114 of this Subchapter.
    - (B) A standby power source or pump shall be required at all pump stations except for simplex pump stations. Controls shall be provided to automatically activate the standby source and signal an alarm condition.
    - (C) As an alternative to Part (B) of this Subparagraph for pump stations with an average daily design flow less than 15,000 gallons per day as calculated using Rule .0114 of this Subchapter, a portable power source or pumping capability may be used. The portable source shall be owned or contracted by the permittee and shall be compatible with the station. If the portable power source or pump is dedicated to multiple pump stations, an evaluation of all the pump stations' storage capacities and the rotation schedule of the portable power source or pump in a multiple station power outage, including travel timeframes, shall be provided.
    - (D) Simplex pump or vacuum stations connecting a single building to a sewer system shall provide 24-hours worth of wastewater storage or shall provide storage in excess of that needed during the greatest power outage over the last three years or the documented response time to replace a failed pump, whichever is greater. Documentation of wastewater storage shall be provided with the permit application. In no case shall less than 6 hours worth of wastewater storage be provided above the pump-on level.
    - (E) All pump stations designed for two pumps or more shall have a telemetry system to provide remote notification of a problem condition, including power failure and high water alarm.
    - (F) All pump stations shall have a high water audio and visual alarm.
  - (2) Pump stations shall have a permanent weatherproof sign stating the pump station identifier, 24-hour emergency number, and instructions to call in case of emergency. Simplex pump or vacuum stations serving a single-family residence shall have a placard or sticker placed inside the control panel with a 24-hour emergency contact number.
  - (3) Wet wells shall be equipped with screened vents.
  - (4) The public shall be restricted from access to the site and equipment.
  - (5) Air relief valves shall be provided at all high points along force mains where the vertical distance exceeds ten feet.
- (i) The following criteria shall be met for gravity sewers:
- (1) public gravity sewers shall be equipped with a minimum eight inch diameter pipe and private gravity sewers shall be equipped with a minimum six inch diameter pipe;
  - (2) the maximum separation between manholes shall be 425 feet unless documentation is submitted with the application that the owner has the capability to perform routine cleaning and maintenance of the sewer at the specified manhole separation; and
  - (3) drop manholes shall be provided where invert separations exceed 2.5 feet.

(j) The following criteria shall be met for low pressure sewers, vacuum sewers, STEP, and other alternative sewers discharging into another sewer system:

- (1) Hydraulic modeling of the system shall be submitted using the statistically projected number of pumps running at one time. If computer modeling is provided by a pump manufacturer, it shall be indicated and shall be considered part of the design calculations pursuant to Subparagraph (b)(2) of this Rule.
- (2) Simplex pump stations shall only serve a single building with an average daily design flow less than 600 gallons per day as calculated using Rule .0114 of this Subchapter. All other buildings connected to the system shall at a minimum have duplex pumps.
- (3) Septic tanks shall adhere to the standards established in 15A NCAC 18A .1900.

*History Note: Authority G.S. 143-215.1; 143-215.3(a);  
Eff. September 1, 2006;  
Readopted Eff. September 1, 2018;  
Amended Eff. April 1, 2021.*