

November 11, 2020

System Design Preferences and Considerations for Private Sector Submittals

1. Conformance to Topography: Individual lines are to be installed on contour (Ref. Rule 15A NCAC 18A .1955(g)). Minor variations in topo may be accommodated but is dependent on depth of soil with usable characteristics and maintenance of required vertical separations along with limitations on maximum trench depth and minimum soil cover.
2. The slope of sites proposed for “at grade”, shallow placed drainfield systems (Ref. Rule 15A NCAC 18A .1956 (1)) is not to exceed 5 percent.
3. Use of stepdowns: Use of stepdowns is to be avoided.
4. Any individual drainline segment for conventional gravel or innovative trench system shall be minimum of 50 feet.
5. Modes of wastewater/effluent distribution:
 - a. Gravity distribution for lines of equal length: When 4 or less lines are utilized, an approved distribution device such as flow dividers or distribution box may be utilized.
 - b. When a pump is required, a pressure Mani-tee may be used for two to four equal drain lines.
 - c. Pressurized manifold distribution system will be necessary when drainlines are of varying lengths or there are 5 or more lines in the system. Options include pressure manifold or Low-Pressure Pipe distribution.
 - d. Additionally, layouts incorporating pressure manifolds for wastewater distribution are to be such that a manifold can be designed to provide for the same flow per linear foot of line for all lines supplied by the manifold.
 - e. A following design parameters must be simultaneously considered and optimized:
 - i. LTAR for each line must not exceed 105 % of the assigned LTAR.
 - ii. Minimum pump run time/dose is to be five minutes when lines are of unequal length. Preferably runtime is to be between seven and twelve minutes.
 - iii. Dose volume should be between 66% to 75% of 4” pipe used in the drainline.
 - iv. Adjusting combination of Tap sizes used in manifolds and using residual/pressure head of 2.5 or 3 feet may provide optimal solutions.
 - f. Mode of wastewater distribution is to be clearly indicated on submissions.
6. Layout/Drainline Configuration:
 - a. The standard approach is to attempt to achieve the best possible system configuration, utilizing the least complex technology and be practical to construct.
 - b. If this entails modification of the proposed building envelope, design wastewater flow, etc., the developer/builder should be so informed and necessary modifications made in siting/use.
 - c. To accommodate the ‘unforeseen’ constraints that invariably occur, it is considered prudent that layouts be based on the linear footage of line that would be calculated for a system and repair as described in Rules .1955, .1956, .1957(a) and/or WCDES Regs., as applicable. The developer/builder should also be appraised of limitations imposed on

location of appurtenances (i.e. swimming pools, detached garages, etc.) by proposed siting/use and system layout.

- d. All regulatory setbacks and constraints on system location (i.e. setbacks from wells, foundation, foundation drain, cut banks, streams, etc.) must be adhered to.

Take special note of the following setback requirements:

- 1) Interceptor drains, foundation drains, and storm water diversions: Feature located upslope from system-10 feet, sideslope-15 feet, & downslope-25 feet. See Session Law 2019-215, Section 3 for exceptions.
- 2) Private wells: Initial installation -100 feet & repair installation -50 feet. Note that the reduction to 50 feet for the initial installation is not considered applicable since location of site features are not fixed in planning stages of development. Additionally, wells are to be located a minimum of 50 feet from the structure and a minimum of 10 feet from any property line. Adjoining wells are to be separated by a minimum of 50 feet.

- e. Number of lines stacked on a common slope is to be minimized and line lengths are to be maximized and maintained as equal as possible. Avoid decreasing line lengths from higher to lower elevations (Ref. WCDES Regs. Sec. IV 8).

7. Special Design Considerations:

Sites having very limited available space may require installation of initial and repair system (Ref. Rule 15A NCAC 18A. 1955 (p)).

8. Other Considerations:

It is imperative that the developer/builder understand that areas designated for installation and repair of wastewater disposal systems be protected from all land disturbing activities. This may necessitate clearly flagging or fencing these areas to prevent unauthorized activities.

Please note that the foregoing “System Design Preferences and Considerations for Private Sector Subdivision Submittals” is not intended to be totally inclusive for all proposals, nor can it be. This is a ‘developing’ document and will almost certainly change with time as new proposals and technology are encountered.