

## **RECOMMENDED DESIGN CRITERIA FOR SEPTIC TANK EFFLUENT PUMPS (STEP) SEWAGE SYSTEMS**

### **A. Septic Tank**

1. Use two-compartment tank, sized and constructed in accordance with the state sewage rules (15A NCAC 18A .1900, et. seq.).
2. Provide risers above access manhole above sanitary tee to ground surface and divert surface runoff away from the manhole cover and/or make it watertight.

### **B. Pump Tank**

Tanks must be generally constructed as per sewage rules (15A NCAC 18A .1900, et. seq.) with following modifications:

1. Tank must be large enough to provide:
  - 18 inches for pump submergence, minimum;
  - 3 minute minimum pump run time (15 gallon per minute minimum pump flow rate);
  - full day of emergency storage capacity above high-water alarm level. This may include septic tank freeboard capacity, if effluent will remain below ground and below building drain outlet invert.
2. Tank must be sealed watertight tank (fiber glass or one-piece, precast pump tank or special provisions for assuring watertight tank indicated).
3. Anti-buoyancy provisions must be adequate.
4. All pipe and wire conduits into tank must be through hubs or fittings made during the construction of the tank and installed in a watertight and gastight fashion.
5. Tank access riser must extend at least six inches above finished grade.

### **C. Pump**

1. Must be an effluent pump capable of delivering at least 15 gallons per minute at the expected total dynamic head at each station.
2. All pump in a single STEP system must be the same model and size.
3. Pumps must be activated by mercury level control switch(es).
4. Pump discharge pipe must be of Schedule 40 PVC, or stronger material, and include a check valve, disconnect union, and gate valve within the pump tank. Pump must be readily removable from the ground surface.

5. When any pump is located at a higher elevation than the elevation at the terminal end then a siphon-break valve must be provided for that pump. As a rule if a siphon-break valve is provided for more than one pump in the system then such valves should be considered to be provided for all pumps.
  6. Provisions for ventilation should be provided for all pump tanks with the vent opening located above the 100-year flood elevation. A vent with screen must be provided for all pump tanks.
- D. Wires must be conveyed to a watertight (NEMA 4X), outside, vandal-resistant junction box through waterproof and gasproof conduits, with no splices made inside the lift station. Junction box may be mounted on the outside of the lift station riser above the ground surface.
- E. Control panel must be mounted on the side of the house nearest the pump tank and readily accessible.
1. Panel must be in a NEMA 4X, vandal-resistant enclosure and located above 100-year flood.
  2. Panel must be U.L. listed and include a pump run light and hand-off-automatic (H-O-A) switch. The panel should also include an elapsed time clock and cycle counter.
  3. An audible and visible high-water alarm must be provided. The visible alarm must be visible from the road. The audible alarm must be audible inside the house and may be located in the house.
  4. Two separate circuits must be supplied from the main house electrical panel--one circuit for the pumps and pump controls and one circuit for the high-water alarm.
- F. Service laterals must be of Schedule 40 PVC, or stronger material, and must include a check valve and gate valve within a valve box adjacent to the property line, prior to connecting in the force main.
- G. Force mains must include cleanouts at the end of each line, and at all main junctins and at least every 1000 feet. Air release valves must be provided at any high spots along the line.
- H. Surge storage tank must be provided in front of the final common dosing tank with liquid capacity of at least 10 percent the total required septic tank capacity for the project as a whole to give further solids retention in case of upset at one or more of the individual lift station.
- I. Legal Arrangements/Operation and Maintenance Requirements
1. Developer or owners association must be responsible for installing the individual lift stations and for continuous station maintenance. They must retain easements permitting access and maintenance to each lift station and to the electrical controls.

2. Developer or owners association must retain a certified subsurface wastewater system operator (Operator in Responsible Charge) to be responsible for operation and maintenance of the entire system, including the individual lift stations and individual septic tanks.
3. An inventory of at least 10 percent of the active pumps, level control floats, and complete control panels must be maintained by the developer or owners association and readily available to the system operator.
4. The tri-party agreement among the developer, owners association , and health department must clearly indicate ownership, operation and maintenance requirements for the individual lift stations.