



I. Designing of a PPBPS Fill System

PPBPS fill systems can help to provide a 50% reduction in nitrification line lengths over what would be required in conventional fill systems.

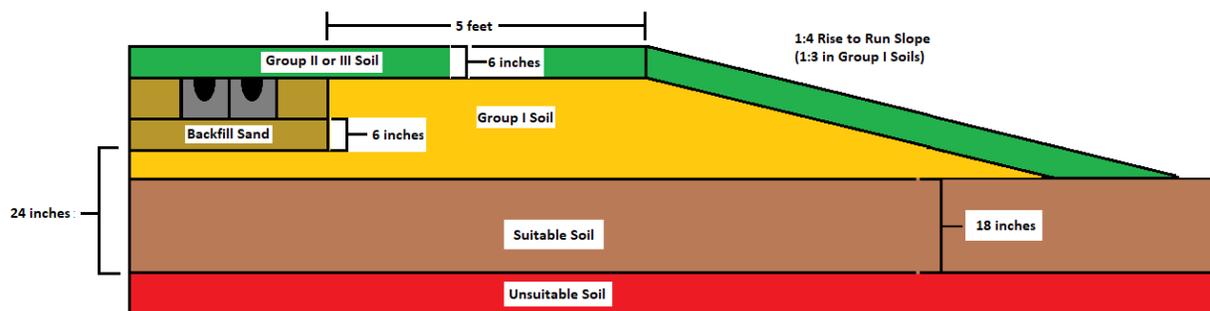
PPBPS fill systems are installed using Horizontal panels. There are several reasons we use horizontal rather than vertical panels in fill. Horizontal panels are shorter vertically than Vertical panels. Horizontal panels also have an advantage in that both chambers are dosed, meaning more area for biomat growth and aerobic treatment.

In calculating the required linear footage for a PPBPS's nitrification field, the linear footage for the nitrification line as determined in Rule .1955 (b) and (c), or in Rule .1956 (6)(b), Table III(a) of the 15A NCAC 18A .1900 rules, when applicable, shall be multiplied by 0.5 for a 16 inch PPBPS;

Key elements to consider in the design and installation of PPBPS Fill Systems include:

1. All rules listed under .1957(b) and (c) are applicable to the design and installation of PPBPS fill systems.
2. Trench bottom must have at least 24 inches of separation to any soil horizon UNSUITABLE as to soil structure, clay mineralogy, organic soil, rock or saprolite. However, if a low pressure pipe system is used, the minimum separation distance shall be 18 inches. *Note: Trench Bottom refers to the bottom of the excavated trench*
3. Nitrification trenches shall be installed with at least 18 inches separating the trench bottom and any soil wetness condition. This separation requirement for soil wetness conditions may be met with the use of a groundwater lowering system only in Soil Groups I and II, with SUITABLE structure and clay mineralogy. However, if a low pressure pipe system is used, the minimum separation distance shall be 12 inches.

The figure below is a visual representation of a PPBPS Fill System



II. Installation of a Fill System

1. All rules listed under .1957(b) and (c) are applicable to the installation of PPBPS fill systems.
2. Where fill material is added, the fill material and the existing soil shall be mixed to a depth of six inches below the interface. Heavy vegetative cover or organic litter shall be removed before the additional fill material is incorporated.
3. The fill system shall be constructed as an elongated berm with the long axis parallel to the ground elevation contours of the slope.
4. The side slope of the fill shall not exceed a rise to run ratio of 1:4. However, if the first 18 inches below the naturally occurring soil surface is Group I soil, the side slope of the fill shall not exceed a rise to run ratio of 1:3.
5. The outside edge of the nitrification trench shall be located at least five feet horizontally from the top of the side slope.
6. The fill system shall be shaped to shed surface water and shall be stabilized with a vegetative cover against erosion.
7. Add the appropriate amount of fill material to achieve elevation of the top of the nitrification trench (must meet afore mentioned separation requirements).
8. Excavate 36-inch wide trenches to an appropriate depth (must meet separation requirements).
9. Follow Trench Installation Methods for Horizontal Panels
 - a. Add 6 inches of backfill sand into the bottom of the trench (If the bottom of the panel is installed into a natural Group I soil, this 6-inch layer is not necessary provided appropriate separation requirements are met).
 - b. Place 1x6 boards in the middle of trench.
 - c. Place the appropriate number of panels centered on the boards in the trench and space about six inches apart (spacing can be adjusted to fit designed line length).
 - d. Utilize 1.5-inch PVC (smaller diameter pipe may be used for LPP systems) to span from panel to panel, making sure that the pipe ends in the inner chambers of each panel.
 - e. Utilize GE Foam Sealer to construct partial seals in the inner cutouts and full seals on the outer cutouts of each panel.
 - f. Place cap blocks on each end of the panel.
 - g. Backfill trenches with appropriate back fill sand up to the top of the panel blocks.
10. After inspection of the PPBPS installation, the final six inches of fill used to cover the system shall have a finer texture (such as Group II, III) for the establishment of a vegetative cover.
11. When installing in existing fill, all rules listed under .1957(b) are applicable.

III. Inspection of a PPBPS Fill System

1. Ensure that the fill system was constructed in accordance with all rules listed under .1957(b) and (c).
2. Determine that the proper number of panels were installed in each nitrification line
3. Shoot grade off the cap blocks to see if lines are level or less than 0.25-inch of fall per ten feet
4. Lift several cap blocks to ensure the PVC pipe extends from inner chamber of one panel to the inner chamber of the following panel and inspect inner and outer seals
5. Ensure that the proper backfill sand was used (either a clean, screened river sand or a concrete sand; naturally occurring sands, no man-made sands)