

FREEZING CLIMATE DESIGNS

INSTRUCTIONS FOR FREEZING CLIMATE DESIGN AND OTHER CONSIDERATIONS

The goal of freezing climate designs is to be able to drain the entire system as quickly as possible - preferably in 10 to 15 minutes or less. Any pipe or component that does not drain after a dose must be buried below the frost line and/or properly insulated.

LANDSCAPE AND COVER

1. Additional depth over dripline:
 - Driplines that are buried deeper in the ground are less likely to freeze than shallow.
 - Whenever possible, add solid cover (soil) to increase the depth of the dripline.
 - **Note:** It is better to have the driplines in the 6" - 8" range if possible for better nutrient removal, but this should be weighed against the climate.
2. Established and undisturbed wooded sites where trees have not been removed, have been shown to allow shallow systems to perform without freezing.¹
3. Landscapes with drip dispersal fields should have vegetative cover over them. This may be prairie grass, plants, bushes, shrubs, trees, turfgrass or any combination.
4. Vegetative height should be at least 4" to 6".
5. In areas where warm season grasses go dormant:
 - The area should be overseeded to ensure sufficient ground cover.
 - Overseeding should begin as early as possible to allow enough growth.
 - Cover all areas with at least 6" of straw/hay until the cover is properly established.
6. Stop mowing operations as early as possible so grasses can grow as tall as possible.
7. Managing snow cover:
 - Because snow is an excellent insulator, provisions should be made to ensure that snow can stay in place over the drip field.
 - Use anything that will help the snow to accumulate and stay over the field, including snow fences or other fencing, stands of trees, bushes, hedges, or decorative grasses.
8. In windy areas, it may be necessary to have more than turfgrass as a cover.
9. If it is not possible to grow a cover over the field, use at least 6" of straw/hay to cover the entire system. In areas/seasons with minimum snow cover, check the depth of the straw/hay during the season. Add more cover as needed.
10. Keep foot traffic away from the drip field, especially when it has a snow cover.

HEADERS AND DRIPLINE

1. **Note:** Netafim Bioline® Dripline is made from low-density, linear polyethylene to weather the effects of cold weather. Due to its emitters, it will drain available effluent after dosing. Our design and operation efforts therefore are to protect the non-Bioline piping network, fittings, valves and hard/rigid components that can break or fail if frozen.
2. Manifolds and supply/return lines should be installed lower than driplines to provide positive drainback after the zone shuts off.
3. Manifolds and supply/return lines should be sloped back to the tank to provide positive drainback.
4. Under extreme conditions, manifolds and supply/return lines should be buried below the frost line.
5. Consider insulating all manifolds and supply/return lines with Styrofoam board if the system is in an extremely cold location.
6. Any drain valves must be able to remain open long enough for the entire field to drain. **Note:** Hydraulically operated valves may close when system pressure is too low.
7. Motorized drain valves may be installed to help drain the system in lieu of hydraulic valves.
8. Dripline should be installed level across the contour of any discernible slope.

¹ Mokma, D.L., T.L. Loudon & P. Miller, 2001 Rational for shallow trenches in soil treatment systems. In: Onsite Wastewater Treatment. Proceedings of the 9th National Symposium on Individual and Small Community Sewage Systems. ASAE, 2950 Niles Rd., St. Joseph, MI. www.asae.org.

HEADERS AND DRIPLINE (CONT.)

9. On laterals with blank tubing or flex connections, they may be installed slightly above the driplines. This will allow them to drain into the dripline laterals.
10. Consider using larger piping on the supply and return lines to accommodate a high pressure nozzle and tubing along with clean out ports to gain entrance into the system. There are several brands of water jets on the market that can clear ice from inside the headers. They rely on warm water and its special nozzling allows it to move forward in the pipe as the stream of water dislodges any blockages.

AIR VALVES / HEADWORKS / VALVES / VALVE BOXES

1. Install larger valve boxes than would normally be used to accommodate any service work that may be done in the winter.
2. Insulate all equipment boxes, including headworks boxes, filters, field flush valve boxes, as well as zone dosing valves and air/vacuum relief valves. Use Styrofoam panels or chips, or other closed cell insulating materials such as perlite or vermiculite in bags around the inside and the outside of valve boxes. If fiberglass is used, ensure that it cannot become waterlogged.
3. Install headworks and other components in risers over the treatment tank to capture available warmth.
4. Design the system around providing a continuous flush. This will keep water moving throughout the system during a dose and allow for fast draining on shutdown.
5. Insulate or add a heater to the headworks.
6. If using an index valve to split field zones, be sure it is capable of draining.
7. Air/Vacuum Relief Valves (A/VRV) should be used liberally, and at least on the end of supply and flush manifolds.
8. Air/Vacuum Relief Valves should be placed below grade at any high point(s) and always above dripline laterals. The top of A/VRV must be no higher than the soil surface.
9. Attach and secure something metallic to the lid of valve boxes and A/VRV boxes to make them easier to find when they are covered with snow or vegetation.
10. Add a gravel sump of at least 6" under any valve box.
11. Grade away from all valve boxes to reduce groundwater incursion.

INSTALLATION

1. As noted above, dripline laterals on any discernible slope should be installed as close to contour as possible.
2. Due to potential shrinkage of the dripline in cold weather, it should be installed so there is slack in the tubing. "Weaving" it back and forth if being installed in an open trench is an acceptable method.
3. If repairs are made to the system, keep the dripline from becoming taut by adding sufficient tubing so the dripline is not stretched.
4. Insulate the septic/treatment tank and pump tank to preserve whatever heat is inside.
5. All electrical components must be properly sealed to prevent condensation getting inside any controllers or panels.
6. Position and angle all filters to ensure that water does not get trapped inside.
7. Remove the check valve at the pump.

OPERATION

1. In multi-zone systems with lower flows in the winter, reduce the number of zones being used.
2. Reduce the time between doses, but do not overload the soil.

For additional questions, please contact Netafim USA Customer Service at 888-638-2346 or visit www.netafimusa.com/wastewater.

