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Installing D-Boxes

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There are two primary methods of delivering septic effluent to the soil treatment area by gravity: The distribution box and the drop box.

Distribution boxes are used in subsurface bed systems and in series of trenches on level sites. The name used for this type of distribution is parallel. Drop boxes are used to deliver effluent between trenches on sloping sites through sequential distribution.

Basic definitions

Distribution boxes are constructed with an inlet at the highest elevation and multiple outlets at a single lower elevation. In theory, the box will then distribute the effluent equally between trenches. This is why most state and local codes require every trench fed by a distribution box to be of the same length.

In practice, equal distribution rarely if ever happens. Usually one of the outlets is slightly lower than the others, or growth of organic material in the box or the piping results in the flow all going to one trench. Once the biomat has formed in that trench and effluent is ponded, the effluent backs up into the distribution box and flows out one of the other lines. This is why distribution boxes should only be used on level sites or in bed systems that are constructed level.

Drop boxes have an inlet near the top of the box and the invert of the outlet pipe to the next drop box one inch below the inlet pipe. The outlet pipes to the trenches are located at the bottom of the box.

Effluent then flows through a watertight pipe from the septic tank to the first drop box, where all the effluent enters the first trench until the biomat is formed and ponding occurs. This allows the effluent to flow in a supply pipe laid so that there is at least a one-inch drop to the next box in sequence. The effluent then flows into the next trench, and the process is repeated until all trenches are used.

Keeping it level

Whether using distribution or drop boxes, it is important to install them level. They can be placed directly on level natural soil, or on three to six inches of coarse sand or washed pea rock if there are concerns about the stability of the native soil.

Inlet and outlet pipes must be properly supported and bedded. One common mistake we see with drop boxes is over-excavation to the trenches where the supply pipes are installed. This leaves the pipes unsupported as they enter and leave the boxes.

Backfilling without proper support can knock the boxes out of level or, even worse, break or crack the supply lines. The elevation and orientation of distribution or drop boxes is important because that will determine the depth of the trenches themselves. If the boxes are not at the proper elevations, the installer may inadvertently over-excavate the trenches causing them to lack the proper separation distance from limiting conditions.

Both types of boxes are typically made of concrete, plastic or fiberglass. It is important for the boxes to be watertight and resistant to root penetration. Most boxes today have built-in boots or sleeves to ensure that the penetrations remain watertight after backfill.

If it is left to you to make a concrete box watertight, you should use a flexible rubber boot rather than try to use concrete or mortar to seal the box. Over time and during backfill, the concrete will crack and allow roots and water to penetrate.

Regulating flow

For each type of box there are various flow-control devices that can be installed to adjust flow to the individual trenches. These are meant to provide for management of the system and biomat formation. They are not intended to compensate for bad installation practices!

There are also some proprietary products on the market that use a “tipping bucket” concept to dose and rest the gravity trenches. You and the homeowner need to recognize that if these technologies are employed, they need a higher level of management and care. This means the boxes must be easily accessible through risers that are brought to grade. Another good installation practice that allows for inspection and management of the system is to install solid pipe from the box to the surface. This enables the service provider to check the boxes periodically for root intrusion and to see how the system is operating.

One example of bad practice involves using earthen dams and piping configurations to move effluent between trenches without a drop box. This is unwise because there is no way to inspect or manage the system without digging up a part of it. Our experience also shows that at each stepdown or crossover location, there is an area where effluent is likely to surface. So this is a good way to end up with a series of wet spots in the backyard.

SOWMA Town Hall Series

Plans are underway for a series of Town Hall events to be held in various locations throughout Saskatchewan. These events will feature opportunities to learn about technologies in the industry, system design and installation tips and troubleshooting, and regulatory issues.

Events will be held in Cypress, Regina, Saskatoon, Prince Albert and Prairie North Parkland. Further events may be planned based on demand.

For information on these sessions, or to help sponsor an event, please contact the SOWMA office. Dates for these events will be released in the next few weeks.

Onsite Wastewater Practitioner Training

The next available training session dates are:

Days 1-3 - May 4, 5 & 6, 2015 - Lloydminster, SK

Days 4-7 - May 24, 25, 26 & 27 2015 - Lloydminster, SK

Register online or contact the association office at 855-872-2650 for more information.

Saskatchewan Urban Municipalities Association Annual Convention

The Saskatchewan Urban Municipalities Association Annual Convention will be held January 31 – February 3, 2016 in Regina, SK.

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