

## THE LIFTING STATION



Although we should always favour gravity-fed systems for its completely passive treatment process, the use of a lifting station is common practice in the wastewater treatment industry for isolated dwellings. To ensure the optimal functioning of residential septic systems, DBO Expert is sharing some information and best practices for the design, installation and use of a lifting station.

### WHY USE A LIFTING STATION?

In situations where a gravity feed from the house to the treatment units is impossible, a lifting station is required to ensure a flow of water. In this case, the water from the house, or more usually from the pre-treatment tank, flows to a lifting station to then be pumped towards the rest of the treatment chain.



## SELECTING A LIFTING STATION

### Dose Volume

The first criterion in selecting a lifting station is regarding the required dose volume, enabling the selection of a tank whose effective volume is sufficient. But what should this lifting volume be? A compromise must be made between a low dose volume, requiring a smaller, less expensive tank, and a higher dose volume, thereby reducing the frequency of pump starts and stops that contributes to its wear and tear. A rule of thumb is to fix the number of pumping cycles per day, for example, to eight. For a residence whose theoretical water use is 1,260 L/day, the dose volume would then be around 158 L.

### Effective Volume

The dose volume helps determine the effective volume required by the tank. Keep in mind that a specific height is required to use an alarm float. Best practices suggest a significant increase the effective height to allow, in case of a power or mechanical failure, for an increased water volume while waiting for a return to normal. This refers in some cases to the possibility of storing the equivalent of up to 2 days' worth of water use.

### The Material

Three materials are currently available in the market: concrete, plastic and fiberglass.

Each has its pros and cons:

#### *Concrete*

- + Can be installed in any type of soil because of its anti-floatation weight
- + Available in several models and sizes because of its frequent use
- Its weight makes transport and installation more difficult
- Can deteriorate over the years

#### *Plastic*

- + Its light weight makes transport and installation easier
- + No long-term degradation
- + Generally, least expensive in its category
- Can float when installed in impermeable soil or in the water table\*

#### *Fiberglass*

- + Its light weight makes transport and installation easier
- + No long-term degradation
- Can be less expensive
- Can float when installed in impermeable soil or in the water table\*

\*This inconvenience can be easily resolved by using a tank with a larger base or anchors whose basis is to counter Archimedes' principle with a superior downward force. DBO Expert's new AncrO)) underground anchors are ideal for light tanks that tend to float, that is, in impermeable soil or when the water table is high.



Figure 1. AncrO)) underground tank anchor

## CHOOSING THE PUMP

In the domestic wastewater treatment market, the type of pump used is the submersible pump, also called sump pump or effluent pump. These pumps are ideal because of their capacity to handle solids of a certain size and because of the many types and varieties available. Note that sewage grinder pumps should never be used prior to the pre-treatment tank: retention time in the pre-treatment tank is not sufficient to allow the solids pulverised by the garburator to decant, resulting in an effluent with a high organic load.

Regarding technical specifications, the slope and distance between the lifting station and the point of discharge should be taken. Combined with the diameter and the intended material of the supply pipe, total head and flow rate can be calculated, indicating that the pump should be able to provide for this distribution.

## OTHER THINGS TO CONSIDER

### Insulation

In regions where the ground freezes, precautions must be taken to prevent the distribution equipment from freezing. To do so, avoid using a backflow valve so that the supply pipe can empty after each pumping cycle. Moreover, pipes that are not deep enough should be insulated with, for example, insulation panels.

### Ventilation

For a System O)) solution or any other system whose treatment relies on passive aeration, the ventilation is an indispensable element. Usually, the ventilation starts at an inlet vent at one end of the system. The ventilation circuit then travels throughout the system, goes through the pre-treatment tank and ends at the roof vent. When a lifting station is installed, this circuit is blocked by the use of a submerged supply pipe connected to the pump. To ensure the continuity of this ventilation and an optimal treatment without odours, a bypass should be connected to the lifting station. If the lifting station is too far from the treatment system or a bypass is impossible, an exit vent should be installed directly at the beginning of the system. Here are a few different options:

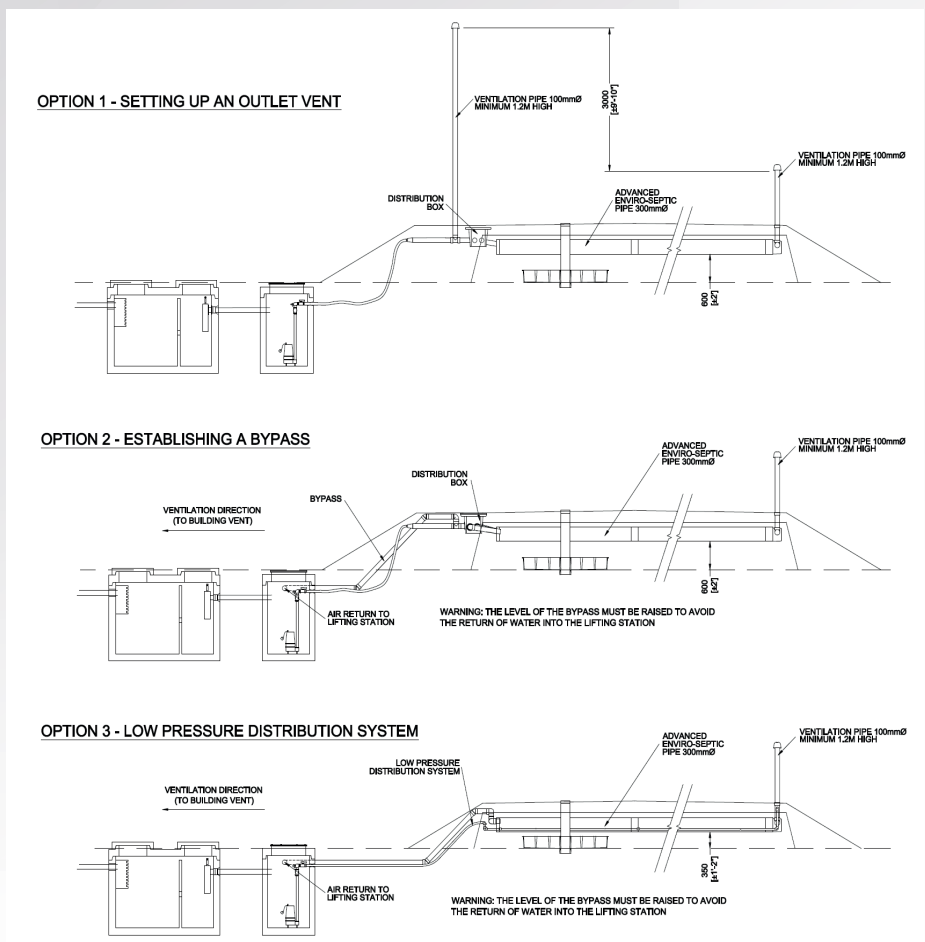
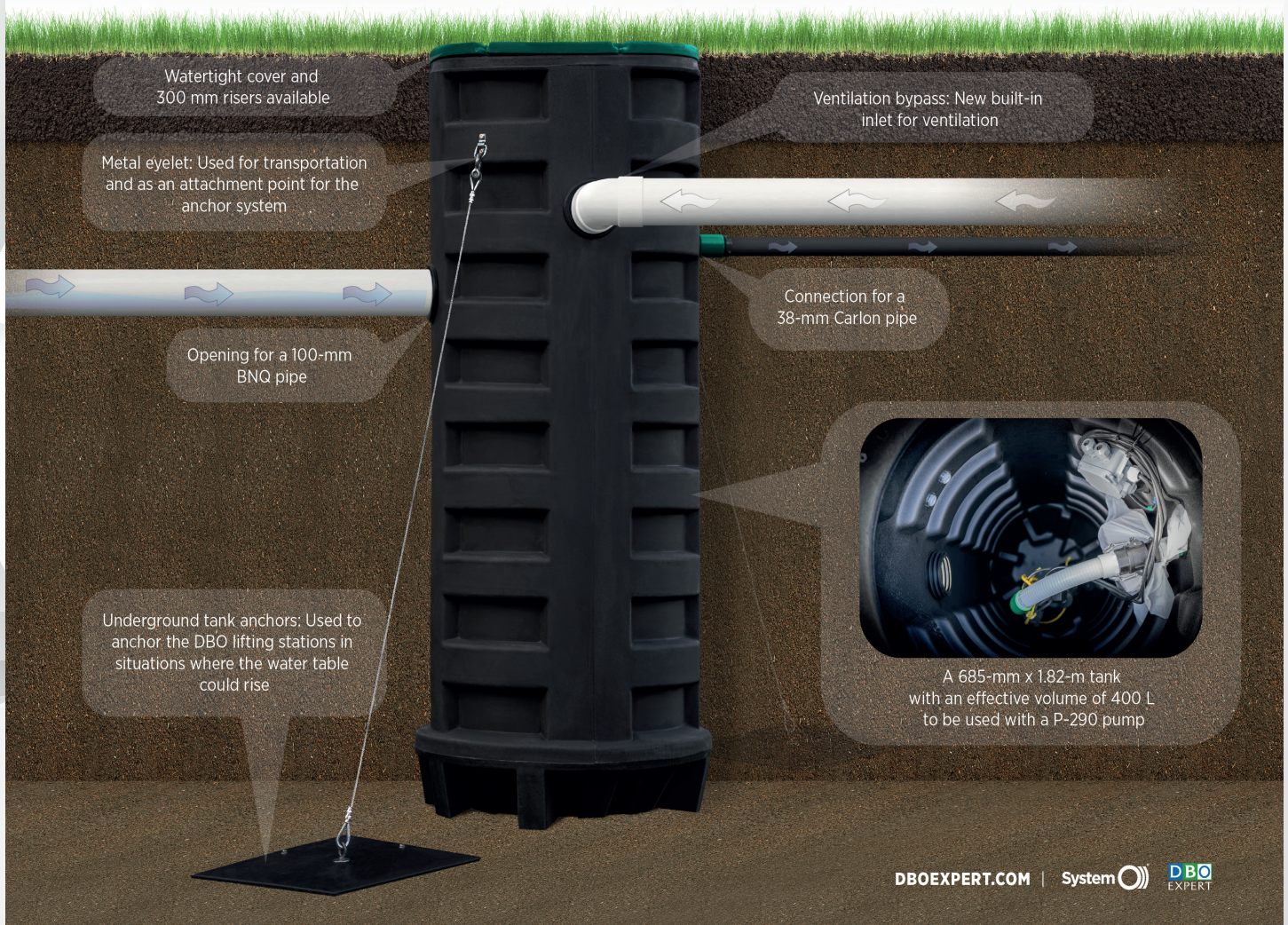


Figure 2. Ventilation circuits with lifting stations



THE NEW  
**LIFTING STATION**  
APPROPRIATE FOR ALL TERRAINS

**O-SP-400**



## O-SP-400 LIFTING STATION

With the introduction of the new System O)) solution with low-pressure distribution, DBO Expert also launched its first lifting stations. In response to comments and suggestions from the field, DBO Expert improved its product by introducing its new O-SP-400 lifting station.

This new lifting station differs from previous models in that:

- It is smaller. Extenders are available if need be;
- Metal eyelets that allow not only for easier manipulation, but also serves as an attachment point for the AncrO)) tank anchors that help anchor the tank in the ground in conditions where it could float, if needed;
- An additional opening for a ventilation bypass;
- AncrO)) underground tank anchors that help anchor the tank in the ground in conditions where it could float

**For additional information, please consult our O-SP-400 Lifting Station Guide.**