



OOWA's Best Practices Series: Shallow Buried Trench Guidance Document

Produced by the OOWA Onsite Technical Committee

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BP 3: Shallow Buried Trench Guidance Document

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1.0 Overview & Objectives

The Ontario Building Code (OBC) permits the use of Shallow Buried Trenches (SBT) as a specific type of leaching bed for disposal of treated effluent, as described in Subsection 8.7.6. of the OBC. The OBC sets out the minimum requirements of a shallow buried trench leaching bed, but there are a number of design and installation elements that should be considered that are not necessarily included in the OBC.

This guidance document provides the designer with guidance on the best practices for determining the size and layout of the various components of the shallow buried trench system. Construction and maintenance considerations are also included. The objective of this document is to bring consistency to the way the OBC requirements for shallow buried trenches are applied.

2.0 Introduction to Shallow Buried Trenches

A shallow buried trench is an alternative to a conventional leaching bed. SBT systems are always used in conjunction with a treatment unit capable of consistently providing effluent with 10 mg/L cBOD₅ and 10 mg/L TSS.

A shallow buried trench leaching bed is a pressurized distribution system which delivers regular timed doses of effluent to small diameter laterals (typically PVC pipe) supported inside a plastic chamber. The laterals are perforated at regular intervals on the top of the pipe and are provided with an adequate number of orifices on the bottom, which provide self-drainage to prevent freezing during cold weather. When the dosing pump is activated, effluent is forced along the entire length of the lateral and sprayed upwards where it hits the chamber and trickles down into the soil. The pump is sized to account for not only the friction losses in the pipe network (manifold and distribution laterals) and the static losses due to elevation head, but also to provide a residual pressure head of at least 600 mm at the point furthest from the pump. This ensures the entire footprint of the leaching bed is utilized and provides a more efficient distribution and use of the soil absorption system.

The footprint of a shallow buried trench system is much smaller than a conventional absorption trench system, because the soil is not relied upon for any significant portion of the treatment. Shallow buried trenches may be installed in native soil or leaching bed fill with a T-time up to 125 min/cm.

3.0 Background & Historical Information

Shallow buried trenches were first introduced and allowed in the Chatham-Kent Region under a trial basis in 1997 and were then approved for use throughout the Province of Ontario in 1998.

In 2002, the consulting firm Stantec, mandated by the Ministry of Municipal Affairs and Housing (MMAH), conducted a study on shallow buried trenches to review existing design

criteria, as well as investigate potential deficiencies or problems associated with these systems and establish remedial actions for these deficiencies. This study outlined the importance of the soil characteristics and hydraulic loading conditions of the subsurface system, as well as dosing rates and pump chamber sizing requirements, all of which are critical for the proper function of SBT systems. This resulted in code changes which increased the spacing between runs within the bed (increased to a minimum of 2.0 m from the previous 1.6 m) and required timed dosing as opposed to demand dosing. The code changes became effective in 2006. The study also reported that the operational effectiveness of SBT systems is dependent on the efficiency of the tertiary treatment unit (identified now in the Code as CAN/BNQ Level IV certified treatment units) and on-going maintenance of the entire sewage system.

The sizing formulas were also reviewed which resulted in a change in the sizing formulas. Prior to 2006 there were only two T-time ranges and sizing formulas for soils. In 2006, an additional range of T-times was added for consideration (20 – 50) and the minimum length of distribution pipe increased for soils with a T-time of over 50. Sizing formulas are further discussed in Section 5.

4.0 Soils

According to Subclause 8.7.2.1.(1)(b)(i) a leaching bed constructed as a shallow buried trench may NOT be installed **in soil or leaching bed fill** with a percolation rate of less than 1 min/cm or greater than 125 min/cm. Therefore, shallow buried trenches may be installed in native soil or leaching bed fill as long as the T-time is between 1 and 125 min/cm.

Although the code allows it, installing shallow buried trenches in soils with a T-time over 50 min/cm should be carefully considered. A soil with a T-time of 50 min/cm theoretically means that a centimeter of clean water ponding in the trench will take 50 minutes to move into the soil, i.e., for the ponding to be reduced to zero. For soils with T-times up to 50 min/cm, hourly dosing is generally sufficient to allow the ponded water in the trench to infiltrate into the soil. However, as the T-time increases and the percolation rate decreases, the ponding in the trench will take longer to reduce. Timed dosing rates must be carefully considered for soils with a T-time in excess of 50 min/cm in order to overcome this issue.

4.1 Determining T-time in Low Permeability Soils

Obtaining an accurate T-time estimate for soils over 50 min/cm must also be carefully considered. Most laboratories only provide T-time estimates and/or ranges for soils with a T-time of less than 50 min/cm. It is also very rare that a laboratory indicates that the T-time of a soil is less than 125 min/cm, which is a key design constraint. If installation in soils with a T-time over 50 min/cm is being considered, it is highly recommended that in situ soils tests be conducted to confirm that the T-time is less than 125 min/cm. In situ tests that may be considered include the percolation test hole, the use of a constant

head permeameter or the use of an infiltrometer. Regardless of the method, at least three test holes should be conducted in the area of the proposed leaching bed. The test hole that yields the slowest result, i.e. the highest T-time, must be used as the governing T-time.

In-situ testing of soils containing clay should be conducted carefully. Weathering fractures and root/worm channels in the soil can create secondary permeability pathways that are not necessarily representative of the true soil permeability and may yield a lower T-time during the test. Some of these features can be reduced or closed if enough water is added to saturate the soil and cause the clay to swell. The results of any in-situ testing should also be reviewed in the context of the grain size and soil density in order to judge the reliability of the in-situ results.

4.2 Installing Shallow Buried Trenches in Fill Soils

It should be noted that there is currently some disagreement in the industry regarding the installation of shallow buried trenches in fill soils. Although Clause 8.7.2.1.(1)(b) clearly states “**soil or leaching bed fill**”, there are different interpretations of this clause across the province. There appears to be some conflict with Sentence 8.7.4.2.(1), which states the following:

“**Except for a shallow buried trench**, a leaching bed comprised of absorption trenches may be constructed in leaching bed fill, if unsaturated soil or leaching bed fill complying with Subclause 8.7.2.1.(1)(b)(ii) extends,

(a) to a depth of at least 250 mm over the area covered by the leaching bed fill, and

(b) for at least 15 m beyond the outer distribution pipes in any direction in which the effluent entering the soil or leaching bed fill will move horizontally.”

Some interpret this code clause to mean that shallow buried trenches may not be installed in fill. However, this directly contradicts Clause 8.7.2.1.(1)(b). An alternative interpretation is that the clause does not preclude the installation of shallow buried trenches in fill, rather, it exempts shallow buried trench installations from complying with the remainder of the clause (i.e. it does not need to meet the requirements of Articles 8.7.4.1. and 8.7.4.2.) and are therefore not required to meet a loading rate of 4, 6, 8 or 10 L/m²-d, have 250 mm thickness of fill material covering the loading area, or have a 15 m mantle extension. There does not appear to be any consensus across the province as to which is the correct interpretation.

Some regulators allow the construction of leaching beds in fill, others do not. It is advised that you consult your local regulator should you be considering the installation of a shallow buried trench in fill in your area.

5.0 Design Considerations

5.1 Components

A shallow buried trench is a leaching bed constructed of plastic chambers and small diameter pressurized distribution pipe, as opposed to larger diameter gravity pipe and stone which are used in conventional absorption trench leaching beds. Components of a shallow buried trench system include:

- Treatment unit certified to Level IV CAN/BNQ 3680-600, "Onsite Residential Wastewater Treatment Technologies"
- Dosing pump chamber and pump equipped with timer controls
- Forcemain from dosing chamber to distribution manifold which may be PVC Schedule 40 or HDPE, whichever is preferred
- Manifold (header) assembly, consisting of minimum 25 mm (1") pressure pipe (PVC Schedule 40)
- Laterals in leaching bed consisting of minimum 25 mm (1") pressure pipe (PVC Schedule 40) with 3 mm orifice holes spaced evenly along the top of the pipe, and 3 mm drain holes occasionally on the bottom
- Pipe support to keep the lateral off the bottom of the trench
- Leaching chamber covering the laterals. Large diameter pipe cut in half is not acceptable, as the footprint of the sidewalls is not sufficient to prevent settling of chambers over time. Chambers with a wide resting foot are preferred.
- Filter cloth over the chambers (optional; consult with the chamber manufacturer regarding requirements for filter cloth)
- "Sweep 90" fitting extending to within 10 cm of finished grade at the end of each lateral. Vertical piece may be equipped with a ball valve if desired, and terminate in a threaded cap.

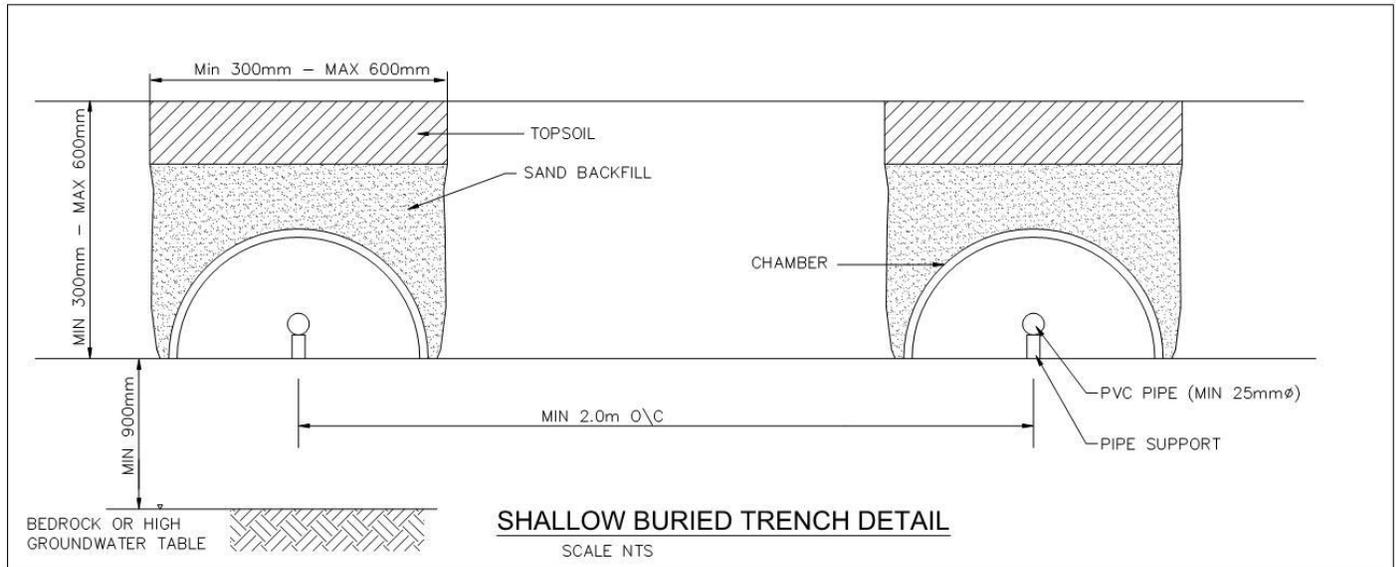


Figure 1: Typical Shallow Buried Trench Installation



Figure 2: Sweep 90 with ball valve and end cap

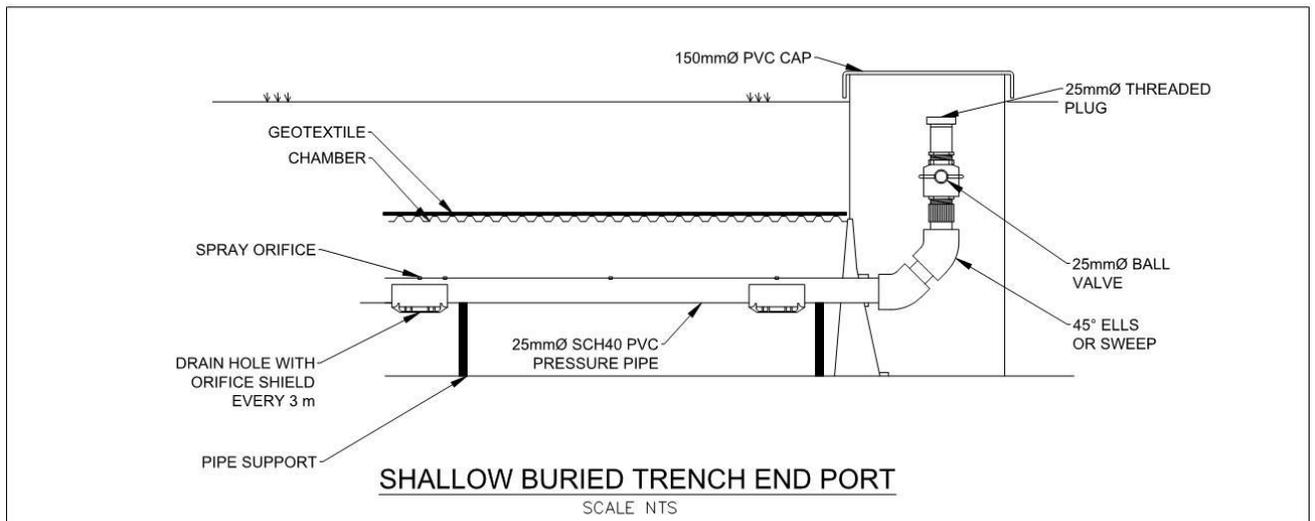


Figure 3: End Port Typical Detail

5.2 Sizing Shallow Buried Trenches

5.2.1 Determining the Trench Length Required

Shallow buried trenches are sized according to Table 8.7.3.1. of the OBC. The table provides a formula to calculate the total length of distribution pipe required for three different T-time ranges. The daily design sanitary sewage flow (Q) as well as the T-time of the underlying receiving soils (or in some cases the T-time of the fill) are required variables in order to use the table correctly.

Table 8.7.3.1. Length of Shallow Buried Trench, Forming Part of Sentence 8.7.3.1.(4)

Percolation Time (T) of soil (min/cm)	Trench Length (m)
$1 < T \leq 20$	$Q/75$
$20 < T \leq 50$	$Q/50$
$50 < T \leq 125$	$Q/30$
Column A	Column B

Example

<p>Example: $Q = 2000 \text{ L/day}$, $T = 40 \text{ min/cm}$</p> <p>The T-time of the existing soil is 40 min/cm, which falls in the range of $20 < T \leq 50$. Therefore, the formula in Column B in the same row is applied, as follows:</p> $L = Q/50 \text{ (i.e. flow divided by 50)}$ $= 2000/50$ $= 40 \text{ m}$ <p>Therefore, the total distribution pipe length for this system must equal at least 40 lineal metres.</p>
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This calculation provides the designer with the total length of distribution pipe required. The designer must then determine the number of trenches or runs required, based on the 30 m maximum trench length as specified in Clause 8.7.3.2.(2)(a) as well as the area available for the bed. A shallow buried trench pressurizes the whole leaching bed during every pump cycle, therefore even distribution is easier to achieve than with gravity distribution or dosed systems. However, longer trench lengths affect the size of the pump required to pressurize the bed. Optimizing the layout of the trenches is discussed in the next section.

It has been well established in the industry that shallow buried trenches provide the shortest distribution pipe length and therefore the smallest footprint of any type of

leaching bed. The OBC requirements are the *minimum* requirement. It is advised to use caution when sizing shallow buried trenches and consider “up-sizing” or using a more conservative T-time estimate in order to provide sufficient distribution pipe length.

5.2.2 Determining the Trench Length Required for Installations in Fill

If installing shallow buried trenches in fill, two scenarios may be considered for calculating the total length of trench required. The first is to use the T-time of the underlying native receiving soil to calculate the length of trench. This provides sufficient trench length to transition effluent in to the native soil. The T-time of the native soil must be carefully evaluated, as described in Section 4.1. This may be an advantageous approach for partially raised systems, or installations that use fill as a layer of bedding under the trenches.

An alternative approach is to use the T-time of the fill to calculate the trench length; this may be required for fully raised systems. In this case, the contact area of the base of the fill material should be carefully considered, as the pipe length provided may be insufficient to transition effluent into lower permeability underlying soils. This is discussed in further detail in the next section.

5.2.3 Loading Area & Mantle Requirements

According to some interpretations of the code, a shallow buried trench installed in fill does not require a mantle or loading area. However, the contact area at the base of a fill system should be carefully considered, regardless of the interpretation of the code clause. It must be considered that the intention of the loading area, including the mantle extension is to provide sufficient contact area between the imported fill and the native receiving soils in order to safely transition treated effluent from the fill to the native soils without causing a public health or environmental risk. Generally speaking, less permeable native soils require a larger area for the mantle.

The reasons for constructing a shallow buried trench in fill soil should be examined when considering whether or not a mantle should be included in the design. If the existing native soil is sandy, but of insufficient depth to permit the installation in the native soil, then the transition from sandy fill into native soil may not be of concern. For larger systems, groundwater mounding may become an issue, and the footprint may need to be expanded to accommodate mounding.

Similarly, when a shallow buried trench is installed in soils with a higher percentage of fine-grained particles, such as silty sands or sandy clays, sand fill is often used to bed the trenches. If constructed in the upper horizons, where the structure of the underlying and adjacent soils is intact and permits some drainage, the contact area of the trenches may be sufficient without additional area or an extension.

However, if shallow buried trenches are installed fully in fill material, overlying low permeability soils that resist infiltration, a larger contact area and a mantle extension should be considered, especially if the trenches have been sized according to the T-

time of the fill, instead of the underlying native soils. As a general guideline, it is recommended that if the underlying or adjacent native receiving soils have a T-time in excess of 35 min/cm, consideration should be given to providing a larger contact area, in order to better transition from fill to receiving soils. Two approaches may be considered in this case. The loading rate requirements as outlined in Table 8.7.4.1. could be used to determine the contact area. In this case, it is recommended that a 15 m mantle be incorporated into the loading area if possible.

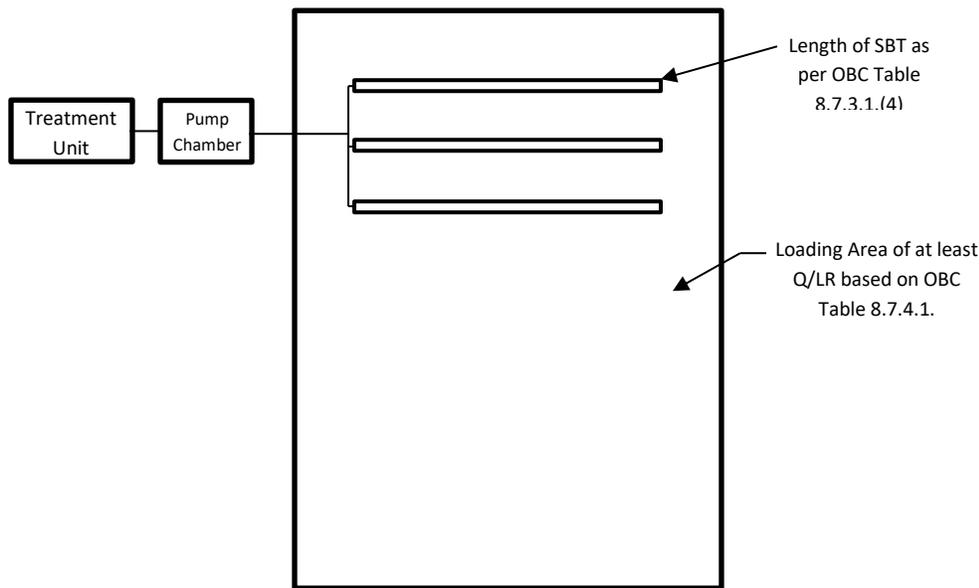


Figure 4: Schematic of Shallow Buried Trench in fill and Contact Area as per Article 8.7.4.1.

Alternatively, consideration could be given to calculating a contact area using the methodology applied to a Type A Dispersal Bed, since effluent is of equal quality prior to discharge to the leaching bed. In this case, the contact area between the native soils and the fill material in which the shallow buried trenches are bedded should be at least equal to the following formula:

$$A = QT/850,$$

Where

Q = the total daily design sanitary sewage flow and

T = the T-time of the receiving soils

It is recommended that the trenches be spaced evenly over this area to ensure even distribution of effluent over the contact area.

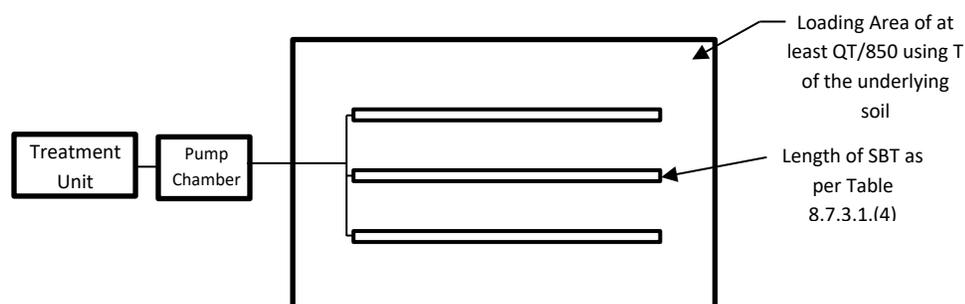


Figure 5: Schematic of Shallow Buried Trench in fill and Contact Area as per Article 8.7.7.1.(4)

5.2.4 Layout, orifice spacing, etc.

The design and layout of a SBT system is important to create a functional system, practical dosing strategy and to keep the calculations as simple as possible. This implies that a design should comprise equally sized lateral lengths, zones, and cells as required. General recommendations on the design and layout are as follows:

- Calculate the number of laterals required by dividing the total length [as calculated in accordance with Sentence 8.7.3.1.(4)] by the desired lateral length, typically between 6 m and 30 m maximum per lateral. The total number of laterals can then be divided into separate *cells* or subdivided into *zones* in each cell depending on available area and/or dosing calculation (described below).
- The forcemain from the dosing pump chamber should be buried at frost depth (or insulated) and come up vertically into the distribution manifold.
- Even distribution in each zone can be achieved by centering the forcemain on each distribution manifold or increasing the size of the manifold for lower pressure drop along its length.
- Distribution to multiple zones can be done using pressurized flow splitting, but it is more common to use an *automatic distribution valve* to cycle flow to different zones with each pump cycle. An automatic distribution valve can be used to reduce pump size and dose volume by facilitating multiple small doses to individual zones, as opposed to a single large dose to the entire cell. Distribution valves are generally available in 2, 3, 4, 5, or 6 zone configurations.
- It is recommended that each lateral include a test port at the end of each line, this may be an individual access port at the end of each lateral, or a common access riser containing all lines connected in one spot. It is recommended to have a long radius sweep bend at each test port equipped with a normally closed ball valve, and a removable plug with a drilled orifice the same diameter as the lateral spray orifices. The test ports are intended to allow individual line

squirt testing of all lines in a zone at once. The plugs should be removable to allow line flushing/cleaning as necessary.

- SBT design must account for elevation differences, pressure drop in the pump system, forcemain, distribution valve(s), distribution manifold, and the laterals themselves, all of which must be included in the calculation. It is recommended that the design use either a vendor package software specifically designed for pressure distribution, or a spreadsheet program that is customized to account for all of these factors. A summary of these design elements is as follows:
 - Calculate the static elevation difference between the low water level in the dosing pump chamber and the highest element in the system (either the highest lateral or distribution valve), and then add the required residual pressure (minimum 600 mm as per Sentence 8.7.6.1.(2) at the furthest lateral). A safety factor can be added by increasing the residual pressure, for example to 750 mm.
 - Assume a dosing volume at each zone (e.g., once per hour per zone).
 - Specify an orifice size. The minimum size is 3 mm (1/8" nominal). Note that the orifice size is very important in the flow/pressure calculation, and it is recommended that 3 mm sizing be used as a default, and the spacing can be varied to modify the flow. The sizing can be larger; however, the flow increases significantly as orifice diameter gets larger, and the squirt height would get proportionally lower with increasing orifice diameter. The recommended orifice spacing is 0.6 m to 1.2 m along the lateral for even distribution of effluent.
 - Specify a number of drain orifices. Drain orifices must be evenly spaced, facing downward, on each lateral to allow drain-out and prevent freezing between pump cycles. It is recommended to have a drain orifice every 2 to 4 spray orifices, offset from the spray orifices, and having orifice shields installed to prevent erosion of the trench base. Note that drain orifices must also be included in the flow/pressure calculation.
 - Calculate the flow through each lateral using a standard orifice equation and iterate dosing time until the lateral flow matches the required flow. Typical dosing times should range from 1 – 5 minutes.
 - Calculate pressure drop in the pump discharge, forcemain, fittings, valves, etc. up to the manifold. Typical forcemain sizing should be between 32 mm (1.25" nominal), and 50 mm (2" nominal).
 - Calculate the pressure drop in the manifold from the point the forcemain enters the manifold until the furthest lateral, accounting for flow reduction at each lateral outlet. It is recommended that there be no more than 10% flow difference between the first and last lateral outlet from the manifold to ensure even distribution. Except in very small systems, the manifold should be at least one trade size larger than the laterals, typically between 32 mm (1.25" nominal), and 50 mm (2" nominal).

- If the distribution manifold is very long (>10% differential in flow along the manifold), or if the manifold is set on a slope and the laterals are at different elevations, it is recommended to use orifice plates at the discharge to each lateral. The standard orifice equation can be used for this calculation to determine hole size in each plate (they increase in size from the lateral closest to the forcemain entry to the last lateral), and the plates should be installed in a removable union fitting for serviceability.
- Calculate the pressure drop in the lateral, accounting for flow reduction at each orifice. It is recommended to design the orifice sizing and spacing so that the difference in flow within the laterals has less than 5% between the first orifice and last orifice. Typical lateral sizing should be between 25 mm (1" nominal, minimum), and 40 mm (1.5" nominal).

As can be seen from the above summary, SBT design is complex and this is why a software design tool is recommended, though the designer should still have an understanding of all the elements of the calculation to ensure that the software produces a reasonable design.

5.2.5 Pump Chamber Sizing and Dosing rates

The OBC states that the pump chamber shall be sized to provide sufficient storage volume so that the effluent is evenly dosed on an hourly basis over a 24-hour period [Sentence 8.7.6.1 (3)]. This should be the goal of the design; however, it may be advantageous to use either more frequent dosing of lesser volumes or less frequent dosing of larger volumes depending on the size of the zones, and hourly dosing should be considered a guideline (subject to approval by the regulator). The intent of this specification is to maintain unsaturated conditions within the SBTs, i.e., allowing the effluent to drain into the soil leaving it in an unsaturated state prior to the next dosing cycle. In any case, the dosing pump chamber in an SBT system is intended to act as an equalization tank and must have sufficient volume to balance the flow over 24 hours. As a rule of thumb, this would require a minimum tank size between 50% and 75% of daily design capacity.

It is recommended to consider hourly peaking factors for a maximum daily flow scenario and design the dosing pump chamber to hold the peak accumulated flow plus a safety factor of at least 25%. Pump chambers need to be sized adequately to provide sufficient volume for dosing with additional reserve capacity in the event of alarms and pump/float failure and service/replacement timeline. Some Level IV treatment systems may dose the SBTs directly from the treatment without the need for an additional dosing pump chamber.

5.2.6 Effluent Pump System

A pump system can be specified after the SBT design has been completed, since the calculation will determine the flow and pressure requirements. At time of design, it is recommended that readily available and replaceable pumps be selected, and that these pumps be rated for effluent duty (typically 3 mm - 20 mm solids handling capacity). It is beyond the scope of this document to detail all the possible pump configurations/details; however, a general summary of recommendations is as follows:

- An alternating duplex pump configuration is recommended to allow time for service in the event of pump failure. Alternatively, a simplex configuration may be used if adequate volume is provided to account to service response time.
- The specified pump must have a capacity equal to or greater than the calculated maximum pressure requirement (total dynamic head) as per the SBT design at the design flow. It is recommended that a safety factor of at least 10% above design pressure to account for calculation errors and potential line clogging.
- If the pump capacity requirement is very large, it is recommended to consider a design with smaller zones using an automatic distribution valve to reduce the dose size, which can also lower the maximum pressure requirement (total dynamic head). If line pressure loss is significant, it is recommended to consider a larger forcemain diameter.
- Each pump requires a discharge check valve (with the exception of simplex pump systems intended to drain back through the pump), and isolation valve.
- Each pump system requires at least two-level float switches or an analog level transmitter to provide a low level cut-off point, minimum start level, and high level alarm.
- A drain-back hole on the pump discharge (or spring-check valve assembly) may be used to drain effluent back into the chamber from the forcemain as a freeze protection measure; however, the tank size and pump cycle time must account for the extra capacity equal to the volume of the forcemain.
- The pump installation should provide easy access to valves and piping from grade to allow for removal the pumps without entering the tank.

Consult the OOWA Pump Chamber Guidance Document for additional design considerations specific to pumping systems.

6.0 Construction Considerations

Proper site preparation and installation methods are important for the functionality of any leaching bed system and are crucial to the proper functioning of an SBT system. Sentence 8.7.6.1.(4) of the OBC states that “A shallow buried trench shall not be constructed unless the soil or leaching bed fill is sufficiently dry to resist compaction and

smearing during excavation.” This is critically important in order to maintain the permeability of the underlying receiving soil, particularly when installing in lower permeability soils that contain clay.

Care should be taken to minimize traffic in the area of the bed. This includes ensuring that construction traffic is not permitted to drive across the leaching bed area prior to the start of installation. For example, if the SBT leaching bed is located in the front yard of a property, construction traffic associated with other elements of the building construction should not be permitted to access the site by crossing the area of the SBT bed.

When installing in permeable native soils, the following should be considered:

- Use track mounted equipment only.

When installing in **low permeability native soils**, the following should be considered:

- Use track mounted equipment only.
- Avoid foot traffic directly in the trenches when working in clay.
- Underlying soil should be scarified with the teeth of the bucket.

When installing in **leaching bed fill**, the following should be considered:

- Use track mounted equipment only.
- Backfill placed between trenches should be hand tamped.
- Base contact area underlying soil should be scarified with the teeth of the bucket.
- Leaching bed fill should be sufficiently compacted to prevent chambers from settling. Consideration could be given to placing thin layer of crushed stone beneath chambers to prevent settlement of the chamber in leaching bed fill, although this is not a code requirement.

Onsite soil could be used as backfill in the trench. At least 300 mm of topsoil should cover the chamber.

When using infiltration chambers, consideration should be given to the use of a geotextile over the chambers to prevent errant pressure flows hitting the side louvers and possibly drawing in backfill material.

The placement and positioning of the pressurized piping within the chamber is important and the following should be considered:

- Provide support for the piping within the chamber; piping should not be placed directly on the soil in the base of the trench.

- Orient the pipe within the chamber to allow the effluent spray pattern to be upward, toward the top of the chamber. Piping should not be placed at the very top of the chamber.
- Secure the piping to prevent it from twisting within the chamber, which would affect the spray pattern orientation.
- Orifice drain holes in the bottom of the piping should have orifice shields installed.
- At the end of each pressurized pipe a long radius sweep elbow should be installed to allow clean out. The elbow should be fitted with a gate valve, and a threaded end cap. It is recommended that the end cap not be glued on, as future maintenance activities such as pipe flushing are more easily conducted with the end cap removed.
- Consider whether check valves and/or high point vacuum breaks are required. This will be dependent on the elevation of the SBT relative to the dosing pump chamber.

7.0 Maintenance Considerations

All systems require regular preventative maintenance. It is recommended that in conjunction with regular maintenance of the other components of the sewage system (i.e. treatment tanks and pumping equipment, etc.), the SBT system be regularly inspected. The area of the SBT should be visually inspected on at least annually for obvious signs of malfunction. Maintenance activities recommended for SBT leaching beds include the following:

- Flush distribution piping on an annual basis or as required to remove any accumulated sediment or debris within the distribution laterals. This can be conducted by opening the inspection ports, removing the threaded end cap, opening the gate valve, and manually running the pump to flush any debris out the end of the pipes.
- OBC Sentence 8.7.1.6.(2) requires that a minimum pressure head of 600 mm be maintained at the end of the furthest lateral in the system. A squirt height test should be conducted on a regular basis and compared to the original design and specifications. To conduct a squirt height test, the height of effluent is measured at the end of each run when the pump is turned on. If the minimum 600 mm squirt height is not observed, there may be a need to troubleshoot the system and determine what is causing the loss of pressure through the system.
- The pumps used to dose an SBT system require regular maintenance. As part of that regular maintenance, it is recommended that a draw down test be periodically conducted to measure the volume of effluent being pumped per dose (i.e. run the pump for a specified period of time and measure the volume of effluent that is removed from the tank to calculate the pumping rate).

- Timer settings may need to be periodically adjusted in conjunction with the results of the drawdown test.
- If the system includes an automatic distribution valve, regular inspections should be conducted to ensure it is properly rotating between zones in the bed. If the valve gets stuck in one position and does not properly rotate, it can overload one portion of the bed.