

## Tank Installation Guide

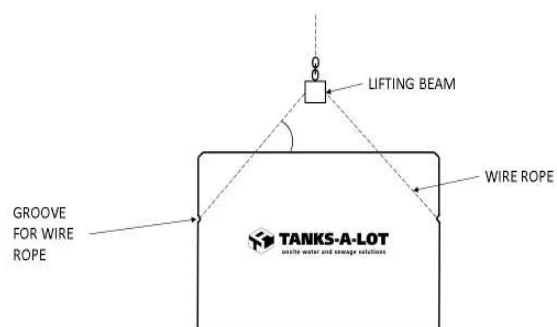
### Introduction

Proper installation of each tank is absolutely critical for it to function properly; that's why it is recommended that only trained professionals install these products. Many of the problems experienced with tank operation, leaking, or premature system failure can be attributed to incorrect procedures during installation. Improper installation practices can seriously damage the tank or other system components, can reduce the capacity or efficiency of the tank, and can even cause serious personal injury. This tank installation guide is offered to assist the purchaser with advance planning, proper site preparation, safe handling and sound installation procedures. The purchaser should check with local permitting agencies for each site to ensure proper set back and design criteria have been met. If at any time the purchaser is unfamiliar with installing the specific product purchased, they should contact a Tanks-A-Lot technical representative. Failure to follow these installation recommendations will void any tank warranty.

### Transportation and storage

Tanks must be secured during transportation using nylon straps. The use of chains, cables or wire ropes to secure the product could cause damage to the tank. Extensions should be transported in the upright position; lids should be placed directly on a flat surface, and neither the lid nor extensions should be over tightened as it may cause damage. Tanks are best lifted by a crane using a proper lifting sling and only lifted by using the intended slots on the outside corners of the tank (see Figure 1 below). If the tank placement is self-performed, Tanks-A-Lot can lend out slings for a refundable deposit. Using any other lifting apparatus could cause damage and void the warranty. Tanks-A-Lot cannot validate a tank's structural integrity if it is lifted using any other rigging. Lifting the extension should only be done in its intended manner by using lifting "tongs" at the lifting points. When storing a tank prior to installation, place tanks carefully onto a smooth level surface on timbers; it is important to prevent the tank bottom from making direct contact with the earth's surface during storage.

Figure #1



### Site conditions

Planning your project well in advance will save time and money. You will need to know the measurement from the underside of the tank to the bottom of the tank's inlet opening in order to prepare the sub-bed elevation to allow the tank to properly receive the sewer pipe coming from the building. Review the most current literature and drawings for the tank which are available on the internet at [www.tanks-a-lot.com](http://www.tanks-a-lot.com) or by calling Tanks-A-Lot at 1.800.661.5667. Knowing the accurate dimensions of your tank is critical

information for the installation process. Keep in mind that the site where the tank is to be installed must be accessible by large and heavily loaded trucks (up to 60,000 pounds). This site must allow for reasonable access under the truck's own power (not be towed or pushed); it must be clear of trees and branches, overhead wires, underground utilities or other structures that could be damaged by, or interfere with, the delivery and offloading of the tank. Typically, the delivery truck must be able to safely utilize an area within three feet of the excavation and have 30 feet of room for outriggers in order to unload and set the tank. The purchaser is responsible for any damage to the site, the delivery truck or the tank that enters the work site. Therefore, adequate access for delivery equipment to get to the excavation and unload the tank is important. Standard concrete tanks are not designed to be installed under traffic loads or to carry unusual heavy construction or maintenance equipment.

### **Tanks in high water table applications**

Tanks in high water tables can be subjected to outside hydraulic pressure. While rare, if this pressure is strong enough water can be forced through seams and joints. In high water tables, low-profile one-piece tanks are recommended. Additionally, deep burial should be avoided, and installers should apply extra grouting with a barrier of joint wrap or butyl tape to the riser seams as seen in Figure #9 at the end of this guide. Tanks can also be configured for ultra-rib extensions. In this instance, tanks will come with approximately a foot of exposed pipe cast-in to the top of the tank (see Figure #10). A grade ring insert is provided to make the ultra-rib connection using a fast set polyurethane adhesive. In high water table applications where infiltration is a concern, a 2-part epoxy adhesive is recommended for added protection.

As a best practice, Tanks-A-Lot recommends wrapping any seam or joint with a mastic seal. Products such as Sopraseal or Henry's Blueskin are a simple and effective addition to any tank to help ensure its water tightness. These products are applied with a coat of adhesive first and then mastic is wrapped around any joint or seam as shown in Figure #2. Installation is simple, quick and cost effective. Tanks can be wrapped before or after leaving the production plant. 2-piece tanks must be done at site by a wastewater professional. If additional waterproofing is required due to site conditions, custom concrete using Xypex waterproofing additive can be made. Xypex is a unique chemical treatment for the waterproofing, protection and improvement of concrete. Xypex is added to the concrete mix at the time of batching. Speak to a Tanks-A-Lot Sales representative if you think your project requires Xypex.

Figure #2



## Excavation

For the safety of your excavation equipment operator and the public good, all buried utilities should be identified and located before you dig. Lay out your hole at least 18 inches larger than the tank to allow space to properly compact the fill material. More space is recommended for worker safety; nevertheless, it is recommended that no worker should be in the excavation until the tank has been set. Spoil piles should be moved from access area to allow for setup of picker truck. Excavations should be sloped for stability and worker safety, but one side of the excavation's bank should have a limited slope to allow access for the picker truck to install the tank. The reach of these picker trucks is limited and over sloping the bank could prevent the picker from reaching the intended installation location.

## Bedding

Proper bedding is important to ensure a long service life of all tanks. In order to install a level tank, the bottom of the excavation must be free of any large rocks or debris. It is extremely important that the base of all tanks be stabilized using appropriate bedding. A minimum of 4 inches of suitable base material must be placed in the excavation for the tank to be placed on. If the excavation is over excavated and material is required to be added to the base, correct compaction of the underlying soil is required to ensure the tank is set on a level and firm base. Tanks must not bear on large stones, boulders, or rock edges. An uneven base could result in point loading as the weight of the tank coupled with the backfill presses down against the bottom of the tank that isn't resting on a firm and even base. Figure #3 below shows a tank that was not installed on level base. The red markings indicate cracks that have formed as a result of the base experiencing point loading.

Figure #3



Tanks should be bedded with a layer of granular material (materials such as pea gravel, washed rock or road crush) to fully support the bottom of the tank and distribute the weight evenly. Regardless of the material used to construct the tank, the bedding material for all tanks should be free of clumps, large rocks, frozen matter and debris. Unless a self-compacting bedding material is used, the bedding should be carefully compacted using a vibratory plate compactor or similar device.

As per the Alberta Private Sewage Systems Standard of Practice 3.1.2.4 and 4.2.2.7 *'The bottom of an excavation for a holding tank/septic tank shall provide a uniform base to support the tank in a level position and meet the manufacturer's installation instructions.'*

**Failure to properly bed the tank will void the warranty.**

## Tank Placement

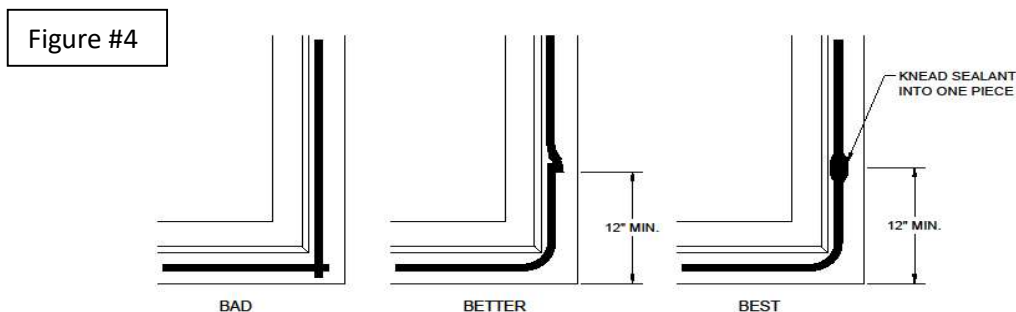
First, inspect the delivered tank while it is on the truck, check for any defects or shipping damage, and order accuracy. If there are any discrepancies, bring them to the attention of the driver, and clearly note them on the driver's bill of lading or delivery documents. Once all discrepancies are noted, contact Tanks-A-Lot. Prior to placement, the tank's orientation should be confirmed (inlet, outlet and manway openings). After placement, check that the tank is level, and that the inlet/outlet elevation will closely match the bottom of the pipe coming from the house at the point where it will enter the tank. Be sure that the pitch of the sewer pipe from the house to the tank meets the local code requirements. Tanks-A-Lot policy requires that all persons shall be kept clear of loads about to be lifted and of suspended loads, and that at no time should a Tanks-A-Lot employee enter an excavation. The crane operator has final say over lift. If the operator deems the lift is unsafe, the product will be placed on timbers outside the excavation at the site and it becomes the responsibility of the purchaser to arrange for the proper equipment to place the tank into the excavation at the cost of the purchaser.

## Joint seal

High quality sealant has been supplied and its proper placement is critical to ensure a positive seal. Mating surfaces must be clean, dry, and free of any debris. Any "slag" debris must be removed from all edges where sealant will be placed before the sealant is applied. The sealant is intended to be placed in the middle of the mating surface of the joint and over lapping in the corners. Instead of placing one strip of sealant over top of the other, knead the two strips together until they act as one piece as seen in Figure 4.

**Exterior joint wrap sealant must be applied to all cisterns.** Single piece tanks must be wrapped where the roof meets the tank and two-piece tanks at the joint. To install, prime the substrate with the provided primer, peel the release paper and position the strip into place with the center of the material at the joint. Hold the material in place so that it is plumb from top to bottom. Press the material in place so that it adheres to the substrate. Make sure the membrane is kept tight and adheres completely to avoid air pockets and wrinkles. All membrane overlaps must be a minimum of 50 mm (2 in). Once the membrane is installed, use a hard roller to apply pressure over the entire surface to ensure uniform adhesion to the substrate. Manholes, risers, inspection ports, etc. must also be properly sealed. Recheck tank and extension for joint alignment and grade before backfilling. Delivery drivers do not apply the sealant.

At Tanks-A-Lot we stock and recommend ConSeal CS-75 Surface Primer. ConSeal CS-75 enhances the bonding between preformed sealants and concrete surfaces aiding in the installation process. Conveniently applied at the job site, CS-75 improves adhesion of the sealant to the concrete. To apply, clean the surface with a brush and remove any dirt, debris, flashing, or concrete high points which could keep ConSeal primer from adhering to the concrete. Allow the primer to dry before placing sealant. CS-75 will be tacky within 15-20 minutes.



## Connections

A rubber boot inlet that accepts 3" or 4" pipe has been cast into the sewage holding or septic tank. To connect the inlet pipe to this connection first cut the end of the rubber boot at the desired size, slide the inlet pipe into the tank and then use a stainless-steel clamp to tighten the rubber boot to inlet pipe. A high quality sch80 PVC fitting, threaded on the inside and outside has been cast into the septic tank and is intended as the outlet; connecting to this fitting should be done using a ridged material such as brass or stainless steel. Brass or stainless steel is used to prevent failure due to shearing during backfill or corrosion over time.

The best practice when using brass would be to use a 90-degree elbow to deflect any force applied on the fitting as shown in Figure #5. If using plastic fittings, the best practice would be to sleeve the fitting with 4" plastic pipe. The indent around the outlet is designed for this purpose. This length of 4" plastic pipe needs to be long enough to bridge the space of backfilled soil around the tank. This will add a rigid structure in case of ground settling or heaving.

Figure #5

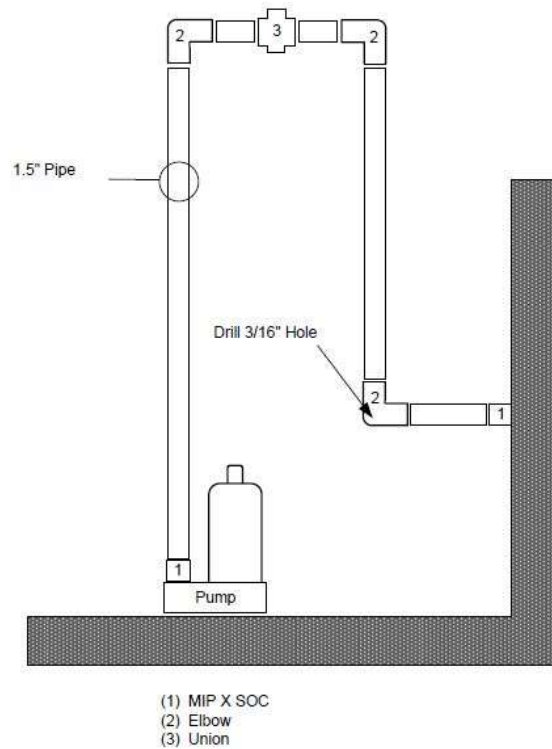




## Pump Connection

Tanks-A-Lot provides a septic hookup kit in either 1.5" or 2" sizes. The benefit of using this kit is the ability to disconnect the union to remove the pump for replacement or servicing without entering the tank. Inside this fittings kit are all the fittings required to assemble the connection shown in Figure #6. It is important to drill a 3/16" hole, as shown, to allow the line to drain back after the pump turns off.

Figure #6



## Bell & Siphon Connection

Bell and siphon systems are used for pump out systems without the need for a pump. During a siphon cycle, the siphon traps must be filled with water. When liquid rises above the open end of a pipe called a snifter or vent pipe, air is sealed in the bell and long leg of the siphon. As the fluid in the tank rises, the pressure on the confined air increases and forces water out of the long leg of the trap. When the air pressure is great enough to force all the water out of the long leg, trapped air escapes through the short leg to the air release vent pipe. At this point, the siphon has been "tripped" and fluid is discharged from the siphon until the liquid level in the tank drops to the bottom of the bell. Air is then drawn under the bell, which "breaks" the siphoning action, and the process begins again.

The most common problem you'll find is the siphon trickling or leaking effluent rather than providing the expected dose. This is called a trickling siphon or a siphon that has lost its prime. When a siphon has lost its prime there is a loss of air pressure under the bell. Lack of air volume under the bell means the liquid level will not achieve the necessary head to drive the effluent into the distribution system. Another situation that can cause problems with siphon operation is when a home is intermittently occupied. These include lake homes, vacation cabins or snow birds that leave the north for warmer climates. If the water

level is high when they leave, air can diffuse into the effluent over time, which reduces the air volume and causes trickling. One of the most common issues seen is the bell being installed upside down. The open end of the bell must be facing downwards as shown in Figure #7.

Figure #7



## Backfilling

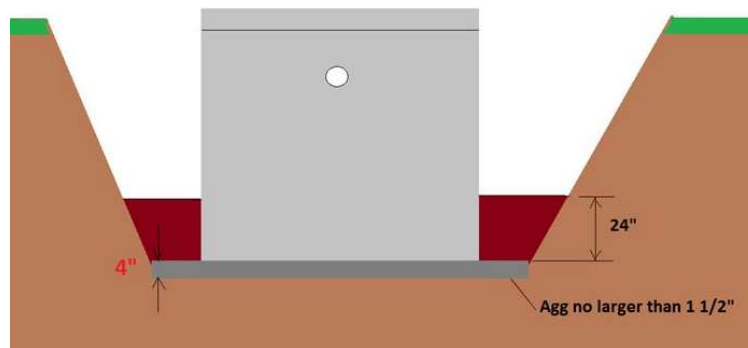
Care should be taken when backfilling to prevent damage or misalignment of the tank, fittings, or any joints. Excavated material may be reused for this purpose, but must not contain any large stones or “chunks” of frozen material. Backfill should be placed in a uniform sequence to all sides of the excavation. Each layer should be uniform, no greater than 24 inches thick, and of nearly equal heights around the perimeter of the tank as shown in Figure #8. If the material used is compactable, it should be hand compacted to prevent settling of the soil around the tank. Be sure that the method used to compact the material does not compromise the structural integrity of the tank. Mechanical compaction should not be used and will void the manufacturer’s warranty.

**Uneven backfill can cause two-piece tanks to shift resulting in leaking joints.** Concrete tanks are significantly heavier than fiberglass or high-density polyethylene tanks and are least likely to float in a flooded excavation. However, even empty concrete tanks will float if the water level rises high enough. To

prevent floating from happening after the tank is set, keep water pumped out of the excavation until backfilling is completed. If flotation is a concern in certain unique situations, Tanks-A-Lot can manufacture tanks with an anti-flotation pad. Do not fill tank until the backfill is complete; failure to do this may cause damage to the tank and void warranty. Backfill will normally settle over a year and allowance should be made to prevent a “**birdbath**” over the tank. Failure to do so can cause water to pool above the tank, exerting additional forces that could compromise the structural integrity of the tank. Landscaping over and around the tank area should be sloped to divert rainwater from the area. Special consideration should be made to protect fittings during the backfill. Hand backfilling around connections and using a supporting structure such as a sleeve on the outlet or a gang plate under the inlet will help protect these fittings during backfill and settling. Mechanical compaction on or around the tank could cause damage and void the tank’s warranty.

All pipe connections through tanks must remain watertight after backfill. It is critical to ensure there is minimal movement of the inlet and outlet pipes during the backfill process. Tamp the backfilled soil under the pipe to give it a firm foundation. The section of pipe that runs across the excavation from the tank to undisturbed soil should be rigid (Schedule 40 PVC or stronger) to eliminate deflection. The pipe joints should be over native soil rather than in the excavation to ensure they do not settle. Pipes that may run over the top of the tank or in excavated areas (such as electrical conduit and/or effluent lines) can be sleeved in larger pipes to provide extra support.

Figure #8





## General Notes

- Warning: Do not enter the tank; confined spaces can be hazardous. Only trained personnel with proper equipment should consider entering a tank, and never alone
- Vehicular traffic should be kept a minimum of 5' away from perimeter of the tank edge and nothing heavier than a standard lawn tractor should be allowed to drive over a tank (including during construction). Standard Tanks are NOT manufactured to withstand vehicular traffic; doing so can damage the tank and will void the warranty.
- Plotting the layout of the house, tank and system components using measurements from specific permanent markers such as buildings, power poles and property lines could become beneficial to for the homeowner, pumper and contractor in the years ahead
- Purchaser should protect the tank from overhead loads prior to, during, and after the placement of the tank. This can be achieved by placing landscape features such as a flower bed or caution tape during the home's construction period
- Immediately prior to using a cistern, it should be scrubbed with a chlorine solution (e.g. Javex) to remove potential contamination by micro-organisms acquired during transportation, installation, inactive use, etc. Please refer to Alberta Health Services' detailed guide located at <https://www.albertahealthservices.ca/Advisories/ne-pha-cistern-disinfection.pdf>
- Our tanks have been manufactured for the use of potable water or residential strength wastewater. As such, special consideration should be made when using a tank for other than the intended manner
- Frost heave can cause extensions to shift resulting in compromised joints. In instances where frost is a concern, Tanks-A-Lot recommends strapping 1" strips of thick blue Styrofoam insulation to the extension as seen in Figure #3
- Tanks must be filled with a minimum 1 foot of water and never be left empty over the winter months
- Tanks are rated to specific burial depths. Burying a tank over its design depth will void the warranty. Please consult with a Tanks-A-Lot representative prior to burying the tank
- Delivery drivers are not certified installers. While they can answer most questions about the product, they are not responsible for tank installation

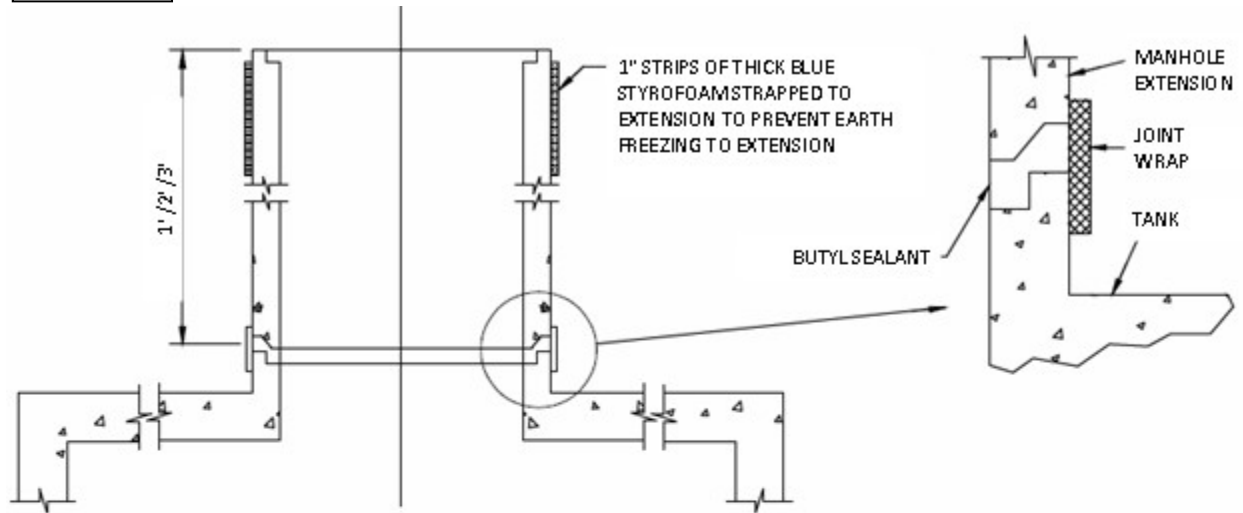
## Basic Care of Your System

- Subjecting your underground tank to heavy weight from cars, trucks, or tractors, construction equipment, etc. risks damaging the tank. Driving, parking, or building infrastructure over tanks risks damaging your tank, possibly leading to a cave-in. Unless special provisions have been made such as protection of sewer piping and septic tanks from damage, vehicle-rated septic tank covers or similar steps, do not drive vehicles over septic system piping or septic tanks. A property owner may not immediately recognize a septic system problem when piping has been run below a driveway, as crushing and blockage of the line may not happen until a heavy vehicle enters the driveway (such as the loaded septic pumping truck arriving to pump the septic tank). A septic line may also be broken, permitting soil or roots to enter and complete the clogging process. Septic tanks should never be built underneath driveways or garages. Your septic tank is ideally situated underneath a soft area of land and away from traffic. If at all possible, mark off the area under which your septic tank is placed. This is so you can be sure not to drive over it and, more importantly, never to park on top of it. Water hauling trucks and vacuum trucks should be kept at least 15 feet away from tanks due to their weight. Almost all trucks will have enough hose to be able to keep a safe distance. Vehicle traffic over or near your tank will void the manufacturer's warranty
- Normal household amounts of detergent, bleach, drain cleaner, toilet bowl deodorizer and other chemicals will not harm the bacterial growth in the sewage tank system

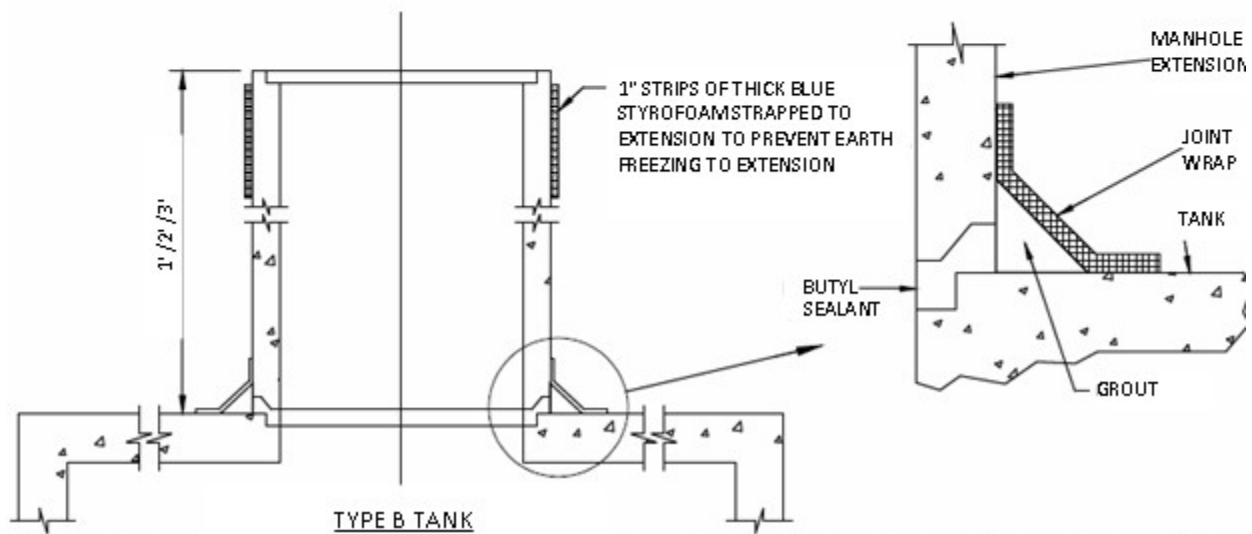
- Do not deposit coffee grounds, cooking fats, wet wipes, disposable diapers, facial tissue, cigarettes and similar non-compostable material into the septic tank. Place these items in your trash can
- Use toilet tissue that breaks up easily when wet. There is one available that is specifically for use with a septic tank
- Sludge buildup should be checked by a wastewater professional and cleaned by a service provider
- If you have a garburator you may need to have your tank cleaned yearly
- Call a vacuum truck to empty and clean your septic tank every 2 to 3 years depending on use
- Be conservative with your use of water. Repair all leaky fixtures and reduce the amount of water used in laundry, bathing and toilet flushing
- Wash only full loads of laundry. Spread the laundry out over the week to avoid overloading the sewage system in a single day
- Showers typically use less water than baths. Avoid filling the tub to full and do not turn the shower on full. This could save several gallons with each bath or shower
- Routinely check the toilet float valve to be sure it isn't sticking and leaking. Do not flush the toilet unnecessarily
- If your system is used seasonally, ensure there is 1 foot of fluid remaining in the tank for the offseason, this will help prevent frost heaving
- Do not allow water softening devices to discharge into the septic system



Figure #9



TYPE A TANK



TYPE B TANK

Figure #10

