



Subsurface Sewage Treatment Systems and Building, Structures and Lot Improvements

Setbacks and Other Restrictions

This factsheet is offered to assist Subsurface Sewage Treatment Systems (SSTS) designers and local units of government in the sometimes difficult decision on the needed separation distance or other restrictions between Buildings, Structures or other Lot Improvements (BSLI) and a SSTS.

Purpose of setbacks

The purpose of a setback to BSLI is as follows:

1. That construction of the SSTS does not damage the superstructure or in-ground structural integrity of an existing BSLI.
2. That construction of the BSLI does not damage an existing SSTS or future area of a proposed soil dispersal system.
3. That the location, use or operation of the BSLI does not hinder the use, operation and maintenance of the SSTS.
4. That the location, use, operation or maintenance of the SSTS does not hinder the operation of the BSLI.
5. That personal and/or public health and safety is protected.

Setback requirements

If a BSLI is implicated in just one of the items in one through five above, it is considered a “structure” as defined in Minn. R. 7080.1100, subp. 80(A). The distance between a “structure” and a SSTS is a minimum of 10 feet from sewage tanks and a minimum of 20 feet from the absorption area of the soil dispersal system (Minn. R. 7080.2150, subp. 2(E) - Table VII).

In some instances, a BSLI which does not qualify as a “structure” may need to have some other requirement placed (i.e., restriction) for justifiable reasons to accommodate unforeseen issues not covered under items one through five.

Mandatory situations

There are some situations in which there is very little discretion in determining the regulatory requirements between a SSTS and a BSLI as described below:

1. In no instance should the soil dispersal unit be covered by an impermeable surface which cuts off oxygen into the soil, even if aerobic effluent is being discharged.
2. Sewage tanks must not be placed in areas receiving traffic from heavy equipment, unless the tank is designed for the anticipated load.
3. No lot improvement shall damage or prohibit use of the secondary (back-up) soil dispersal site.
4. A setback is required from all occupied structures.

Types of lot improvements

There are many types of lot improvements which need to be considered when assessing if a suitable setback distance or other restriction is imposed. A list of some common lot improvements are listed below:

- dwellings with basements
- dwellings with frost footings
- dwellings without a foundation (mobile homes)
- attached and unattached garages with frost footings
- unattached garages or buildings with slab-on-grade foundations
- attached and unattached decks with frost footings

- driveways, patios and other paved areas
- sheds, gazebos, saunas, kennels, etc.
- fences, retaining walls, etc.
- swimming pools

Situations and Considerations

There are many and varied situations that may arise in the determination if a setback or restriction should be required. It is thought that these decisions could be better made on a case-by-case situation at the local level (except for the situations in the Mandatory situations section above).

This section provides some guidance on the risks involved in making setback or restriction decisions.

1. Damage done to the superstructure of an existing BSLI from SSTS installation.

In most situations, the installation of the SSTS could damage the superstructure of a BSLI. However, given that fact, it does not seem prudent to require a setback on all BSLI. It is recommended that careful consideration be given to possible damage during SSTS construction and require setbacks, restrictions or guidance based on possible risk and value of the BSLI. Examples in this area would include:

- The damage caused if a sewage tank hits the superstructure when being placed into the excavation (tank swing).
- The tail swing from excavation equipment hitting the superstructure.
- Driving on paved areas with SSTS construction equipment not designed to carry a heavy load.

2. Damage to the in-ground structural integrity of an existing BSLI during installation of a SSTS (provided by Paul R. Heimkes, Minnesota Department of Labor and Industry; paul.heimkes@state.mn.us).

There are requirements for the design of a buildings' footing and/or foundation that will require a designer to address how a sewage tank may affect the footing/foundation system.

It should be remembered that foundations are designed and constructed of many different types of designs and/or materials. Examples include: piers, piles, wood foundations, pea-gravel footings, masonry blocks, geo-piers (piers usually drilled in and filled with larger compacted rock), timbers, etc. All of these types of materials can and will be affected differently by soil loading conditions, moisture, soil types, differential movement, or other bearing elements located adjacent to the structure(s).

Below are seven items that must be reviewed and/or accounted for when considering the placement of a sewage tank next to a buildings' footing/foundation system:

A. Frost depth and frost protection for the footing/foundation

Soil is used to protect the building footing/foundation from frost/freezing and potential soil movement. In the southern part of the state, a minimum of 42-inches of soil coverage is required. In the northern parts of the state, 60-inches of soil coverage is required. Depending on soil conditions/types, even more could be required by the building designer. So placement of a sewage tank must not affect the soil coverage over the building footing or foundation.

B. Minimum soil bearing capacity

Minimum soil bearing capacity must be considered for the footing/foundation when an object encroaches into the required soil bearing area of the building. There is usually a minimum of a 2:1 ratio needed for soil bearing (projection area) under - and extending away from - a buildings' footing. Tanks or other elements that are placed in or below this area will require review of the standard footing/foundation design.



Photo by LeRoy Janski – WI Dept of Commerce

C. Tank placement on slope

Placement of a tank in the upper or downside toe of a nearby slope can and should also be considered before installation of a tank (next to a building footing or foundation). Again, soil coverage for frost protection is a big item to consider in this situation as is added loading and/or moving or removing soils for required bearing capacity and frost protection of the building.

D. Tank weight and/or pressures

Tank weight and/or pressures from the installation of a tank when placed in close proximity to a buildings footing/foundation system (even the excavation work itself) must also be considered. Either condition could affect the building footing/foundation system design.

E. Insulation

In some instances, for some frost-free footing/foundation or building slab designs, the building code will require extensions of certain soil types or even foundation insulation that can/may project out and away from a buildings' foundation system to protect the footing/foundation from potential movement due to frost. For some designs, you could have certain soils and/or rigid insulation extending out and away from a building upwards of four to six feet away from the foundation. Tanks or other elements that are placed in this area could affect those required building designs.

F. Deck or porch type pier (isolated) footings

For deck or porch type pier (isolated) footings, differential movement/settlement of the nearby soils could have major impacts when tanks or other buried elements are placed too close to the footing/foundation. Detrimental disturbances or affects always need to be considered.

G. Drainage

Proper footing/foundation drainage must also be considered. Most building footings/foundations have exterior drainage systems up against the foundation wall or down by the footing for removal of hydraulic loading in the soils. Excavations should be located so they do not affect required building foundation drainage at the surface and/or below ground near the required subsurface drainage system.

H. Other

It should be understood that the building code does not address possible damage to the building foundations from an existing sewage tank that is leaking.

Also, the potential loading conditions of a pump truck driving in or near a buildings' footing or foundation system must be considered.

If there is any question about the relationship between the building foundation and the SSTS tank, consultation must be sought from the Building Official/Building Designer/other authority having jurisdiction.

3. Damage to the SSTS from construction of the BSLI.

There is a concern about damage to the SSTS during construction of the BSLI. This can include driving over and crushing or compacting the soil dispersal system's components and driving over and cracking a sewage tank. If a concern, a restriction could be imposed, such as fencing the SSTS to restrict construction equipment.

4. Hindrances from the location, operation or use of the BSLI in the operation and maintenance of the SSTS.

This issue can manifest itself in many ways. A short list is provided below:

- Change in surface drainage of precipitation and spring meltwater with the addition of new BSLI. Examples include run on drainage from roofs (without gutters) or parking lots sloped toward the SSTS.
- The new BSLI blocks the route needed to pump the tanks.
- The new BSLI restricts SSTS construction equipment to repair or replace the SSTS.
- The new BSLI hinders or prohibits access to maintenance hole covers.

Some of these issues may be best alleviated by requiring a setback; other may be adequately handled by a restriction or guidance.

5. Hindrances from the location, use, operation or maintenance of the SSTS to the operation of the BSLI.

It should be noted that the building code does not have a setback from a building to a sewage tank or soil dispersal system for operational issues. However, in some situations a setback may be desired. An example would be the noise and possible odors of an aerobic treatment unit (ATU) placed close to a window of a dwelling.

6. That personal and/or public health and safety is protected.

An example of this would be sewage effluent travelling laterally into the foundation drain tile /sump and odors emitting from the sump basket.