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A Septic Tank for Farm Sewage Disposal

Ralph L. Patty

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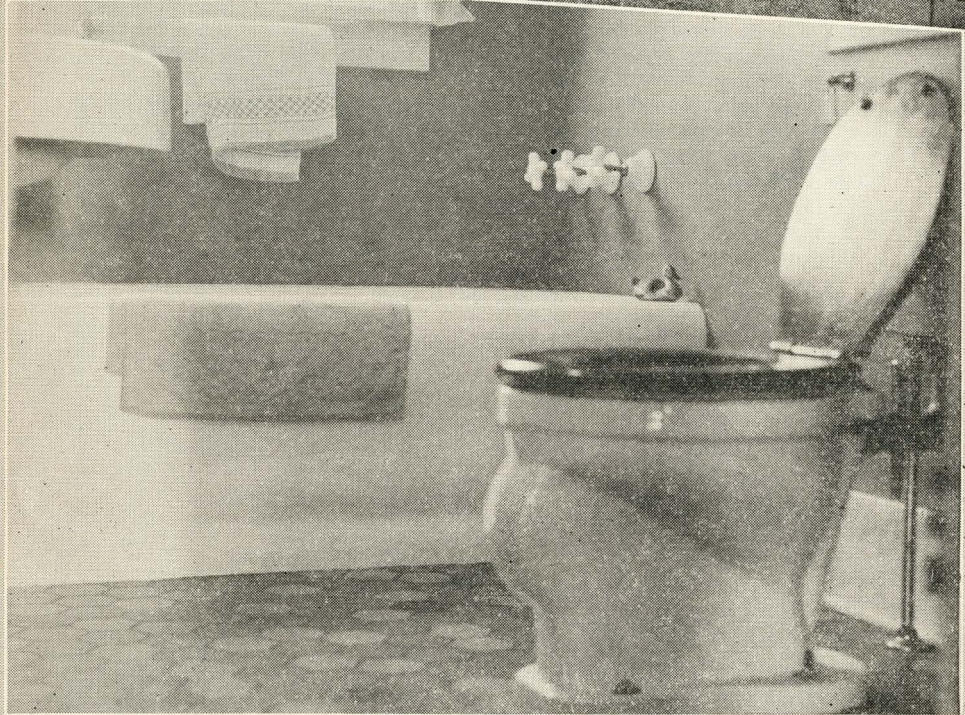
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A SEPTIC TANK for FARM SEWAGE DISPOSAL



EXTENSION SERVICE
SOUTH DAKOTA STATE COLLEGE OF AGRICULTURE AND MECHANIC ARTS
BROOKINGS

Introduction

The purpose of this circular is to show the plan for constructing an efficient and inexpensive septic tank for the disposal of sewage from the farm home. If properly installed and furnished with proper outlet tile, this tank will need no attention whatever, except the removal of the greater part of the sludge every 5 to 10 years.

A few years ago there were dozens of different plans advocated for farm septic tanks. Many of them worked satisfactorily, including most of those that used drain tile for the disposal system. The rest were failures. Recent investigational work tends to standardize the plans for farm septic tanks. The type of tank shown in this plan has been found by recent experimental work to be most satisfactory and efficient.

A blue print plan of this farm septic tank which is drawn to scale would be helpful in constructing the tank. Such a plan may be secured for ten cents by addressing the Extension Service of the South Dakota State College, Brookings, S. Dak.

A Septic Tank for Farm Sewage Disposal

Ralph L. Patty

Extension Specialist in Agricultural Engineering

Advantages of a Septic Tank

A septic tank is more sanitary than the leaching cesspool or the outside vault.

There is much less danger of the water supply being contaminated.

In its mechanical action it is far more efficient than the cesspool and requires less maintenance.

The septic tank is less expensive than a cesspool when the cesspool is properly installed because of the saving in sewer pipe. A cesspool should never be located closer than 200 feet from the house or from a shallow well.

A septic tank when properly made of concrete from screened sand and gravel will last indefinitely.

The septic tank will work in tight soils where the leaching cesspool fails and is much less dangerous in porous soils where the cesspool will work.

Two Ways of Disposing of Liquid Effluent

A satisfactory disposal of sewage through a septic tank may be had in any location that is high enough so that the water in the ground does not actually stand within three or four feet of the surface. Locations may be divided into two classes: those that are high enough so that an open outlet is available—the land falling away to a draw or creek, and those that are so flat that no outlet is possible.

Open Outlet.—An open outlet is desirable and should always be used when available. Drain tile is not expensive and if the open outlet can be reached with 500 feet of outlet tile this would be practical. When such an outlet is available, the liquid effluent is carried directly to the open outlet (see Fig. 4) and every emergency such as a flooded basement or a neglected running faucet will be taken care of safely.

When enough fall is available a simple filter of sand should be provided near the open outlet. Such a filter is shown in Fig. 1 except that it should be as far from the septic tank and as close to the open outlet as possible. Notice in Fig. 1 that the end of the drain tile leading directly from the tank is plugged up absolutely tight at the end and this forces the liquid to filter through the sand into the tile line below and on to the open outlet. At the open outlet the sump shown in Fig. 4 should be located.

No Outlet.—When no outlet is available, the liquid effluent is taken from the tank into an underground system of drain tile from which it must be absorbed by the soil. These disposal tile are plugged up tight at the ends so as to keep out all rats and other rodents. A good plan for laying out this disposal system of blind-tile is shown in Fig. 5. A long single line of tile having the same amount of tile in it would be just as satisfactory when there is room for it. It is important that for this kind of dis-

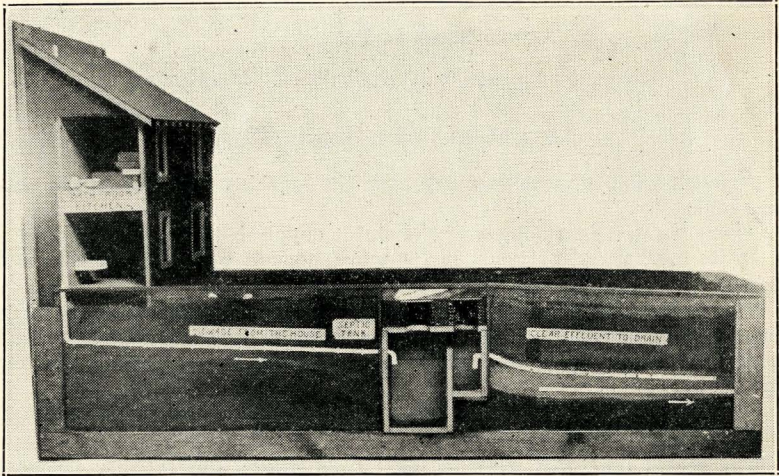


FIG. 1.—CROSS-SECTION OF A TYPICAL SEPTIC TANK INSTALLATION

The picture above shows a simple septic tank installation relative to the plumbing in the house and to the outlet. There is enough fall away from the house so the lower line of tile will open to the top of the ground in a draw. It is 300 feet from the tank to the draw and the sand filter between the two lines of tile is not as close to the tank as is shown in the picture. If there was a basement under the house to be drained into the system, the whole installation would necessarily be a few feet deeper.

posal system the tile drop down 4 inches in the first few feet from the tank and then slope only about 2 inches for each 100 feet thereafter. The grade for each of the branch lines shown in Fig. 6 should be the same and they should be on the same level. An engineer's grade for these lines is therefore desirable. The amount of tile that must be provided for the absorbent system of disposal will naturally depend upon the porosity of the soil. It is good practice to figure so much tile for each person living in the house and allow for at least an average sized family. The amount of tile to figure will vary from 40 to 85 lineal feet per person.

Locating the Tank

The septic tank should be located 16 to 20 feet from the house ordinarily, but if the ground falls away rapidly at a little greater distance it will not take so deep a tank. For this reason it might save money to build it 30 or even 40 feet from the house. The tank should be located so that the

sewer line from the house to the tank will be in an absolutely straight line if possible. If the ground is level, the closer the tank is placed to the house the shallower the tank and tile lines of the system will be. The tank should be located so that sharp turns in the disposal tile, especially up close to the tank, can also be avoided. The outlet tee might leave the liquid chamber at the side of the tank instead of at the end, as shown in all plans, if necessary. This would not interfere with the septic action and might save a sharp turn in the tile. If it is necessary to go through a grove or a row of trees, the belled sewer pipe should be used and all joints cemented absolutely tight for a distance of 50 feet from the trees. This is to protect the line from tree roots. Tree roots do not just happen to get into tile. They hunt the joints in tile and overlook no open spaces in times of deficient moisture. For this reason the location of groves or trees may influence the location of the septic tank materially.

Plumbing for the House

There is no direct connection between the disposal system and the water supply system in the modern house. The disposal system merely takes care of the waste water, and the water pipes and supply tank furnish the fresh water. The disposal system generally presupposes the water supply system. The waste water is collected from the sink, bath tub and lavatories in 2-inch soil pipe and the stool should be placed adjacent to the main soil pipe. The main soil pipe is 4-inch and is usually extended on through the attic and roof of the house where it is called the "stack." It opens to the outside air for purpose of ventilation and also to furnish air pressure to the system. Water seals are provided at all fixtures and drains that open into the sewer system to prevent the escape of sewer gas at any point in the house. Soil pipe used for the disposal system throughout the house and extending out through the foundation is made of cast iron. The joints of soil pipe have bells on them so the connection can be made air tight. These joints are not cemented, however. They are very carefully leaded. Four-inch soil pipe is standard for main lines and it is 4 inches inside-diameter. The joints are 5 feet long. It is advisable to have all inside plumbing and the laying of the sewer line done by a reliable plumbing crew. A very careful man might lay the outside sewer line satisfactorily, however.

Excavating for Tank and Tile Lines

The inside disposal system of soil pipe should be installed throughout the house before any work is started on the outside. Beginning then at the point where the main 4-inch soil pipe comes through the foundation to the outside of the house, the outside disposal system may be installed. It is recommended that after this work is started it move ahead as rapidly as possible. It has not generally proven satisfactory to try to do this work at odd times. This is mostly because of the caving of the walls of the trenches and tank pit. The hole for the tank should be dug just a trifle under-size so that it can be smoothly trimmed and made true. This will save a great deal of concrete when the tank is poured. In digging the trench for the sewer pipe the bottom should slope $\frac{1}{4}$ inch per foot and the grade should be perfect. The proper slope may be obtained by using a

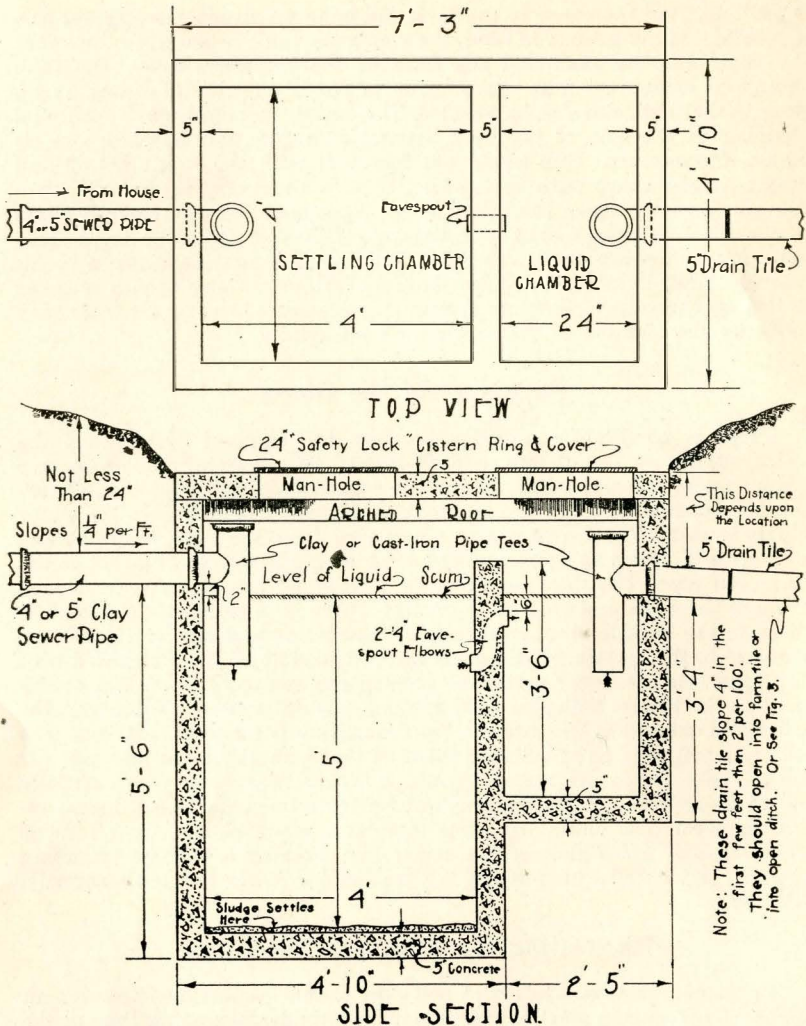


FIG. 2.—PLAN FOR BUILDING A SIMPLE SEPTIC TANK FOR THE FARM HOME

The clay or cast-iron tees shown in this plan are used in place of elbows which were shown in a former plan. If elbows can be secured that turn down under the surface of the water by 9 to 12 inches, they are just as satisfactory as the tees shown above. The two eavespout elbows are fitted together and placed in the forms before mixing the concrete. It is very important that the top of this connection be 6 inches below the level of the water.

12-foot straight-edge in the bottom. If a 3-inch block is nailed to the lower edge at one end (see Fig 7) the slope of the bottom of the ditch will be just right when the top edge of the board is level. The smooth edge may be used for obtaining a smooth bottom line for the ditch. Places are dug

for the bells of the pipe in the bottom of the trench as the sewer line is laid and careful work is necessary.

Laying the Sewer Lines

Clay sewer pipe are usually used between the house and tank and the size should be either 4-inch or 5-inch. Cast-iron soil pipe may be used in place of the sewer tile if desired. The joints are cemented water tight with cement mortar. The mortar is made by mixing cement and sand in the proportion of two parts of sand to one of cement. The mortar should be mixed rather stiff. If this mortar should squeeze into the inside of the line when the joint is being cemented, it would cause serious trouble. For this reason

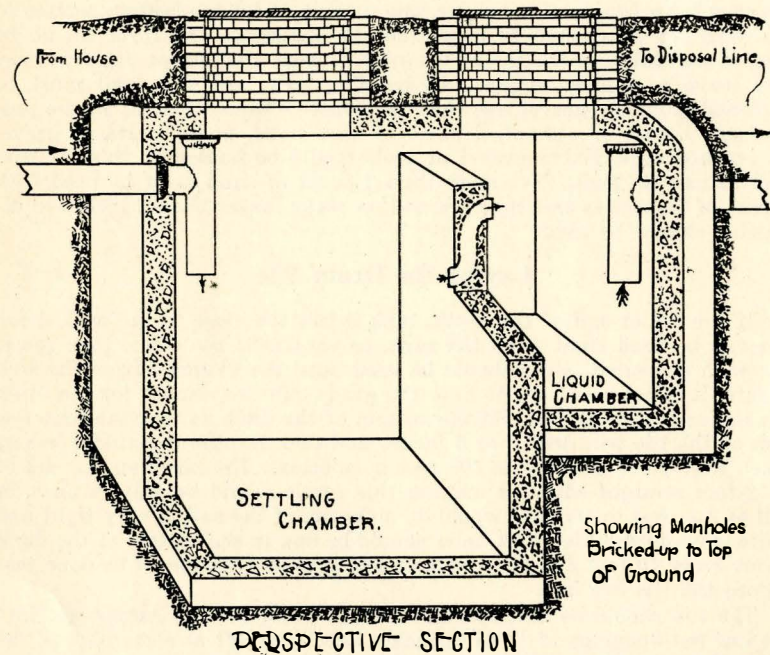


FIG. 3.—A PERSPECTIVE VIEW OF THE TANK

The liquid chamber is shown nearly two feet shallower than the settling chamber, but there is no advantage in this except a saving in materials. If desired, this chamber could as well be the same depth as the other. If enough room is provided between the partition and the top of the tank, one manhole will suffice for both chambers.

oakum or a similar material must be pushed back into the bell first to keep the mortar from squeezing through. After each pipe is laid, a swab on a stick should be drawn through the pipe (used like a cleaning rod for a gun) to make sure the inside line is clean and smooth.

The soil pipe tees and form lumber should be on hand and ready when the hole is excavated for the tank so there will be no delay.

Pouring the Concrete

The inside forms are built in two sections (the liquid chamber can be built a foot longer if more room is desired) and the form lumber can be run "up-and-down" or horizontally as desired. Running the form lumber up-and-down will save sawing it. When the concrete is poured, plenty of bracing must be used on the inside of the forms as the pressure from fresh concrete gets very great when the pouring nears the top. The tee at the inlet should be set in the form first. The tee at the outlet should be placed next, just 2 inches lower, and the two eave-spout elbows when fitted together should be placed in the forms so that the tops of them will be at least 6 inches below the outlet tee. This will make it 6 inches below the water surface. Everything should be ready before starting to mix the concrete, and after pouring the first foot or two of the walls the work may be stopped for a couple of hours, or long enough to let the bottom section of the wall set up enough to help take the pressure. The form should be spaded carefully on the inside in order to push the coarse pebbles away and leave a smooth surface. In building this tank the sand must be screened from the gravel and then the concrete mixed (1-2-3) in the proportion: 1 part of cement, 2 parts of hard sand, and 3 parts of gravel or crushed rock. Extra gravel or rock should be hauled so this mixture will be exactly right. Not more than 2 parts of sand must be used with 1 part of cement in this mixture and no rocks larger than 2 inches in diameter should be used.

Laying the Drain Tile

If the outlet end of the septic tank is not too close to the well, drain tile can be used right from the tank, as shown. If too close, then sewer tile with cemented joints should be used until the distance from the well is safe. It is not necessary to have the grade quite so smooth for the drain tile as for the sewer line. Fit the bottom of the ditch so that the first few feet of the tile will drop 3 or 4 inches and then lay the remainder nearly level. A slope of 2 inches in 100 feet is sufficient. The block on the end of a 12-foot straight-edge for making this grade would be only $\frac{1}{4}$ inch. A fall of 3 inches to 100 feet would do no harm. If the soil is very tight and there is no open outlet, post holes should be dug in the bottom of the ditch about every 10 feet and filled with coarse gravel. This should be done just before the tile are laid.

The tile should be laid up close so that small rodents cannot get into the line but openings of $\frac{1}{4}$ to $\frac{3}{8}$ inches should be left at some part of the joint. Heavy paper or tar paper should be laid over these open joints when they come on top. The paper will last until the earth has firmly settled. The top dirt should be thrown out on one side of the trench and should be filled into the ditch first—just on top of the tile. The end of the blind tile should be plugged up with tile bats and concrete.

Amount of Disposal Tile When No Outlet Is Available

Ninety-five per cent of all trouble with septic tank systems is due to too few tile in the disposal lines. This trouble is only found in the "no outlet" type of system. The amount of tile will depend upon the nature of

the soil. It is fairly safe to allow 40 feet of tile per person in sandy or gravelly soils and up to 85 feet per person in heavy clay soils. A minimum length of 300 feet of tile should be allowed in tight soils regardless of a small family. The laundry water on wash day makes a fairly heavy load for tight soils. For this type of system we would recommend a shallow installation that does not drain the basement. Plenty of disposal tile can then be laid for disposal of the effluent at a low cost.

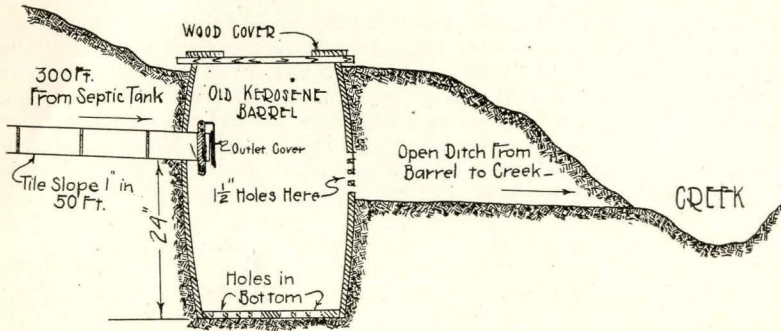


FIG. 4.—PROTECTION OF OUTLET FROM FREEZING AND RODENTS

An open outlet is always desirable when the ground falls away so as to make it possible. An open outlet within a distance of 500 feet would be practical. The outlet cover is for protection against rodents and to prevent a cold blast of air through the tile. The outlet cover for the end of the tile was designed by the author and may be secured from the Sioux City Foundry and Boiler Co., Sioux City, Iowa.

Outlet Protection

When an open outlet is available the end of the tile should be protected from freezing in winter time and from rodents in the summer. Fig. 4 shows clearly how this protection can be had at practically no expense. It is very necessary that the holes be provided in the barrel and that they be not smaller than $1\frac{1}{2}$ inches. They should be larger rather than smaller. Rodents are very bad around a disposal system of this kind and if even the smaller ones get in, trouble is sure to follow eventually. Every tile should be laid carefully and if holes or joints are patched with tile bats, cement mortar should be used to hold the patches in place.

Size and Shape of the Tank

The capacity of the tank to handle sewage depends largely on the capacity of the settling chamber. The capacity of the settling chamber is figured below the water line and in this tank is therefore 4 feet by 4 feet by 5 feet or 80 cubic feet. This is approximately 600 gallons. According to recent investigations at the University of Illinois, the average flow of sewage into farm septic tanks per person per 24 hours will be 20 to 25 gallons. Studies show that a 48-hour capacity will give very satisfactory results but that 72-hour capacity is also satisfactory, and allows more capacity for settling sludge. This tank when clean will have a 72-hour capacity for 8 persons, so it is amply large, but the capacity slowly decreases as the sludge accumulates in the tank. If for some very particular reason

it is desired to make the tank only 4 feet deep instead of 5 feet it will work, but it must be cleaned out and looked after more often. To be exact, the depth of $4\frac{1}{2}$ feet seems to be the most efficient depth. The rectangular shape which is shown is believed to be the easiest to build. Other shapes having the same capacity and depth would work equally well.

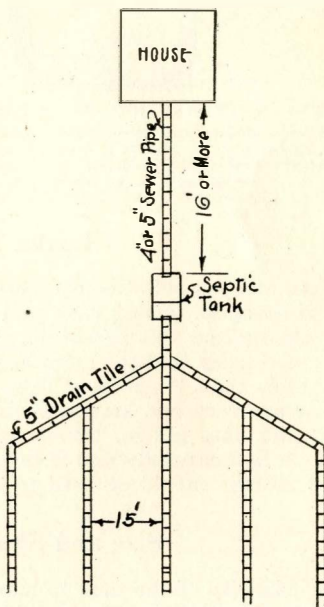
Action of the Tank in Brief

The sewage from the house, including the waste from the inside toilet, bathtub, kitchen sink, laundry tubs, and lavatories is flushed into the tank. Approximately two-tenths of one per cent of it is solid matter. A form of nature's bacteria known as anaerobes attack the solids, changing a considerable portion of them to a liquid or gaseous state. A small per cent (comparable to ashes after burning) settles to the bottom of the tank as sludge and must be cleaned out once in 5 or 10 years. Many disease germs are killed in the process but the effluent from a septic tank cannot

FIG. 5.—PLAN SHOWING ARRANGEMENT OF LEACHING TILE WHEN NO OPEN OUTLET IS AVAILABLE.

When country is absolutely flat and no outlet to top of ground is available this plan must be used. The amount of tile required here will vary with the soil from 40 feet per person in gravelly soil to 85 feet per person in tight clay. In tight soils a minimum length of 300 feet should be provided regardless of a small family.

A shallow system is often advisable when the open outlet is not available.



be considered entirely harmless. The above named bacteria work and live in the absence of air. It is not necessary to make the tank air tight, however, as the natural scum which forms over the top seals the sewage below, from the air. The reason for the two compartments and for the tees at the inlet and outlet of the tank is to keep the surface quiet and to protect this scum.

When the liquid effluent leaves the tank it is further purified by a type of bacteria called aerobes. They work in the presence of air, during a fil-

tering process or in the stream of water as it flows. In city plants carefully prepared filter beds are made of sand, gravel, and drain tile in order to handle a large quantity of effluent. An automatic syphon is desirable under these conditions. These filter beds are ideal for aerobic action. The layer of gravel or sand between the outlet tile and the tile line below, as shown in Fig. 1 will help considerably and should be put in wherever possible. No addition of any material whatsoever is necessary at any time to aid in the septic process. The tank is merely an aid to make nature's own process more effective. After the system is installed it should be used, as the bacteria must be fed if they are to thrive and do good work.

The Automatic Syphon

Many plans for septic tanks show an automatic syphon in the liquid chamber. The automatic syphon furnishes an intermittent discharge of liquid effluent into the outlet tile. Where a sand filter bed is available such as is used in city plants, there is a decided advantage in this. The aerobic bacteria working in the presence of air have a better opportunity to work in the filter bed. In thickly settled districts and where the extra cost is

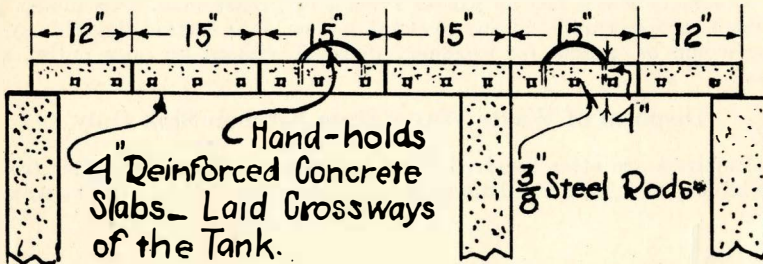


FIG. 6.—CONCRETE SLABS FOR TOP OF SEPTIC TANK

In many cases a roof of reinforced concrete slabs will be easier to build for this septic tank than the arched roof shown in Fig. 3. These slabs are easy to mold in a trough of the size shown for the slabs. The slabs should be long enough to span the tank cross ways—at least 4 feet, 6 inches. The mixture for the slabs should be the same as for the tank—1: 2: 3. Horseshoes may be used for the handholds on those slabs that are to be raised for opening the tank. All other cracks between slabs should be plastered dirt tight.

not an important item, the automatic syphon and sand filter-bed should be used. This simple 2 compartment inexpensive tank without the automatic syphon is recommended for farm service in most states. It has been used for 15 years in South Dakota and has been found entirely satisfactory without exception when properly installed. It is not 100 per cent sanitary but is much more sanitary than the leaching cesspool, and gives very much greater satisfaction mechanically.

Care of the Tank

After the tank is finished and the forms for the walls removed, it should be checked over carefully to see that everything is correct and in working order. The tank should then be covered with dirt and may be for-

gotten for five years at least. If reinforced slabs are used for the top of the tank as shown in Fig. 6 the tank should be entirely covered with from 8 to 12 inches of good black dirt and seeded for grass. When the tank is opened the sod can be rolled back, and if the dirt is tamped under it again and well wet down after closing the tank, the sod will not even wilt. A planting of shrubs around the tank will protect it from heavy trucks and mark its location.

No chemicals or disinfectants of any kind should ever be added to the tank. An excess of lye should be avoided as should also an excess of grease. This does not mean amounts that are in normal waste water. Heavy paper is apt to cause trouble and should not be used.

Disposals for Schools and Creameries

The disposal system shown in this circular is for the farm home. It is not intended or recommended for schools or creameries. It has been used for these purposes after slight modifications and reported satisfactory, but this satisfactory service is probably due to special care. For school disposal systems we would suggest getting in touch with the office of the State Board of Health at Waubay.

Creamery waste has an excess amount of grease in it. This makes it difficult to take care of in any disposal system. It is certain that this system would be useless for creamery disposal without an open outlet, at least.

Disposal of Waste Water from Kitchen Sink Only

Inquiries are often received about disposing of the waste water from the kitchen sink including laundry water. It is important to keep the waste

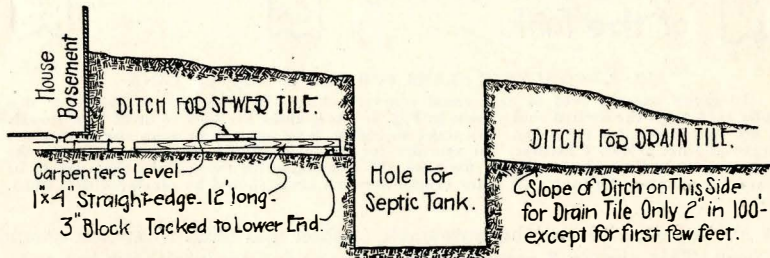


FIG. 7.—METHOD OF DIGGING DITCHES FOR SEWER LINE AND FOR TILE LINE

This figure shows the best method for getting the proper slope for the tile lines when an engineer's grade stakes are not possible. The sewer tile should have a fall of $\frac{1}{4}$ -inch per lineal foot. The straight-edge can be used with a block of the right height on the lower end to get this amount of fall in the bottom of the ditch. The plan for laying the drain tile can be figured out in the same way.

pipes well under ground for this purpose, as smaller pipes are generally used. It is also well to wrap these pipes or otherwise insulate them under the kitchen floor. Not less than 2-inch pipes should be used for this purpose and larger would be better. Almost any kind of pipe may be used. Smaller pipes are apt to fill with grease and other foreign matter. This pipe should have a slope of $\frac{1}{4}$ -inch per foot. A disposal well not less than

8 feet deep and 24 inches in diameter should be provided at the end of the pipe and it may be curbed up with loose rock or even filled with large rock to prevent caving. The most important thing is to have a fly tight cover over this well. The pipe should enter the well at a depth of 4 or more feet.

If it is intended to make the house completely modern very soon, it would be good practice to install the septic tank at once and use it for the kitchen waste. The septic action would not be very complete but it would be entirely satisfactory. The entire disposal system of tile should be installed at the time the tank is built.

Bill of Material for a Tank of Average Depth

Prices vary so greatly in different localities that no cost estimate will be made. Prices obtained from the local lumbermen on the items listed below will give a good idea of the cost. The materials and cost will vary somewhat with the location and depth of the tank.

23 sacks of cement.

1½ yards of sand.

3 yards of gravel or crushed rock.

2 cast-iron soil pipe tees.

200 feet of form lumber.

2 eavespout elbows.

16 feet of 4 or 5-inch sewer pipe.

300 or more feet of 5-inch drain tile.

80 feet of ¾-inch steel reinforcing rod for top slabs.

Questions and Answers

1. Q.—Should the septic tank be covered for protection?

A.—Yes. When slabs are used for the top, it is recommended that approximately 12 inches of dirt be put over the entire top of the tank. Where manholes are built up to the surface of the ground and steel covers are used, it is advisable to protect the covers with loose straw in winter time. Planting of shrubs around the tank site will not only help to hide the straw but will prevent the straw from blowing away.

2. Q.—Must a tank be exactly the same shape as shown in the plan?

A.—No. The settling chamber, however, should have approximately the same capacity in cubic feet, and a depth of between 4 and 5 feet. The liquid chamber could be the same depth as the other and there is no objection to its being larger than shown in the plan.

3. Q.—Can a satisfactory septic tank be made from large 24-inch drain tile?

A.—No. A tank made from 24-inch drain tile, unless it has several compartments does not have enough capacity, and even then the first compartment will quickly fill with sludge.

4. Q.—Must the septic tank be exactly this depth?

A.—It should be between 4 and 5 feet deep, and when the sludge reduces the depth to 3 feet the tank must be cleaned.

5. Q.—When the tank is cleaned, should it be pumped entirely empty?
A.—No. It is better to leave a small amount of sludge in the tank.
6. Q.—Must the outlet tee, as shown in the plan in Fig. 2, be just 2 inches lower than the inlet tee?
A.—Yes. This is very important. It must not be less than 1 inch lower nor more than 2 inches.
7. Q.—Must the eavespout connection between the two chambers be located exactly as shown in the plan?
A.—Not exactly, but it must be between 6 and 12 inches below the surface of the water.
8. Q.—Where will the exact level of the water be in the tank?
A.—It will be level with the bottom of the outlet tee. (First locate the inlet tee, then the outlet tee and then the eavespout connection in the forms.)
9. Q.—Are the two manholes absolutely necessary?
A.—Not if the tank is deep enough to allow easy access to either chamber of the tank from a single manhole located just above the partition.
10. Q.—For a family of three, would you advise building so large a tank?
A.—Yes, for permanent property. There is little difference in cost, and an unexpected change of tenants would make the small tank altogether impractical.
11. Q.—Do I need to put chemicals into this tank for any purpose?
A.—No. Never put anything in the tank unless it might be a forkful of barnyard manure when the tank is new.
12. Q.—How often should the septic tank be cleaned out?
A.—When the sludge fills the settling chamber to within 3 feet of the surface of the water. It might be 5 years and might be 15 years, depending upon the amount of sewage.
13. Q.—What wastes should go into the septic tank?
A.—Laundry water, bath water, water from the kitchen sink, lavatory, the cellar drain, and the stool in the bathroom.
14. Q.—Is there danger of running too much waste water in the tank?
A.—Yes. Too much dilution will impair the septic action somewhat. Leaky faucets should be attended to at once.
15. Q.—What other things might interfere with the best action of the system?
A.—Too much grease or lye will impair the action of the tank, and heavy paper should not be used.
16. Q.—Should a clean-out plug be provided in the system by the plumber when the plumbing is installed?
A.—Yes, without fail. This is located so the sewer line between the tank and the house can be opened up with a clean-out tool in case of plugging.

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17. Q.—Will the septic tank have an odor when working satisfactorily?
A.—Yes. The gases due to the septic action have a decided odor. The cover if open to the top of the ground, should be sealed tight by means of a rubber tire or similar gasket.
18. Q.—If no open outlet is available for the system, would you advise installing the system deep enough to drain the basement?
A.—No. We would recommend a shallow system so that plenty of tile can be installed for the absorption system without unreasonable work.
19. Q.—When no open outlet is available is it good practice to fill under the drain tile with gravel to increase the absorptive capacity?
A.—Yes. A post hole filled with gravel every 10 feet along the line will do almost as well, however. But this must not reduce the amount of tile that should be provided—85 feet per person in tight soils.
20. Q.—What causes the most trouble with septic tanks that are otherwise properly installed?
A.—Lack of enough disposal tile for the kind of soil causes over 95 per cent of the trouble.
21. Q.—Why do the 5-inch tile just at the outlet of the tank slope 4 inches in the first few feet as shown in Fig. 1?
A.—The reason for this is so that the liquid effluent will clear the tank. It is more important when no open outlet is available. It allows the drain tile to stand nearly full of water until it has time to leach away.
22. Q.—If a very small amount of sludge leaves the tank from time to time through the outlet, does this indicate that the tank is not working properly?
A.—No. There may be a small amount of settleable solids in the liquid effluent.
23. Q.—If a shallow system is installed, one that does not drain the basement, how deep must the sewer pipe be laid to avoid trouble from freezing?
A.—There are sewer lines not over 3 feet deep in the State that have given no trouble. No water stands in the sewer line.
24. Q.—Should the tile disposal bed be deeper?
A.—Yes. Its depth should range from 3 to 4 feet as a minimum.

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