# SANDERS COUNTY

## ENVIRONMENTAL HEALTH

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# PROPERTY OWNER
# SEPTIC INSTALLATION BOOKLET

This booklet discusses some of the things to consider before and during installation of your septic system.

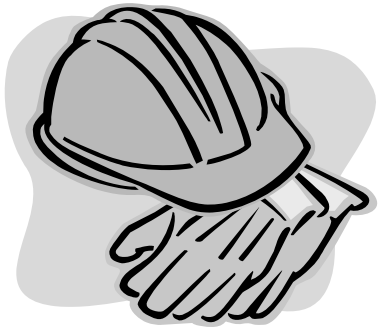
You will need a copy of the Sanders County Regulations for Wastewater Treatment Systems and DEQ Circular 4, both available on line. This booklet is to be used as a supplement to those regulations, as it is only a guide with some hints to consider. The most important point is that you install your system so it functions properly and meets or exceeds all of our Government's regulations. A properly installed septic system will help to protect groundwater and public health and give you years of trouble-free service.

# Getting Started

- Apply for a **Septic Permit** from Sanders County Environmental Health office. An approved permit will come with a "stamped **APPROVED**" site plan. The site plan and permit will show you the type, size, location and orientation of the drainfield or absorption area. You must consider the placement of the septic system before you build your house.
- Before you start to build your home, find and stake the approved location for the drain field areas and the well.
- Get the utilities located

For **Safety** Use the correct **Equipment::** Items you might need

- Levels, tape measures, marking paint, shovels rakes, gloves, rags, eye protection
- Sealant for the tank lids and risers
- Solvent and Colored Glue/Weld
- Accurate laser level, tripod, rod, and laser receiver





## DEFINITIONS

**AS-BUILT** A drawing which accurately locates the septic tank and drain field on your property.

**AUTO LEVELER/SPEED LEVELER-** Devise used to control the flow of effluent from the distribution box.

**EFFLUENT–** Partially treated sewage from a septic tank or other treatment facility.

**GRAVELLESS ABSORPTION CHAMBERS-** High density polyolefin or other plastic that is used in lieu of pipe & washed rock in absorption trenches.

**INFLUENT–** Wastewater flow stream prior to any treatment.

**LATERALS–** Legs of an absorption area or the individual lines of perforated piping lines in an absorption bed. Maximum length of a lateral is 100ft.

**MANIFOLD-**Solid (non-perforated) main wastewater line that distributes effluent to individual distribution pipes.

**PROPERTY OWNER–** Legal title-holder of a parcel of land.

**PVC–** Poly Vinyl Chloride pipe, comes in varies diameters & densities.

**REPAIR-** Anything done to an existing system, either major or minor in construction.

**SEPTIC PERMIT–** A legal document allowing construction, repair, replacement, or alteration of an approved septic permit.

**SEPTIC TANK-** Watertight storage tank receiving raw sewage, providing primary treatment by settling, anaerobic digestion, and scum removal.

**SEWER LINE-** The PVC pipe connecting the house to the septic.

**STANDARD TRENCH–** An excavation that is 12-36 inches in depth & 2 feet wide for systems utilizing gravity or dosed, 3 feet in width for systems utilizing pressure distribution., using PVC pipe & drain rock as detailed in the regulations.

**SYNTHETIC DRAINAGE FABRIC-** non-woven drainage fabric with a minimum weight per square yard of 4oz, a water flow rate of 100-200 gal per minute per square foot, and an apparent opening size equivalent to a #50—#110 sieve.

**UPGRADE–** Addition of a component and/or treatment technology to an existing system beyond what was previously permitted.

**WASHED ROCK** (drain rock)- washed stone of 3/4—2 1/2 in for absorption trenches. Recommend 1 1/2—2 1/2 in for gravity systems.

**WASTEWATER–** Liquid waste discharged from any building; human excreta; or animal & vegetable matter in suspension or solution and included gray water.

## You should now have everything connected glued/welded and ready for inspection.

1 Call the Sanders County Environmental Health Office **72** hours in advance to schedule an inspection.

- Have your copy of the permit ready.

2 Make a drawing of your system, this will be the As-Built. You will have received an **As-Built/Statement of Accuracy** sheet with an as-built drawing example. Your drawing should show all of the same type measurements.

3 A Sanders County septic inspector will meet you on site for your inspection. They will let you know any discrepancies that will have to be fixed.

4 When you get approval you will be able to backfill.

5 When backfilling, mound all the backfill material over the trenches as settling will occur.

6 Protect your drainfield area and the replacement area. Some day you will have to replace the system, so do not plant anything except grass in these areas, and **do not build** in these areas.

- **Remember, do not drive or run livestock over these areas.**
- **Most types of trees should not be planted near the drainfield as roots could break the pipes.**
- **Your system requires care & maintenance. You will receive a helpful Homeowner information sheet with your septic permit.**

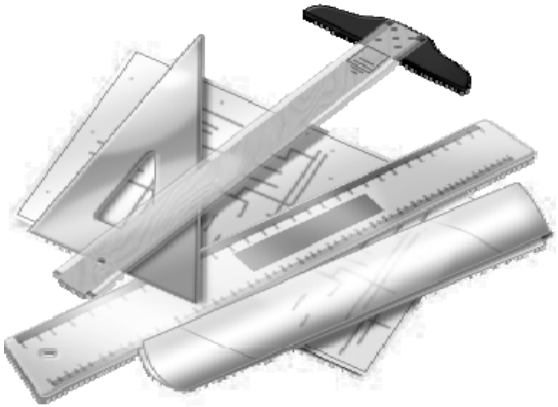


# Preparation Points to Remember

- Review the permit and approved site plan. Important details are contained within the **Sanders County Septic Permit** and on the **Site Plan.** The site plan will show you the correct location and orientation of the absorption area. Be sure to call our office with any questions 827-6961.
- It is very important to install the drainfield as shown on the approved site plan.
- Do not adjust the orientation, location or depth of the drain field area as stated on the permit/site plan. Many times **if** the orientation does not agree with the slope it is so that the drainfield areas can disperse the effluent in a manner that will least degrade **State** waters.
- Obtain the specifications for the septic tank and materials you will be working with. If you are using a distribution box (d-box) get the dimensions for your calculations.
- Figure the lengths, widths, depths and slopes for all parts of your system. Use the specification sheets from your supplier.
- Maximum length of a lateral is 100ft, in a gravity system.
- Lateral's must be of equal length
- **If the system exceeds 500 lineal feet you will have to hire a licensed installer.**
- It is acceptable to go to 1/8" per foot **out** of the septic tank, **if** 1/4" per foot will make your system **too deep**. It is preferable to design with a 1/4" per foot drop if possible.
- You need 6" of "1 - 2 1/2" washed rock under your perforated pipe in the drain field lateral.
- If you have a maximum trench depth of 36" you will need to figure your tank placement based on the effluent pipe reaching the manifold at 30" deep.
- **Any doubts of how to properly install your system, we suggest you hire a licensed installer.**

# Getting The Site Ready

- Verify your calculations with laser level and tape.
- Locate utilities.
- Check for slope variations and any variations noted on site plan.
- Should you come into a situation where you will be unable to install a standard gravity feed system you will have to hire a licensed installer. ( If a pump becomes necessary)
- Your excavation trench bottom **can not** exceed that specified on the permit . Digging too deep will not be approved.
- Transfer the approved site plan directly to the ground. This will be easy with a scaled plan. Use laser level, stakes, paint, tape, etc. to lay out your system.
- The more guide lines you have on the ground the easier it will be to follow the correct line.
- Figure all depths before you start to dig.



If the well has not yet been installed, place a stake in the approved location. You can measure from this stake and the well drillers will know where to correctly place the well. The well must be at least 100' from the drainfield. If the well is already installed and less than 100' from approved location— **STOP AND CALL US!**



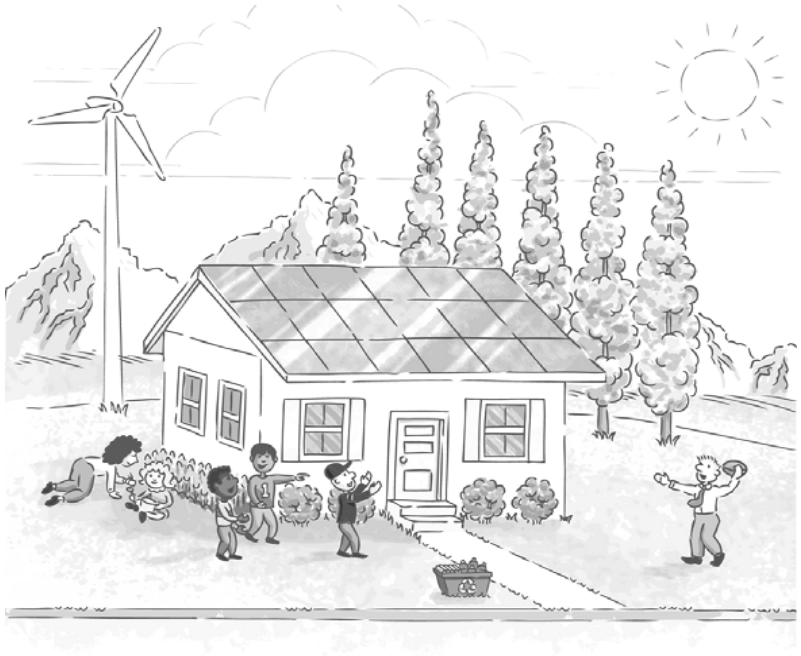
**FINISHING UP:**

1 Install the determined length of Sch 40 or Sch 80 from the house to the tank. Place clean outs as designed for. Remember a 1/4 per ft slope.
   - All PVC has to be color glued/welded
   - Make clean straight cuts & remove all burrs & mold flash
   - Make sure you have 4" separation between the Sch 40 and septic tank baffles. Many times when the plumber joins the sewer line to the septic tank the Sch 40 will get pushed up against the baffle. Recheck that there is a 4" separation between the baffle and Sch 40.

2 Install the effluent filter, handle extending to ground surface

3 Place the risers over the effluent filter access hole of the septic tank and seal them.

4 Install a minimum of 10 ft solid Sch 40 starting at the tank to the manifold or d-box.



Distribution Boxes:

A. Must be bedded to prevent settling. 2 or 3 inches of a bedding material should work.

B. Must have a minimum of 5 ft of schedule 35 PVC **SOLID** pipe for connection to each lateral.

C. Must have absorption trenches of equal length.

D. Must have same concrete requirements as the septic tank.

E. May need speed or auto levelers. These are inexpensive round pieces of plastic with an offset hole that you place in the lateral and adjust to make sure that each lateral gets an even amount of effluent.

F. Get a 5-gal bucket of water to water test to level the box and your speed or auto levelers.

G. Must be marked w/rebar to use as a locate for d-box.

H. Must use a flow control device-a splash plate 90 degree elbow in the d-box on the line from the tank to the d-box. This will stop the effluent from feeding one lateral more than the others, especially if you have lateral feed directly across the box from the inlet.

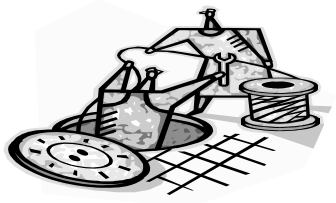
* If your baffling device will be completely submerged under the level determined with you water test, you might want to cut the elbow at such and angle that it breaks the surface tension. This will help prevent freezing. You can also use rigid foam insulation over the lid.



# Materials Needed:

## Gravelless Chambers

- Properly sized Septic Tank
- Risers
- Effluent Filter
- Inlet Baffle
- Proper diameter PVC pipe for the handle extension of the effluent filter screen. The handle of the screen has to extend to the ground surface. This will ease maintenance of the **filter** as it **should be cleaned once a year.**
- A minimum of **2 ten-foot** sections of **4 inch SCH 40** or **SCH 80** for the **lines IN and OUT of the tank. This is REQUIRED between the house and the septic tank.**
- Use **Solid PVC pipe** from— house to septic tank — tank to manifold or D box — manifold to gravelless chambers **or**, — D box to gravelless chambers.
- Any additional protection for insulation and driveway crossings.
- All elbows, caps, T's, Y's. ( You will know all of these when you put the site plan directly on the ground)
- All PVC must be joined with a glue/weld **with color**. This will provide a visible indication and eliminate wasteful reapplication.
- Sand— **If septic tank location** has large rock used to bed the tank. Weight must be evenly distributed so the tank does not crack.

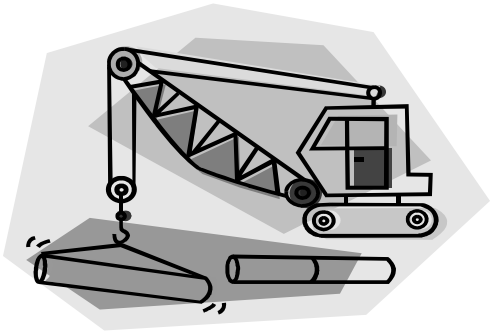


# Materials Needed:

## Pipe & Gravel

- Properly sized Septic Tank
- Risers
- Effluent Filter
- Inlet Baffle
- Proper diameter PVC pipe for the handle extension of the effluent filter screen. The handle of the screen has to extend to the ground surface. This will ease maintenance of the **filter** as it **should be cleaned once a year.**
- Filter fabric, untreated building paper (not Tar paper), or straw to place over the absorption laterals.
- A minimum of **2 ten-foot** sections of **4 inch SCH 40** or **SCH 80** for the **lines IN and OUT of the tank. This is REQUIRED between the house and the septic tank.**
- Any additional protection for insulation and driveway crossings.
- All elbows, caps, T's, Y's. (You will know all of these when you put the site plan directly on the ground)
- All PVC must be joined with a glue/weld **with color.** This will provide a visible indication and eliminate wasteful reapplication.
- Sand— **If septic tank location** has large rock used to bed the tank. Weight must be evenly distributed so the tank does not crack.





## Gravelless Chambers Installation

13 Place chambers in trenches and connect according to manufacture's specifications.

14 Place end caps on at the end of each trench.

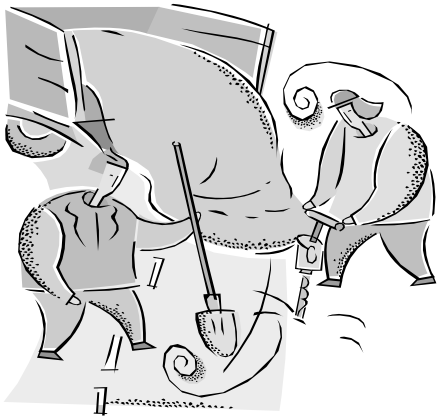
15 Punch out hole for PVC in end caps at beginning of trenches.

16 Connect chambers to D-box or manifold, allowing extra PVC to slide into chambers in case minor shifting occurs during backfilling.

## DO NOT BACKFILL: **The laterals need to be inspected.**

**Move on to the next lateral, complete as the first one.**

17 Use a shovel to dump some dirt around outside edges of chambers to secure before backfilling with large rocks.



11 Excavate a dranifield lateral. Use your laser transmitter throughout the process. **1** For ease of moving around your site you may have to excavate and install one trench at a time. **2** Make sure that you lateral trench excavation is level and the correct length. **Do not exceed** the maximum trench depth specified on the permit. **3** Laterals must be at least 7 ft apart pipe to pipe. If you have plenty of room, 10 ft on center is easier to work around. **4** Place the excavated soil to the side of the trench. You will have piles in between your trenches. *** It is very important to excavate your lateral trench level.**

12 Rake and scarify any smeared soil surfaces in the trenches.

## Pipe and Gravel Installation

13 Place 6" of washed gravel in bottom of trench.

14 Properly install the perforated PVC: use the solvent and weld, locate perforations at 5 o'clock and 7 o'clock. ***** The perforations have to **face down**, not up. Do not use the lettering as a guide it may **not** place your perforations at the 5 and 7 o'clock

15 Use rakes to level the gravel as needed.

16 Do not forget to connect the perforated PVC to the manifold be fore you start to dump washed rock on top of it. ***** If you are using a d-box you should have figured the layout with the d-box before you started digging.

17 Cap the ends.

***** With the help of a co-worker place additional washed rock until there is at least 2" of it over the level perforated PVC.

18 Roll out the filter fabric over the washed rock and secure it with some rock. This will help keep the soil out of the washed rock.

## DO NOT BACKFILL: The laterals need to be inspected.

**Move on to the next lateral, complete as the first one.**



**Washed Rock -** order the correct amount of washed rock at 3/4 to 2 1/2 inches for the absorption trenches. Recommend 1 1/2—2 1/2 for gravity systems.

**Rock Conversions -** This may help you figure how much you will need to order.

- 3 feet = 1 yard
- 1 square yard = 9 square feet
- 1 cubic yard = 27 cubic feet ( this will cover 27 square when the trench depth is 12 inches)

### Square Or Rectangle:

- Length (in feet) x width (in feet) x depth (in inches) / 324 = cubic yards
- Length (in feet) x width (in feet) x depth (in feet) / 27 = cubic yards
- **Example:** 3 absorption laterals at 100 ft each, a trench width of 24 in and a depth of 12 in —— Figure the cubic yards of 3/4 to 2 1/2 in washed rock by:
- 100' x 2' x 12" / 324 = 7.407 cubic yards per lateral
- For 3 laterals 3 x 7.407 = 22.221 cubic yards
- **OR** 100' x 2' x 1' / 27 = 7.407 cubic yard per lateral
- For 3 laterals 3 x 7.407 = 22.221 cubic yards

# Excavation & Installation

- If you are not familiar with the backhoe you may want to practice before you get started
- Good site preparation/marking is a key to good excavation
- Identify the markers you used to lay out your system. Re-stake and paint as necessary
- Some installers set the tank before they excavate the lateral trenches to make sure of the correct depth
- Make clean straight PVC cuts and remove all burrs & mold flash
- Follow all instructions carefully on the solvents & welds. Production materials & methods may change with fittings & pipe.
- Use plenty of rags to clean
- If it's not already set, keep the sewer line "stub" out of the house as shallow as possible. The tank can then be set fairly shallow for easier maintenance access in the future. With a shallow-set tank, your drainfield laterals can more easily be kept at the proper depth. With a basement you will probably need a pump to lift the wastewater to the trenches.
- If you set your septic tank too deep and you must reset the tank , backfill with sand.
- If the ground is too wet (soil ribbons easy) **STOP** and try again when it dries out.

**Remember** the absorption lateral trenches can only be excavated to a maximum of 36" or the **depth specified on the permit.** In order for proper effluent treatment the soil under this depth must not be disturbed. If you go too deep on the lateral trenches you must get that replacement area ready because you will have to use it.



# The Dirt Work

1 Start at the foundation and excavate for the line to the tank, working out to where the tank will be located. The slope of this line must be a 1/4 inch per foot.

2 Excavate to the depth you calculated for the septic tank. Have all your calculations with you. Level, smooth and compact the bottom of hole.

3 Have the boom truck set the tank, you will want to be onsite for this too. * Make sure it is level and the **inlets** and **outlets** are on the right ends.

4 Use the laser and tape to check that you set the septic tank at the depth you calculated.

5 If you need to raise the tank you may want to do it before the boom truck leaves. Just in case have some bedding material ready to backfill on tank delivery day. If the tank is to be set on large rocks, sand bedding may be needed.

6 Excavate the effluent line to the manifold or distribution box. The line must have a slight slope to the manifold.

7 Excavate for the manifold or distribution box and lines. (If you are using a D-box see D-Box section). Make sure that you have your manifold trench **level.** If you do not get this level you will not be able to distribute the effluent evenly. If one lateral is getting all the wastewater that means the other laterals (that you spent an equal amount of time and money on) are not getting any. This will cause your system to fail prematurely.

8 Check and recheck that the manifold trench is level.

9 Place the necessary amount of bedding under you manifold: it should be 6 inches if you are level. Assemble your manifold and have it ready to connect to the absorption laterals as you complete each one. Do not put washed rock over your manifold yet. The septic inspector will have to check to ensure that it is level.