

San Juan County Health & Community Services

On-site Sewage Requirements

Permit, Design and Construction Standards

Revised 11/12/03

These design and construction standards apply to on-site sewage systems not designated by as Larger On-Site Systems.

SECTION ONE: ON-SITE SEWAGE PERMIT PROCEDURAL REQUIREMENTS	1
1. PERMIT REQUIREMENTS	1
2. DESIGN, STAKE-OUT AND SITE INSPECTION	2
3. NOTIFICATION AND FINAL INSPECTION	4
4. FINAL APPROVAL.....	4
SECTION TWO: DESIGN SUBMITTAL ELEMENTS	4
1. PROPERTY AND APPLICANT INFORMATION.....	4
2. DESIGN PARAMETERS - DRAWINGS AND SKETCHES	4
3. OPERATION AND MAINTENANCE AGREEMENTS	5
SECTION THREE: DESIGN AND INSTALLATION REQUIREMENTS	5
1. COMMUNICATION.....	5
2. FLOW CALCULATION.....	5
3. SEPTIC TANKS	5
5. SLOPE OF LINES	6
6. TRENCH SYSTEMS.....	6
7. USE OF DISTRIBUTION BOX.....	7
8. USE OF CURTAIN DRAIN.....	7
9. CONDITIONS DURING INSTALLATION.....	8
SECTION FOUR: SPECIAL REQUIREMENTS	9
1. SOURCE OF SAND.....	9
2. SMALL DIAMETER PIPE	9
3. BARRIER MATERIAL.....	9
4. MAINTENANCE FEATURES	9
5. ORIFICE SIZING AND SPACING	9
6. PRESSURE CHECKS	9
7. RESERVE AREAS.....	10
APPENDIX 1: EXISTING SYSTEM REQUIREMENTS - NEW BUILDING PERMIT PROPOSALS	11
APPENDIX 2: DESIGN FORM.....	13
APPENDIX 3: PERMIT TO INSTALL AND AS-BUILT FORM	14

SECTION ONE: ON-SITE SEWAGE PERMIT PROCEDURAL REQUIREMENTS

1. PERMIT REQUIREMENTS

A. *New or Repair Septic Systems*

San Juan County Health & Community Services (Health Department) requires an approved On-site Sewage Design for a variety of activities including, installing new systems or repairing failing systems. The table below lists a variety of on-site septic activities, whether or not a design is required and the appropriate fee category. Activities not listed may require a design. Therefore, property owners, designers and installers are encouraged to contact the health department to determine if an activity not listed below requires a design application.

Table 1: Septic Activity & Appropriate Design Requirements

Septic Activity	Design Required (Yes/No)	Appropriate Fee
Install new system	Yes	Sewage Design Approval
Design revision to expired permit – Drainfield in same location	Yes	Sewage Design Approval – Existing Soil Log Data
Design revision to a current permit – Drainfield in different location (new test holes required)	Yes	Sewage Design Approval
Install a repair system	Yes	Repair Design Approval
Design resubmission – Initial design not approvable	No	N/A – covered under original design fee
Replace septic tank including pumping and crushing of existing tank (note: installers may submit the necessary paperwork for tank replacements)	Yes	Existing Design Revision Approval
Upgrade system to current code	Yes	Sewage Design Approval
Replace a drainfield lateral: 1. Same Area 2. Different Area	No Yes	N/A Repair Design Approval
Add to drainfield	Yes	Existing Design Revision Approval
Repair/Replace sand filter, ATU or other treatment device	Yes	Repair Design Approval
Replace portion of drain pipe	No	N/A
Replace pump, floats, screens	No	N/A
Abandon septic system/privies/fixtures	No	N/A
Repair or replace D-box	No	N/A
Add additional cover to existing system	No	N/A
Remove roots from drainfield	No	N/A
Replace septic tank baffles	No	N/A
Replace portion of drain rock or gravelless chamber	No	N/A

B. Existing Systems

Many parcels have an existing septic system already installed. Individuals wanting to utilize an existing system for a building permit proposal may be allowed provided the system is not failing, complete records are on file and the proposal does not exceed the design flow rates. Existing systems not meeting these requirements potentially can be utilized, however the system may need to meet additional requirements. Complete requirements for utilizing existing systems can be found in appendix 1.

2. DESIGN, STAKE-OUT AND SITE INSPECTION

A. *Design Submittal*

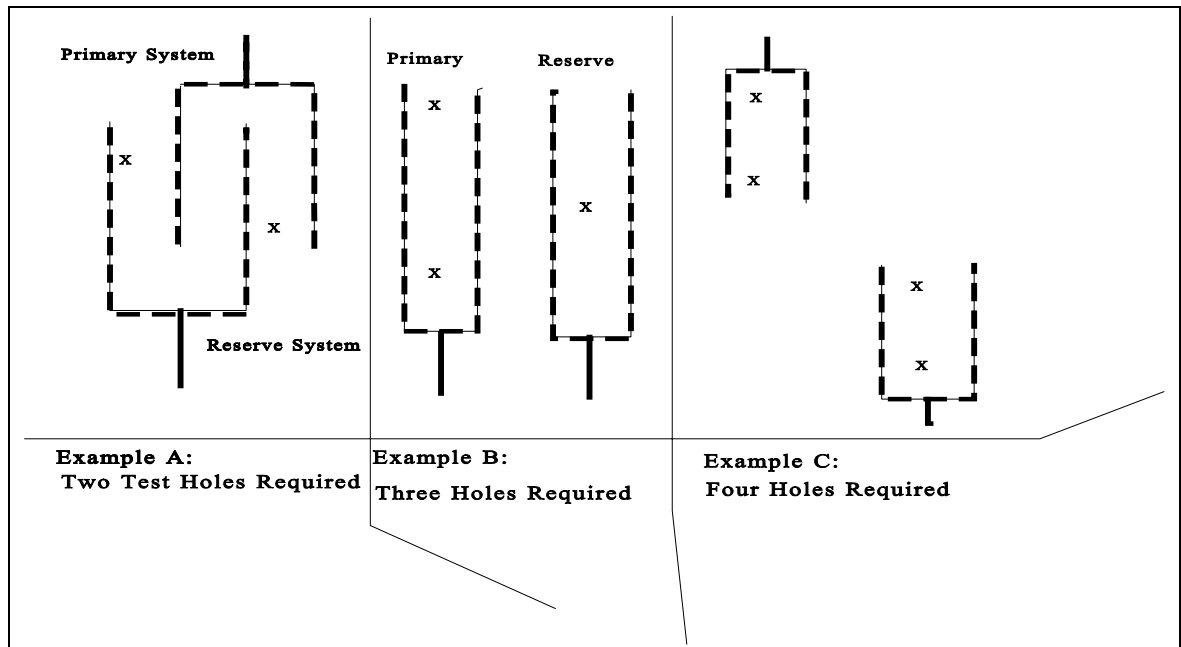
The first step for installing an on-site sewage system is to have a State Certified Designer complete a design application (see appendix A for a copy), provide test holes for inspection, and submit the design with the appropriate fee to the Health Department. The designer must place a 3/4" PVC pipe and ribbon in the middle the primary drainfield area. This will alert homeowners of these critical developmental features so that building and excavation activities can be controlled appropriately. This will also allow health department staff to confirm the adequacy of designs prior to installation of systems. The design application will need to show the exact location of the test holes and provide measurable distances between test holes and property lines, or reliable reference point.

Do not submit the design application until the test holes have been excavated and are ready for inspection.

B. *Number and Location of Test Holes*

A minimum of 2 to 4 test holes are required per site, depending on the location of the reserve repair area.

- Λ If the reserve area is located interior to the primary system (Example A, below), a minimum of 2 test holes are required.
- Λ If the reserve area is located contiguous to the primary system (Example B, below), a minimum of 3 test holes are required.
- Λ If the reserved area is located in an area separated from the primary system (Example C, below), a minimum of 4 holes are required.

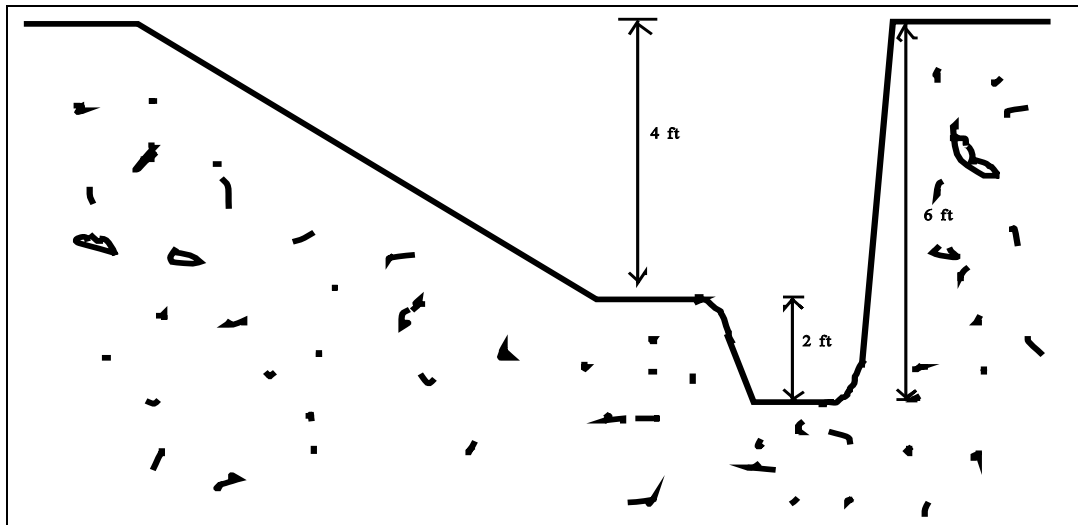


C. *Dimensions of Test Holes*

The holes are generally excavated by a backhoe and need to be a minimum of 6 feet deep, 2 feet wide, and have one end sloped for easy ingress and egress. The minimum depth of the test hole is set at 6 feet because allowed drainfield depth can go up to 3 feet, and system designs are determined by the 3 feet of soil under the adsorption bed or trench bottom. In addition, the sidewalls of backhoe pits often sluff reducing the depth of observable sidewall.

An exception to this rule is where hardpan or definite impermeable layer is encountered shallower than 5 feet. In such cases, the backhoe should quit digging when the hole has been excavated 6 inches into the impermeable layer.

Backhoe operators may opt for providing shallower test holes, depending on soil sloughing characteristics and access to the site by children or animals. These situations will be considered by the health department on a case-by-case basis. Possible mitigating measures might include arranging to meet staff on-site or covering the hole with plywood.



Note: Safety is a legitimate concern of both backhoe operator and health department staff. Holes should be excavated with a 6 foot deep end and a 4 foot deep shelf. The end of the shelf should then be ramped up to the ground surface. This allows staff to enter and exit the hole via the ramp, and to examine the 6 foot sidewall without going deeper than 4 feet by standing on the shelf.

D. *Health Department Review*

Submitted design applications are initially routed to the San Juan County Permit Center for a “Critical Area” review. Here the applications are reviewed to insure proper setbacks to critical areas (e.g. wetlands, hazardous slopes, and endangered species habitats) are maintained. The Health Department then conducts a site inspection and reviews the design for compliance with State and local regulations. If in compliance the design is approved.

Approved designs will be numbered, signed and dated by the health department. If the design is not numbered, signed and dated it should not be installed.

3. NOTIFICATION AND FINAL INSPECTION

The second step for installing an on-site sewage disposal system is for the installer to contact the health department and apply for a Permit to Install (see appendix B for a copy) prior to installing the system. The installer then can install the system in accordance with the approved design. Once installed, a final inspection is arranged with department staff. If the designer has not waived the right for a final inspection, the installer must also contact the designer (see special note). The system must then be left open for a maximum of 48 hours, allowing the installation to be inspected by the designer and the health department.

The installer must have the Permit to Install at the site for signature from department staff and if necessary the designer.

Special note: Designers of proprietary devices must inspect the installation to insure the device is installed in accordance with the manufacture specifications. Installers will need to insure the designer documents their inspection on the Permit to Install form.

4. FINAL APPROVAL

After completing the installation and necessary inspections, the installer must complete the checklist and an as-built drawing on the Permit to Install. The Permit to Install is then submitted to the health department for review. The Permit to Install will be mark "Approved" once the installation and as-built has been verified and signed by the installer and health department. Final approval must be received prior to building occupancy being granted by the building department.

SECTION TWO: DESIGN SUBMITTAL ELEMENTS

1. PROPERTY AND APPLICANT INFORMATION

Information in these sections identifies the parcel, applicant, designer, application type, and system type. This information is needed for the design to be accurately filed, to determine the appropriate fee, and for use by the health department to review the design.

2. DESIGN PARAMETERS - DRAWINGS AND SKETCHES

This portion of the design requires drawings that provide sufficient detail to allow the design to be reviewed and the system to be installed. Checklists are included for each drawing and all applicable items in the checklist must be shown on the appropriate drawings.

A. *Scaled Plot Plan*

This drawing needs to show the placement of the septic system in relationship to the overall developmental plan for the property. The plot plan must match the building permit plot plan and should verify that the system can be installed in conformance with setbacks and site limitations.

B. *Scaled Layout Sketch*

This drawing shows the detail of the drainfield layout and details of the system design. The layout sketch is intended to be a close-up of the portion of the plot plan where the septic system is located.

C. *Cross-Section Sketch*

This drawing shows the depth from original grade of the septic system components. The cross-section

sketch is intended to be used both as a guide for system construction and as verification that vertical separation and component depths meet code. At a minimum a cross-section sketch is needed for the drainfield indicating the maximum trench depth.

3. OPERATION AND MAINTENANCE AGREEMENTS

Design applications for proprietary systems must include proof that a signed operation and maintenance agreement for the system has been filed with the County Auditor. The department will not process design application until this has been provided.

SECTION THREE: DESIGN AND INSTALLATION REQUIREMENTS

1. COMMUNICATION

Proper installation of on-site sewage disposal systems in San Juan County requires a partnership between designers, installers, and the health department. Communication is essential to this partnership.

Designers and installers have a responsibility to communicate with each other and with the health department when they find site conditions different than those listed in the permit or design.

The health department has a responsibility to protect public health by developing the most effective permitting process possible and being accessible to designers, installers, and the public.

2. FLOW CALCULATION

Design flow calculations for single family residence are found in WAC 246-272. Design flows for other facilities (e.g. commercial buildings, restaurants) must be based on projected flows from comparable facilities or calculated using the EPA design manual. The design must include calculations and source used to determine the proposed design flow.

3. SEPTIC TANKS

A. Install only approved, two-compartment septic tank with a minimum volume based on the number of bedrooms in the home, as follows:

Number of Bedrooms	Volume of Tank (in Gallons)
1 - 3	1,000
4	1,000 – Gravity; 1,250 – vaulted pump; 1,000 + 500 – separate pump chamber
5+	Add 250 Gallons per Bedroom

Note: For Facilities handling residential strength sewage, other than one single-family residence, size the septic tank at 1.5 times the daily design flow with a minimum of 1000 gallons.

B. Place septic tank close to house to minimize the need for step-downs.

C. Install clean-outs and inspection accesses for both compartments and baffles at or above finished grade

- D. Install tanks to be water tight, with protection against floatation and groundwater intrusion.
- E. Tightline 3 feet to and out of septic tank using ASTM 3034 pipe and fittings.
- F. Make sure the inner partition separating the compartments is intact and no gaps are seen between the partition and the side of the tank. Also, make sure when using tanks with concrete baffles that all residual concrete is knocked off leaving a smooth surface.

4. PUMP CHAMBERS

- A. Install only pump chambers from the approved list maintained by the department and approved by the Health Officer;
- B. Install clean-outs and inspection accesses on all compartments and baffles at or above finished grade; and
- C. Install tanks to be water tight, with protection against floatation and groundwater intrusion.

5. SLOPE OF LINES

A. *Tightline From House*

Maintain 1/8 to 1/4 inch drop per running foot (1% to 2% slope). Use two 45-degree fittings and a clean-out when a step-down is necessary. Locate step-downs as close to house and as far from septic tank as possible to avoid unnecessary turbulence in septic tank.

B. *Gravity Tightline From Septic Tank*

Maintain minimum of 1/8 inch drop per running foot (1% slope) to the drainfield.

6. TRENCH SYSTEMS

A. *Trench Depth*

Excavate trench bottom no deeper than 3 feet from finished grade. Contact the designer and health department immediately when conditions beyond the installer's control (such as building plumbing depth) necessitate a trench deeper than 3 feet; the health department will consider such situations on a case-by-case basis. Installations contrary to the design or deeper than 3 feet, will require specific approval from the designer and Health Department.

B. *Trench Width*

Measure trench width at bottom of trench. May be up to 3 feet wide at designer's discretion, unless otherwise specified on the permit.

C. *Trench Layout*

Install a minimum of two trenches when site conditions allow. Limit length of any one trench to 100 feet. Make all trenches and laterals equal length when using gravity distribution. Separate trenches by a minimum of 6 feet of original, undisturbed soil. Follow ground contour with each trench.

Determine trench length based on total square footage of trench bottom specified on permit.

NOTE: It is extremely important the trench bottom is excavated to be level.
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D. *Trench Layout – Special Considerations for Sloping Sites*

Do not use step-downs. Divide flow equally between trenches by using a distribution box (d-box) located at or above the uppermost trench.

- E. Install two (2) SSAS lateral inspection ports per drainfield lateral. The ports are to be capped at or above grade and located within 20 feet from each end.

7. USE OF DISTRIBUTION BOX

- A. Distribution box construction must allow unobstructed view of all outlets, in order for the health department to verify proper installation.

NOTE: D-boxes with only a small observation port on their tops are not acceptable.

- B. When the d-box outlet that is located directly across from the inlet is used, the inlet must be diverted downward in order to prevent short-circuiting effluent across the d-box.

- C. Distribution boxes (d-boxes) are required in order to achieve equal distribution of effluent on sloping sites and on flat sites where two drainfield laterals are utilized.

- D. Install d-boxes on undisturbed or compacted soil. In addition, the d-box must be bedded in concrete or sand to reduce risk of settling. Effluent must be tightlined a minimum of 3 feet from each outlet of a d-box, except where the d-box is located on the interior portion of a bed design.

- E. The outlets of the d-box must be water leveled by the installer prior to the final inspection by the health department.

Note: If wet mortar is involved, leave the water level just below the mortar seal. During final inspection, the health department staff will insert an object into the d-box to temporarily displace enough water to overflow the outlets and verify compliance.

- F. The health department recommends use of Speed Levelers or equivalent for easy, precise equalization of d-box outlet flow.

- G. Place a permanent ferrous metal marker or ring on distribution box, to identify the location of the distribution box (if applicable).

8. USE OF CURTAIN DRAIN

The following are guidelines for curtain drain usage. Because they are recommendations and not requirements, variations can be made provided there is sufficient technical justification.

IMPORTANT!

When reduced design standards for sewage systems are proposed based on an increase in vertical separation provided through use of a curtain drain, the curtain drain must be proven effective. Therefore, the design must be conditioned to state that “Enhance treatment must be installed if the curtain drain fails to adequately lower the water table.” In addition, the design must show installation of a minimum of 2 observation ports one between the curtain drain & upper lateral and one 10 feet below the lowest lateral. Recommended monitoring port design will consist of a vertically oriented section of 2-4 inch diameter perforated pipe, wrapped in filter fabric and bedded in clean, washed drainrock or pea-gravel. The monitoring ports must be installed at or below the depth of soil needed for the designed system type (i.e. 3 feet below trench bottom for gravity etc.).

A. *Required Site Conditions*

Curtain drains in soil types 4-6 should be installed only under unsaturated conditions. Determine if the site is unsaturated by rolling a soil sample between the hands. If it rolls into a ribbon, the site is too wet for installation of a curtain drain. If it crumbles, the curtain drain can be installed. The site to be drained may need to be prepared for curtain drain installation by digging several pits upslope from the installation area and artificially lowering the watertable with sump pumps. Soil saturation is not a critical consideration for installation of a curtain drain in soil types 1-3.

B. *Trench Discharge*

Trench should discharge at least 30 feet downslope from the lowermost drainfield lateral. At least the last 3 feet of the discharge end of the curtain drain pipe should be graveled so that the end of the line will not be exposed. If a solid line is needed to carry discharge water from the curtain drain, a solid, 4-inch pipe may be utilized.

C. *Trench Depth*

Trench depth must be a minimum of 6 inches into underlying restrictive layer.

D. *Trench Width*

Trench width should be a minimum of 18 inches when the trench depth is 42 inches or less, and a minimum of 24 inches when the trench depth is greater than 42 inches.

E. *Slope*

Trench and pipe slope should be a minimum of 1% in order to properly drain.

F. *Perforated Pipe*

Perforated pipe running the length of the intercepting portion of the curtain drain should be located 6 inches off the bottom of the trench until it is within 10 feet of the disposal portion of the curtain drain, where it will be sloped down to the bottom of the trench. The pipe should be smooth, 4-inch diameter ASTM D2729, D3033, or D3034, and perforations in drainpipe should be oriented the same as for drainpipe used in a gravity drainfield (holes @ 5:00 & 7:00 o'clock). Corrugated drainpipe, 4-inch diameter, is also acceptable.

G. *Protection from Clogging*

Curtain drains must be protected from infiltration of fine soil particles that can seal bottom and sidewalls. The two methods generally used to protect against clogging are either use of filter fabric or use of filter material. The designer should include a method in the design. In addition, 6-mil plastic can be utilized on the downslope sidewall of the curtain drain trench to improve the drains effectiveness.

9. **CONDITIONS DURING INSTALLATION**

A major cause of sewage system failure is installation of the system during periods when the soil is nearly saturated with water. Such conditions results in finer textured soils smearing and compacting during construction of the system. Systems should therefore be installed during dry weather conditions.

During the period November 1 to March 30, no systems should be installed in Type 4 (sandy loam) or finer

textured soil without the designer first inspecting the site, examining the soil, and communicating to the installer and health department that conditions are suitable for system installation.

SECTION FOUR: SPECIAL REQUIREMENTS

1. SOURCE OF SAND

Sand must be from a commercial gravel pit and meet design specifications. The design must contain the sand specifications for the system. A copy of a sieve analysis that is to be performed within the 60 days of installation should be provided with the design.

Commercial gravel pits may perform their own sieve analyses, provided the method used conforms to ASTM C-136 Method for Sieve Analysis of Fine and Coarse Aggregates and ASTM E-11 Specifications for Wire-Cloth Sieves for Testing Purposes, Annual Book of ASTM Standards, Volume 04.02.

2. SMALL DIAMETER PIPE

Transport, manifold, and lateral pipes must be Class 200 or better and a minimum of 1 inch in diameter.

3. BARRIER MATERIAL

Geotextile (filter fabric) is required as a barrier material for all alternative systems.

4. MAINTENANCE FEATURES

A. Access risers must be installed on all septic tank and pump chamber access ports at or above final grade to allow for on-going operation and maintenance.

B. Clean-outs - Pressure Distribution & Sand Filter Systems

i. Install clean-outs at the end of each lateral by using sweeping 45's.

ii. Clean-outs should be protected with section of capped 4-inch diameter PVC pipe extended 4 inches above finished grade, or marked with metal stake maximum of 6 inches below finished grade.

C. Observation Ports – All Systems

i. Install a minimum of two observation ports per drainfield lateral and one observation port per sand filter. For drainfield laterals place a port approximately 6 feet from each end. In sand filters place port to detect ponding at interface between drainrock and sand.

ii. Construct observation ports of 4 inch diameter PVC, extended 4 inches above finished grade, or enclosed in durable, accessible box.

iii. Observation ports must be equipped with **easily removable** caps

5. ORIFICE SIZING AND SPACING

Orifice spacing for pressure distribution systems will not exceed 36 inches. Orifice diameter will fall within the range of 1/8" to 3/16".

6. PRESSURE CHECKS

The health department will verify that there is a minimum residual head and uniform distribution for pressure distribution and sand filter systems. Connect laterals to the manifold, with orifices pointed up. During the final

inspection the pump must be cycled and the height of the squirt measured.

Note: All systems must be pressure tested prior to final approval. The health department highly recommends utilizing generators or other means of supplying power to conduct the pressure test during the final inspection. Pressure tests not observed by department staff generally will require documentation, such as pictures or verification from the designer (initials on Permit to Install), be submitted with the as-built.

When all laterals cannot be left exposed for the pressure check, due to site conditions requiring the laterals to be backfilled during construction, at least one of the laterals plus 6 feet at the end of the other laterals will be left exposed with orifices facing up for the pressure check. Other pressure check alternatives will be considered for approval by the health department on a case-by-case basis.

7. RESERVE AREAS

A full size reserve area must be designated on all designs. This includes designs for enhanced treatment where a 50% reduction in drainfield sizing is allowed.

**APPENDIX 1: EXISTING SYSTEM REQUIREMENTS - NEW BUILDING PERMIT
PROPOSALS**

Environmental Health On-site Sewage Requirements for Building Permit Proposals Served by Existing Systems

I. Existing On-site Septic System – Complete Records

Expansions – Increases in anticipated sewage flows by either increasing the number of bedrooms beyond the total approved on the septic permit or changing the use of the structure (e.g.: residential to commercial), or changes that would result in adverse impact on the existing system & reserve.

- **Requirements** – System and reserve must be in compliance with current codes. This typically will require submittal of a new or revised design showing how system will be expanded to accommodate increase flows.

Additions/Remodels – No increase in anticipated sewage flow or number of bedrooms and no structural or use changes that would adversely impact the existing system and/or reserve area.

- **Requirements** – System must be non-failing. In order to document the system is non-failing; the applicant must submit a pumper's or wastewater inspector's report, from the past 3 years for gravity & pressure distribution systems and within the past year for alternative systems (sand filters, aerobic units, etc.), documenting the non-failing status of the system. Note: Gravity and pressure distribution systems installed within last 3 years are exempt from this requirement.

Structural Repairs – Routine maintenance and repair of roofs, foundations or walls without restructuring the basic floor plan of the residence.

- **Requirements** – Not applicable

II. Existing On-site Septic System – Incomplete Records

Expansions (see definition above) - System and reserve must be in compliance with current codes. This typically will require submittal of a new or revised design showing how system will be expanded to accommodate increase flows. Proposals to add onto or utilize the existing system will require completion of an as-built for the existing system showing location, layout, depth to bottom of trench, soil type & depth of profile and other key components.

Additions/Remodels that Expand Building Footprint (but do not increase the load) - System must be non-failing. In order to document the system is non-failing, the applicant must submit a pumper's or wastewater inspector's report, from the past 3 years for gravity & pressure distribution systems and within the past year for alternative systems (sand filters, aerobic units, etc.), documenting the non-failing status of the system. In addition, a designer must complete an as-built drawing documenting the primary and reserve drainfield area.

Internal Remodels Only - System must be non-failing. In order to document the system is non-failing; the applicant must submit a pumper's or wastewater inspector's report, from the past 3 years for gravity & pressure distribution systems and within the past year for alternative systems (sand filters, aerobic units, etc.), documenting the non-failing status of the system.

Structural Repairs (see definition above) – No requirements

Note: Systems installed within last 10 years should have complete records on file. If no records can be found, the applicant must apply for an on-site septic permit (including fee), expose the ends of each lateral to verify length and layout, dig a test hole adjacent to the drainfield and two test holes in an area suitable for a reserve field. A designer must complete an as-built drawing and submit records for the system.

APPENDIX 2: DESIGN FORM

APPENDIX 3: PERMIT TO INSTALL AND AS-BUILT FORM