

ONONDAGA COUNTY



DESIGN GUIDELINES FOR INDIVIDUAL SEWAGE SYSTEMS 1999



ISSUED BY
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Forward

The Onondaga County Health Department has prepared these design guidelines in order to inform design professionals, homeowners, builders, and contractors of the procedures for design and preparation of plans for individual household systems. Included in this bulletin is basic information on the procedure for site investigation and soil percolation testing. Design tables and details for some typical system components are also included.

In December of 1990 the New York State Health Department issued new regulations entitled Appendix 75-A, Wastewater Treatment Standards - Individual Household Systems. These standards are comprehensive in nature and include some of the most recent improvements in design and construction of individual sewage disposal systems. In April of 1993 the Health Department released the draft copy of a guidance manual for implementation of the standards entitled Individual Residential Wastewater Treatment Systems Design Handbook. This handbook became available in its final form in June of 1996.

The New York State handbook includes detailed information on soil testing, septic tanks, distribution devices and a complete description of the site requirements and design guidelines for seven types of conventional sewage systems and several alternative systems. Individuals in need of additional assistance should consult the design handbook for this supplemental information.

Copies of the handbook are available for a fee through:

**HRI, Health Education Services
Post Office Box 7126
Albany, N.Y. 12224**

Telephone: (518) 439-7286

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INTRODUCTION

This bulletin is intended to outline the requirements for design and construction of subsurface sewage disposal systems in Onondaga County. It is primarily directed toward individual household systems although much of the information applies equally to commercial sewerage facilities.

This is to be used as an addendum to the New York State Department of Health regulations entitled "Wastewater Treatment Standards Individual Household Systems" and the companion publication entitled "Individual Residential Wastewater Treatment Systems Design Handbook".

Information on design of institutional and commercial sewerage facilities is provided in the New York State Department of Environmental Conservation publication "Design Standards for Wastewater Treatment Works, Intermediate Sized Sewerage Facilities". Any subsurface sewage system designed to discharge and discharging a flow of 1000 gallons per day or more or serving more than two family units must be covered by a special SPDES permit. Contact the Onondaga County Health Department at the planning state for any commercial or institutional project in order to obtain further information on permit requirements, required site evaluations or other pertinent items.

NOTICE REGARDING FEES

A schedule of fees has been established by Onondaga County for issuance of permits, approvals and other services of the Department of Health. For individual sewage disposal plan review the required fee must be submitted at the time plans are submitted for approval. This fee covers all project activities including site visits, plan review and construction inspection at the time the facilities are installed. The current fee schedule is available from the Division of Environmental Health Office.

PLAN SUBMISSION REQUIREMENTS FOR INDIVIDUAL HOUSEHOLD SYSTEMS

All new subsurface sewage disposal systems require the approval of the Onondaga County Department of Health as provided in Article V of the Onondaga County Sanitary Code. Plans for individual household systems must be prepared by a design professional (i.e. Professional Engineer, Registered Architect, or Licensed Land Surveyor with a State Education Department exemption for limited projects) as per the State Education Law. Such plans must conform with the minimum requirements outlined in this bulletin.

The general procedural requirements for preparing plans are summarized in Table I. More specific details regarding the Skaneateles and Otisco Lake Watersheds are given in the section that follows.

**TABLE I
PLAN PREPARATION**

Site Location	Number of Plans Required (Minimum)	Application Required	Witnessing of Tests
Skaneateles Lake Watershed	5	Yes	Yes
Otisco Lake Watershed	5	Yes	No
All other areas	3	No	No

A map designating the Skaneateles and Otisco Lake Watershed boundaries is provided as an attachment to this bulletin along with a sample application form. Forms can be obtained from the Division of Environmental Health office.

Upon approval, one copy of the approved plan will be mailed to the municipality in which the project is located, one copy will be retained for file purposes and the remaining copy (s) will be returned to the individual submitting the plan. In addition, two (2) copies of the letter of approval will accompany the approved plans. By this procedure it is intended that the individual submitting the plans can provide the homeowner, builder or installer with a copy of both the letter and approved plan.

To avoid problems caused by unapproved plans being used for construction it is important that no such plans be released unless they are clearly labeled as "preliminary" and not to be used for construction.

SPECIAL REQUIREMENTS - SKANEATELES & OTISCO LAKE WATERSHEDS

Additional requirements apply to those sites located within the watershed areas of Skaneateles and Otisco Lakes which are sources of public water supply. The procedure for submitting plans in these areas is as follows:

- A. Skaneateles Lake Watershed (includes portions of the Towns of Skaneateles, Spafford and Marcellus in Onondaga County).**
- 1) An Onondaga County "Application for Permit to Construct a Waste Disposal System" must be completed and signed by the applicant (owner). One copy (with original signature) must be submitted with a minimum of 4 copies of the plans.**
 - 2) One copy of the plan and one (1) copy of the application must be submitted to Dan Robbino, City of Syracuse Gatehouse, 20 West Genesee Street, Skaneateles, New York 13152. Upon completion of their review, the city will forward a recommendation to the Onondaga County Health Department before final review and approval.**
 - 3) All soil percolation tests and six foot deep test holes on sites located within the Skaneateles Lake Watershed must be witnessed by a representative of the City of Syracuse. Arrangements can be made by contacting Dan Robbino or one of the watershed inspectors at the City of Syracuse, Skaneateles office, 685-6486.**
- B. Otisco Lake Watershed (includes portions of the Town of Otisco, Spafford, Marcellus, Onondaga and Tully).**
- 1) An Onondaga County "Application for Permit to Construct a Waste Disposal System" must be completed and signed by the applicant (owner). One copy (with original signature) must be submitted with a minimum of 4 copies of the plans.**
 - 2) A minimum of one (1) copy of the plan must be submitted to Mark Murphy, Onondaga County Water Authority Filter Plant, 2460 Lawrence Road, Marcellus, New York 13108. Upon completion of their review, OCWA will forward a recommendation to the Onondaga County Health Department before final review and approval.**

SOIL PERCOLATION TESTS AND SITE APPRAISAL

Proper site appraisal is the most important aspect of subsurface sewage disposal design. The table entitled **Site Requirements for Design of Individual Wastewater Treatment Systems** found in the back of this bulletin presents the site requirements for various system designs in a quick reference type of format. You will find this to be of value in assessing the various design selections available. Your attention in particular is directed toward the column entitled **"Minimum Depth of In Situ Usable Soil"** which concerns one of the most critical design elements. Procedures for site and soil investigation as well as conducting percolation tests are outlined in the appendix. More detail concerning these procedures may be found in the **"Individual Residential Wastewater Treatment Systems Design Handbook"**.

At least two separate soil percolation tests must be performed within the design area of the proposed sewage disposal system. Their locations must be staked in the field. The test holes must be widely spaced (on sloping sites the second hole should be located by measuring 40' from the first hole along the contour and 40' downslope from that point). The depth of the test holes must be consistent with the specific depth of the sewage disposal system being proposed and should relate to the design criteria outlined in the **Wastewater Treatment Standards**. Extreme caution in this regard is urged as failure to conduct tests in accordance with the proper procedure invalidates the test results as a basis for design (County technicians may conduct confirming analysis in suspect areas).

A deep test pit must be conducted within or immediately adjacent to the design area of the absorption system. The test pit results are to be shown on the plan with a soil profile description to a depth of 6 feet. Special conditions such as seepage, water tables, impermeable layers or bedrock should be given special attention in reporting the profile.

Adequate separation between the sewage disposal system and groundwater or bedrock is necessary. There should be at least two feet of separation between the bottom of the sewage disposal system and the highest groundwater level. A minimum of four feet of suitable soil may be necessary between the bottom of the system and bedrock in areas where it is determined necessary to protect underground aquifers.

The variations in site conditions are such that every available reference needs to be used as a part of the site evaluation process. One of the most valuable sources of information is the **Soil Survey of Onondaga County** prepared by the Soil Conservation Service. This document is particularly valuable in identifying areas susceptible to high groundwater or bedrock. The Onondaga County Health Department has also developed a system of color coding of soil types based on their limitations for sewage disposal. A copy of this listing is available upon request.

FLOOD HAZARD AREAS

Federal and State regulations applicable to areas of special flood hazard stipulate that on-site waste disposal systems shall be located so as to avoid impairment to them or contamination from them during flooding. At a minimum, the elevation in the area of all sewage disposal systems must be located above the 100 year flood level. Documentation of the elevations must be provided on the plan.

WETLANDS

The New York State Freshwater Wetlands Act provides that a permit may be required for construction within the 100 foot adjacent area to a freshwater wetland. Maps indicating the boundaries of such restricted areas are available. The permit must be obtained from the New York State Department of Environmental Conservation.

SEPARATION REQUIREMENTS

The minimum recommended separations to be maintained from various components of the subsurface sewage disposal system are presented in the New York State Department of Health publication. These have been shown as a reasonable standard to be followed for construction on all newly developed lots and most existing situations as well. It should be recognized that as recommended distances considerable judgement needs to be exercised in applying them to many situations. In any case, there can be no variation to the separations indicated unless authorized by the Department.

SHALLOW ABSORPTION TRENCHES

In order to demonstrate a basis for design of shallow absorption trenches the designer must first show that the required 2' minimum depth of suitable soil exists. A percolation test must be conducted at that depth in order to demonstrate that the minimum required depth of soil exists. For purposes of the actual system design, shallower tests can be conducted at the elevation of the bottom of the proposed trenches and the system sized accordingly.

GRAVELLESS LEACHING CHAMBERS

In the current Design Handbook, the site requirements outlined for the use of gravelless leaching chambers limit the use of these systems to sites with a design percolation rate of less than 45 minutes per inch. As it has been determined that there is no technical basis for this limitation, specific waivers to this restriction can be issued on a project by project basis. Several manufacturers of gravelless leaching chambers have had their products reviewed for conformance to New York State standards. Requests from design professionals to use such products as an equivalent to all 24" absorption field systems (1-60 min./inch design) will be honored provided that the design professional gives approval for use either on the plan or in a separate letter.

Please note the following special requirements:

- 1) For raised systems, the use of these products requires that perforated pipe be installed attached to the inside top of the chambers to provide for improved distribution.
- 2) When used for mound systems designed with absorption trenches, the pressure pipe must be installed attached to the inside top of the chambers.
- 3) Dosing is required when used for conventional or shallow systems in cases where trenches exceed 60' in length or where the total system length exceeds 500'. The installation of pipe within the chambers is not required, however fabric must be installed in the bottom of each entrance section to minimize soil erosion.

The above information only pertains to gravelless chambers and not gravelless pipe which also requires individual product review and approval for use on a case by case basis.

ALTERNATIVE SYSTEMS

While alternative systems are included in the design standards their use is not encouraged due to the complexities of design and construction, the high initial cost, unknown longevity, and the difficulties and high cost associated with future replacement. Their use should only be considered as a last alternative. In many cases the restrictions associated with alternative systems make them incompatible with the individual's needs and an alternate site needs to be considered. It is also necessary to recognize that some sites are totally unsuitable for development using any type of sewage disposal method.

If an alternative system is to be considered there are a multitude of factors that must be carefully evaluated in determining the suitability of the site. These factors are presented in detail on page 13 of this bulletin. If a proposal is submitted for conceptual approval, the design professional must address each of these issues as a part of the submittal. The procedures associated with approval and construction of alternative systems are also outlined on page 13.

INFORMATION REQUIRED ON SUBSURFACE SEWAGE DISPOSAL PLANS

Listed below is the minimum required information to be shown on plans submitted for approval:

1) General

Plans must be clear and legible and must be drawn to scale.

A title block is required. The title must designate the plan as a sewage disposal plan. The name and address of the owner (or prospective owner) must be shown. Other pertinent information such as the date (including revision dates), scale and town must be included.

The farm lot/military lot number in which the project is located must be indicated. The tax map number of this lot or of the lot from which it is being separated must also be provided.

2) Location Map

A location map shown to scale must be provided by including either an inset on the plan or a separate location map. Sufficient detail must be included on this map and on the layout to allow for the site to be identified in the field. Approximate distances from the site to fixed reference points should be included. Suggested items are measured distances from the site to identifiable reference points, adjacent house numbers or utility pole numbers.

3) Test Hole and Test Pit Results

A minimum of two percolation test holes widely spaced in the system area are required. (The test hole locations must be staked in the field). The required test hole depth for conventional absorption systems is 30 inches.

A deep test pit must be dug in the system area. The pit must be reported to a depth of at least six feet for conventional systems, or deeper if the nature of the system design indicates it.

The location and results of all tests must be indicated on the plan and shown to scale. The date of testing, depth of test holes and soil description must be provided.

4) **Lot Layout**

The proposed lot layout must be clearly drawn to scale. The lot boundaries and all structures, existing or proposed, both above and below ground must be shown. This includes the dwelling, accessory buildings, driveways, water supply wells, springs, service lines, and other utility lines or easements. A complete sewage disposal system layout must be shown. The design should give consideration to providing an additional 50 percent area for future expansion of the system. Minimum required distances between the system and other features such as structures, property lines, road boundary, streams, footing drains, embankments and water supply must be shown to assist in proper location and installation of the system. The actual measured distance should be shown where needed to specify an exact location. Heavily wooded sites should be labeled as such including a notation that trees within the general system area must be removed to allow for installation of the system.

The system layout must be in accordance with the site conditions and topography. On rolling sites in particular it may be helpful to stipulate that the trenches should be installed such that they are paralleled to the site contours.

5) **Elevations**

Elevations must be taken on all proposed sites in order for the layouts to be properly oriented with the property contours; to show that there is sufficient elevation drop from the dwelling site; and to allow for an assessment of drainage needs on the lot. Please note that a sufficient number of elevation shots must be taken in order to be able to establish the contours in the system area. In all cases the elevations must be shown on the plan along with a fixed benchmark that can be readily accessed by the installer or builder. The elevations can be shown as either spot elevations or contours. If contours are shown, a 1' contour interval is required.

A proposed house sewer invert elevation at the foundation wall must be provided for certain types of designs. These include all shallow systems or alternative systems where no pump is provided and for any system where significant regrading at the house site is necessary in order to install the system at the specified depth. A sewer invert elevation must also be provided when a dosing siphon is specified.

6) **Drainage**

Swales, curtain drains and other measures outlined in the design bulletin are often necessary to allow for proper year round operation of the sewage disposal system. Careful evaluation of the soil profile is necessary so as to observe features such as

soil mottling or restrictive layers that may support groundwater during periods of seasonal wetness. When drainage measures are incorporated as a part of the design the required details of construction must be included on the plan.

7) System Details

a) House Sewer

The minimum specifications for this sewer is four inch diameter cast Iron or schedule 40 PVC with tight joints, installed at a minimum slope of one quarter inch per foot. No right angle bends are allowed. A fresh air inlet and building trap must be installed on this sewer directly ahead of the point of entry into the septic tank. The fresh air inlet must not be terminated within ten feet of any window or doorway opening and should be located away from any outside deck or patio as well.

b) Septic Tank

The capacity and minimum specifications for the septic tank must be shown along with a detail (see typical septic tank detail). If a prefabricated metal tank is proposed it must be indicated as conforming with Underwriters Laboratory Standard UL-70. If a precast concrete tank is specified, it must be indicated as meeting minimum requirements of the Onondaga County Department of Health or the manufacturer's name and model number specified. If the tank is going to be constructed on site, complete details must be provided and a section and plan view drawn. All tanks must conform with requirements outlined in the "Individual Household Systems" handbook.

Septic tanks should be located such that the top access covers are within approximately twelve inches (12") of the ground surface. If this can not be accomplished, risers must be specified to bring the cover within this depth range which will allow for easier access for maintenance.

Several manufacturers now market polyethylene (plastic) septic tanks. These have been found to be acceptable provided that they are installed in accordance with the manufacturer's recommendations, which generally require the use of sand or granular material for backfill. If such a tank is specified, the manufacturer and tank capacity must be stated along with any special instructions.

c) Pump Chambers and Dosing Siphons

When pump chambers or dosing siphons are required, a detail must be included on the plan (see appendix for typical pump and siphon chamber details). A pump chamber size and float settings representing the

desired pumping volume and storage volume above alarm level must be specified. The volume represented by the float settings must be stated. A required pump and discharge pipe size must be shown.

d) **Distribution Box**

A plan and section view of the distribution box must be provided. The layout must include the location of the inlet, outlets and baffle.

e) **Absorption System Details**

Information indicating the basis of design for the system must be provided. The design percolation rate, number of bedrooms or design flow, and required system size must be stated.

A cross sectional and longitudinal view of the trench or bed must be shown. Details must be in accordance with the New York State Handbook. For all shallow, alternative, cut and fill, and deep trench designs, a cross-sectional view of the proposed system is required. The cross section must be drawn so as to reflect the actual site elevations.

The following note must be placed on all plans for which the fill placement must be supervised by the design professional. These include alternative systems, cut and fill systems and those shallow systems in which portions of the trench sidewall will be contained within the fill:

The contractor must notify the engineer before starting construction in order to arrange for inspection of the proposed fill material and its placement and stabilization. The Health Department must receive certification from the engineer as to satisfactory completion of the above, including the results of percolation testing of the fill material, before the contractor installs the absorption system.

b) **Pipe Specifications**

Rigid plastic (PVC or ABS) is the most common material in use today for subsurface systems. Because of its widespread usage, it is recommended that minimum standards be directed toward this material.

- 1) The pipe installed between the septic tank and distribution box must be specified as four inch tight joint pipe installed at a minimum slope of one eighth inch per foot. For short sections, a pipe with greater wall thickness such as Schedule 40 PVC is recommended based on its ability to withstand increased stress. Cast iron is not acceptable because of potential problems with corrosion.

2) Outlet pipes from the distribution box to each perforated distributor pipe must be four inch tight joint pipe installed at a minimum slope of 1/32 inch per foot. A greater slope is desirable. Each distributor pipe must be individually connected to the distribution box. The installation of "speed levelers" on each outlet pipe is recommended.

3) The perforated distributor pipes must be four inch diameter installed at a maximum slope of one sixteenth inch per foot.

8) Water Supply

The approximate location and type of water supply (drilled, dug well, spring, etc.) must be shown. Particular attention should be given to showing wells 15' minimum from property lines, 50' minimum to septic tanks and 100' minimum to any absorption system. Wells should also be located uphill from the sewage disposal system and away from areas where they may be subject to contamination.

Water lines under pressure must be shown as ten foot minimum away from any part of the sewage disposal system. Water lines under suction require greater separation as outline in the design standards

Proper separation must be maintained between all sewage disposal systems and water supply sources including those on surrounding lots. In closely spaced situations, the actual location of such facilities on adjoining lots must be shown.

9) Certification

The design professional submitting the plan is responsible for all aspects of design including the site evaluation, soil testing and detailed design in accordance with rules of the State Education Department. A copy of a State Education Department notice in this regard is included in the appendix.

The signature and seal of the design professional must appear on all plans submitted for approval.

10) Space for Approval

A space of about three inches by six inches must be reserved on the face of the plan for the approval stamp of the Department.

INSPECTIONS

The Onondaga County Department of Health representative is authorized to make such inspections as are necessary to determine satisfactory compliance with the approved plan. The Department must be notified approximately 24 hours in advance of required inspections. It shall be the duty of the owner or occupant of the property to give this official free access to the property at reasonable times for the purpose of making such inspections as are necessary.

Inspection will be conducted of the entire premises including the size of dwelling unit, septic tank, distribution devices, the absorption unit and all connecting piping. For new installations, the inside plumbing, including the connection to the septic tank must be installed by a plumber, licensed by the Plumbing Control Section of the Onondaga County Department of Health, and will be inspected separately by a representative of that Section. The only exception to this requirement is in the case of a single mobile home unit with approved factory installed plumbing. In such cases the connection to the septic tank can be installed by the sewage disposal system contractor and will be inspected along with the remainder of the system.

FIGURES



Alternative System Design and Construction Procedures

In order to determine the suitability of a site for an alternative sewage system design there are a multitude of factors that must be very carefully evaluated by the design professional. These factors include the following:

- 1) What is the depth of the highest seasonal groundwater level?**
- 2) Is there at least one foot of original soil with a faster than 60 minute percolation rate?**
- 3) What are the surface drainage characteristics - is there sufficient slope both onsite and offsite for any required drainage improvements?**
- 4) Is the site topography in the proposed system area conducive to this type of design?**
- 5) Will construction of an alternative system on this site result in any unmitigated adverse environmental effects on adjoining properties?**
- 6) Is there an area available on the site for future expansion or replacement of the system?**

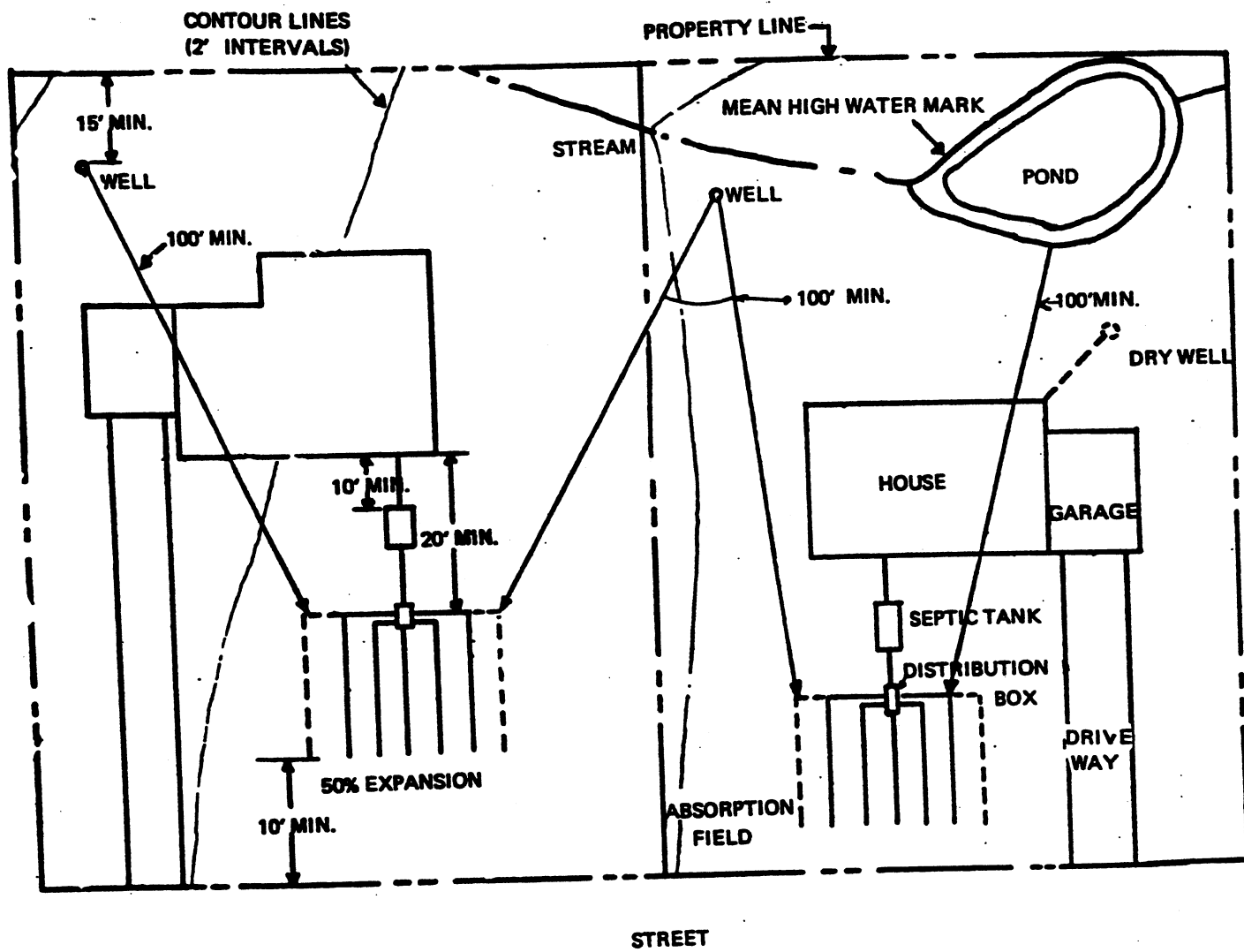
The design professional must address each of these factors as a part of the site evaluation and plan preparation process in order to receive conceptual approval of a proposal. The complexity of these factors is such that for some sites it is clearly necessary to conduct the site evaluation during the period of seasonal wetness in order to obtain the information needed for an informed basis of design.

Once conceptual approval of an alternative design is granted the placement of fill can be undertaken. The design professional is responsible for overseeing the selection of fill material and its method of placement, and for percolation testing of the fill after stabilization. Movement and placement of the fill should not be undertaken until the design professional determines that dry enough soil conditions exist to prevent damage to the underlying soil during placement and for proper compaction of the fill. Any mechanical compaction of the fill must be accomplished in shallow lifts under the supervision of the design professional.

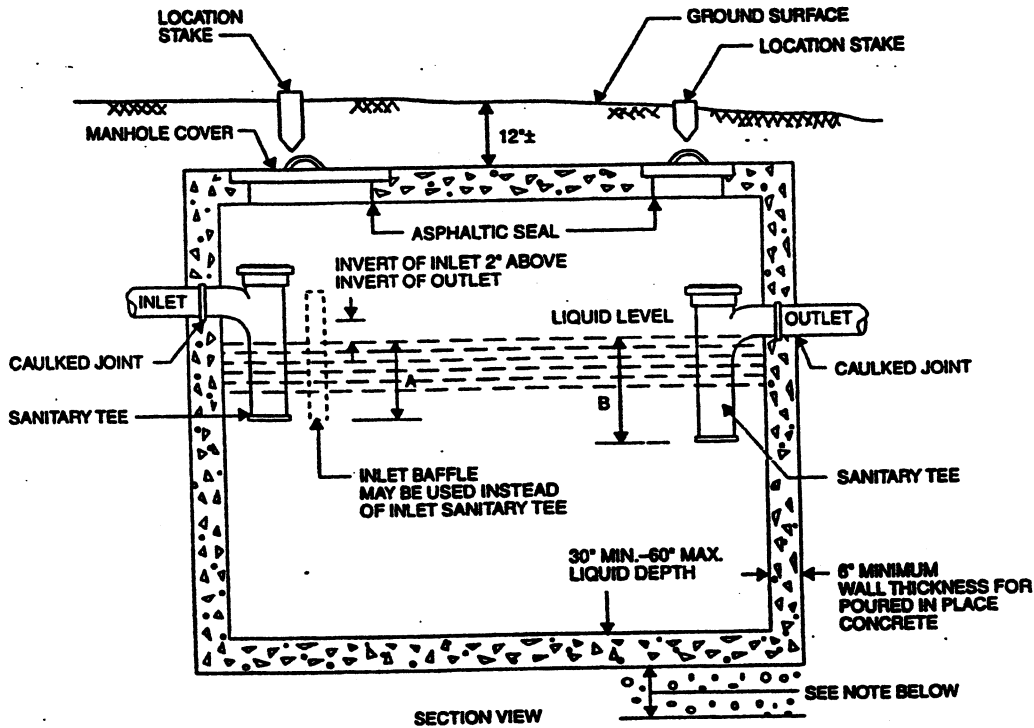
For raised systems, formal approval of the plan and authorization for release of the building permit will not be given until such time as the fill is in place and certification received from the design professional as to its satisfactory placement and percolation test results.

For mound systems the formal plan approval will be granted upon receipt of the owner's immediate construction schedule which reflects that the installation can be completed during a period of dry soil conditions as require for this type of installation.

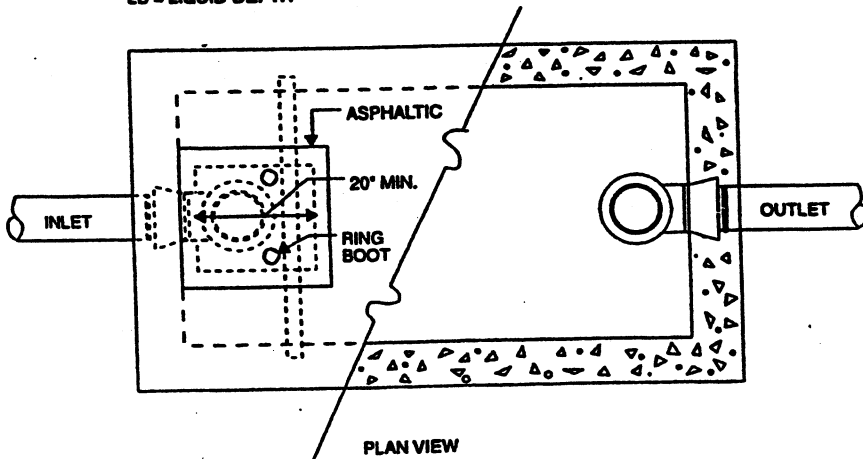




ABSORPTION FIELD SEPARATION REQUIREMENTS

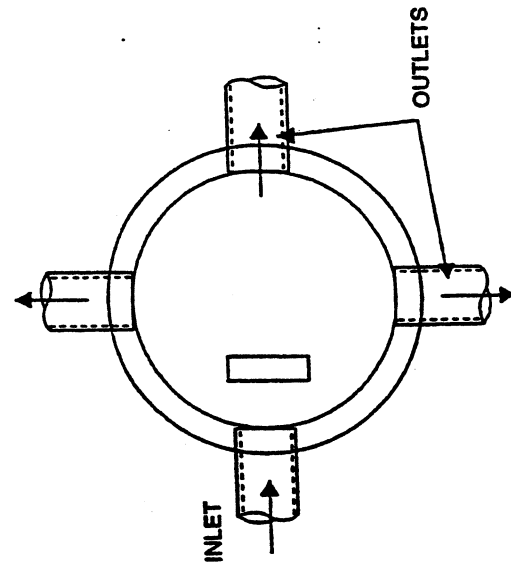


A = 12" MIN. FOR LD < 40" AND 16" MIN. FOR LD ≥ 40"
 B = 14" MIN. FOR LD < 40" AND 18" MIN. FOR LD ≥ 40"
 LD = LIQUID DEPTH



NOTE
 A minimum of 3" of clean sand or pea gravel, or 5" of washed aggregate 3/4"-1-1/2"

Typical Septic Tank



PLAN VIEW

NOTES:

1. PIPE JOINTS TO BE SEALED WITH ASPHALTIC MATERIAL OR EQUIVALENT.
2. INVERT ELEVATIONS OF ALL OUTLET PIPES MUST BE EQUAL. USE OF SPEED LEVELING DEVICES IS RECOMMENDED.
3. THE SLOPE OF OUTLET PIPES BETWEEN THE DISTRIBUTION BOX AND DISTRIBUTOR LATERALS SHOULD BE AT LEAST 1/32" PER FOOT.
4. BAFFLE REQUIRED FOR SIPHON OR AUTOMATIC DOSING OR IF INLET PIPE SLOPE EXCEEDS 1/2" PER FOOT.

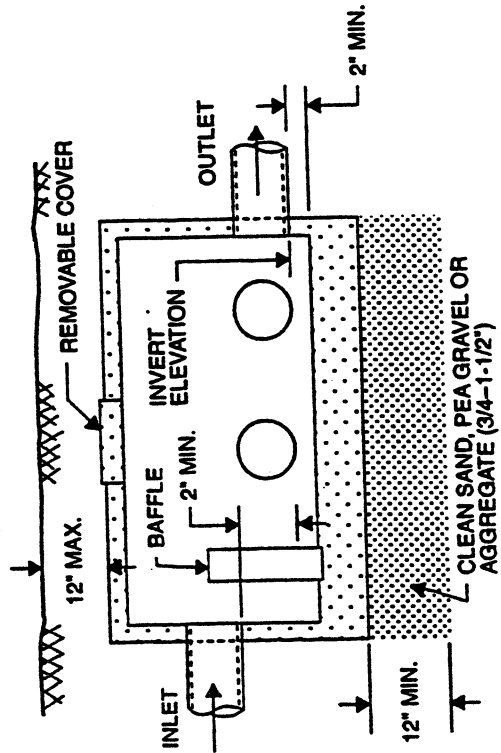
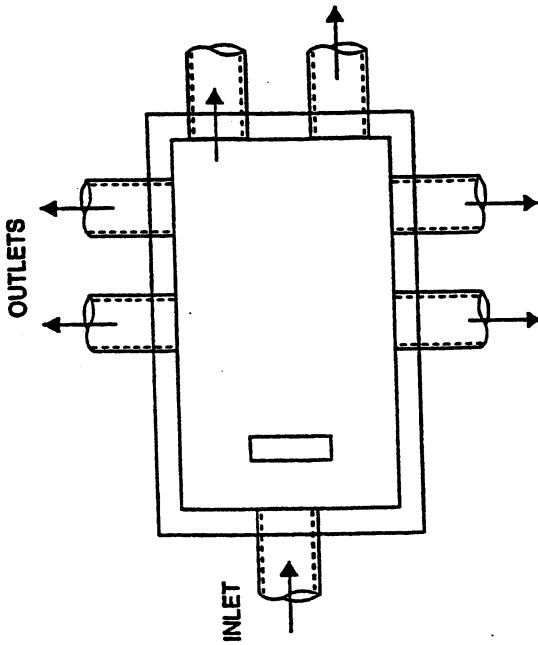
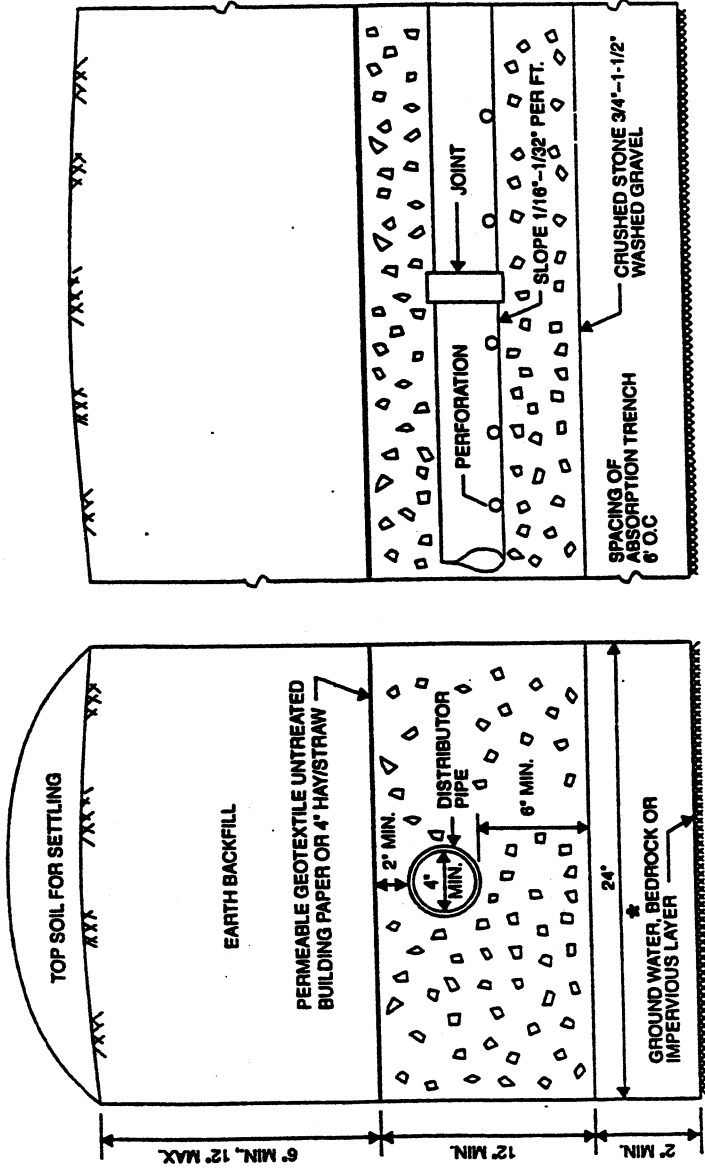
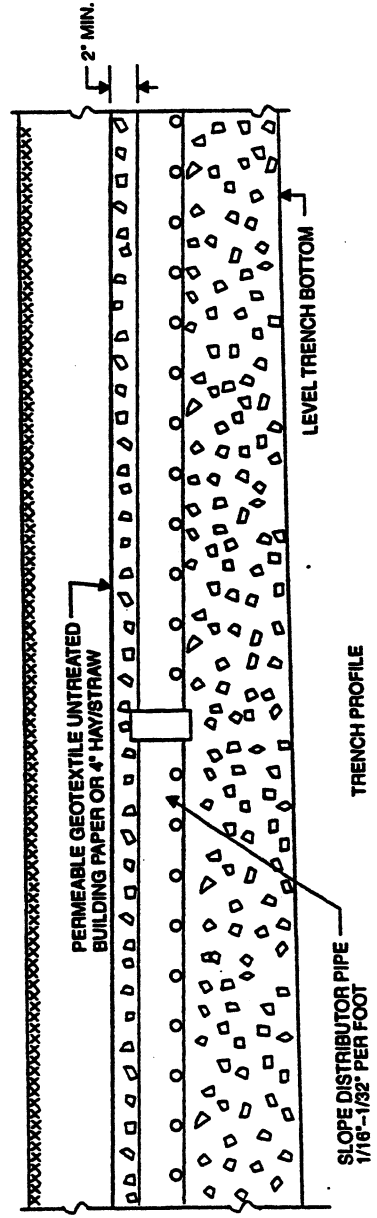


Figure 10
Distribution Box Detail



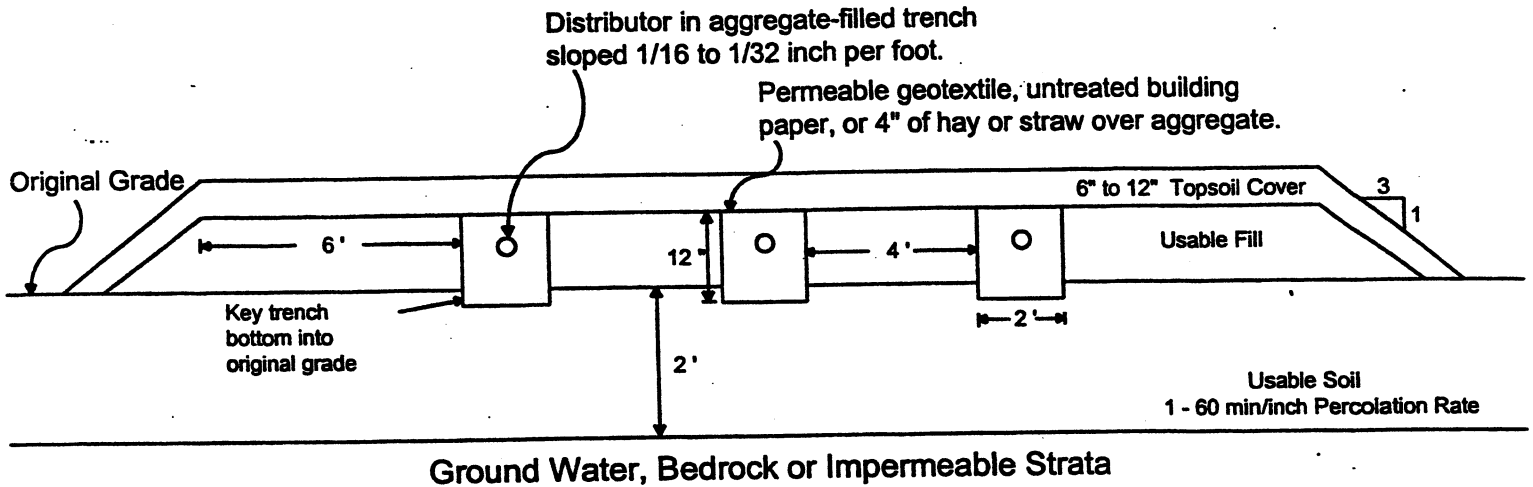
***SEPARATION FROM BEDROCK IN AREAS SERVED BY WELLS IS 4' MINIMUM.**



NOTE: DO NOT INSTALL TRENCHES IN WET SOIL.
 INSTALL TRENCHES PARALLEL TO CONTOURS.
 INSTALL TRENCHES AS SHALLOW AS POSSIBLE WHICH MEET ABOVE NOTED MINIMUM DEPTHS.
 RAKE SIDES AND BOTTOM OF TRENCH PRIOR TO PLACING GRAVEL.
 ENDS OF ALL DISTRIBUTOR PIPES MUST BE CAPPED

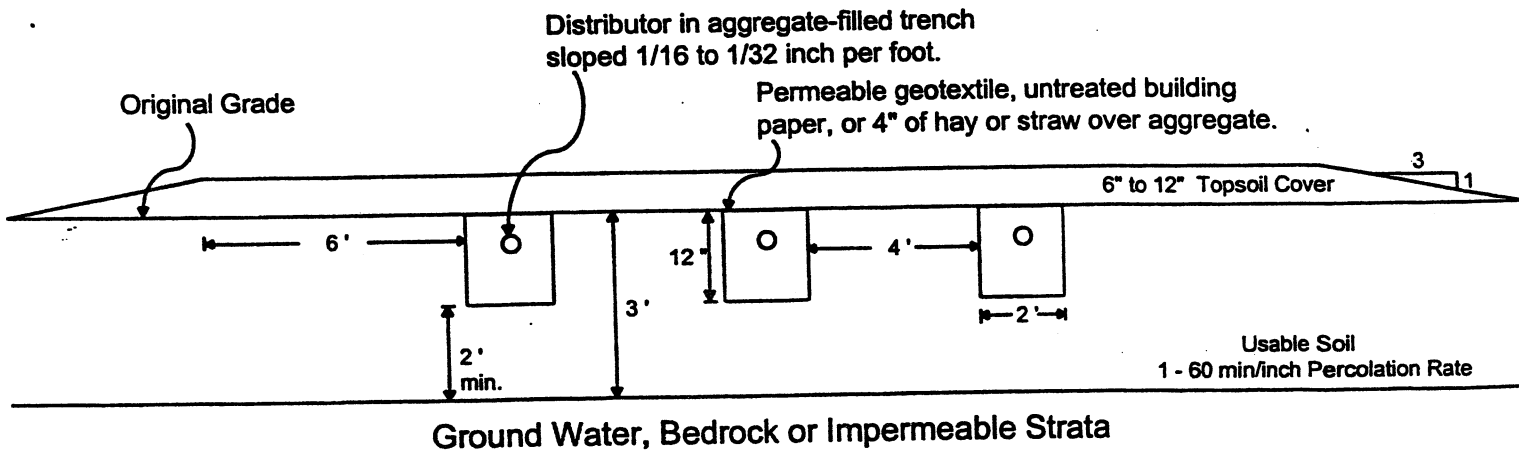
Figure 17
Absorption Trench Detail

**Typical Shallow Trench System
For a Site with 2' of Usable Soil**



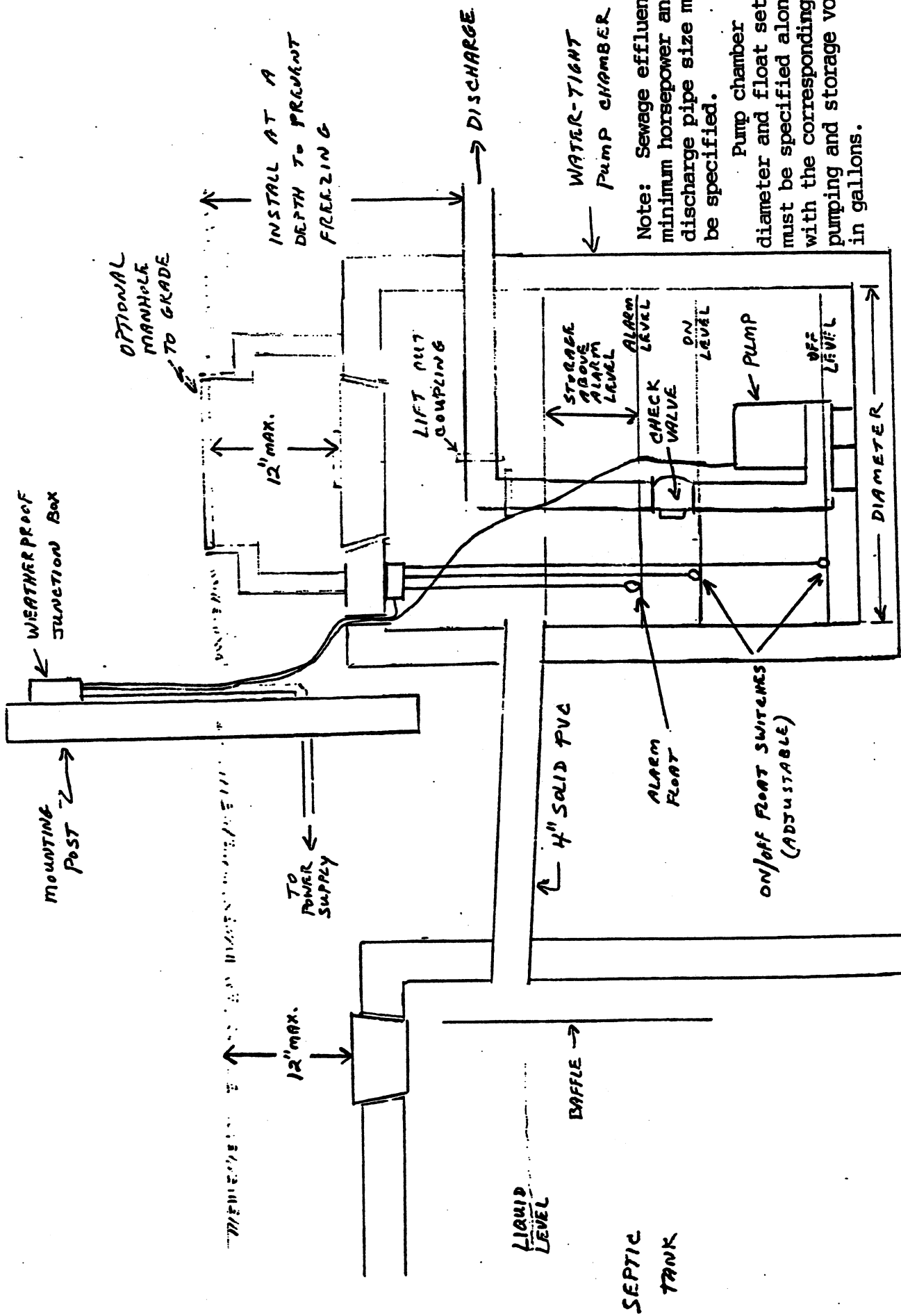
1. Bottom of all trenches shall be keyed into existing soil not more than 6 inches.
2. Usable fill shall have a percolation rate similar to but not faster than the usable soil percolation rate.
3. Trench bottoms shall be level. Trenches shall be parallel to ground contours.
4. On sloped sites, a diversion ditch shall be constructed uphill from the fill to prevent surface runoff from entering the fill.
5. Fill shall extend at least six feet beyond ends of trenches before starting 1 on 3 edges of fill.

**Typical Shallow Trench System
For a Site with 3' of Usable Soil**



1. Trench bottoms shall be level. Trenches shall be parallel to ground contours.
2. On sloped sites, a diversion ditch shall be constructed uphill from the fill to prevent surface runoff from entering the fill.
3. Fill shall extend at least six feet beyond ends of trenches before starting 1 on 3 edges of fill.

TYPICAL SEPTIC TANK EFFLUENT PUMP CHAMBER

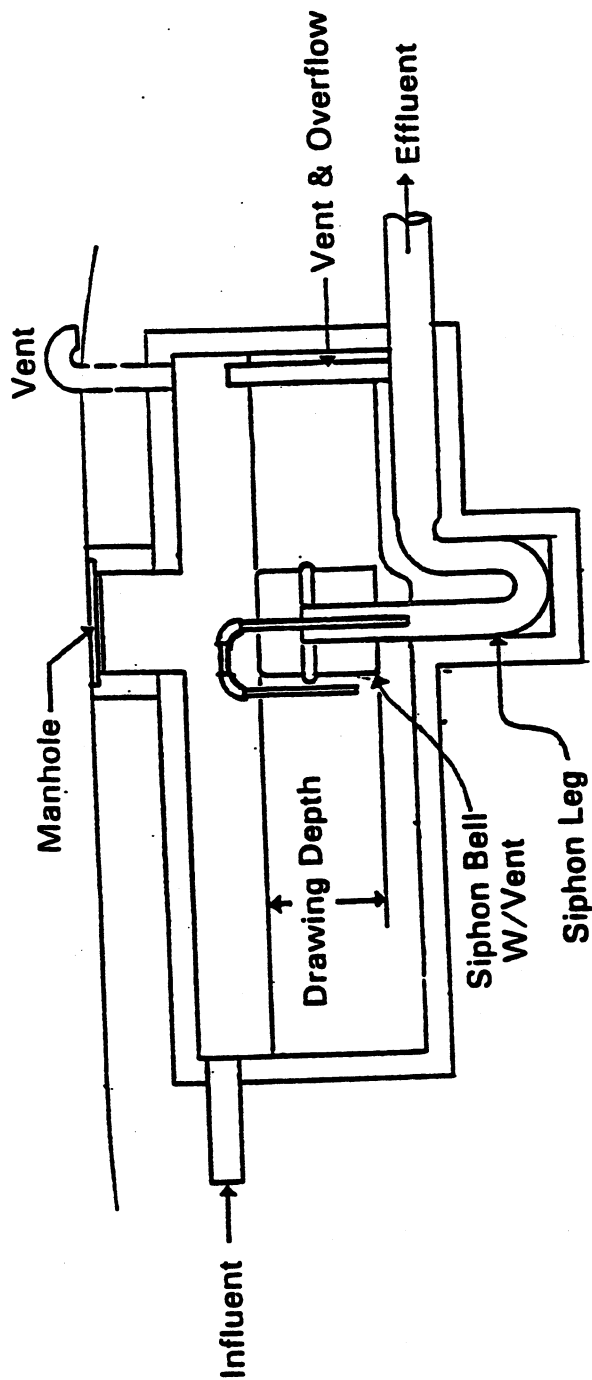


Note: Sewage effluent pump minimum horsepower and discharge pipe size must be specified.

Pump chamber diameter and float settings must be specified along with the corresponding pumping and storage volumes in gallons.

Alarm float must activate a warning light or alarm located in a visible area inside or outside of the building.

TYPICAL DOSING CHAMBER WITH SIPHON



Design Notes:

- 1) Refer to manufacturer's literature for the draw down depth for a particular model of siphon.
- 2) Based on the dosing volume needed and the siphon draw down selected determine the size of siphon chamber required.
- 3) The required siphon chamber size and siphon draw down must be specified on the plan.
- 4) It is important to note that most residential siphons require approximately 24" of elevation drop between the inlet and outlet. This factor needs to be taken into account when evaluating the elevation drop available at the site.

TABLES

SEPARATION DISTANCES FROM WASTEWATER SYSTEM COMPONENTS

<u>System Components</u>	<u>Well or Suction Line</u>	<u>To Stream, Lake Watercourse (b), or Wetland</u>	<u>Dwelling</u>	<u>Property Line</u>	<u>Drainage Ditch</u>
House Sewer (watertight joints)	25' if cast iron or PVC with O-ring joints, 50' otherwise	25'	3'	10'	—
Septic tank	50'	50'	10'	10'	10'
Effluent line to distribution box	50'	50'	10'	10'	10'
Distribution box	100'	100'	20'	10'	20'
Absorption field	100' (a)	100'	20'	10'	20'
Seepage pit	150' (a)	100'	20'	10'	20'
Dry well (roof and footing)	50'	25'	20'	10'	10'
Raised or Mound System (c)	100'(a)	100'	20'	10'	20'
Intermittent Sand Filter (c)	100'(a)	100'	20'	10'	20'
Evapotranspiration-absorption system (c)	100'(a)	50'	20'	10'	20'
Composter	50'	50'	20'	10'	10'
Sanitary Privy Pit	100'	50'	20'	10'	20'
Privy, Watertight Vault	50'	50'	20'	10'	10'

NOTES:

(a) When sewage treatment systems are located in coarse gravel or upgrade and in the general path of drainage to a well, the closest part of the treatment system shall be at least 200 feet away from the well.

(b) Mean high water mark.

(c) For all systems involving the placement of fill material, separation distances are measured from the toe of slope of the fill.

(d) Any water service line under pressure (i.e., public water supply main, household service line, well to household service line) located within ten feet of any absorption field, seepage pit or sanitary privy shall be installed inside a larger diameter water main to protect the potable water supply.

(e) Any water service line under pressure (i.e., public water supply main, household service line, well to household service line) crossing a sewer shall be installed with one full length of water main centered above the sewer so both water connecting joints are as far as possible from the sewer. Section 8.6, of the Ten States Recommended Standards for Water Works, shall be followed for separation of water mains, sanitary sewers and storm sewers.

MINIMUM SEPTIC TANK CAPACITIES

<u>Number of Bedrooms</u>	<u>Minimum Tank Capacity (Gallons)</u>	<u>Minimum Liquid Surface Area (sq. ft.)</u>
1, 2, or 3	1,000	27
4	1,250	34
5	1,500	40
6	1,750	47

NOTE: Tank size requirements for more than six bedrooms shall be calculated by adding 250 gallons and seven square feet of surface area for each additional bedroom. A garbage grinder shall be considered equivalent to an additional bedroom for determining tank size. A hot tub/spa should be considered equivalent to an additional bedroom for determining tank size.

Design Flows for Various Household Plumbing Fixtures

<u>Plumbing Fixtures</u>	<u>Design Flows</u> <u>GPD per Bedroom</u>
Standard fixtures (Prior to 1980) 3.5+ gal per flush water closets and 3.0+ gpm faucets/showerheads	150
Standard fixtures (1980-1991) 3.5 gpf max. water closets and 3.0 gpm max. faucets/showerheads	130
Water saving fixtures (post 1991) 1.6 gpf max. water closets and 3.0 gpm max. faucets/showerheads	110
Water saving fixtures (post 1991) ≤ 1.0 gpf max. water closets and 3.0 gpm max. faucets/showerheads	90
Waterless toilet (e.g., composter) and 3.0 gpm max. faucets/showerheads	75 (greywater only)

Note: The volume of existing or proposed hot tubs/spas should be added to the total design flow calculated from this table.

REQUIRED LENGTH OF ABSORPTION TRENCH (based upon 2 ft. wide trench)

Flow Rate (Gals/Day)

Percolation Rate Min./Inch	2 bedrooms		3 bedrooms			4 bedrooms			5 bedrooms			6 bedrooms			
	220	260	300	330	390	450	440	520	600	550	650	750	660	780	900
1 - 5	92	108	125	138	162	187	184	216	250	230	270	312	275	325	374
6 - 7	110	130	150	165	195	225	220	260	300	275	325	375	330	390	450
8 - 10	123	145	167	184	217	250	245	290	333	306	360	417	367	433	500
11 - 15	138	162	188	207	244	281	275	325	375	344	406	469	413	488	563
16 - 20	158	186	214	236	279	321	315	372	429	393	464	536	472	557	643
21 - 30	184	217	250	275	325	375	367	433	500	459	542	625	550	650	750
31 - 45	220	260	300	330	390	450	440	520	600	550	650	750	660	780	900
46 - 60	245	290	333	367	433	500	489	578	667	612	722	833	734	867	1000*
Dosing Not Required												Dosing or Alternate Design Required			

* Greater than 1,000 ft. of trench requires Alternate Dosing

**TABLE 3A
SITE REQUIREMENTS FOR DESIGN OF INDIVIDUAL WASTEWATER TREATMENT SYSTEMS**

METHOD OF SUBSURFACE TREATMENT	DEPTH OF PERCOLATION TEST HOLE FOR SYSTEM DESIGN (INCHES)	MINIMUM DEPTH OF IN SITU USABLE SOIL (FEET) (USABLE SOIL MEANS PERCOLATION RATE OF 1 - 60 MIN/IN UNLESS OTHERWISE STATED)	MINIMUM SEPARATION BETWEEN TRENCH BOTTOM AND GROUNDWATER, SOIL MOTTLING, BEDROCK, OR IMPERMEABLE STRATA (FEET)	PERCOLATION RATE OF SITE USABLE SOIL (MIN/INCH)	ALLOWABLE SLOPE OF SITE (PERCENT)
CONVENTIONAL SYSTEMS					
ABSORPTION FIELD SYSTEM	24 - 30	4	2	1 - 60	0 - 16
GRAVELLESS ABSORPTION SYSTEM	24 - 30	4	2	1 - 46	0 - 16
DEEP ABSORPTION TRENCHES	AT TRENCH DEPTH	4	2	1 - 60	0 - 16
SHALLOW ABSORPTION TRENCHES	AT TRENCH DEPTH (1)	2	2	1 - 60	0 - 16
CUT AND FILL SYSTEM	ONE FOOT INTO (2) IN SITU USABLE SOIL	3	2	1 - 60	0 - 16
ABSORPTION BED SYSTEM	24 - 30	4	2	1 - 30	0 - 8
SEEPAGE PITS	PIT DEPTH AND HALF OF PIT DEPTH OR AT EACH USABLE SOIL LAYER	3 FEET BELOW BOTTOM OF PIT	3 FEET BELOW BOTTOM OF PIT	1 - 60	0 - 16
ALTERNATIVE SYSTEMS					
RAISED SYSTEM	12	1	2 FEET IF DOSING DEVICE USED	1 - 60	0 - 16
MOUND	12	1	2 FEET TO GROUNDWATER 3 FEET TO BEDROCK	1 - 120	0 - 12
INTERMITTENT SAND FILTER AND DOWNSREAM MOUND	—	0	2	—	0 - 16
	6 AND 12	0.5	2.5 FEET TO GROUNDWATER 4 FEET TO BEDROCK	1 - 120 AT 8" UNLIMITED AT 12"	0 - 12

(1) A PERCOLATION TEST MUST BE CONDUCTED AT THE DEPTH OF THE BOTTOM OF THE PROPOSED TRENCHES. IF THE TRENCH BOTTOMS WILL BE BETWEEN GRADE AND SIX INCHES DEEP, CONDUCT THE TEST AT SIX INCH DEPTH.

(2) A PERCOLATION TEST MUST ALSO BE CONDUCTED 24 - 30 INCHES BELOW GRADE IN STABILIZED SOIL (IN SITU OR FILL). THE SLOWER OF THE TWO PERCOLATION RATES SHALL BE USED FOR DESIGN OF THE SYSTEM.

(3) IF NO DOSING DEVICE IS USED, A MINIMUM OF THREE FEET OF USABLE SOIL MUST BE PRESENT BENEATH THE BOTTOM OF THE TRENCHES (REQUIRES LOCAL HEALTH DEPARTMENT INSPECTION AND CERTIFICATION PROGRAM).

(4) THERE MUST BE AT LEAST TWO FEET OF NATURALLY OCCURRING SOIL ABOVE BEDROCK.

APPENDICES

Soil Percolation Test

The soil percolation test results are related to the ability of a soil to accept treated sewage.

If a shallow sewage disposal system is planned, at least two percolation tests should be performed within the area of the absorption field, and at the depth of the bottom of the trench, as previously stated.

At least two percolation tests should be made at the site of each proposed seepage pit; one at the bottom depth, and the other at half the pit depth. If different soil layers are encountered when digging the test pit, a percolation test should be performed in each layer with overall percolation rate being the weighted average of each test based upon the depth of each layer.

Where absorption fields are to be built in fill or disturbed soils, soils should be permitted to stabilize naturally before percolation tests are performed. Stabilization of loamy soils is dependent on rainfall and may require six to nine months.

The procedure noted below should be followed in performing a soil percolation test for an absorption field or seepage pit: (Take construction safety precautions.)

- a) Dig a hole with vertical sides and approximately 12 inches wide. If an absorption field is being considered, the depth of the percolation test hole should be 24 to 30 inches below the final ground surface. If a seepage pit is under consideration, percolation tests should be run at one-half the depth and at the full estimated depth of the seepage pit. In order to facilitate the running of the test and prevent cave-in, a larger excavation should be made for the upper portion of the hole with the actual percolation test hole in the bottom (Figure 3). It is necessary to place small stones in the bottom of the test hole to reduce scouring and silting action when water is poured in the hole. Scrape the sides to eliminate smearing.
- b) Presoak the test hole by periodically filling the hole with water and allowing the water to seep away. This

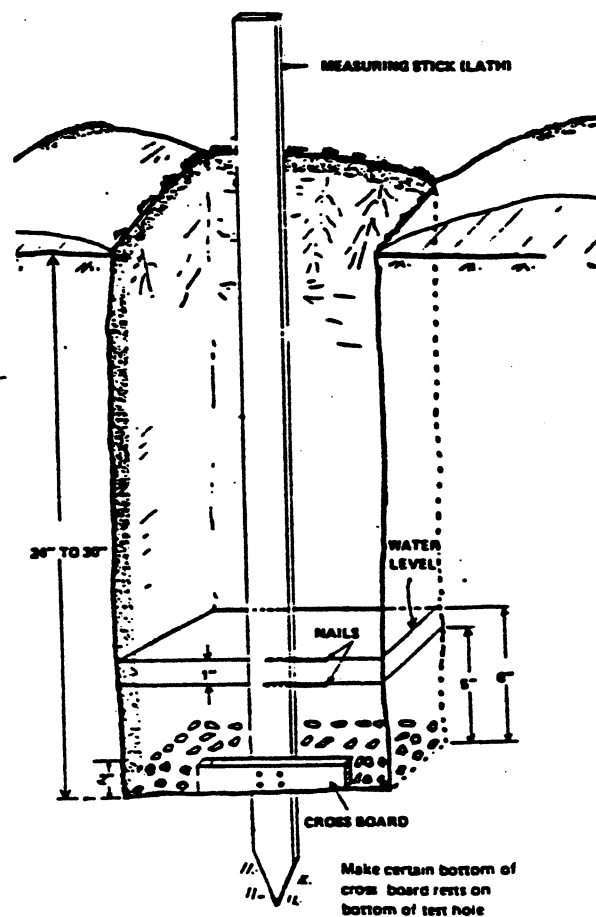
procedure should be performed for at least four hours and should begin one day before the test except for clean coarse sand and gravel. After the water has seeped away, remove any loose soil that has fallen from the sides of the hole.

- c) Pour clean water into the hole, with as little splashing as possible, to a depth of six inches.
- d) Observe and record the time in minutes required for the water to drop from six inches to five inches.
- e) Repeat the test (a minimum of three times) until the time for the water to drop one inch for two successive tests is approximately equal. The last test will then be taken as the stabilized rate of percolation and the time recorded for this test will be the design basis for determining the absorption area required for a subsurface absorption system.

For example, assume the following rates were obtained in running a test (see d above):

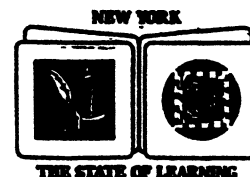
Run No.	Time (minutes)
1	24
2	26
3	30
4	30

The stabilized rate of percolation would then be taken as 30 minutes per inch.



SOIL PERCOLATION TEST

- Dig a hole about 12" wide – 24" to 30" deep.
- Scrape sides and remove loose soil from bottom.
- Place 2" of gravel or crushed stone on bottom.
- Presoak and saturate soil.
- Then count the minutes it takes for the water level to drop from 6" to 5".



THE STATE EDUCATION DEPARTMENT / THE UNIVERSITY OF THE STATE OF NEW YORK / ALBANY, N.Y. 12230

DEPUTY COMMISSIONER FOR THE PROFESSIONS

IMPORTANT NOTICE

TO ALL LICENSEES IN THE PROFESSIONS OF ARCHITECTURE, ENGINEERING, LANDSCAPE ARCHITECTURE AND LAND SURVEYING.

Section 29.3 of the Rules of the Board of Regents on Unprofessional Conduct is amended effective March 10, 1989.

The amendment addresses the circumstances under which licensed architects, engineers, landscape architects, and land surveyors may affix their seals to work not performed by the licensee or under the licensee's direct supervision.

The amendment requires licensees who adopt documents prepared by persons who are not employees under direct supervision to prepare a thorough written evaluation documenting the professional review of that work. This evaluation, as well as all preliminary and final plans, documents, computations and records prepared by licensees themselves or their employees, must be maintained for a period of not less than six years.

The amendment will facilitate the Department's identification and prosecution of instances of unlawful practice and protect consumers from the practice of "rubber stamping", or situations in which licensees stamp documents prepared by unlicensed persons without carefully evaluating the content of the work.

In adopting plans and specifications furnished by a third party, the licensee must ascertain that the person furnishing the plans has not violated the statutory restrictions on practice. The practice of professional engineering or architecture by an unlicensed or unauthorized person or corporation is prohibited by law. The professional who aids and abets such unlawful practice may be guilty of unprofessional conduct. Compliance with Section 29.3 or with other State and local ordinances does not protect an unlicensed practitioner or a licensee who aids and abets such a practitioner from prosecution for those offenses arising from unlawful practice. If, for example, an unlicensed person or corporation undertook by contract to provide architectural or engineering services to a client, in violation of the prohibitions against unlawful practice, the fact that such services were actually performed or evaluated by a licensee would not make it any less an act of unlawful practice.

The text of Section 29.3 is provided on the other side of this notice.

GENERAL PROVISIONS FOR DESIGN PROFESSIONS

(a) Unprofessional conduct shall also include, in the professions of architecture and landscape architecture, engineering and land surveying:

(1) being associated in a professional capacity with any project or practice known to the licensee to be fraudulent or dishonest in character, or not reporting knowledge of such fraudulence or dishonesty to the Education Department;

(2) failing to report in writing to the owner or to the owner's designated agent any unauthorized or improperly authorized substantial disregard by any contractor of plans or specifications for construction or fabrication, when professional observation or supervision of the work is provided for in the agreement between the owner and the design professional or when supervision of the work is under the control of the design professional;

(3) certifying by affixing the licensee's signature and seal to documents for which the professional services have not been performed by, or thoroughly reviewed by, the licensee; or failing to prepare and retain a written evaluation of the professional services represented by such documents in accordance with the following requirements:

(i) A licensee who signs and seals documents not prepared by the licensee or by an employee under the licensee's direct supervision shall prepare, and retain for a period of not less than six years, a thorough written evaluation of the professional services represented by the documents, including but not limited to drawings, specifications, reports, design calculations and references to applicable codes and standards. Such written evaluation shall clearly identify the project and the documents to which it relates, the sources of the documents and the name of the person or organization for which the written evaluation was conducted, and the date of the evaluation, and the seal and signature of the licensee shall also be affixed thereto.

(ii) Nothing in this paragraph shall be construed as authorizing the practice of a design profession in this State by persons other than those authorized to practice pursuant to the provision of Articles 145, 147 or 148 of the Education Law;

(4) Failure by a licensee to maintain for at least six years all preliminary and final plans, documents, computations, records and professional evaluations prepared by the licensee, or the licensee's employees, relating to work to which the licensee has affixed his seal and signature.

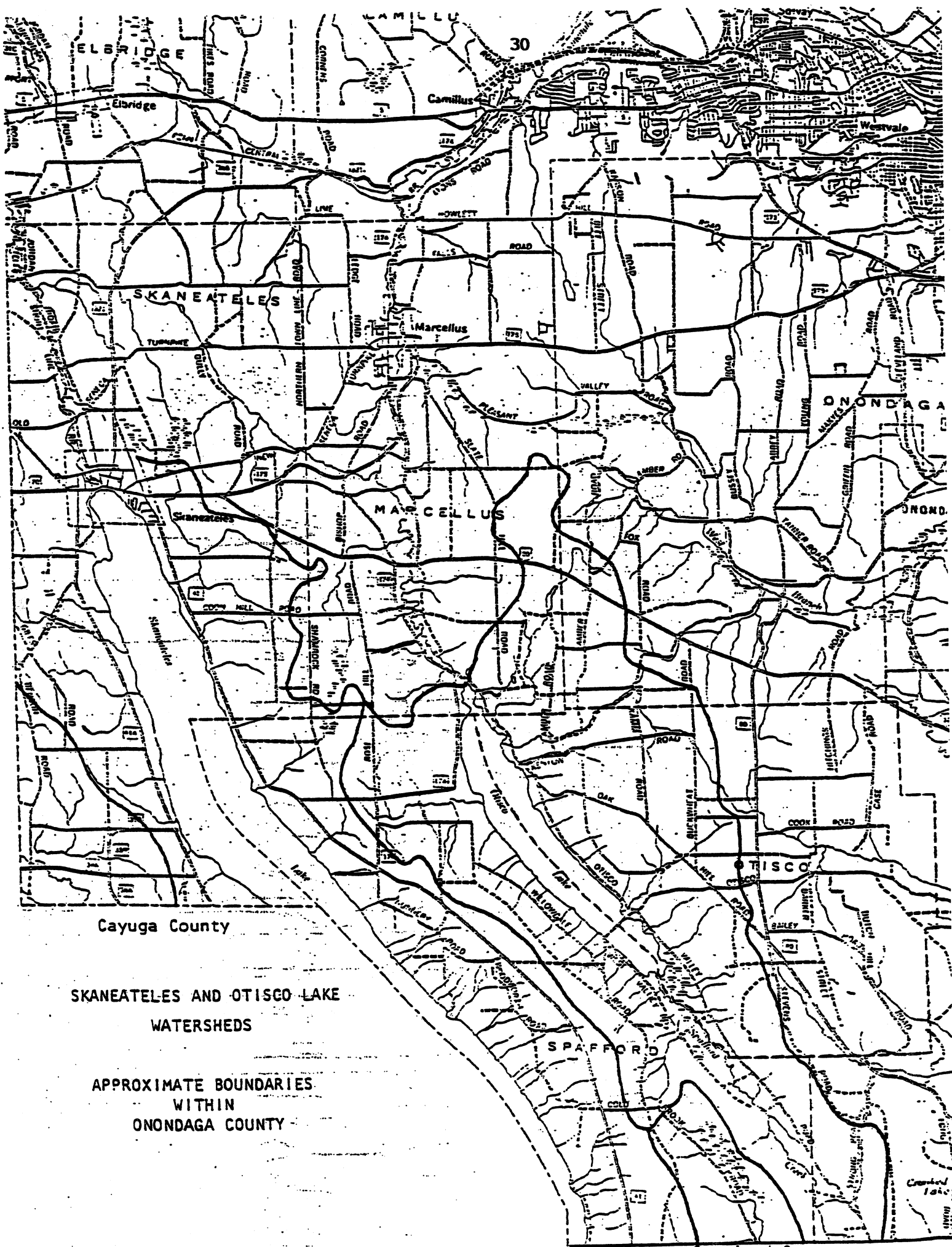
(5) have a substantial financial interest, without the knowledge and approval of the client or employer, in any product or in the bids or earnings of any contractor, manufacturer or supplier on work for which the professional has responsibility;

(6) permitting any person to share in the fees for professional services, other than: a partner, employee, associate in a professional firm or corporation, sub contractor or consultant. This prohibition shall include any arrangement or agreement whereby the amount received in payment for furnishing space, facilities, equipment, or personnel services used by a professional licensee constitute a percentage of or is otherwise dependent upon the income or receipts of the licensee from such practice. This provision shall apply in lieu of section 29.1(b)(4) of the Part;

(7) accepting any form of compensation from more than one party for services on the same project without full disclosing the circumstances and receiving approval from all interested parties; or

(8) participating as a member, advisor or employee of a government body in those actions or deliberations which pertain to services provided by the practitioner or his or her organization for such government body.

(b) Unprofessional conduct shall not be construed to include the employment, with the knowledge of the client, of qualified consultants to perform work in which the consultant has special expertise. This provision shall apply in conjunction with section 29.1(b)(9) of this Part.



Cayuga County

SKANEATELES AND OTISCO LAKE
WATERSHEDS

APPROXIMATE BOUNDARIES
WITHIN
ONONDAGA COUNTY

Approx. Scale 1 Inch = 2 Miles

Cortland County

**ONONDAGA COUNTY DEPARTMENT OF HEALTH
APPLICATION FOR
PERMIT TO CONSTRUCT A WASTE DISPOSAL SYSTEM**

(Becomes A Permit When Signed By Permit Issuing Official)

Note: This permit is only required for any project located within the Skaneateles or Otisco Lake Watershed

Name of Applicant (Owner)	Location of Works (City, Village, Town)	County		
Entity or Area Served	Type of Ownership <input type="checkbox"/> Private <input type="checkbox"/> Commercial <input type="checkbox"/> Other	Type of Water Supply		
Nature of Construction <input type="checkbox"/> New <input type="checkbox"/> Addition or Alteration				
Degree of Treatment <input type="checkbox"/> Septic Tank <input type="checkbox"/> Other	Design Flow _____ Gallons per day			
Point of Discharge Location (City, Village, Town) _____ Name of Watercourse to which ground water is tributary _____				
Plans Prepared by: _____ N.Y. License No. _____				
Address _____ Telephone No. _____				
This form must be signed by the applicant unless accompanied by a letter of authorization.				
Signature of Applicant _____				
Mailing Address _____				
Date of Application _____ Telephone No. _____				
By initiating construction of the approved works, the permittee accepts and agrees to abide by and conform with the following:				
1) THAT the construction permit shall be maintained on file by the permittee. 2) THAT the permit is revocable or subject to modification or change pursuant to Article V of the Onondaga County Sanitary Code. 3) THAT the facilities shall be fully constructed and completed in compliance with the engineering report, plans, and specifications as approved. 4) THAT the facilities shall not be placed in operation until construction has been completed and inspected by the Department representative and authorization allowing use issued.				
ISSUED FOR THE COUNTY COMMISSIONER OF HEALTH		EFFECTIVE DATE _____		
<table border="1" style="width:100%; height: 40px;"> <tr> <td style="width:70%;"></td> <td style="width:30%; text-align: center;">Date</td> </tr> </table>		Date	EXPIRATION DATE _____	
	Date			
		ATTACHMENTS _____		
Director, Division of Environmental Health Onondaga County Health Department				