County of Santa Cruz

HEALTH SERVICES AGENCY

701 OCEAN STREET, ROOM 312, SANTA CRUZ, CA 95060-4073

(831) 454-2022 FAX: (831) 454-3128 TDD: (831) 454-2123

ENVIRONMENTAL HEALTH **www.co.santa-cruz.ca.us/eh/ehhome.htm**

ONSITE WASTEWATER TREATMENT AND DISPOSAL REGULATIONS

CHAMBER LEACHING SYSTEMS REGULATIONS

INTRODUCTION

These regulations have been developed and promulgated pursuant to Section 7.38.150(B) of the County Code. This section of the County Code directs the Health Officer to develop regulations and standards for the use of chamber leaching systems. The following regulations shall be used for the sizing, installation and inspection of chamber leaching systems, only. All other aspects of onsite wastewater treatment and disposal shall be regulated as provided by Chapter 7.38 of the County Code.

BACKGROUND

The leaching of septic tank effluent into the ground in Santa Cruz County has historically been primarily accomplished by the use of rock filled trenches. The rock in the trenches does not aid in the treatment of septic effluent, but rather serves to support the distribution pipe and the soil excavation, and provides velocity reduction. Chambered leachfields have been in use in the United States and other countries for twenty-five years. Chambered leachfields made of light weight, synthetic materials have installation advantages for sites where equipment access is difficult. The Santa Cruz County Board of Supervisors approved an amendment to Chapter 7.38 of the County Code effective in 1997 which provides for the use of chamber leaching in the county.

REVIEW OF PROPRIETARY LEACHING CHAMBERS AND APPROVAL FOR USE

Chamber leaching devices are proprietary products that are engineered to provide for the disposal of septic tank effluent. Since each product may have different design aspects that may affect the infiltration of effluent into the ground, the manufacturers of each product must provide a product package for the review of the Health Officer that supports the use of their product. The package must contain the following documentation: 1) Studies conducted by agencies not associated with the manufacturer regarding the use of the product as a leaching device. 2) Acceptance or approval letters by other regulator agencies. 3) Review or approval documents from recognized standards and testing organizations, such as International Association of Plumbing and Mechanical Officials, Underwriters Laboratories, Uniform Plumbing Code, etc. 4) Recommended sizing and installation standards.

The Health Officer shall evaluate the package regarding the quality of the studies conducted, the quality and quantity of the agencies and organizations that permit and/or endorse the product, and shall evaluate the manufacturer's recommended sizing and installation standards for appropriateness in Santa Cruz County. The Health Officer shall prepare a report before approving specific chamber leaching products in Santa Cruz and may revise and approve sizing and installation criteria, if appropriate. If the product is approved for use, the report must

adopt sizing requirements based on soil characteristics, soil percolation rates, installation requirements, and construction inspection points. Reports approving specific chamber leaching devices shall be appended to these regulations in a cumulative manner.

All reports, sizing tables, etc., on proprietary products shall contain the following language: THE COUNTY OF SANTA CRUZ, HEALTH SERVICES AGENCY, ENVIRONMENTAL HEALTH SERVICE DOES NOT ENDORSE, RECOMMEND OR GUARANTEE THE USE AND EFFICACY OF ANY PROPRIETARY PRODUCTS.

CHAMBER LEACHING REGULATIONS
APPENDIX A
REPORT ON INFILTRATOR SYSTEMS, INC.
CHAMBER LEACHING SYSTEMS
MAY, 1999 Revised JANUARY, 2008

INTRODUCTION

This report is prepared pursuant to the Chamber Leaching Regulations adopted by the Health Officer as directed by Section 7.38.150(B)1 of the County Code and has been promulgated according to Chapter 7.38.300 of County Code. The following presents an analysis of the Infiltrator Systems, Inc. products submitted for approval for use in Santa Cruz County. The sizing, installation and inspection of these products are addressed.

APPROVAL FOR USE IN SANTA CRUZ COUNTY

A product package has been prepared and submitted by Infiltrator System. The package contains studies conducted by researchers at the University of Wisconsin, the Water Authority of Western Australia, the City of Amarillo, and numerous other independent research reports that support the use of Infiltrator products. The Uniform Plumbing Code recognizes the use of plastic chamber leaching devices. Infiltrator products are approved in 15 states and 24 counties in California. After evaluating the package prepared by Infiltrator Systems, Inc., leaching chambers models: Quick4 High Capacity, Quick4 Standard, Quick4 Equalizer 36 and Quick4 Equalizer 24 are hereby approved for use in Santa Cruz County with the conditions noted in this report and on the attached table. A permit must be obtained from the County Environmental Health Service for their installation as wastewater leaching devices. Model H-20 Infiltrator products were approved in May, 1999, for use in driveways and parking lots.

SIZING

Attached to this report is a sizing chart approved for the use of four models of Infiltrator leaching chambers. This chart represents the sizing recommended by the Manufacturer with the exception that a 6-15 Minute Per Inch (MPI) soil sizing range was combined with the 16-30 MPI range to match County percolation rate ranges. Thus, the County sizing criteria for 6-30 MPI soils are more conservative for the soils in the 6-15 MPI range. The application rates from the US EPA Design Manual for Onsite Wastewater Treatment and Disposal Systems (EPA 625/1-80-012, table 7-2, p.214) provided the basis for sizing of Infiltrator chambered systems submitted by the manufacturer. A peak flow of 150 gallons per day per bedroom was used as estimated residential flows, which is more conservative than current design flows for rock filled trenches in Santa Cruz.

A comparison of conventional rock filled trenches to Infiltrator chamber leachfields indicates that the amount of disposal area required is approximately equal for two parallel trenches. The conventional, rock filled leach field requirements for a three-bedroom house with 6-30 MPI soils would require a total of 138 lineal feet of trench that has a 2 ½ feet of rock in an 18 inches wide trench. The two parallel rock filled trenches would require approximately 552 square feet of ground surface disposal area. Use of the Infiltrator Quick4 High Capacity model for the same parcel would require 125 lineal feet of chambers (32 chambers at 4.0 lineal feet/chamber). The Infiltrator system would require approximately 558 square feet of ground surface disposal area.

County Code permits a 50% reduction of leaching requirements where there is an approved pretreatment device such as a sand filter or approved proprietary treatment unit prior to the leaching device. This reduction factor shall also apply to Infiltrator chamber models approved in this report.

For commercial installation, only the Infiltrator Quick4 High Capacity model will be permitted. Similarly to rock filled trenches, commercial systems will be designed based on the peak daily flow. The sizing chart indicates the peak gallons per day per chamber for the different soil percolation rates.

INSTALLATION

All setbacks and maximum trench depth requirements specified in Chapter 7.38 shall apply to the installation and siting of all chamber leaching devices. Trenches for the Quick4 High Capacity and Quick4 Standard Models shall be placed at least 3 feet edge to edge and the Quick4 Equalizer 36 and Quick4 Equalizer 24 shall be at least 2 feet edge to edge. The manufacturer's installation procedures appear appropriate. The installer shall read and follow the manufacturer's installation instructions. See the attached Infiltrator, Inc. installation procedures for the H-20 rated models in driveways and parking lots. Inspection risers shall be provided at the end of each trench. Traffic rated riser boxes with cast iron grade rings and lids are required for inspection risers in driveways or parking lots.

INSPECTIONS

The installer shall demonstrate to the inspector that trenches are level and prepared (scarified) according to the manufacturer's instructions. Representative sections of each trench shall be left open until inspected.

CHAMBER LEACHING REGULATIONS

INFILTRATOR SYSTEMS, INC. CHAMBER LEACHING SIZING REQUIREMENTS

30% discount included in chart for fast and medium perc rates
(Total Linear Feet of Trench/Number of Chambers/sqfeet)

MODEL	1-5 MPI	6-30 MPI	31-60 MPI	
Quick4 HIGH CAPACITY	**3 FEET SPACING BETWEEN TRENCHES**			
1 Bedroom	72/18/500	88/22/600	140/35/900	
2 Bedrooms	92/23/625	108/27/750	172/43/1125	
3 Bedrooms	108/27/750	132/33/900	208/52/1350	
4 Bedrooms	128/32/875	152/38/1050	240/60/1575	
Additional Bedrooms	20/5/125	24/6/150	32/8/225	
Peak GPD/Chamber	11.868	9.936	6.624	

Gopher barrier required on chambers unless waived by EHS

If infiltrators are installed deeper than 4 foot total trench depth, 30% discount is not applicable

Draft 1/11/12 dr

UNDER-PAVEMENT/ DRIVEWAY LEACHING BED INSTALLATION INSTRUCTIONS FOR USE WITH H-20 INFILTRATOR CHAMBERS

1. **EXCAVATE** a level leaching bed to a depth of 2" below planned bottom grade.

2. **SPREAD 3"** of coarse sand or bank run gravel over the entire bed bottom. Bank run gravel should have maximum 10% small cobbles, no more than 5% passing #200 sieve.

3. **COMPACT** coarse sand or bank run gravel to 2" thickness using a plate compactor.

4. **RAKE** sidewalls of excavation bed to ensure unsmeared infiltrative surface.

5. **SCREW** splash plate on bottom of open end plate.

6. **SCREW** open end plate into inlet end of first infiltrator chamber with splash plate.

7. **PLACE** first chamber in the inlet end of the bed with interlocks downstream.

8. **RUN** distribution pipe through inlet opening into open end plate, but not beyond restrictive lip on chamber. Pipe does not normally run the length of the bed.

9. **CONNECT** infiltrator chambers fully engaging interlocks to form desired bed length. Screw joints together using two 1 1/2" to 2" drywall screws per joint.

10. **SCREW** closed end plate in downstream end of last unit.

11. **FILL** sidewall area around perimeter and between chamber rows with native soil material or specified fill to the top of louvers and "walk" into place to attain sidewall support. Ladle fill into place from the side of bed using an excavator or backhoe. Do not load the chambers with vehicular weight.

12. **CONTINUE** filling with soil to a height 6" above the tops of chambers. Compact with a vibratory plate or walk-behind vibratory roller. Apply additional fill in 6" lifts to a minimum of 18" above the top of chambers (excluding pavement). Compact lifts with roller having maximum dynamic force of 20,000 lbs. Use a light tracked machine, maintaining at least 6" of material between the tracks and the tops of chambers at all times. Do not use wheeled vehicles on the bed during construction.

13. **INSTALL** geogrid (Tensar BX 1100 or Mirafi MX 1 or equivalent) between pavement subbase and compacted soil.

14. **PREPARE** sub-base and pave. Avoid sudden starts and stops and sharp turns with heavy equipment.

NOTE: **Under-pavement leaching beds may need special treatment to ensure proper aeration. Oxygen supplies are inversely related to system depth, soil density and BOD concentration. Treatment may include ventillation, effluent pretreatment and alternate chamber row loading**.

CHAMBER LEACHING REGULATIONS
APPENDIX B
REPORT ON CULTEC, INC.
CHAMBER LEACHING SYSTEMS
MAY, 1999

INTRODUCTION

This report is prepared pursuant to the Chamber Leaching Regulations adopted by the Health Officer as directed by Section 7.38.150(B)1 of the County Code and has been promulgated according to Chapter 7.38.300 of County Code. The following presents an analysis of the Cultec, Inc. products submitted for approval for use in Santa Cruz County. The sizing, installation and inspection of these products are addressed.

APPROVAL FOR USE IN SANTA CRUZ COUNTY

A product package has been prepared and submitted by Cultec, Inc. The package cites studies conducted by the Environmental Science and Technology Alliance of Canada and the Nicholas County (WV) Health Department that support the use of Cultec. The Uniform Plumbing Code recognizes the use of plastic chamber leaching devices. Cultec products are approved in 20 states and 3 Canadian Provinces. After evaluating the package prepared by Cultec, Inc., leaching chambers models: Field Drain Panel, EZ 24, Contactor 75, Contactor 100, Contactor 125, Recharger 180, Recharger 330, Recharger 400 are hereby approved for use in Santa Cruz County with the conditions noted in this report and on the attached table. A permit must be obtained from the County Environmental Health Service for their installation as wastewater leaching devices.

SIZING

Attached to this report is a sizing chart approved for the use of eight models of Cultec leaching chambers. This chart represents the sizing recommended by the Manufacturer with the exception that a 6-15 Minute Per Inch (MPI) soil sizing range was combined with the 16-30 MPI range to match County percolation rate ranges. Thus, the County sizing criteria for 6-30 MPI soils are more conservative for the soils in the 6-15 MPI range. The application rates from the US EPA Design Manual for Onsite Wastewater Treatment and Disposal Systems (EPA 625/1-80-012, table 7-2, p.214, October, 1984) provided the basis for sizing of Cultec chambered systems submitted by the manufacturer. Conventional residential flows were used for loading and residential strength waste is assumed.

A comparison of conventional rock filled trenches to Cultec chamber leachfields indicates that the amount of disposal area required is approximately equal or slightly greater using Cultec chambers for two parallel trenches. The conventional, rock filled leach field requirements for a three-bedroom house with 6-30 MPI soils would require a total of 138 lineal feet of trench that has a 2 ½ feet of rock in an 18 inches wide trench. The two parallel rock filled trenches would require approximately 552 square feet of ground surface disposal area. Use of the Cultec Contactor 125 model for the same parcel would require 151 lineal feet of chambers (20 chambers at 6.3 lineal feet/chamber). The Cultec system would require approximately 604 square feet of ground surface disposal area for two parallel trenches.

County Code permits a 50% reduction of leaching requirements where there is an approved pretreatment device such as a sand filter or approved proprietary treatment unit prior to the leaching device. This reduction factor shall also apply to Cultec chamber models approved in this report.

Similar to rock filled trenches, commercial systems will be designed based on the peak daily flow. The sizing chart indicates the peak gallons per day per chamber for the different soil percolation rates. Pretreatment may be required for high strength commercial wastewater.

INSTALLATION

All setbacks and maximum trench depth requirements specified in Chapter 7.38 shall apply to the installation and siting of all chamber leaching devices. Cultec Chambers are manufactured to accommodate two load ratings, H-10 and H-20. Only H-20 rated chambers are approved in areas subject to traffic. The manufacturer's installation procedures appear appropriate. The installer shall read and follow the manufacturer's installation instructions. Inspection risers shall be provided at the end of each trench. Filter fabric that complies with the Cultec specifications is required to be installed over the chambers prior to backfill.

INSPECTIONS

The installer shall demonstrate to the inspector that trenches are level and prepared (scarified) according to the manufacturer's instructions. Representative sections of each trench shall be left open until inspected. The filter fabric required by the manufacturer shall be used in all installations and made available for inspection.

CHAMBER LEACHING REGULATIONS
CULTEC, INC. CHAMBER LEACHING REQUIREMENTS
(Total Linear Feet of Trench/Number of Chambers)

MODEL	1-5 MPI	6-30 MPI	31-60 MPI	60-120 MPI
FIELD DRAIN PANEL	**3 FEET SPACING BETWEEN TRENCHES**			
1 Bedroom	57/7	57/7	57/7	161/20
2 Bedrooms	57/7	81/10	113/14	321/40
3 Bedrooms	81/10	121/15	161/20	481/60
4 Bedrooms	115/13	161/20	217/27	641/80
Additional Bedrooms	25/3	41/5	57/7	161/20
Peak GPD/Chamber	50	18.5	15	6.5
EZ 24	**2 FEET SPACING BETWEEN TRENCHES**			
1 Bedroom	89/11	89/11	89/11	273/34
2 Bedrooms	89/11	137/17	184/23	545/68
3 Bedrooms	137/17	209/26	273/34	817/102
4 Bedrooms	185/23	273/34	360/45	1089/136
Additional Bedrooms	49/6	72/9	89/11	273/34
Peak GPD/Chamber	20	8.5	6.8	3
CONTACTOR 75	**3 FEET SPACING BETWEEN TRENCHES**			
1 Bedroom	70/11	70/11	70/11	207/33
2 Bedrooms	70/11	105/16	139/22	424/65
3 Bedrooms	105/16	157/25	207/33	638/98
4 Bedrooms	139/22	207/33	276/44	814/130
Additional Bedrooms	40/6	53/8	70/11	207/33
Peak GPD/Chamber	30	12	9.6	4.2

MODEL	1-5 MPI	6-30 MPI	31-60 MPI	60-120 MPI
CONTACTOR 100	**3 FEET SPACING BETWEEN TRENCHES**			
1 Bedroom	58/9	58/9	58/9	170/26
2 Bedrooms	58/9	84/13	112/17	339/52
3 Bedrooms	84/13	126/20	170/26	489/78
4 Bedrooms	112/17	170/26	229/35	658/105
Additional Bedrooms	27/4	47/7	60/9	170/26
Peak GPD/Chamber	40	20	16	7
CONTACTOR 125	**3 FEET SPACING BETWEEN TRENCHES**			
1 Bedroom	58/9	58/9	58/9	151/24
2 Bedrooms	58/9	76/12	101/16	299/47
3 Bedrooms	76/12	113/18	151/24	463/71
4 Bedrooms	101/16	151/24	209/32	589/94
Additional Bedrooms	26/4	39/6	51/8	151/24
Peak GPD/Chamber	40	20	16	7
RECHARGER 180	**3 FEET SPACING BETWEEN TRENCHES**			
1 Bedroom	64/10	64/10	64/10	122/19
2 Bedrooms	64/10	64/10	83/13	248/38
3 Bedrooms	64/10	89/14	122/19	378/58
4 Bedrooms	83/13	122/19	166/26	489/77
Additional Bedrooms	27/4	33/5	39/6	122/19
Peak GPD/Chamber	60	29	23	10
RECHARGER 330	**4 FEET SPACING BETWEEN TRENCHES**			
1 Bedroom	39/6	39/6	39/6	83/13
2 Bedrooms	39/6	39/6	52/8	164/25
3 Bedrooms	39/6	57/9	83/13	248/38
4 Bedrooms	51/8	83/13	108/17	314/50
Additional Bedrooms	14/2	20/3	27/4	83/13
Peak GPD/Chamber	200	67	53	23

MODEL	1-5 MPI	6-30 MPI	31-60 MPI	60-120 MPI
RECHARGER 400	**4 FEET SPACING BETWEEN TRENCHES**			
1 Bedroom	39/6	39/6	39/6	64/11
2 Bedrooms	39/6	39/6	51/8	145/22
3 Bedrooms	39/6	51/8	69/11	208/33
4 Bedrooms	51/8	69/11	94/15	273/44
Additional Bedrooms	14/2	20/3	26/4	64/11
Peak GPD/Chamber	200	68	54	24

Minimum System Size

Field Drain Panel - 7 chambers, EZ 24 Chambers - 11 chambers
Contactor 75 - 11 chambers, Contactor 100 - 9 chambers, Contactor 125 - 9 chambers
Recharger 180 - 10 chambers, Recharger 330 - 6 chambers, Recharger 400 - 6 chambers

- Filter fabric that meets Cultec specifications is required to cover all chambers prior to backfill.

- H-20 models only, shall be installed in driveways and parking lots for repair/upgrades.

- This sizing chart is for domestic strength septic tank effluent.

- All of the above sizing criteria may be halved when enhanced treatment of septic tank effluent is provided according to the Environmental Health Service Enhanced Treatment Regulations.

- Permits are required for installation of chambers for leach fields.

- Follow Cultec, Inc. Installation Procedures.

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