



Building and Safety Division - Public Information

County of Ventura • Resource Management Agency • http://www.ventura.org/build_safe

Main Office • 800 S. Victoria Ave, Ventura, CA. 93009 • 805-654-2771

East County Office • 3855-F Alamo St., 2nd Fl. # 2019A, Simi Valley, CA 93065 • 805-582-8064

GRAYWATER SYSTEMS FOR RESIDENTIAL BUILDINGS

A. GRAYWATER SYSTEMS

Under the State regulations, graywater is defined as untreated wastewater that has not been contaminated by toilet waste or unhealthy bodily wastes. Graywater includes wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines, and laundry tubs, but does not include wastewater from kitchen sinks or dishwashers.

A graywater system uses graywater for subsurface irrigation and may include tanks, valves, filters, pumps, or other appurtenances along with piping and receiving landscape. Graywater shall not be used in spray irrigation, allowed to pond or runoff, allowed to be discharged directly into or reach any storm water system or any surface body of water, and shall not be used to irrigate root crops or edible parts off food crops that touch the soil.

On-site treated non-potable graywater systems meeting Chapter 16 of the Plumbing Code are permitted to supply water closets, urinals, trap primers for floor drains and floor sinks, above the belowground irrigation.

B. PERMIT REQUIREMENT

A plumbing permit is required to be obtained from the County of Ventura Building and Safety Division prior to the erection, construction, reconstruction, installation, relocation or alteration of any graywater system. A Plumbing and Mechanical Plan Review will require the following in order to approve the plans and issue a permit for a graywater system:

1. A set of plans and specifications showing the graywater system. The graywater system shall be designed in accordance with the requirements in Chapter 16 of the 2013 California Plumbing Code.

Exception: For simple residential system meeting all of the following conditions, a completed Graywater standard plan issued by Ventura County Building and Safety Division (attached) is acceptable

- a. Simple Systems: Graywater discharge is 250 gallons or less per day (CPC 1602.1.2).
- b. Gravity Systems: Systems that do not include pumps to distribute graywater.
- c. Stand Alone: Your system is not connected to any source of potable water or other irrigation systems.
- d. No Storage: Graywater is discharged into the irrigation field immediately without being stored.

C. EXEMPTION FROM PERMIT

A permit is not required from the Building and Safety Division for a graywater system in a one or two-family dwelling that is supplied by only a clothes-washer system provided the system does not require cutting of the existing plumbing piping and provided the requirements of the GW1 Handout are met.

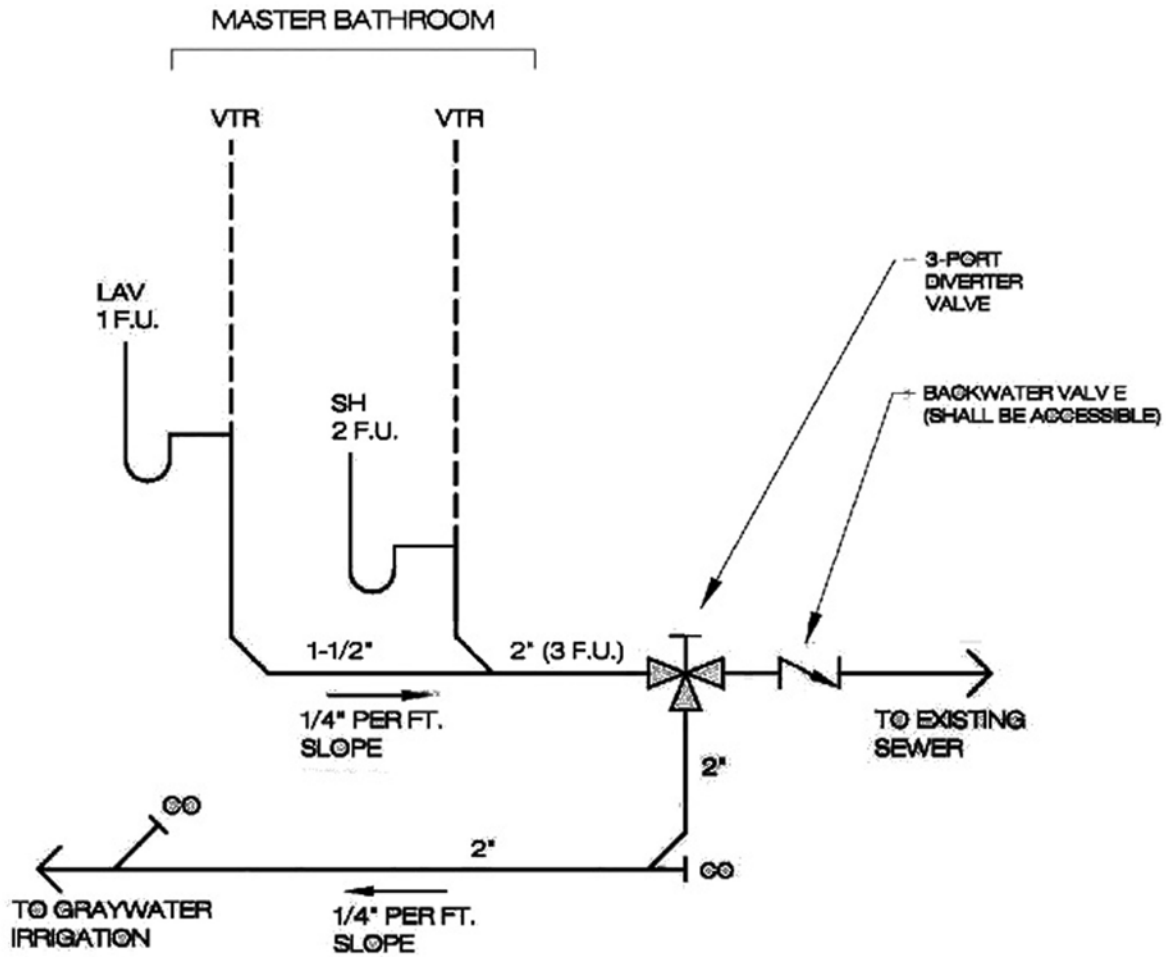
DIVISION OF BUILDING AND SAFETY COUNTY OF VENTURA  BUILDING OFFICIAL _____ Jim MacDonald, CBO	B & S STD	GW-2 SHEET 1 OF 6
	EFFECTIVE: January 1, 2015	

GRAYWATER STANDARD PLAN For Simple Residential Systems

Figure 1: Sample Piping Riser Diagram for Gray Water Systems
(For Reference Only)

ABBREVIATIONS

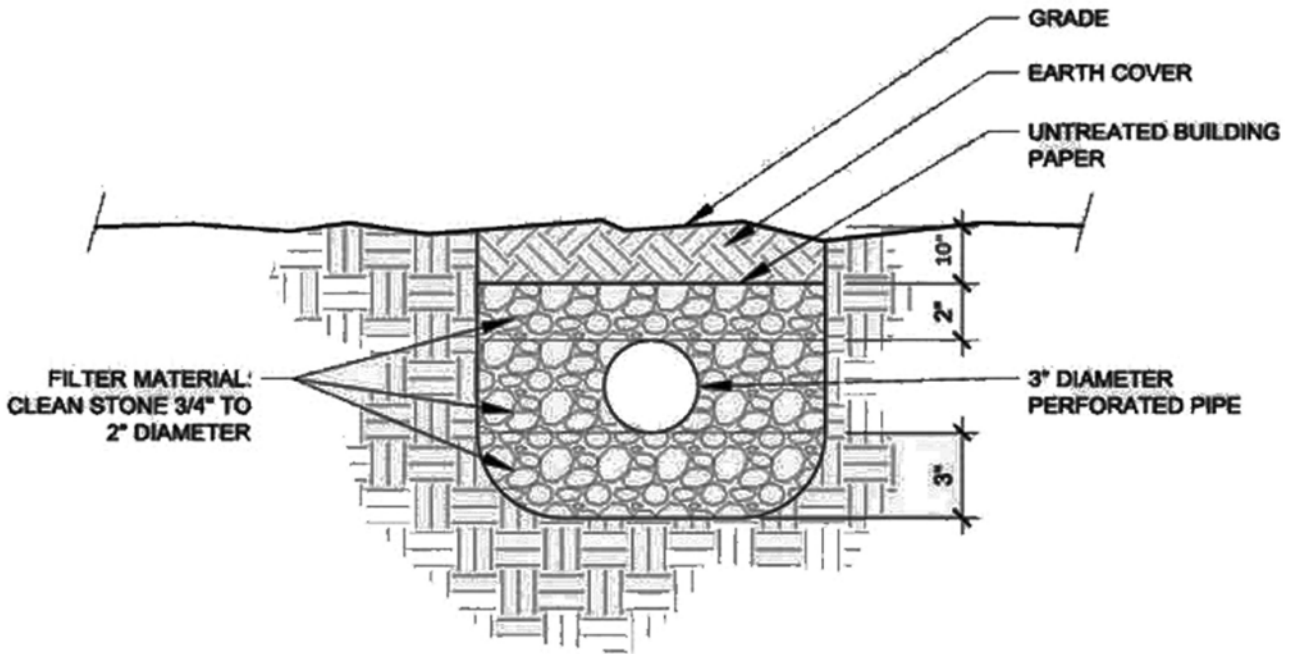
BT	BATHTUB
CO	CLEANOUT
F.U.	FIXTURE UNITS
KS	KITCHEN SINK
LAV	LAVATORY (BATHROOM SINK)
SH	SHOWER
VTR	VENT THROUGH ROOF
WC	WATER CLOSET (TOILET)
WM	WASHING MACHINE



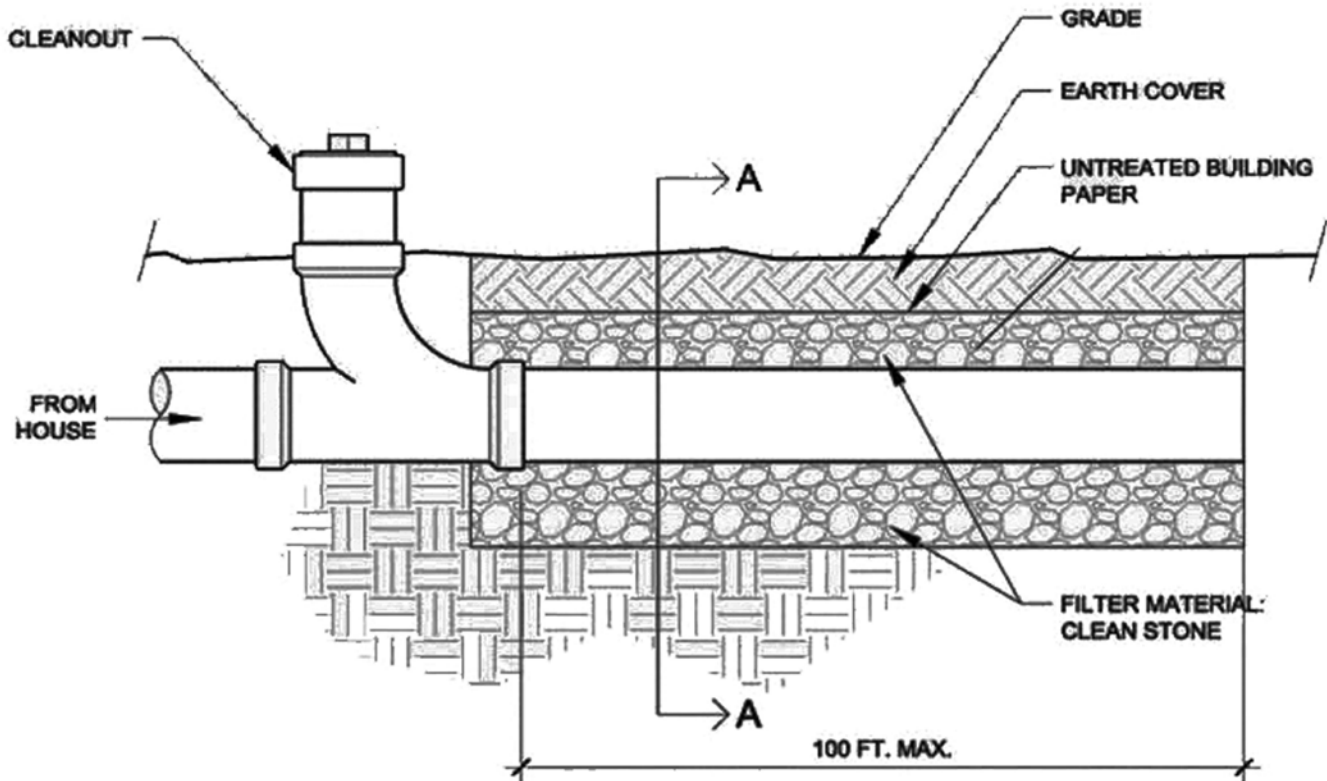
GRAYWATER STANDARD PLAN For Simple Residential Systems

GRAYWATER STANDARD PLAN
For Simple Residential Systems

Detail 1: Typical Detail for Disposal Field Piping



SECTION A-A



**GRAYWATER STANDARD PLAN
For Simple Residential Systems**

Detail 2: Typical Detail for Irrigation Field

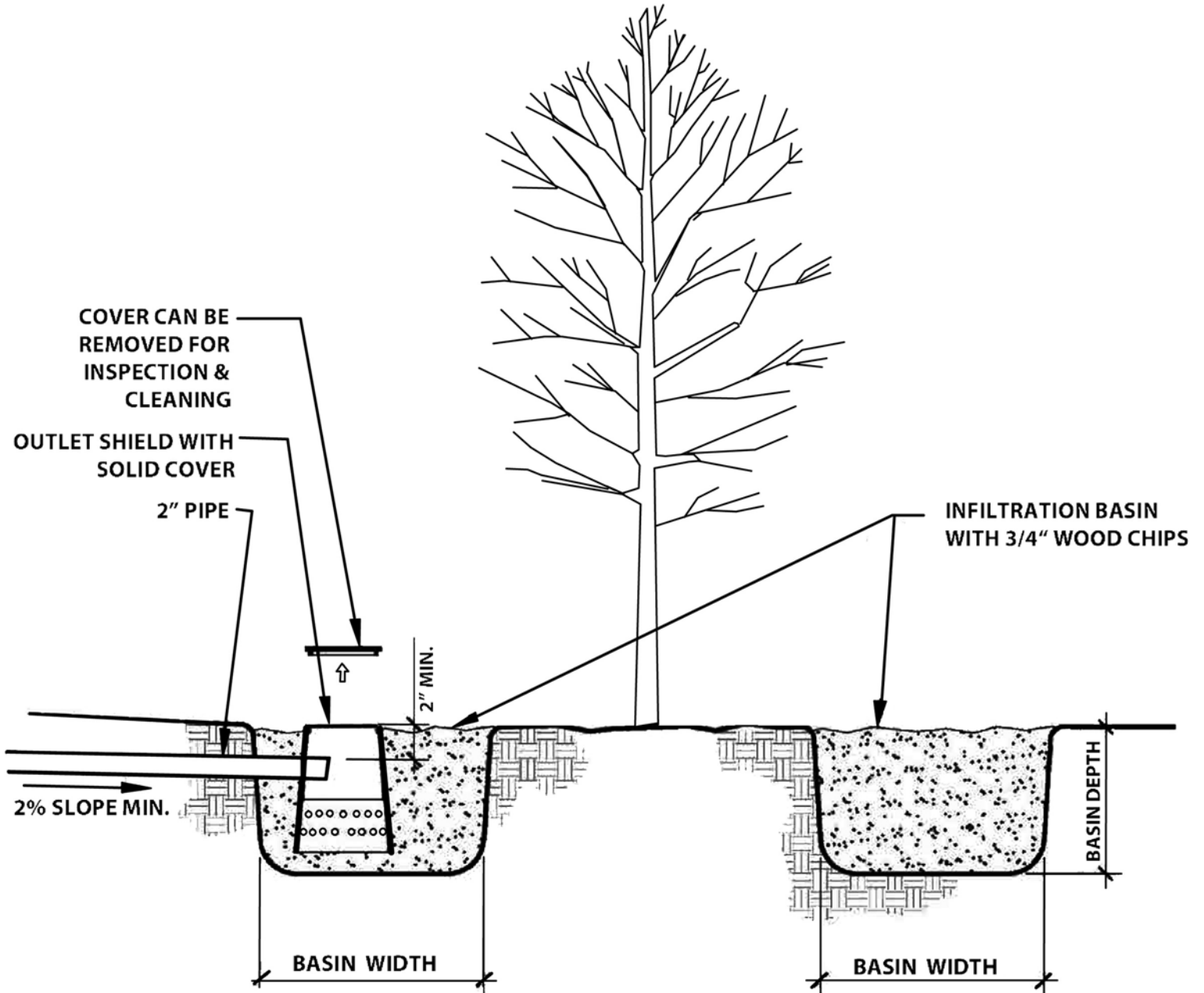


Table 1602.10 (2013 California Plumbing Code)

Soil Type (Column 1)	Maximum absorption capacity in gallons per square foot of irrigation area per day (Column 2)
Coarse sand or gravel	5.0
Fine sand	4.0
Sandy loam	2.5
Sandy clay	1.7
Clay with considerable sand or gravel	1.1
Clay with small amounts of sand or gravel	0.8

Table 703.2 (2013 California Plumbing Code)
MAXIMUM UNIT LOADING AND MAXIMUM LENGTH OF DRAINAGE AND VENT PIPING

SIZE OF PIPE, inches (mm)	1 ¼ (32)	1 ½ (40)	2 (50)	2 ½ (65)	3 (80)	4 (100)	5 (125)	6 (150)	8 (200)	10 (250)	12 (300)
Maximum Units											
Drainage piping	1	2 ²	16 ³	32 ³	48 ⁴	256	600	1380	3600	5600	8400
Vertical	1	1	8 ³	14 ³	35 ⁴	216 ⁵	428 ⁵	720 ⁵	2640 ⁵	4680 ⁵	8200 ⁵
Horizontal											
Maximum Length											
Drainage Piping	45	65	85	148	212	300	390	510	750		
Vertical, feet (m)	(14)	(20)	(26)	(45)	(65)	(91)	(119)	(155)	(228)		
Horizontal (unlimited)											
Vent Piping											
Horizontal and Vertical	1	8 ³	24	48	84	256	600	1380	3600		
Maximum Units	45	60	120	180	212	300	390	510	750		
Maximum Lengths, ft. (m)	(14)	(14)	(14)	(14)	(14)	(14)	(14)	(14)	(14)		

1 Excluding trap arm.

2 Except sinks, urinals, and dishwashers - exceeding one (1) fixture unit.

3 Except six-unit traps or water closets.

4 Only four (4) water closets or six-unit traps allowed on any vertical pipe or stack; and not to exceed three (3) water closets or six-unit traps on any horizontal branch or drain.

5 Based on one-fourth (1/4) inch per foot (20.8 mm/m) slope. For one-eighth (1/8) inch per foot (10.4 mm/m) slope, multiply horizontal fixture units by a factor of eight-tenths (0.8).

Note: The diameter of an individual vent shall be not less than one and one-fourth (1 1/4) inches (32 mm) nor less than one-half (1/2) the diameter of the drain to which it is connected. Fixture unit load values for drainage and vent piping shall be computed from Tables 702.1 and 702.2(b). Not to exceed one-third (1/3) of the total permitted length of any vent may be installed in a horizontal position. When vents are increased one (1) pipe size for their entire length, the maximum length limitations specified in this table do not apply. This table complies with the requirements of Section 901.2.

**TABLE 1602.4
LOCATION OF GRAY WATER SYSTEM**

MINIMUM HORIZONTAL DISTANCE IN CLEAR REQUIRED FROM	SURGE TANK (feet)	SUBSURFACE AND SUBSOIL IRRIGATION FIELD AND MULCH BASIN (feet)	DISPOSAL FIELD
Building structures ¹	5 ^{2,3,9}	2 ^{3,8}	5
Property line adjoining private property	5	5 ⁸	5
Water supply wells ⁴	50	100	100
Streams and lakes ⁴	50	100 ^{5,10}	100 ⁵
Sewage pits or cesspools	5	5	5
Sewage disposal field ¹⁰	5	4 ⁶	4 ⁶
Septic tank	0	5	5
On-site domestic water service line	5	0	0
Pressurized public water main ⁷	10	10	10 ⁷

For SI units: 1 foot = 304.8 mm

Notes:

¹*Building structures do not include porches and steps, whether covered or uncovered, breezeways, roofed carports, roofed porte cocheres, roofed patios, carports, covered walks, covered driveways, and similar structures or appurtenances.*

²*The distance shall be permitted to be reduced to 0 feet for aboveground tanks where first approved by the Authority Having Jurisdiction.*

³*Underground tanks shall not be located within a 45 degree angle from the bottom of the foundation, or they shall be designed to address the surcharge imposed by the structure. The distance may be reduced to six (6) inches (153 mm) for aboveground tanks when first approved by the Enforcing Agency.*

⁴*Where special hazards are involved, the distance required shall be increased as directed by the Authority Having Jurisdiction.*

⁵*These minimum clear horizontal distances shall apply between the Irrigation or disposal field and the ocean mean higher high tide line.*

⁶*Add 2 feet (610 mm) for each additional foot of depth in excess of 1 foot (305 mm) below the bottom of the drain line.*

⁷*For parallel construction or for crossings, approval by the Authority Having Jurisdiction shall be required.*

⁸*The distance shall be permitted to be reduced to 1 1/2 feet (457 mm) for drip and mulch basin Irrigation systems.*

⁹*The distance shall be permitted to be reduced to 0 feet for surge tanks of 75 gallons (284 L) or less.*

¹⁰*The minimum horizontal distance may be reduced to 50 feet (15 240 mm) for irrigation or disposal fields utilizing gray water which has been filtered prior to entering the distribution piping.*



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GRAYWATER STANDARD PLAN 1 For Simple Residential System

Project Address: _____ Permit Number: _____

Scope:

This plan applies only to simple residential systems meeting the following criteria:

- Simple Systems: Graywater discharge is 250 gallons or less per day.
- Gravity Systems: Systems that do not include pumps to distribute gray water.
- Stand Alone: Your system is not connected to any source of potable water or other irrigation systems.
- No Storage; Graywater is discharged into the irrigation field immediately without being stored.

Design Professional Information:

Name: _____ Phone Number: _____

Address: _____

City: _____ State: _____ Zip Code: _____

____ Homeowner ____ Contractor ____ Engineer/Architect

License # _____ License # _____

License Type _____ License Type _____

Checklist

Check if Complete	Item	Comments
	Provide a site plan	
	Show the location of the graywater system on the site plan	
	Show the setback distances of graywater irrigation system per 1602.4 (page 6 from GW-2)	
	Piping riser diagram to be completed prior to rough inspection and (See Example on page 2 GW-2)	
	Provide manufacturer's literature for valves and pipes used	
	Graywater is not connected to any potable water	
	3-way diverter valve is clearly labeled to indicate direction of flow	
	Backwater valve is installed on sewer side of 3-way valve in the horizontal position	
	Drainage piping is sized per Plumbing code Table 703.2 on (page 5 from GW-2)	
	Irrigation field sizes are shown on site plan and meet minimum requirements	
	Graywater discharge is minimum of 2" below ground surface or have 2" minimum mulch cover	
	Graywater is not irrigating edible portion of plants (i.e. No root crops)	
	Groundwater depth is below 3ft. and was checked with a test hole	
	Piping material is indicated on the site plan and on the riser diagram	

**GRAYWATER STANDARD PLAN 2
For Simple Residential System**

1. Daily Graywater Flow Calculation

a. **Number of Bedrooms:** _____

b. **Number of Occupants** (1+number of bedrooms): _____

c. **Type of fixtures connected to graywater system** (check all that apply)

_____ Lavatory (bathroom sink) _____ Shower/Bath _____ Washing Machine/Wash Basin

d. **Daily Graywater Flow:** _____ gallons per day (shall not exceed 250 gallons).

Estimate graywater flow per occupant:

Any combination of lavatory, shower or bath: 25 gallons per day per occupant

Laundry (washing machine or wash basin): 15 gallons per day per occupant

Daily graywater flow example:

$(4 \text{ occupants} \times 25 \text{ gals/day}) + (4 \text{ occupants} \times 15 \text{ gals/day}) = 160 \text{ gallons per day}$

2. **Soil Type** (from Table 1602.10 on page 5 of GW-2) _____
(default is clay with small amounts of sand or gravel)

Note: Written verification of the soil type is required for designs involving the following soil types:
Clay with considerable sand or gravel, sandy clay, sandy loam, fine sand, coarse sand or gravel.

Options for "soil type" verification are: from Professional Engineer, provide soil report from an adjacent property, or provide septic tank design/percolation test from the Ventura County Environmental Health Department.

3. **Maximum Absorption capacity of soil** (from column 2 of Table 1602.10 on Page 5 of GW-2)
_____ gallons/ft (default is 0.8)

4. Size of Irrigation Field

a. **Minimum required irrigation field size:** _____ square feet

Minimum irrigation field size: Divide total gallons per day (from step 1d) by the maximum absorption capacity of the soil (step 3).

Example: 160 gallons/day of graywater in fine sand soil would need $160/4.0 = 40$ square feet of irrigation area.

b. **Actual irrigation field size provided:** _____ square feet

Notes:

1. Pipe shall be labeled "NON-POTABLE WATER, DO NOT DRINK"
2. All valves shall be readily accessible.
3. Installation does not violate other codes or damage the building. Any penetration in the building envelope shall be properly sealed.
4. Only pipes approved for waste shall be used in the plumbing drainage system.
5. Upgrades made to plumbing shall comply with the Plumbing Code.

Project Address: _____



GRAYWATER SIMPLE RESIDENTIAL SYSTEM

Instructions:

1. Use this space to sketch your house, yard, and where you want to use Graywater System.
2. Indicate setbacks to property lines, house and structures.
3. Show Street Frontage.



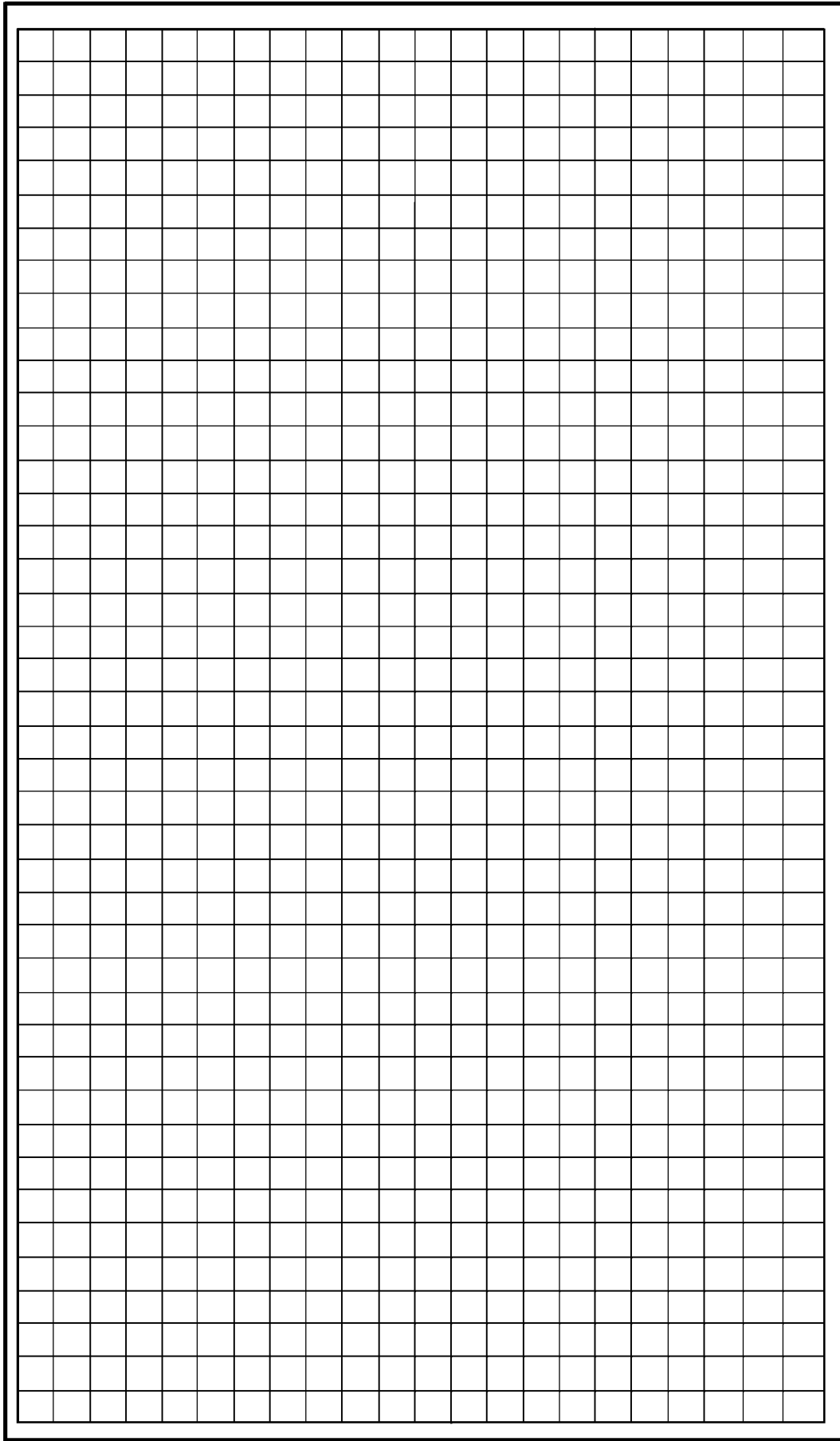
Plot or Site Plan

Project Address: _____

APN: _____



GRAYWATER SIMPLE RESIDENTIAL SYSTEM



Project Address: _____

APN: _____

PIPING RISER DIAGRAM