



## INFORMATION BULLETIN / PUBLIC - PLUMBING CODE

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# GRAY WATER SYSTEMS FOR RESIDENTIAL BUILDINGS

## A. GRAY WATER SYSTEMS

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

A gray water system uses gray water for subsurface irrigation and may include tanks, valves, filters, pumps or other appurtenances along with piping and receiving landscape. Gray water 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 of food crops that touch the soil.

On-site treated non-potable gray water systems meeting Chapter 15 of the plumbing code are permitted to supply water closets, urinals, trap primers for floor drains and floor sinks, above and belowground irrigation.

## B. PERMIT REQUIREMENT

A plumbing permit is required to be obtained from the Los Angeles Department of Building and Safety (LADBS) prior to the erection, construction, reconstruction, installation, relocation or alteration of any gray water system. The Mechanical Plan Check Section of LADBS will require the following in order to approve the plans and issue a permit for a gray water system:

1. A set of plans and specifications showing the gray water system. The gray water system shall be designed in accordance with the requirements in Chapter 15 of the 2017 Los Angeles Plumbing Code.

Exception: For simple systems meeting the following conditions, a completed gray water standard plan issued by LADBS (see attachment 1) is acceptable:

- a. Simple system: Gray water discharge is 250 gallons or less per day (LAPC 1502.1.2)
- b. Gravity systems: System that do not include pumps to distribute gray water
- c. Stand alone: your system is not connected to any source of potable water or other irrigation systems
- d. No storage: gray water is discharged into the irrigation field immediately without being stored

2. Gray water systems being installed in the City of Los Angeles within the designated “Hillside Grading Area” require approval from LADBS’ Grading Division.

**C. EXEMPTION FROM PERMIT**

A permit is not required from the Los Angeles Department of Building and Safety for a gray water 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 following requirements are met:

1. The design shall allow for the user to have the option to direct the flow to the irrigation/ disposal field or the building sewer. The direction control of the gray water shall be clearly labeled and readily accessible to the user. (LAPC 1502.1.1 (2))
2. The installation, change, alteration or repair of the system shall not include a potable water connection, tank or a pump and shall not affect other building, plumbing, electrical or mechanical components including structural features, egress, fire-life safety, sanitation, potable water supply piping or accessibility. (LAPC 1502.1.1 (3))
3. The gray water shall be contained on the site where it is generated. (LAPC 1502.1.1 (4))
4. Gray water shall be directed to and contained within a subsurface irrigation or disposal field. (LAPC 1502.1.1 (5))
5. Ponding or runoff is prohibited and shall be considered a nuisance. (LAPC 1502.1.1 (6))
6. Gray water shall be released no less than two (2) inches below the surface of mulch, rock, or soil. (LAPC 1502.1.1 (7))
7. Gray water systems shall be designed to allow no contact of the gray water with humans and domestic pets. (LAPC 1502.1.1 (8))
8. Water used to wash diapers or similarly soiled or infectious garments shall not be used and shall be diverted to the building sewer. (LAPC 1502.1.1 (9))
9. Gray water shall not contain hazardous chemicals derived from activities such as cleaning car parts, washing greasy or oily rags, or disposing of waste solutions from home photo labs or similar hobbyist or home occupational activities. Gray water shall not contain waste from kitchen sinks or dishwashers. (LAPC 1502.1.1 (10))
10. Exemption from permit requirements of this code shall not be deemed to grant authorization for any gray water system to be installed in a manner that violates other provisions of this code or any other laws or ordinances of the Enforcing Agency. (LAPC 1502.1.1 (11))

11. An operation and maintenance manual for a gray water installation shall be provided. The manual is to remain with the building throughout the life of the system and indicate that upon change of ownership or occupancy, the new owner or tenant shall be notified the structure contains a gray water system. (LAPC 1502.1.1 (12))
12. Comply with all other aspects of Chapter 15 of the 2017 Los Angeles Plumbing Code (e.g. distance from property line, distance from building structure, etc).
13. Exemption from permit requirements of this code for clothes washer gray water systems shall not be deemed to grant authorization to perform other work that requires a permit.
14. Any required fire rated separation, such as the one between the house and the attached parking garage, shall be maintained.

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# GRAYWATER STANDARD PLAN

## For Simple Residential System

(Based on 2017 City of Los Angeles Plumbing Code Chapter 15)

**Project Address:** \_\_\_\_\_ **Permit Number:** \_\_\_\_\_

**Scope:**

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

- Simple system: Graywater discharge is 250 gallons or less per day
- Gravity systems: System that do not include pumps to distribute graywater
- 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 _____		
<input type="checkbox"/> Homeowner	<input type="checkbox"/> Contractor License # _____ License type: _____	<input type="checkbox"/> Engineer/ Architect License # _____ 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 1502.4 (Page 7)	
	Provide a piping riser diagram	
	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 9	
	Irrigation field sizes are shown on site plan and meet minimum requirements	
	Graywater discharge is minimum of 2” below 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	

### 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/ day per occupant

Daily graywater flow example: (4 occupants x 25 gals/day) + (4occupants x 15 gals/day) = 160 Gallons per day.

### 2. Soil Type (from Table 1502.10 on page 9): \_\_\_\_\_

(Note: Written verification of the soil type, from a Professional Engineer, is required for designs involving the following soil types: sandy loam, fine sand, course sand or gravel)

### 3. Maximum Absorption capacity of soil (from column 2 of Table 1502.10 on page 9) \_\_\_\_\_ gallons/ft<sup>2</sup>

### 4. Size of irrigation field

- a. **Minimum required irrigation field size:** \_\_\_\_\_ square feet

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

Example: 160 gallon/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

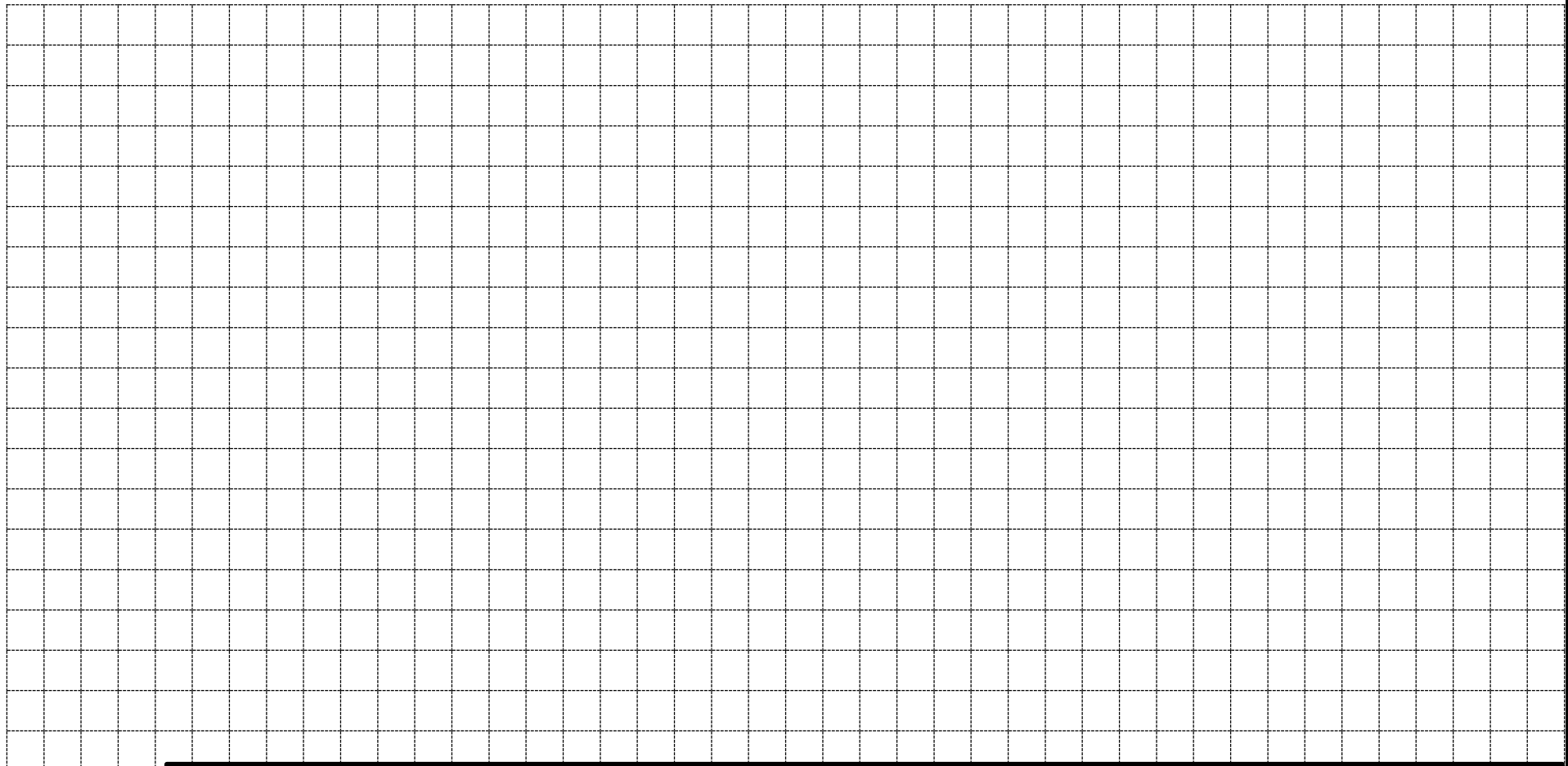
### Notes:

1. Pipe shall be labeled "NON-POTABLE WATER, DO NOT DRINK" per Department of Public Health (DPH) guidelines.
2. All valves shall be readily accessible.
3. Installation doesn't 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 STANDARD PLAN

For Simple Residential Systems



**PLOT OR SITE PLAN**

Indicate where on the property the graywater will be used (see sample site plan on page 7). Indicate setbacks to property lines, house and other structures. Show street frontage.

Project Address: \_\_\_\_\_

# GRAYWATER STANDARD PLAN

For Simple Residential Systems

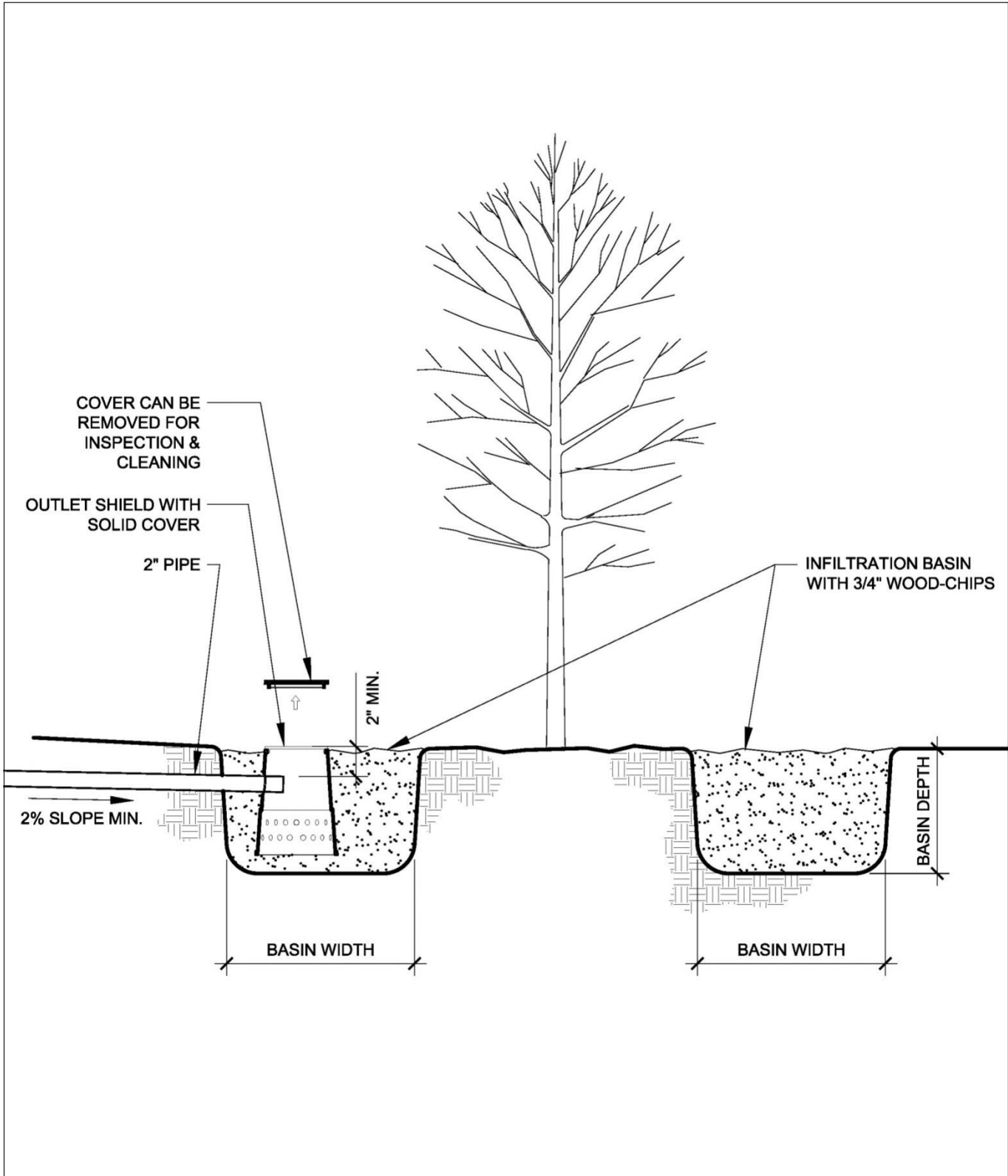
**PIPING RISER DIAGRAM FOR  
GRAYWATER SYSTEM**

Show fixtures draining to the graywater system including waste & vent piping and valves. See sample drawing on page 8

Project Address: \_\_\_\_\_

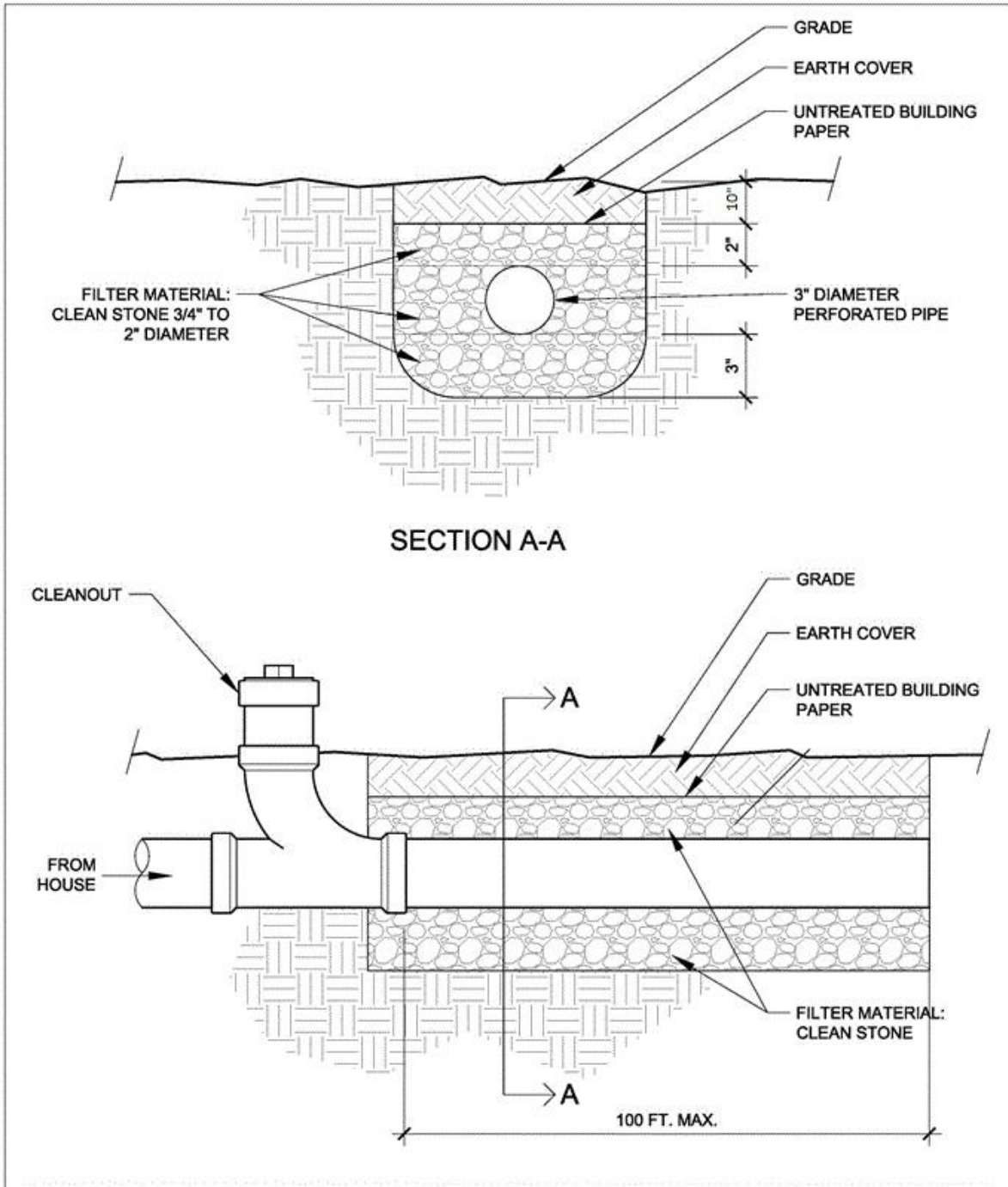


**Detail 1: Typical detail for irrigation field**



Project Address: \_\_\_\_\_

**Detail 2: Typical detail for disposal field piping**



Project Address: \_\_\_\_\_

**Sample Plot Plan**

This drawing is for reference only

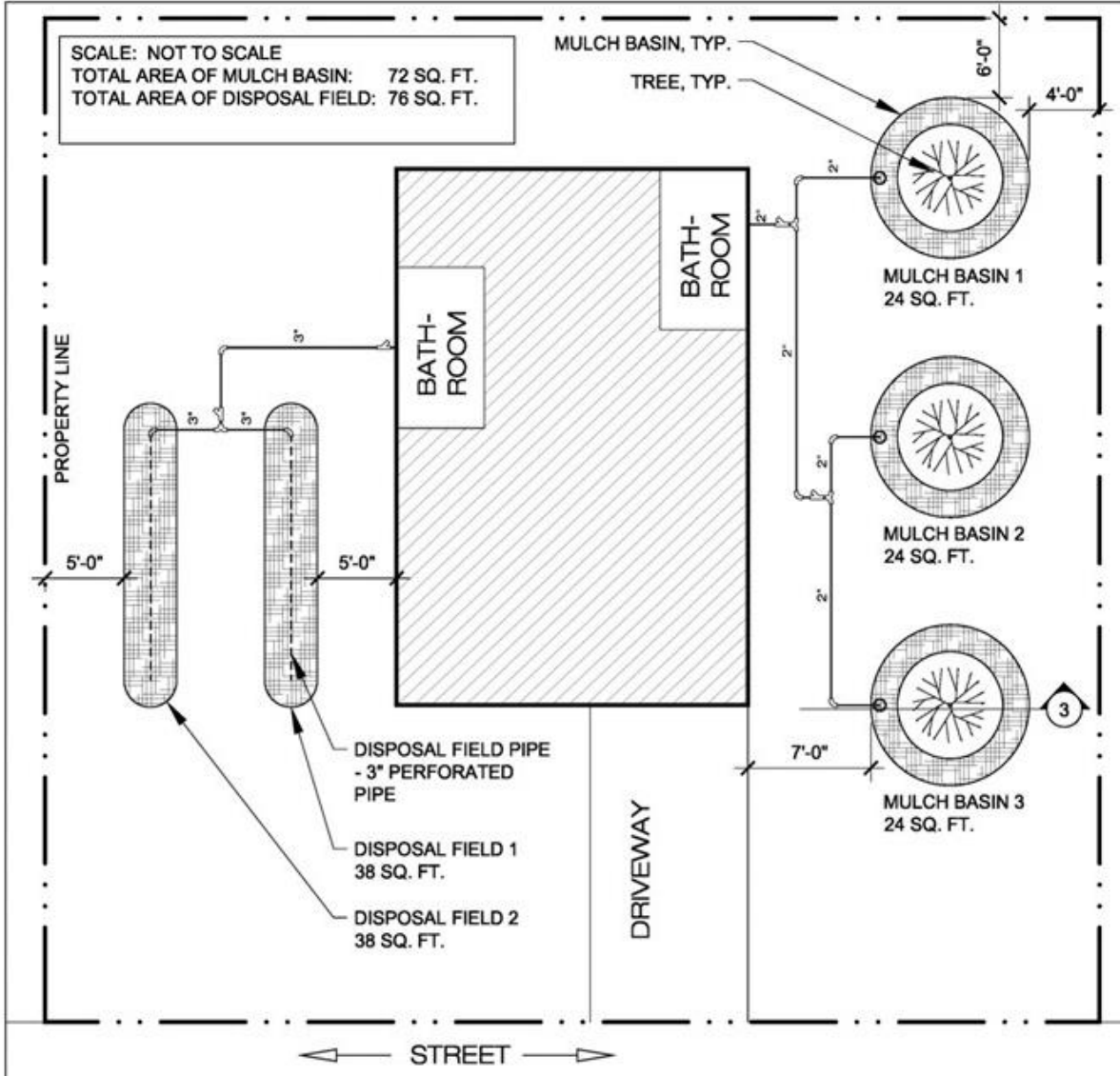


TABLE 1502.4  
 LOCATION OF GRAY WATER SYSTEM

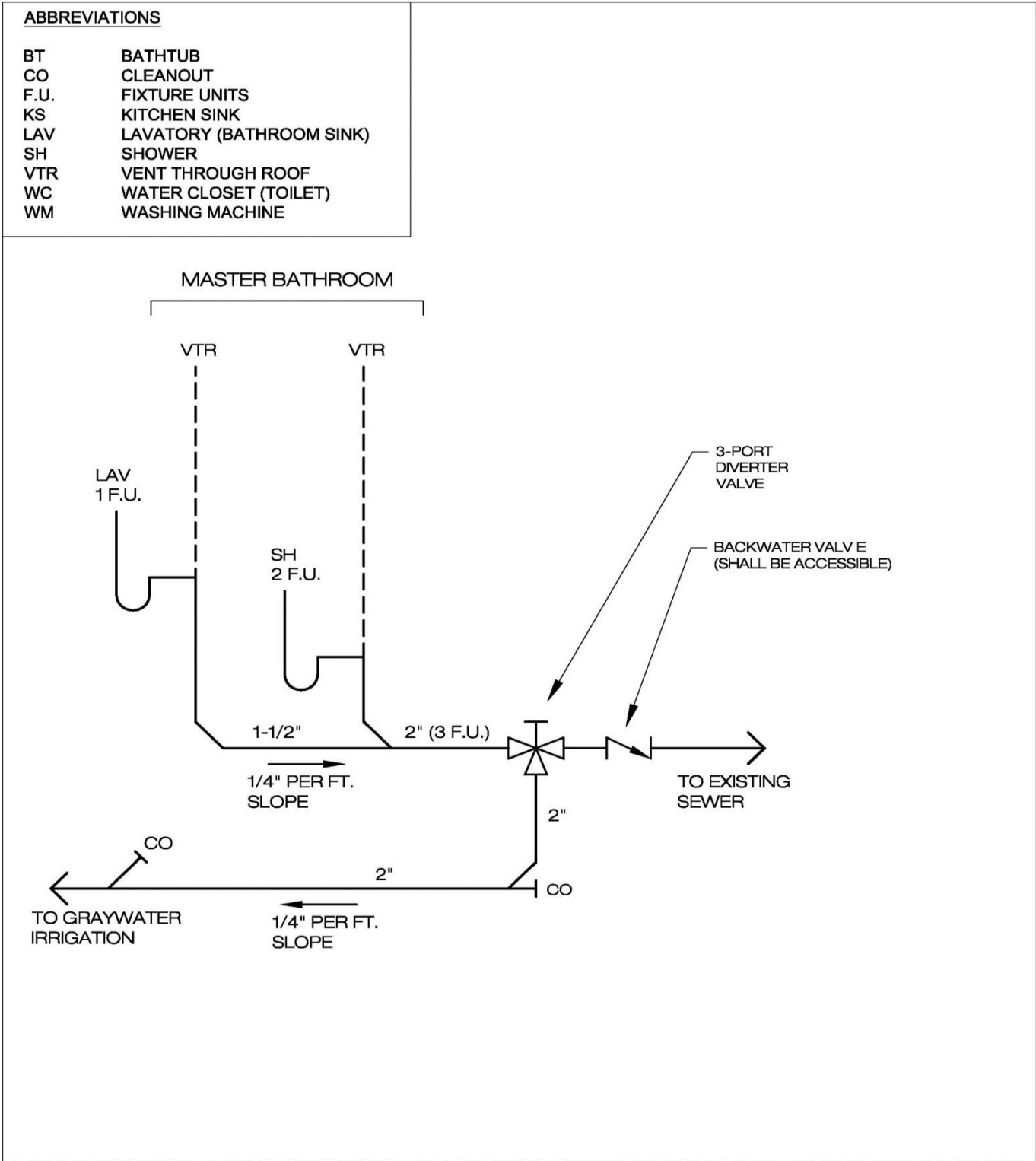
MINIMUM HORIZONTAL DISTANCE IN CLEAR REQUIRED FROM	SURGE TANK (feet)	SUBSURFACE AND SUBSOIL IRRIGATION FIELD AND MULCH BASIN (feet)	DISPOSAL FIELD
Building structures <sup>1</sup>	5 <sup>2, 3, 9</sup>	2 <sup>3, 8</sup>	5
Property line adjoining private property	5	5 <sup>8</sup>	5
Water supply wells 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

For SI units: 1 foot = 304.8 mm

Project Address: \_\_\_\_\_

**Sample piping rise diagram for graywater system**

**This drawing is for reference only**



Project Address: \_\_\_\_\_

**Table 1502.10 (2017 Los Angeles Plumbing code)**

Soil Type (Column 1)	Maximum absorption capacity in gallons per square foot of irrigation area per day (Column 2)
Course 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 (2017 Los Angeles 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)
<b>Maximum Units</b>											
Drainage piping											
Vertical	1	2 <sup>2</sup>	16 <sup>3</sup>	32 <sup>3</sup>	48 <sup>4</sup>	256	600	1380	3600	5600	8400
Horizontal	1	1	8 <sup>3</sup>	14 <sup>3</sup>	35 <sup>4</sup>	216 <sup>5</sup>	428 <sup>5</sup>	720 <sup>5</sup>	2640 <sup>5</sup>	4680 <sup>5</sup>	8200 <sup>5</sup>
<b>Maximum Length</b>											
Drainage Piping											
Vertical, feet (m)	45 (14)	65 (20)	85 (26)	148 (45)	212 (65)	300 (91)	390 (119)	510 (155)	750 (228)		
Horizontal (unlimited)											
<b>Vent Piping</b>											
Horizontal and Vertical											
Maximum Units	1	8 <sup>3</sup>	24	48	84	256	600	1380	3600		
Maximum Lengths, ft. (m)	45 (14)	60 (14)	120 (14)	180 (14)	212 (14)	300 (14)	390 (14)	510 (14)	750 (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.

**Project Address:** \_\_\_\_\_



# GRAYWATER STANDARD PLAN

## For Simple Residential Systems

FOR LADBBS USE ONLY

Project Address: \_\_\_\_\_