



INFORMATION BULLETIN / PUBLIC - PLUMBING CODE

REFERENCE NO.: LAMC 94.16

Effective: 11-05-2012

DOCUMENT NO.: **P/PC 2011-012**

Revised:

Previously Issued As: **P/PC 2008-012**

GRAYWATER SYSTEMS FOR RESIDENTIAL BUILDINGS

A. GRAYWATER SYSTEMS

Under 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 and shall not be allowed to pond, runoff or be discharged directly into or reach any storm water system or any surface body of water. Additionally, graywater shall not be used to irrigate root crops or edible parts of food crops that touch the soil.

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 graywater system. In order to approve plans and issue a permit for a graywater system, LADBS Mechanical Plan Check requires the following:

1. A set of plans and specifications showing the graywater system. The graywater system shall be designed in accordance with the requirements in Chapter 16A, Part I of the 2011 Los Angeles Plumbing Code.

Exception: For simple residential system meeting all the following conditions, a completed graywater standard plan issued by LADBS (attached) is acceptable:

- a. Graywater discharge is 250 gallons or less per day;
 - b. The system does not include pumps to distribute graywater;
 - c. The system is not connected to any source of potable water or other irrigation systems; and
 - d. Graywater is immediately discharged into the irrigation field without being stored
2. Approval from the Los Angeles County Department of Public Health (DPH) Cross

Connection Control Unit. Incorporate DPH's requirements into the drawings. DPH is located at 5050 Commerce Dr., Room 116, Baldwin Park, CA 91706, Telephone number (626) 430-5290.

3. Graywater systems being installed in the City of Los Angeles within the designated "Hillside Grading Area" require approval from the LADBS' Grading Division.

C. EXEMPTION FROM PERMIT

A permit is not required from the Los Angeles Department of Building and Safety 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 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 graywater shall be clearly labeled and readily accessible to the user.
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.
3. The graywater shall be contained on the site where it is generated.
4. Graywater shall be directed to and contained within a subsurface irrigation or disposal field.
5. Ponding or runoff is prohibited and shall be considered a nuisance.
6. Graywater shall be released no less than two (2) inches below the surface of mulch, rock, or soil, or a solid shield covers the release point.
7. Graywater systems shall be designed to prevent contact of the graywater with humans and domestic pets.
8. Water used to wash diapers or similarly soiled or infectious garments shall not be used and shall be diverted to the building sewer.
9. Graywater 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. Graywater shall not contain waste from kitchen sinks or dishwashers.

10. Exemption from permit requirements of this code shall not be deemed to grant authorization for any graywater system to be installed in a manner that violates other provisions of this code or any other City or State laws or ordinances.
11. An operation and maintenance manual for a graywater installation shall be provided to the owner and occupant. 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 graywater system.
12. Comply with all other aspects of Chapter 16A, Part 1 of the 2011 Los Angeles Plumbing Code (e.g. distance from property line, distance from building structure, etc).
13. Exemption from permit requirements of the code for clothes washer graywater 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.



GRAYWATER STANDARD PLAN

For Simple Residential System

(Based on 2011 City of Los Angeles Plumbing Code Chapter 16A Part I)

Project Address: _____ **Permit Number:** _____

Scope:

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

- Graywater discharge is 250 gallons or less per day;
- The system does not include pumps to distribute graywater;
- The system is not connected to any source of potable water or other irrigation systems; and
- Graywater is immediately discharged into the irrigation field without being stored

Designer 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 provided	Item	Comments (if any)
	Provide a site plan	
	Show the location of the graywater system on the site plan	
	Show the setback distances of graywater irrigation system per Table 16A-1, Page 7	
	Provide a piping riser diagram	
	Provide manufacturer’s literature for valves and pipes used	
	Approval from the Los Angeles County Health Department has been obtained	
	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 7-5, 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	

GRAYWATER STANDARD PLAN

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/washbasin
- 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 washbasin): 15 gallons/ day per occupant

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

2. **Soil Type** (from Table 16A-2 on page 9): _____
(Note: Written verification of the soil type, from a Professional Civil 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 16A-2 on page 9) _____ gallons/ft²

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 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

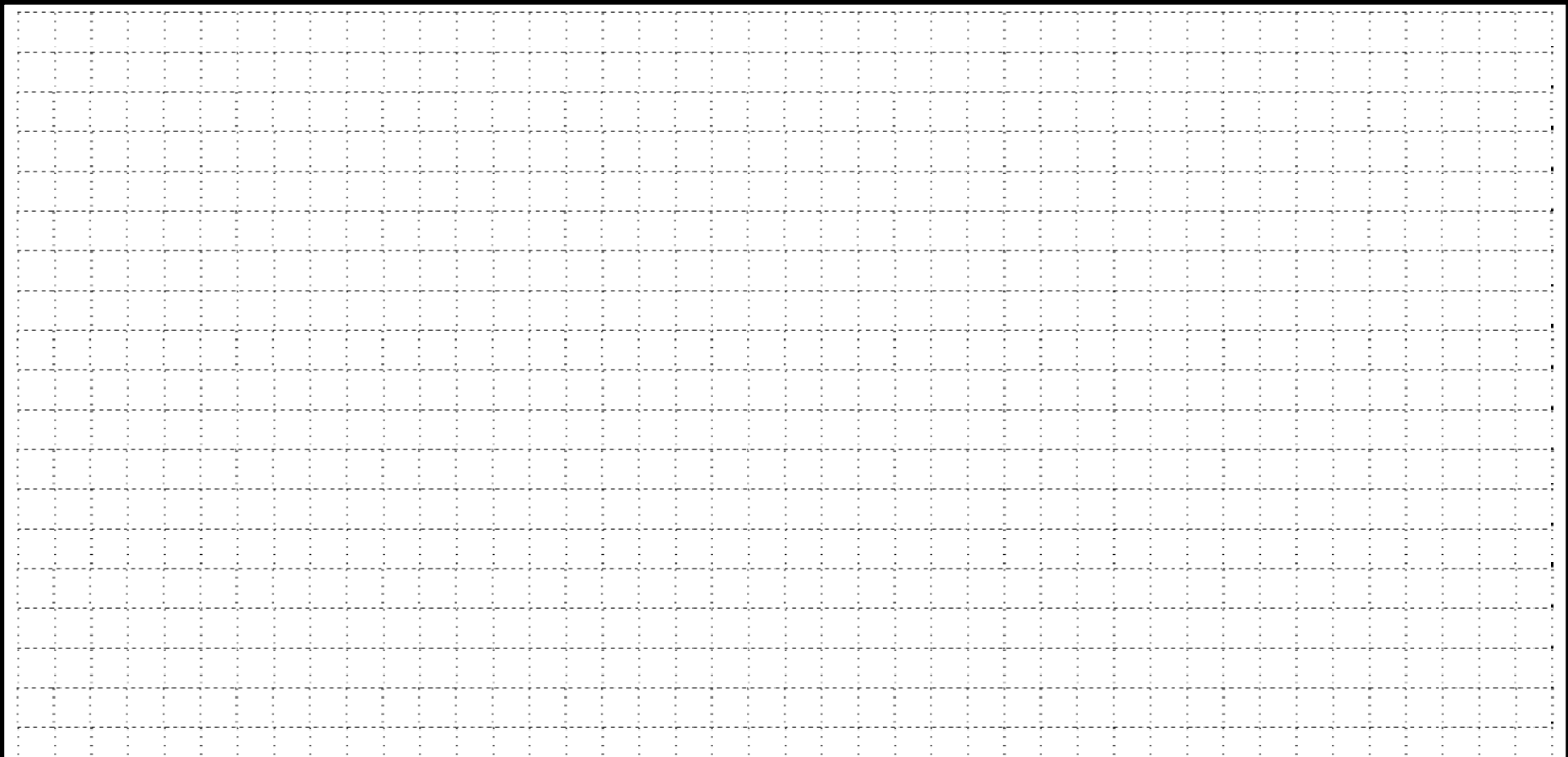
Notes:

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 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 be permitted and shall comply with the Plumbing Code.

Project Address: _____

GRAYWATER STANDARD PLAN

For Simple Residential System



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. Indicate piping material. Show street frontage.

Project Address: _____

GRAYWATER STANDARD PLAN

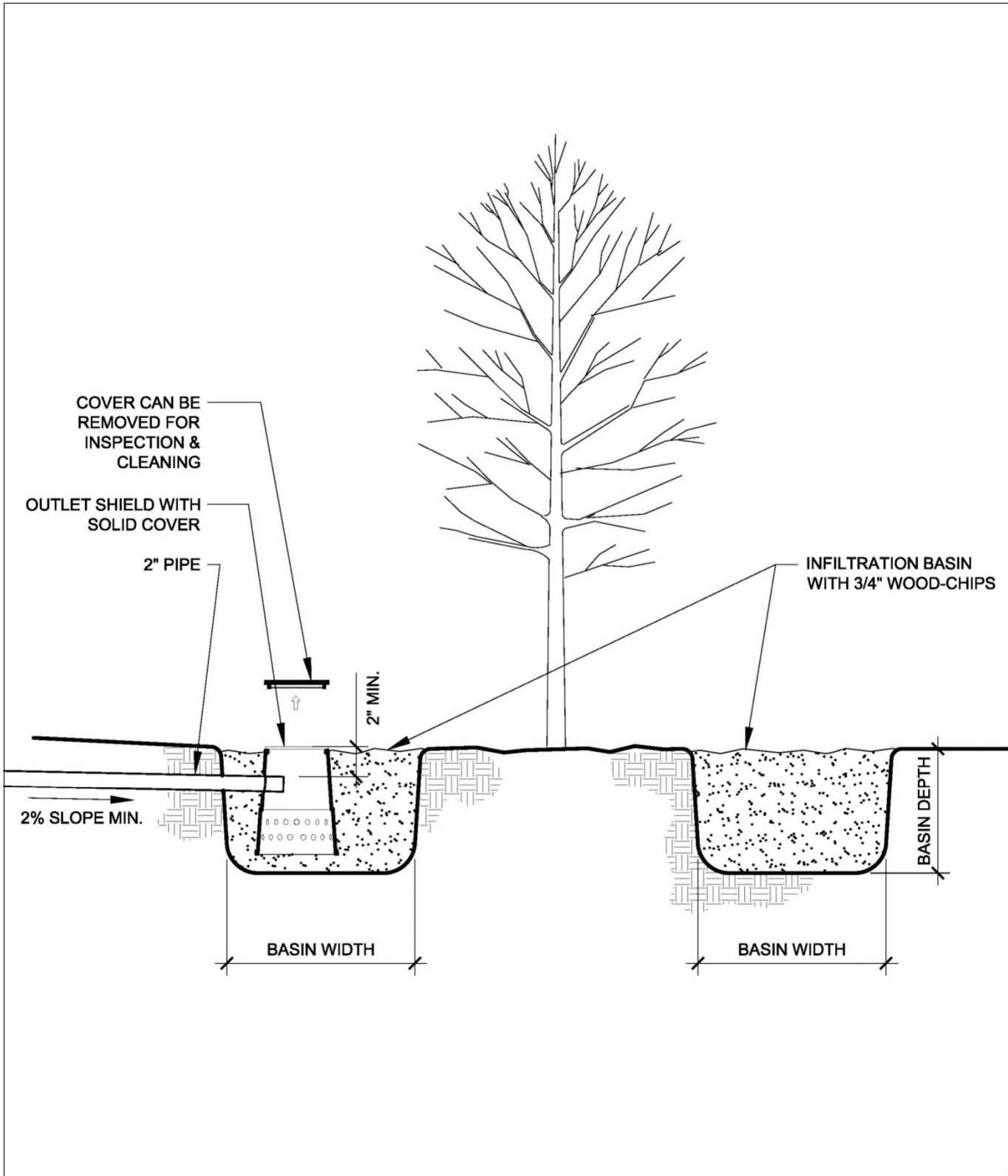
For Simple Residential System

**PIPING RISER DIAGRAM FOR
GRAYWATER SYSTEM**

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

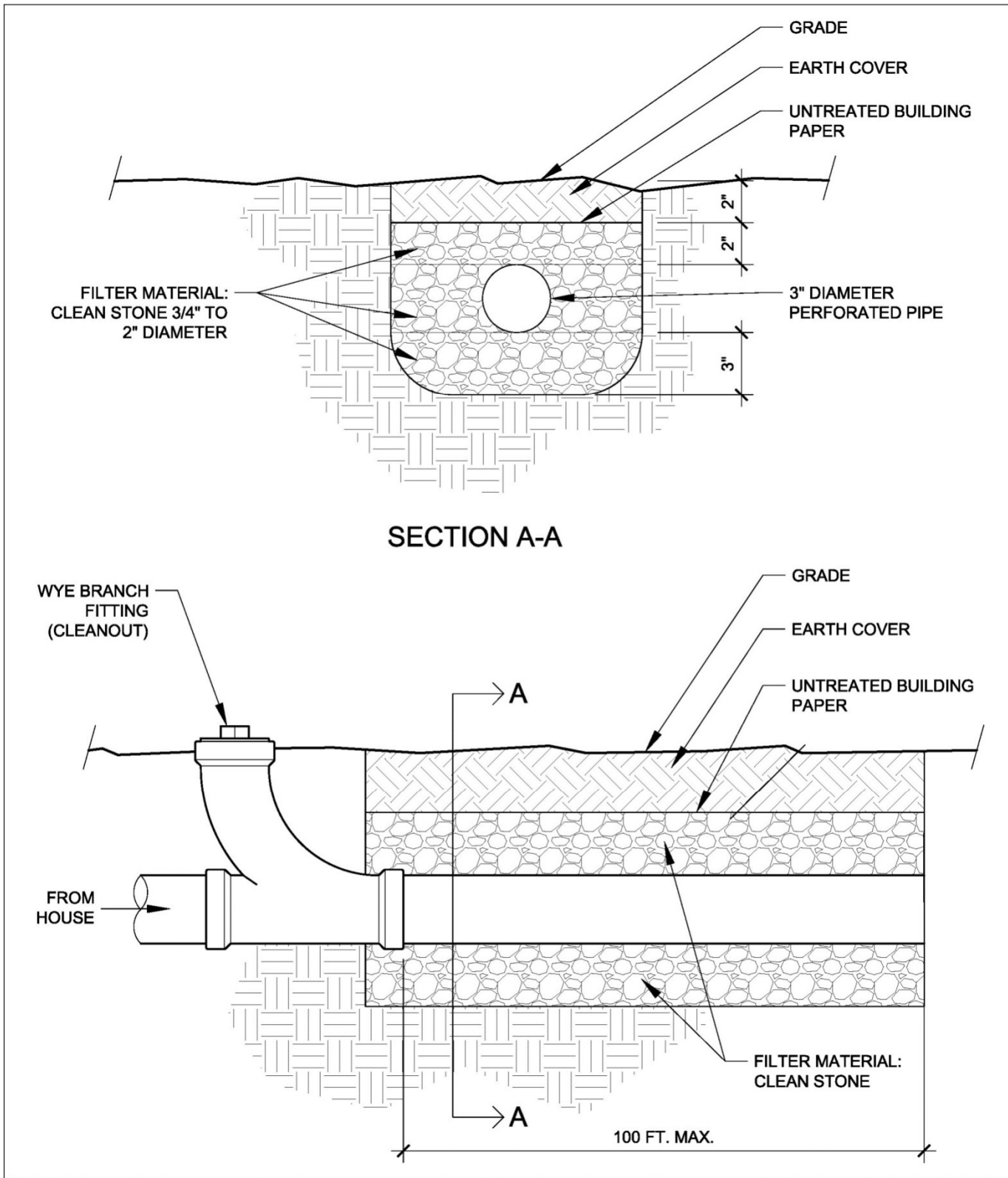
Project Address: _____

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

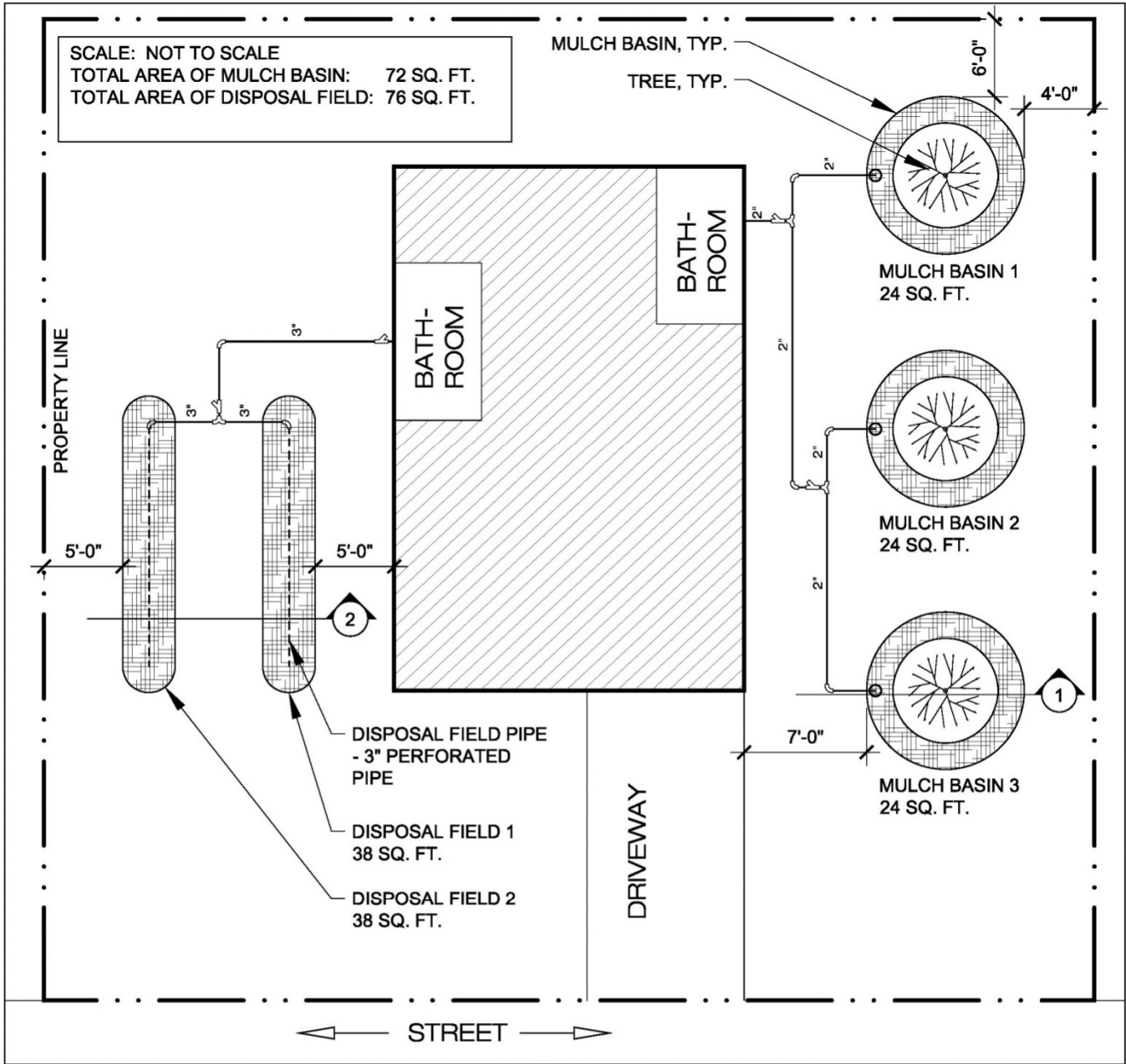


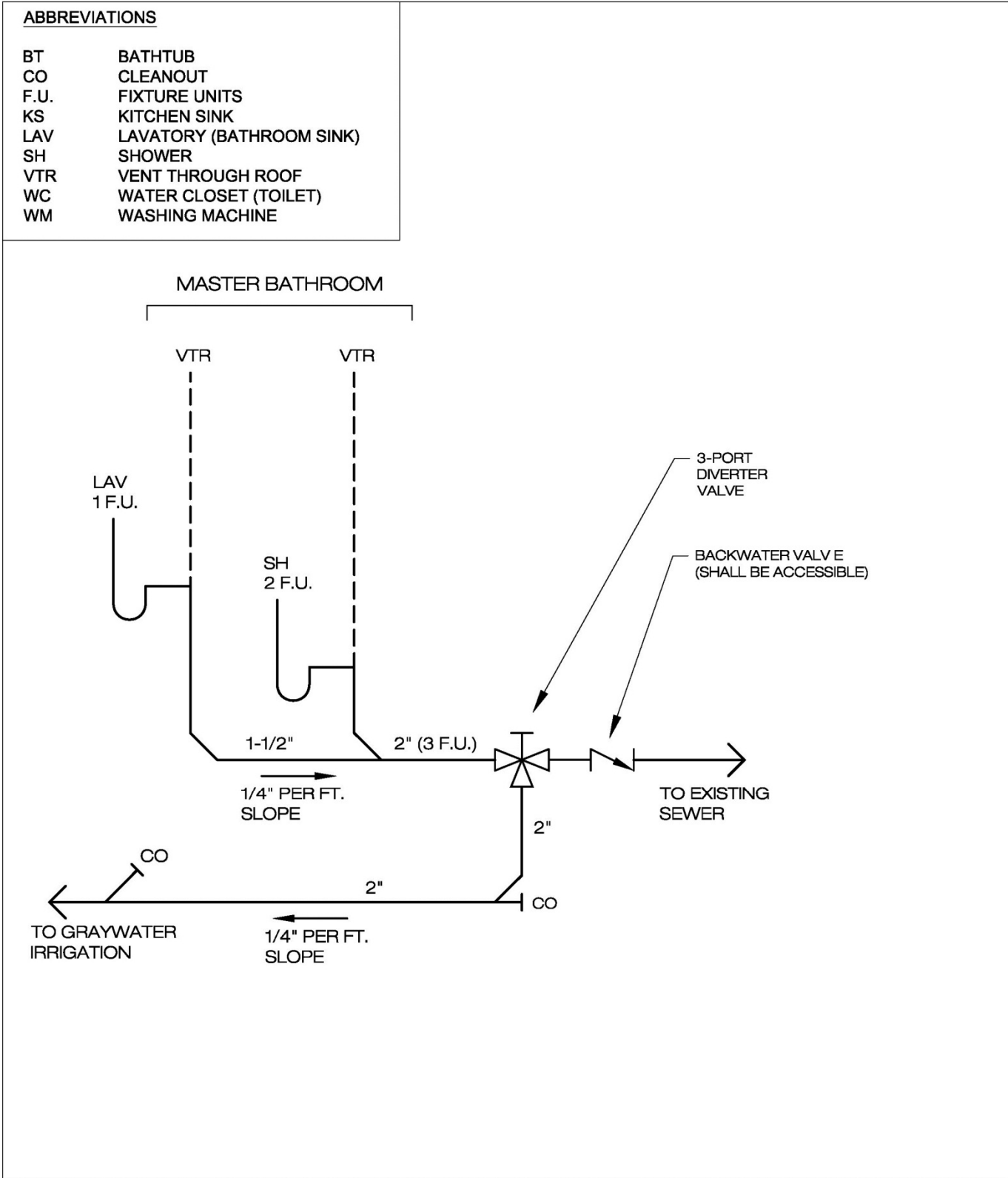
Table 16A-1 Location of Graywater Systems (Setback Requirements)

Minimum horizontal distance required from:	Irrigation Field	Disposal Field
Building structures	2 feet	5 feet
Property line adjoining private property	1.5 feet	5 feet
Water supply wells	100 feet	100 feet
Streams and lakes	100 feet	100 feet
Sewage pits or Cesspools	5 feet	5 feet
Sewage disposal field	4 feet	4 feet
Septic Tank	5 feet	5 feet
Onsite domestic water service line	0 feet	0 feet
Pressurized public water main	10 feet	10 feet

Project Address: _____

Sample piping rise diagram for graywater system

This drawing is for reference only



Project Address: _____

GRAYWATER STANDARD PLAN

For Simple Residential System

Table 16A-2 (2011 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 7-5 (2011 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)
Maximum Units											
Drainage piping ¹											
Vertical	1	2 ²	16 ³	32 ³	48 ⁴	256	600	1380	2600	5600	8400
Horizontal	1	1	8 ³	14 ³	35 ⁴	216 ⁵	428 ⁵	720 ⁵	2640 ⁵	4680 ⁵	8200 ⁵
Maximum Length											
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)											
Vent Piping											
Horizontal and Vertical											
Maximum Units	1	8 ³	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 ¼) 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 7-3 and 7-4. 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 System

FOR LADBS USE ONLY

Project Address: _____