

Proposal: Austin Graywater Pilot Program



Prepared for:
City of Austin

Environmental Board

and

Resource Management Commission

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Pilot Program Elements

- Pilot program participants could submit applications during an 18-month period following implementation of City Council ordinance.
- Pilot graywater systems would operate under the terms of approved applications for up to 5 years provided there was no environmental degradation or public health problem.
- Pilot graywater systems would be limited to residential Austin Water Utility customers.
- Pilot graywater system flow must be less than 250 gallons per day.
- Pilot graywater systems must be conveyed only by gravity.
- Allowed pilot graywater systems sources are laundry, sinks (except kitchen or food-handling), showers, and baths.
- Pilot graywater systems must meet the requirements of the natural language of the 2012 UPC with these amendments:¹
 - Cross-connection inspection would be required only: 1) as part of initial installation; 2) when a plumbing permit for alteration of the water supply system is authorized at a pilot graywater residence; or 3) when a new utility customer applies for water or wastewater service at a pilot graywater residence. A hose bib vacuum assembly would be required on all hose bibs.
 - Graywater distribution would be prohibited over outcrop areas of the Edwards or Georgetown limestone unless a minimum of three soil test pits demonstrate a minimum of 2 feet soil depth in all three pits. Graywater distribution would be prohibited within 50 feet of the edge of any stream bank, bedrock outcrop, recharge features, or Critical Environmental Features, as defined by City of Austin Land Development Code.
 - Percolations rates could be assumed based on soil type.
 - Because of the limited water treatment afforded by coarse sand or gravel, soils meeting these descriptions could not be used for graywater irrigation.
 - Graywater could be released above the natural ground surface provided at least two inches of mulch, rock, or soil, or a solid shield covers the release point. Other methods which provide equivalent separation would also be acceptable.

¹ See attachments for additional detail.

Introduction

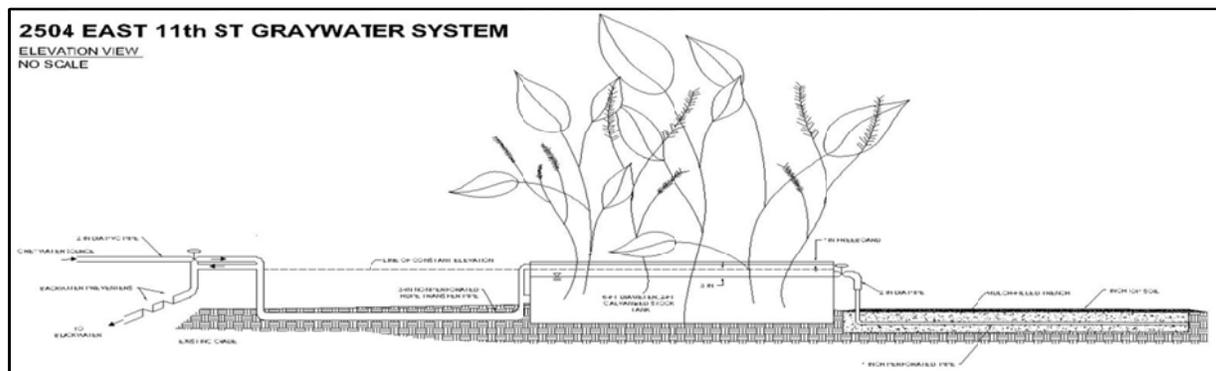
The flow of water across soapy hands, the splashy fun of a bubble bath, clothing swishing back and forth in the washing machine; all of these are graywater. This water could nourish geraniums or flush the toilet, but instead we treat it like sewage. We pump it through miles of pipe, screen, aerate, clarify, and chlorinate it, and then we dump it into the river. At the same time we pull fresh water from the river, draw down lakes, treat, chlorinate, and pump another batch of water just to keep those geraniums blooming.

On a water-rich planet, in an energy-rich culture, treating graywater like sewage is simple and safe. But on a hot July afternoon in Austin, water levels in our lakes are dropping like a stone and most of the water is being used to keep our lawns green. Power plants run past capacity to keep up with peak summertime demands: it takes 2 watt-hours of electricity² to clean a gallon of water and pump it to our faucet. Maybe it is time to try a better idea.

The average U.S. household uses about 70 gallons of water for each person every day. More than half of that water, 40 gallons, is graywater. In the heat of summer, on a warming planet, we could craft a new relationship with this graywater. The purpose of the Austin Graywater Pilot Program will be to demonstrate simple and affordable graywater reuse systems to protect public health, our garden soil, waterways and aquifers.

Graywater Pilot Program Goal

The graywater pilot program goal would be to allow up to 50 residences to install graywater systems



² San Francisco Graywater Design Manual for Outdoor Irrigation, April 2011,

to reuse laundry, shower, and hand sink water for landscape irrigation. These pilot systems would demonstrate the feasibility and benefits of graywater reuse systems in the local Texas Hill Country and Blackland Prairie environments. They would allow the City of Austin to calculate differences in water use based on utility records.

Is Graywater Reuse Safe?

Existing City of Austin code and regulations governing the management of graywater are based on the possibility of contamination with fecal matter. Graywater research shows, however, that this level of regulation isn't necessary. Over-regulation limits graywater use. Residents committed to water conservation are more likely to implement illegal systems, which may be less protective of health and the environment than an appropriately designed and implemented system. Furthermore, Austin graywater regulations are more onerous than for other situations with similar or greater health threats: swimming pools, kiddie wading pools, and even on-site septic tanks.

More than 8 million graywater systems are estimated to be in use in the United States. An extensive investigation of records at the U.S. Center for Disease Control over decades provided no indication of even a single illness from graywater reuse.³ The City of Tucson, after an extensive study of graywater and its potential health effects by Arizona State University, removed all permitting requirements for graywater.⁴

Some of the other US cities that allow graywater reuse include:

- **Los Angeles, California.** Allows homeowner permits for simple residential systems that discharge 250 gallons per day or less, do not use pumps, are not connected to a potable water system or other irrigation system, and operate without storing water.
- **San Francisco, California.** Has allowed a 150-household laundry-to-landscape pilot program since 2011. No permit is required and a \$225 rebate is provided for all systems.



³ Oasisdesign.net.

⁴ Personal conversation with Karen Dotson, former Tucson water and wastewater utility staff, November 6, 2012.

- **Tucson, Arizona.** Allows multiple-fixture graywater systems without a permit. Rebates up to \$200 are provided by the City and up to \$1,000 by the state.
- **Santa Rosa, California.** Allows multiple-fixture graywater systems. Provides \$200 rebates for every 1,000 gallon reduction in monthly water consumption.
- **North Marin Water District, California.** Allows multiple-fixture graywater systems. Provides \$75 rebates for each fixture connected to the graywater system.
- **Sequel Creek Water District, California.** Allows multiple-fixture graywater systems. Provides \$75 rebates for each fixture connected to the graywater system. No permit is required for laundry-to-landscape systems.

Required Submittals to City of Austin

A residential owner would be required to submit the following information to be authorized to install and use a pilot graywater system:

- Name, address, water utility customer number
- House size, number of bathrooms, number of occupants
- A description of each facility (washing machine, sink, and/or bath) to be piped to the graywater system
- Whether the house is slab on grade or pier-and-beam construction
- A lot survey showing the layout of the irrigation area
- A description of the irrigation area in terms of size, soil, geology, and proposed plants
- Irrigation area sizing calculations
- An application fee (tentative)
- A signed and notarized statement of the following
 - I have read and understand the educational information on graywater provided by the City of Austin.
 - I understand that, depending on my choice of cleaning products, graywater may contain chemicals with the potential to damage soils. I will bypass to the sanitary sewer any graywater



- with chlorine bleach, dyes, or other materials that would damage soil.
- I understand that my water usage may be monitored by the City of Austin for the purpose of determining the feasibility of the broader use of graywater systems.
- I understand that at the end of the 5-year pilot program my graywater system will be required to comply with all current City of Austin graywater and plumbing codes.

Fiscal Impacts

Costs to the City of Austin for the pilot graywater program would be labor costs for program administration to review the initial application and perform a field inspection. City staff time for each pilot graywater system is estimated to be 6 hours per system. Staff time for all 50 systems is estimated to be 300 hours.

Required Code Waivers

The following sections of City of Austin Land Development Code would be waived in their application to a maximum of 50 residential pilot graywater systems:

- Chapter 16 of the 2009 UPC attachment
- Section 601.3.4 of the UPC local amendments attachment
- Table 16-3 of part III (refers to commercial graywater but has been used to justify backflow in residential applications) UPC local amendments attachment
- Section 2.3.4 (A) of the UCM attachment
- Table 2.3.4 (A) of the UCM attachment
- Land Development Code 15-1-11

Additional Information

The City of San Francisco allows graywater systems for washing machines (laundry-to-landscape) to be installed



without permits. They have developed an extensive manual to support this practice.⁵

Art Ludwig has been a pioneer in the design and implementation of graywater systems. His website, oasisdesign.net, has information about design, healthy studies, and regulatory code considerations.

The City of Los Angeles has a simple and appropriate graywater permit program similar to the pilot graywater program proposed here. A copy of their permit application can be viewed here:

http://ladbs.org/LADBSWeb/LADBS_Forms/InformationBulletins/IB-P-PC2011-012Graywater.pdf.

⁵ San Francisco Graywater Design Manual for Outdoor Irrigation, April 2011, <http://www.oasisdesign.net/greywater/law/california/index.htm#action>, viewed on May 31, 2012.

Attachments

§ 15-1-11 CROSS CONNECTIONS PROHIBITED.

- (1) install or maintain a potable water supply, plumbing fixture, equipment, or construction device that creates a cross-connection, or allows reclaimed, contaminated, or polluted water, mixtures or other substances, or gases, to enter potable water by back siphoning, backpressure, or other means;
- (2) Connect an auxiliary water supply to the City's public water system or a private plumbing system unless a backflow prevention assembly or air gap is installed as required by this chapter;

Proposed 2012 UPC Amendments:

- **Table 1601.5 Minimum Alternate Water Source testing, Inspection and Maintenance Frequency.** There would be no requirement for an annual cross-connection inspection (also known as a Customer Service Inspection) or annual test for gravity flow systems installed with an air gap or backflow preventers. A hose bib vacuum assembly would be required on all hose bibs. Cross-connection inspection for pilot graywater systems would be required only: 1) as part of initial installation; 2) when a plumbing permit for alteration of the water supply system is authorized at a graywater residence; or 3) when a new utility customer applies for water or wastewater service at a graywater residence.
- **Section 1602.6 Prohibited Locations.** Graywater distribution would be prohibited over outcrop areas of the Edwards or Georgetown limestone unless a minimum of three soil test pits demonstrate a minimum of 2 feet soil depth in all three pits. Graywater distribution would be prohibited within 50 feet of the edge of any stream bank, bedrock outcrop, recharge features, or Critical Environmental Features, as defined by City of Austin Land Development Code.
- **Section 1602.7 (4) Exception -Table 1602.10** could be used in lieu of percolation tests.
- **Table 1602.10.** Because of the limited water treatment afforded by coarse sand or gravel, soils meeting these descriptions could not be used for graywater irrigation.
- **Table 1602.11.2.3.** Graywater may be released above the ground surface provided at least two inches of mulch, rock, or soil, or a solid shield covers the release point. Other methods which provide equivalent separation are also acceptable.

Exceptions:

- (1) Concrete, mortar, or grout shall be permitted to be used to fill the annular spaces around cast-iron, copper, or steel piping that penetrates concrete or masonry fire-resistant-rated assemblies. The nominal diameter of the penetrating item should not exceed six (6) inches (15.2 cm), and the opening size shall not exceed one-hundred and forty-four (144) square inches (929 cm²).

The thickness of concrete, mortar, or grout should be the full thickness of the assembly or the thickness necessary to provide a fire-resistance rating not less than the required fire-resistance rating of the assembly penetrated, or

- (2) The material used to fill the annular space shall prevent the passage of flame and hot gases sufficient to ignite cotton waste for the time period equivalent to the fire-resistance rating of the assembly, when tested to standard(s) referenced in Section 1506.3.

1506.3 Penetrations shall be protected by an approved penetration firestop system installed as tested in accordance with ASTM E119, ASTM E814, UL 263, or UL 1479 with a positive pressure differential of not less than one-one-hundredth (0.01) of an inch of water. Systems shall have an F rating of not less than one (1) hour but not less than the required fire-resistance rating of the assembly being penetrated. Systems protecting floor penetrations shall have a T rating of not less than one (1) hour but not less than the required fire-resistance rating of the floor being penetrated. Floor penetrations contained within the cavity of a wall at the location of the floor penetration do not require a T rating. No T rating shall be required for floor penetrations by piping that is not in direct contact with combustible material.

1506.4 When piping penetrates a rated assembly, combustible piping shall not connect to non-combustible piping unless it can be demonstrated that the transition complies with the requirements of Section 1506.3.

1506.5 Unshielded couplings shall not be used to connect noncombustible piping unless it can be demonstrated that the fire-resistive integrity of the penetration is maintained.

1506.6 Sleeves. Where sleeves are used, the sleeves should be securely fastened to the fire-resistance-rated assembly. The (inside) annular space between the sleeve and the penetrating item and the (outside) annular space between the sleeve and the fire-resistance-rated assembly shall be firestopped in accordance with the requirements for a sleeve-penetrating item.

1506.7 Insulation and Coverings. Insulation and coverings on or in the penetrating item shall not be permitted unless the specific insulating or covering material has been tested as part of the penetrating firestop system.

1507.0 Required Inspection.

1507.1 General. Prior to being concealed, piping penetrations shall be inspected by the Authority Having Jurisdiction to verify compliance with the fire-resistance rating prescribed in the Building Code.

1507.2 The Authority Having Jurisdiction shall conduct a thorough examination of sufficient representative installations, including destructive inspection, to provide verification of satisfactory compliance with this chapter, the appropriate manufacturers installation standards applied by the installer, construction documents, specifications, and applicable manufacturers product information.

1507.3 The Authority Having Jurisdiction shall determine the type, size, and quantity of penetrations to be inspected.

1507.4 The Authority Having Jurisdiction shall compare the field installations with the documentation supplied by the installer to determine the following:

- (1) The required F ratings (one (1), two (2), three (3), or four (4) hour) and T ratings (zero (0), one (1), two (2), three (3), or four (4) hour) of the firestop penetration firestop systems are suitable for the assembly being penetrated.
- (2) The penetrating firestop systems are appropriate for the penetrating items, as documented through testing of the systems conducted by an independent testing agency.
- (3) The penetrating firestop system is installed as tested.

CHAPTER 16

NONPOTABLE WATER REUSE SYSTEMS

Part I**1601.0 Gray Water Systems - General.**

- (A) The provisions of this chapter shall apply to the construction, alteration, and repair of gray water systems for underground landscape irrigation. Gray water installations shall be designed by a person registered or licensed to perform plumbing design work. Except as otherwise provided for in this chapter, the provisions of this code shall be applicable to gray water installation.
- (B) The system, except as otherwise approved, shall consist of a holding tank or tanks that discharge into subsurface irrigation/disposal fields.
- (C) No gray water system or part thereof shall be located on any lot other than the lot that is the site of the building or structure that discharges the gray water, nor shall any gray water system or part thereof be located at any point having less than the minimum distances indicated in Table 16-1.
- (D) No permit for any gray water system shall be issued until a plot plan with appropriate data satisfactory to the Authority Having Jurisdiction has been submitted and approved. When there is insufficient lot area or inappropriate soil conditions for adequate absorption of the gray water, as determined by the Authority Having Jurisdiction, no gray water system shall be permitted.
- (E) No permit shall be issued for a gray water system on any property in a geologically sensitive area as determined by the Authority Having Jurisdiction.
- (F) Private sewage disposal systems existing or to be constructed on the premises shall comply with this chapter. In addition, appropriate clearances from the gray water systems shall be maintained as provided in Table 16-1. The capacity of the private sewage disposal system, including required future areas, shall not be decreased or otherwise affected by the existence or proposed installation of a gray water system servicing the premises.

1602.0 Definition.

Gray water is untreated waste water that has not come into contact with toilet waste, kitchen sink waste, dishwasher waste or similarly contaminated

sources. Gray water includes waste water from bathtubs, showers, bathroom wash basins, clothes-washers and laundry tubs.

1603.0 Permit.

It shall be unlawful for any person to construct, install, or alter, or cause to be constructed, installed, or altered any gray water system in a building or on a premises without first obtaining a permit to do such work from the Authority Having Jurisdiction.

1604.0 Drawings and Specifications.

The Authority Having Jurisdiction may require any or all of the following information to be included with or in the plot plan before a permit is issued for a gray water system, or at any time during the construction thereof:

- (A) Plot plan drawn to scale and completely dimensioned, showing lot lines and structures, direction and approximate slope of surface, location of all present or proposed retaining walls, drainage channels, water supply lines, wells, paved areas and structures on the plot, number of bedrooms and plumbing fixtures in each structure, location of private sewage disposal system and 100 percent expansion area or building sewer connecting to the public sewer, and location of the proposed gray water system.
- (B) Details of construction necessary to ensure compliance with the requirements of this chapter, together with a full description of the complete installation, including installation methods, construction, and materials as required by the Authority Having Jurisdiction.
- (C) A log of soil formations and groundwater level as determined by test holes dug in proximity to any proposed irrigation area, together with a statement of water absorption characteristics of the soil at the proposed site as determined by approved percolation tests.

Exception: The Authority Having Jurisdiction shall be permitted to use of Table 16-2 in lieu of percolation tests.

1605.0 Inspection and Testing.**(A) Inspection.**

- (1) Applicable provisions of this chapter and Section 103.5 of this code shall be complied with.

- (2) System components shall be properly identified as to manufacturer.
- (3) Holding tanks shall be installed on dry, level, well-compacted soil if underground or on a level three (3) inch (76 mm) concrete slab if above ground.
- (4) Holding tanks shall be anchored against overturning.
- (5) If a design is predicated on soil tests, the irrigation/disposal field shall be installed at the same location and depth as the tested area.
- (6) Installation shall conform with the equipment and installation methods identified in the approved plans.

(B) Testing.

- (1) Holding tanks shall be filled with water to the overflow line prior to and during inspection. Seams and joints shall be left exposed, and the tank shall remain water-tight.
- (2) A flow test shall be performed through the system to the point of gray water irrigation/disposal. Lines and components shall be water-tight.

1606.0 Procedure for Estimating Gray Water Discharge.

(A) Single Family Dwellings and Multi-Family Dwellings. The gray water discharge for single family and multi-family dwellings shall be calculated by water use records, calculations of local daily per person interior water use, or the following procedure:

1. The number of occupants of each dwelling unit shall be calculated as follows:

First Bedroom	2 occupants
Each additional bedroom	1 occupant

2. The estimated gray water flows of each occupant shall be calculated as follows:

Showers, bathtubs and wash basins	25 GPD (95 LPD)/occupant
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Laundry	15 GPD (57 LPD)/occupant
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3. The total number of occupants shall be multiplied by the applicable estimated gray water discharge as provided above and the type of fixtures connected to the gray water system.

(B) Commercial, Industrial, and Institutional. The gray water discharge for commercial, industrial and institutional occupancies shall be calculated

by utilizing the procedure in Section 1606.0 (A), water use records, or other documentation to estimate gray water discharge.

(C) Daily Discharge. Gray water systems shall be designed to distribute the total amount of estimated gray water on a daily basis.

1607.0 Required Area of Subsurface Irrigation/Disposal Fields. (See Figure 16-5)

Each valved zone shall have a minimum effective irrigation area in square feet as determined by Table 16-2 for the type of soil found in the excavation, based upon a calculation of estimated gray water discharge pursuant to Section 1606.0 of this chapter, or the size of the holding tank, whichever is larger. The area of the irrigation/disposal field shall be equal to the aggregate length of the perforated pipe sections within the valved zone multiplied the width of the proposed irrigation/disposal field. Each proposed gray water system shall include not less than three (3) zones isolated by valves, and each zone shall be in compliance with the provisions of the section. No excavation for an irrigation/disposal field shall extend within five (5) vertical feet (1,524 mm) of the highest known seasonal ground-water, nor to a depth where gray water contaminates the groundwater or surface water. The applicant shall supply evidence of groundwater depth to the satisfaction of the Authority Having Jurisdiction.

1608.0 Determination of Maximum Absorption Capacity.

(A) Wherever practicable, irrigation/disposal field size shall be computed from Table 16-2.

(B) In order to determine the absorption quantities of questionable soils other than those listed in Table 16-2, the proposed site shall be permitted to be subjected to percolation tests acceptable to the Authority Having Jurisdiction.

(C) When a percolation test is required, no gray water system shall be permitted if the test shows the absorption capacity of the soil is less than eighty-three hundredths (0.83) of a gallon per square foot (33.8 L/m²) or more than five and twelve-hundredths (5.12) of a gallon per square foot (208.6 L/m²) of leaching area per twenty-four (24) hours.

1609.0 Holding Tank Construction. (See Figures 16-1, 16-2, 16-3 and 16-4)

(A) Plans for holding tanks shall be submitted to the Authority Having Jurisdiction for approval. Such plans shall show all dimensions, structural

calculations, bracings, and such other pertinent data as required. A capacity of not less than 50 gallons (189 L) is required.

- (B)** Holding tanks shall be constructed of solid, durable materials not subject to excessive corrosion or decay and shall be water-tight.
- (C)** Each holding tank shall be vented as required by Chapter 9 of this code and shall have a locking, gasketed access opening or approved equivalent to allow for inspection and cleaning.
- (D)** Each holding tank shall have its rated capacity permanently marked on the unit. In addition, a sign stating "GRAY WATER IRRIGATION SYSTEM, DANGER — UNSAFE WATER" shall be permanently marked on the holding tank.
- (E)** Each holding tank installed above ground shall have an emergency drain separate from that connecting the tank with the irrigation/disposal fields and an overflow drain. The emergency and overflow drains shall have permanent connections to the building drain or building sewer, upstream of septic tanks, if any. The overflow drain shall not be equipped with a shutoff valve.
- (F)** The overflow and emergency drainpipes shall be not less in size than the inlet pipe. The vent size shall be determined based on the total gray water fixture units as outlined in Table 7-5 of this code. Unions or equally effective fittings shall be provided for all piping connected to the holding tank.
- (G)** Each holding tank shall be structurally designed to withstand anticipated earth or other loads. Holding tank covers shall be capable of supporting an earth load of not less than three-hundred (300) pounds per square foot (1,464.7 kg/m²) when the tank is designed for underground installation.
- (H)** If a holding tank is installed underground, the system must be designed so that the tank overflow will gravity drain to the existing sewer line or septic tank. The tank shall be protected against sewer line backflow by a backwater valve.
- (I) Materials.**
 - (1) Holding tanks shall be steel, protected from corrosion, both externally and internally by an approved coating or other acceptable means; shall meet nationally recognized standards for the intended use; and shall be approved by the Authority Having Jurisdiction.
 - (2) Holding tanks constructed of alternate material shall be permitted to be approved

by the Authority Having Jurisdiction, provided they comply with approved applicable standards.

1610.0 Gray Water Systems. (See Figures 16-1, 16-2, 16-3, and 16-4)

Gray water systems shall comply with Sections 1610.1 through 1610.4.

1610.1 Pipe Materials. Gray water pipe, valves and fittings shall conform to the requirements of Sections 604.0, 605.0 and 606.0.

1610.2 Color and Information. All gray water systems shall have a purple background with black uppercase lettering, with the words "CAUTION: NONPOTABLE WATER, DO NOT DRINK."

The minimum size of the letters and length of the color field shall conform to Table 6-1. Where used, a colored identification band shall be indicated every twenty (20) feet (6,096 mm) not less than once per room, and shall be visible from the floor level. Marking is not required for pipe manufactured with purple color integral to the pipe and marked with black uppercase lettering to read, "CAUTION: NONPOTABLE WATER, DO NOT DRINK" in intervals not to exceed five (5) feet (1,524 mm). All valves, except fixture supply control valves shall be equipped with a locking feature.

1610.3 Valves. All valves, including the three-way valve, shall be readily accessible and approved by the Authority Having Jurisdiction. A backwater valve installed pursuant to this code shall be provided on all holding tank drain connections to the sanitary drain or sewer piping.

1610.4 Trap. Gray water piping discharging into the holding tank or having a direct connection to the sanitary drain or sewer piping shall be downstream of an approved liquid seal type trap(s). If no such trap(s) exists, an approved vented running trap shall be installed upstream of the connection to protect the building from any possible waste or sewer gases.

1611.0 Irrigation/Disposal Field Construction. (See Figure 16-5)

(A) Perforated sections shall be not less than three (3) inches (80 mm) in diameter and shall be constructed of perforated high-density polyethylene pipe, perforated ABS pipe, perforated PVC pipe, or other approved materials, provided that sufficient openings are available for distribution of the gray water into the trench area. Material, construction, and perforation of the pipe shall be in compliance with the appropriate absorption

fields drainage piping standards and shall be approved by the Authority Having Jurisdiction.

(B) Filter material, clean stone, gravel, slag, or similar filter material acceptable to the Authority Having Jurisdiction, varying in size from three-quarters of an (3/4) inch (19.1 mm) to two and one-half (2-1/2) inches (64 mm), shall be placed in the trench to the depth and grade required by this section. The perforated section shall be laid on the filter material in an approved manner. The perforated section shall then be covered with filter material to the minimum depth required by this section. The filter material shall then be covered with untreated building paper, straw, or similar porous material to prevent closure of voids with earth backfill. No earth backfill shall be placed over the filter material cover until after inspection and acceptance.

(C) Irrigation/disposal fields shall be constructed as follows (see chart on this page):

(D) When necessary on sloping ground to prevent excessive line slopes, irrigation/disposal lines shall be stepped. The lines between each horizontal leaching section shall be made with approved water-tight joints and installed on natural or unfilled ground.

1612.0 Special Provisions.

(A) Other collection and distribution systems shall be permitted by the local Authority Having Jurisdiction, as allowed by Section 301.0 of this code.

(B) Nothing contained in this chapter shall be construed to prevent the Authority Having Jurisdiction from requiring compliance with higher requirements than those contained herein, where such higher requirements are essential to maintain a safe and sanitary condition.

	Minimum	Maximum
Number of drain lines per valved zone	1	—
Length of each perforated line	—	100 ft. (30,480 mm)
Bottom width of trench	12 in. (305 mm)	18 in. (457 mm)
Spacing of lines, center to center	4 ft. (1219 mm)	—
Depth of earth cover of lines	10 in. (254 mm)	—
Depth of filter material cover of lines	2 in. (51 mm)	—
Depth of filter material beneath lines	3 in. (76 mm)	—
Grade of perforated lines	level	3 in./100 ft.(2.5 mm/m)

**TABLE 16-1
Location of Gray Water System**

Minimum Horizontal Distance In Clear Required From:	Holding Tank		Irrigation/ Disposal Field	
	Feet	(mm)	Feet	(mm)
Building structures ¹	5 ²	(1,524 mm)	2 ³	(610 mm)
Property line adjoining private property	5	(1,524 mm)	5	(1,524 mm)
Water supply wells ⁴	50	(15,240 mm)	100	(30,480 mm)
Streams and lakes ⁴	50	(15,240 mm)	50 ⁵	(15,240 mm)
Sewage pits or cesspools	5	(1,524 mm)	5	(1,524 mm)
Disposal field and 100% expansion area	5	(1,524 mm)	4 ⁶	(1,219 mm)
Septic tank	0	(0)	5	(1,524 mm)
On-site domestic water service line	5	(1,524 mm)	5	(1,524 mm)
Pressurized public water main	10	(3,048 mm)	10 ⁷	(3,048 mm)

Note: When irrigation/disposal fields are installed in sloping ground, the minimum horizontal distance between any part of the distribution system and the ground surface shall be fifteen (15) feet (4,572 mm).

- ¹ Including porches and steps, whether covered or uncovered, breezeways, 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 zero (0) feet for above ground tanks when first approved by the Authority Having Jurisdiction.
- ³ Assumes a 45 degree (0.79 rad) angle from foundation.
- 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 also apply between the irrigation/disposal field and the ocean mean higher high tide line.
- ⁶ Plus two (2) feet (610 mm) for each additional foot of depth in excess of one (1) foot (305 mm) below the bottom of the drain line.
- ⁷ For parallel construction/for crossings, approval by the Authority Having Jurisdiction shall be required.

TABLE 16-2
Design Criteria of Six Typical Soils

Type of Soil	Minimum square feet of irrigation/leaching area per 100 gallons of estimated gray water discharge per day	Maximum absorption capacity in gallons per square foot of irrigation/leaching area for a 24-hour period
Coarse sand or gravel	20	5.0
Fine sand	25	4.0
Sandy loam	40	2.5
Sandy clay	60	1.7
Clay with considerable sand or gravel	90	1.1
Clay with small amounts of sand or gravel	120	0.8

TABLE 16-2
(Metric) Design Criteria of Six Typical Soils

Type of Soil	Minimum square meters of irrigation/leaching area per liter of estimated gray water discharge per day	Maximum absorption capacity in liters per square meter of irrigation/leaching area for a 24-hour period
Coarse sand or gravel	0.005	203.7
Fine sand	0.006	162.9
Sandy loam	0.010	101.8
Sandy clay	0.015	69.2
Clay with considerable sand or gravel	0.022	44.8
Clay with small amounts of sand or gravel	0.030	32.6

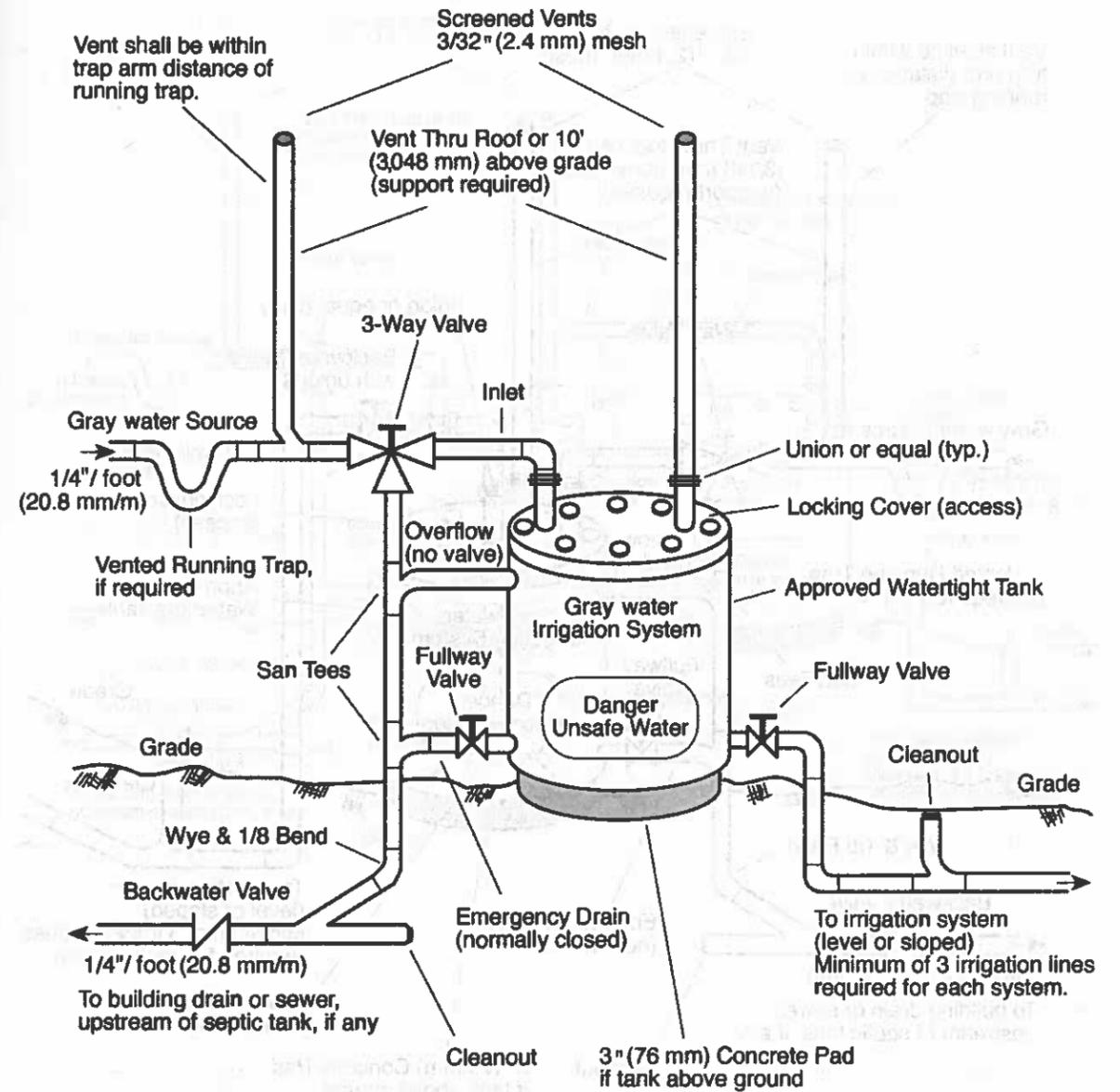


FIGURE 16-1 Gray Water System Tank – Gravity.

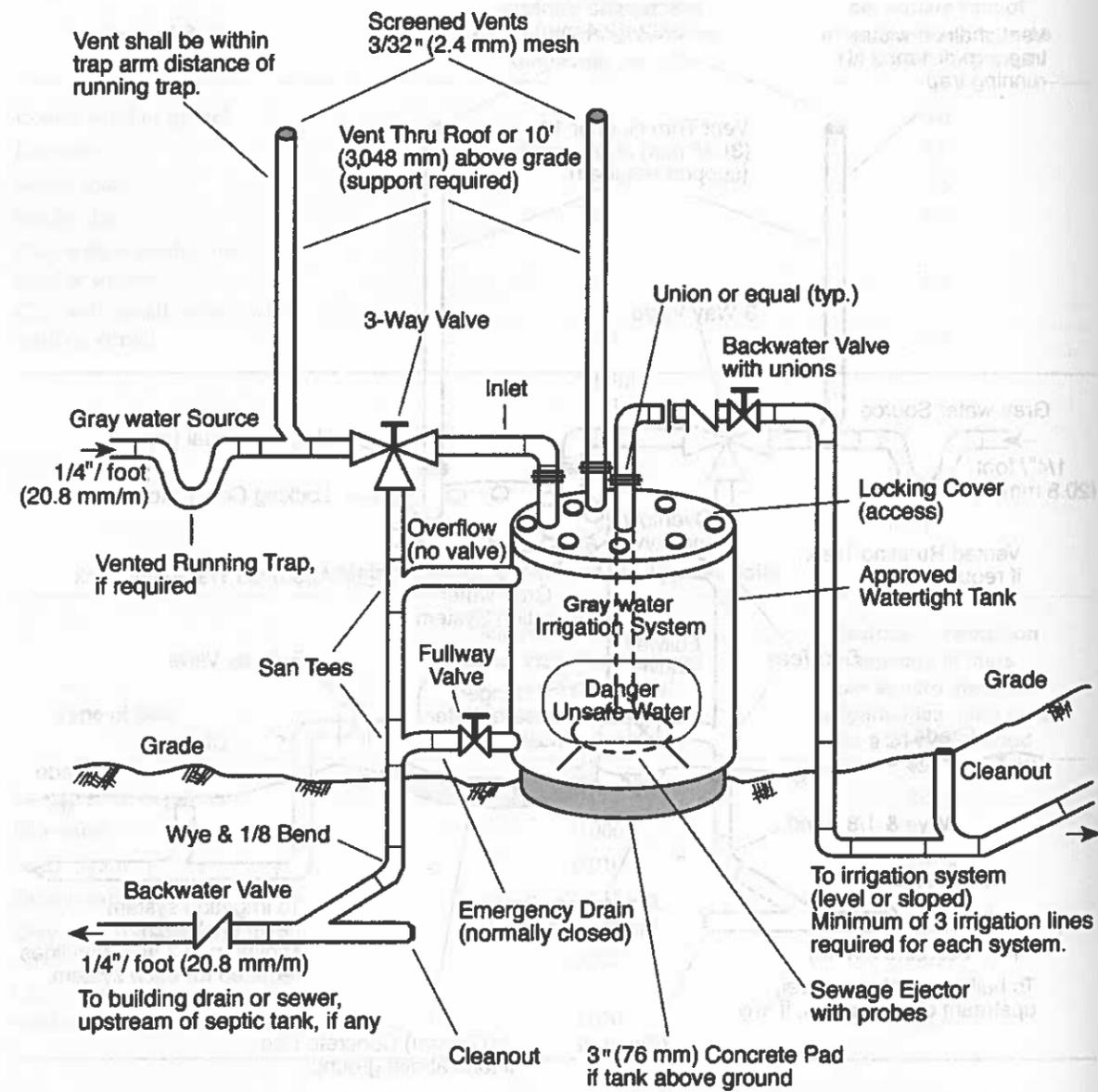


FIGURE 16-2 Gray Water System Tank - Pumped.

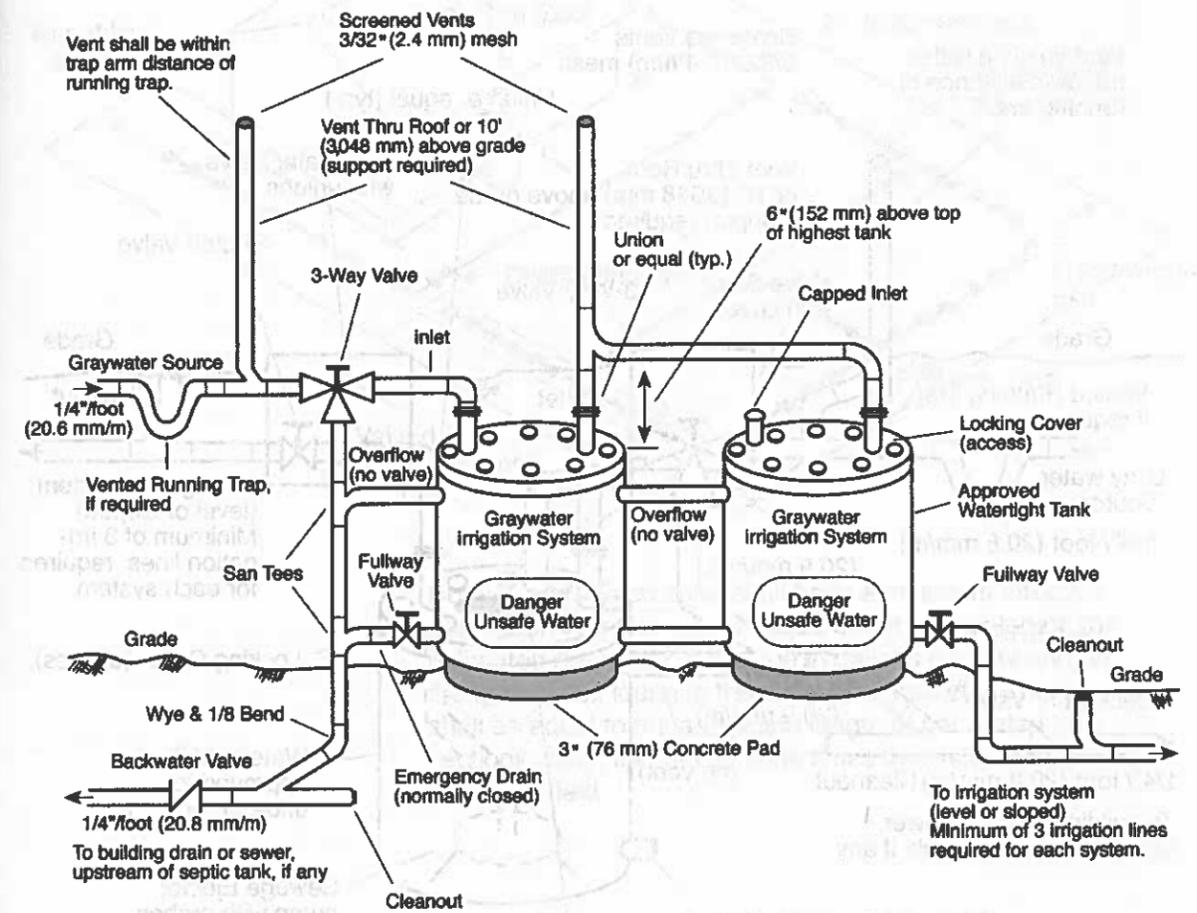


FIGURE 16-3 Gray Water System Multiple-Tank Installation.

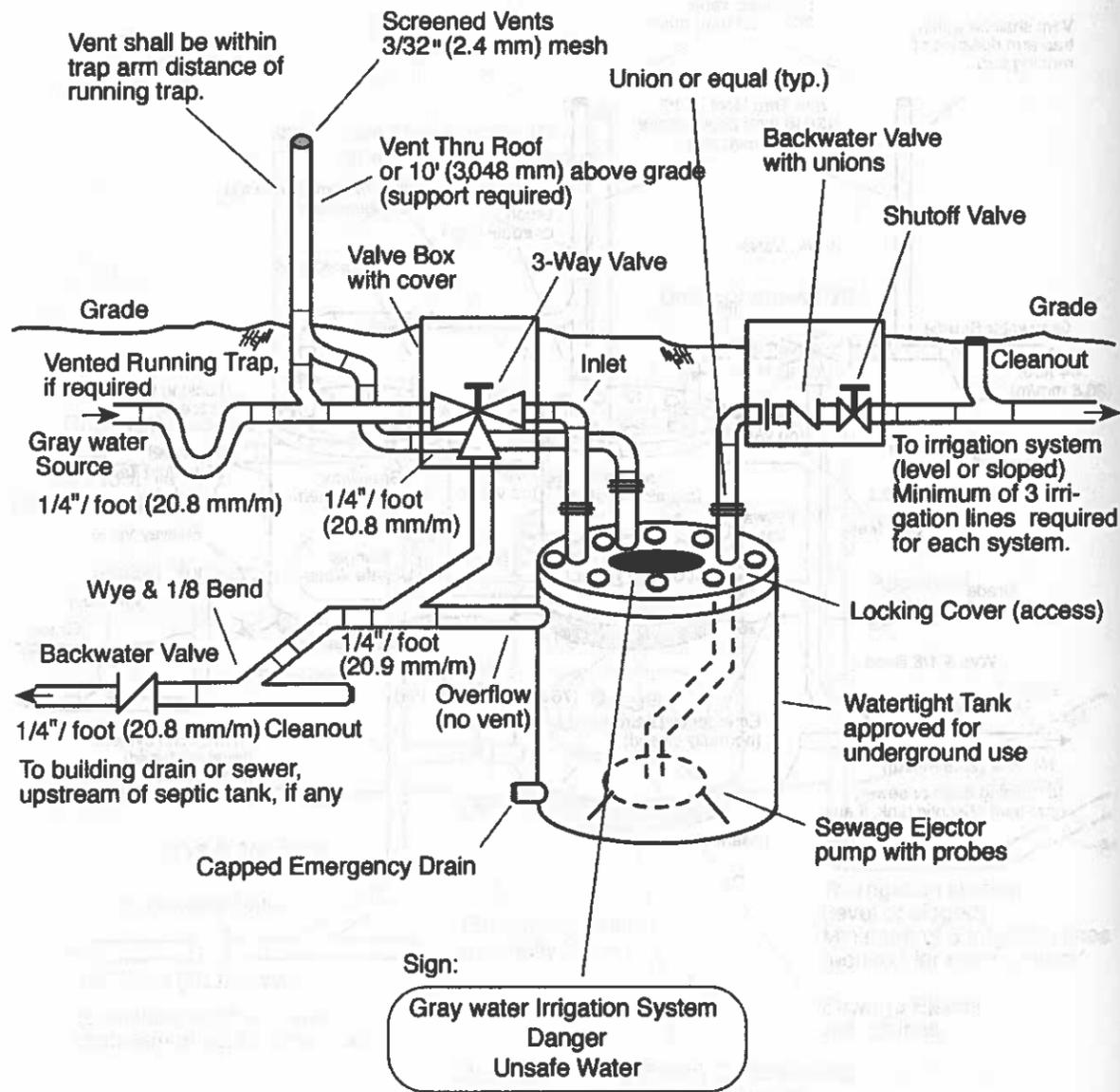
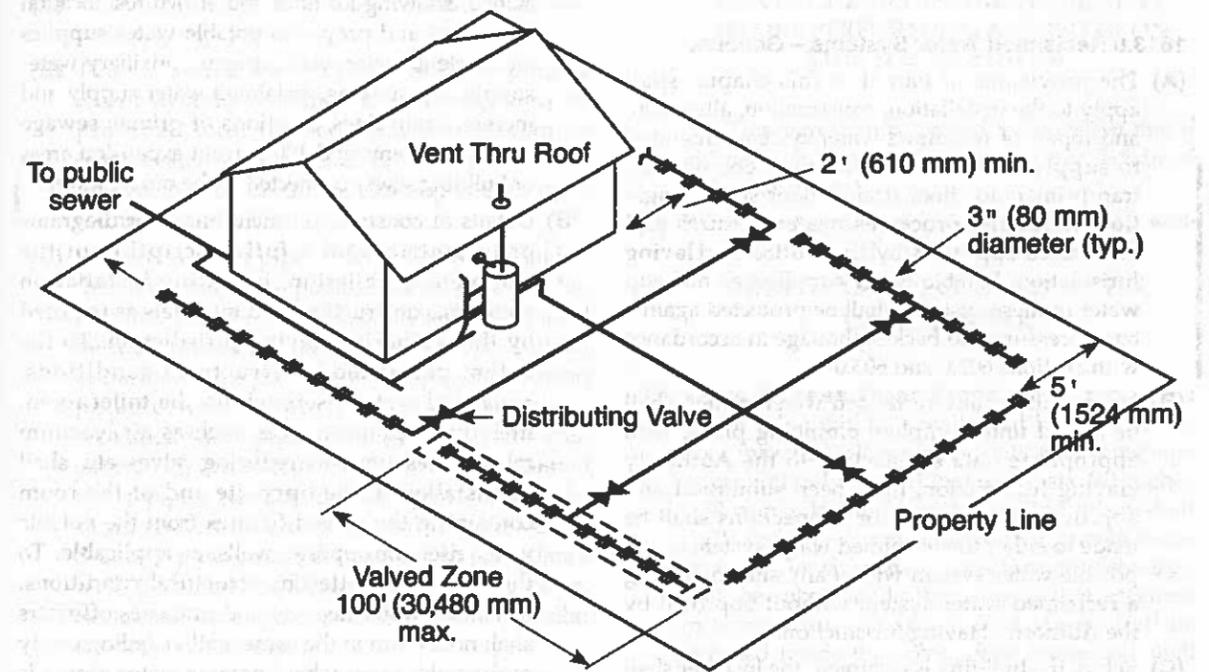


FIGURE 16-4 Gray Water System Underground Tank - Pumped.



Note: Each valved zone shall have a minimum effective absorption/irrigation area in square feet predicated on the estimated graywater discharge in gallons per day and on the type of soil found in the area. The area of the field shall be equal to the aggregate length of perforated pipe sections within the valved zone times the width of the proposed field.

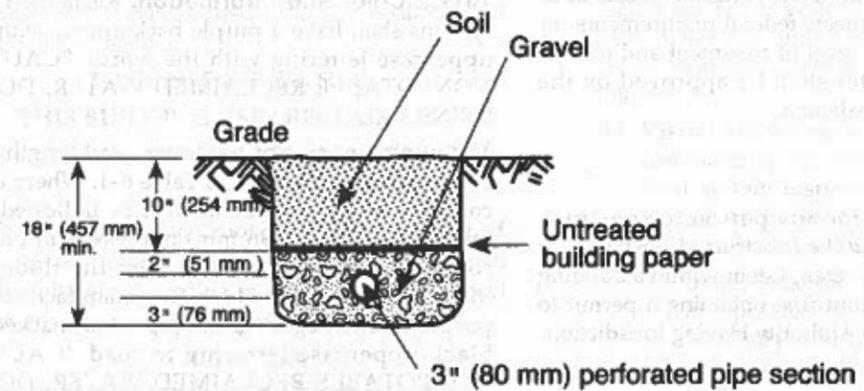


FIGURE 16-5 Gray Water System Typical Irrigation Layout.

SECTION 2 - WATER, RECLAIMED WATER, AND WASTEWATER CRITERIA

2.3.4. Backflow Prevention Rules and Regulations Pertaining to Sites With Both City Potable Water and Auxiliary Water

A. Auxiliary Water means a water from a source other than the City’s potable water supply, or mixture of water and anything else, from any source, which is pressurized for any purpose, use, treatment, or disposal on or available to a site served by the City’s potable water system.

The presence of auxiliary water on a site also served by the City’s potable water system requires that a backflow prevention assembly be installed at all City water service connections to the site in order to prevent the auxiliary water from contaminating the City’s potable water system.

Table 2.3.4. A. includes a partial list of common auxiliary water sources that may be found on sites also serviced by the City’s potable water system, the containment backflow protection required at the service points, and the isolation backflow protection required at the point of supply where the City’s potable water is used as a backup to an auxiliary water source. The table describes the minimum approved backflow protection required at sites using auxiliary water. These requirements apply to all Austin Water customers. Note that backflow preventers approved for higher levels of protection may be used in place of the minimum required backflow preventer described below:

AG = Air Gap. Approved for all hazards, but its use is not always practical. AG’s are the best, or highest level of backflow protection.

RP = Reduced Pressure Zone Backflow Prevention Assembly (also known as RPZ). Approved for all hazards where an air gap would be impractical (exception: sewer). An RP is the best level of approved protection after an Air Gap.

DC = Double Check Backflow Prevention Assembly (also known as DCVB or DCVA). Approved for low hazards only. A DC provides the lowest level of approved protection.

Table 2.3.4. A.

	<i>Containment Backflow Protection Required At</i>	Isolation Backflow Protection Required at Point of Supply
--	-----------------------------------------------------------	-----------------------------------------------------------

List of Pressurized Auxiliary Water Sources and Uses (1)		Domestic Water Meter (2), (3)	Irrigation Water Meter (3)	City Service to Private Fire Mains (4), (5), (6)	Where Austin is used as Back-up to Auxiliary Water Source
Lake/River Water		RP	RP	RP	RP
Well Water		RP	RP	RP	RP
Rainwater Harvesting		RP	RP	RP	RP
Reclaim Water	used on property	RP	RP	DC	AG
	used in building	RP	RP	RP	AG
Gray Water, Re-Irrigation, Disposal		RP	RP	RP	AG
Other Water Supply (7)		RP	RP	RP	AG

Table Notes:

(1) All auxiliary water use sites are required to have a Customer Service Inspection performed in addition to the annual operational test of the backflow assemblies.

(2) Backflow prevention assemblies installed at potable water meters require attention to thermal expansion.

(3) Backflow prevention assemblies installed at potable and irrigation water meters in conjunction with an auxiliary water source are required to have an annual backflow assembly operational test.

(4) New backflow prevention assemblies installed in existing fire systems may result in the need to re-calculate fire system design specifications due to backflow preventer pressure losses.

(5) Backflow prevention assemblies installed in un-metered fire systems are required to be detector assemblies.

(6) DCs installed on fire systems at reclaimed water use sites are required to have a semiannual operational test

(7) Other includes any and all other defined auxiliary waters not listed in this chart and/or any combination of 2 or more auxiliary waters.

B. Reclaimed Water means reclaimed municipal wastewater that is under the direct control of the City treatment plants, satellite facilities, or a treatment plant with which the City contracts, and that has been treated to a quality that meets or exceeds 30 Texas Administrative Code, Chapter 210 requirements. Reclaimed Water is water which, as a result of treatment of wastewater by a public agency, is suitable for a direct beneficial use or a controlled use that would not otherwise occur.

Because reclaimed water is the product of a final stage of a wastewater treatment process, it is prohibited by the plumbing code from connection or contact at any time for any reason with potable water.

The following rules are intended to insure the prevention of cross contamination of potable water with reclaimed water and other auxiliary waters. All measurements shall be made from the pipe's outside diameter.

1. Pressurized auxiliary water piping shall be separated from potable water piping by a horizontal distance of at least ten (10) feet or any piping within ten (10) feet shall be sleeved.
2. Auxiliary water pipes shall not be run or laid in the same trench as potable water pipes. A ten (10) foot horizontal separation shall be maintained between buried pressurized reclaimed and potable water piping.
3. Buried potable water pipes crossing auxiliary water pipes shall be laid a minimum of twelve (12) inches above the auxiliary water pipes and the auxiliary water piping shall have a minimum twenty (20) foot sleeve centered on the potable water pipe.
4. Auxiliary water irrigation (the edge of the soaking of the applied reclaim water) shall stop ten 10 feet from potable water irrigation heads.
5. Operational or tailwater controls shall be provided to preclude discharge of auxiliary water from irrigation sites.
6. Auxiliary systems shall be designed so that the irrigation spray does not reach any privately owned premises outside the designated irrigation area or reach public drinking fountains.
7. A forty (40) foot protected zone shall be established around a drinking fountain installed in an open field of auxiliary water irrigation. A twenty (20) foot radius of drip irrigation around the drinking fountain surrounded by a twenty (20) foot radius of shrub bubblers shall establish the forty (40) foot protected zone. Pop-up spray heads and rotary heads on auxiliary water systems cannot be installed closer than their radius to any potable water outlet and/or protected zones.
8. Hose bibs on reclaimed water systems and hose connections to reclaimed water systems are not permitted
9. Water for housekeeping in areas served with auxiliary water shall be provided from the city potable water source protected by an RPZ at the water meter and/or at the branch off the private potable drinking water system. The line shall be sleeved from the RPZ to an in-ground lockable service box labeled "NON-POTABLE CITY WATER - DO NOT DRINK." The hose connection in the box shall be a unique connection such as a bayonet stab/twist style with the hose permanently connected to the bayonet without use of garden hose threads. The water valve shall require a special key for valve operation.
10. Hose bibs through and outside the walls of buildings on sites using auxiliary water shall have RPZ water protection on the lines serving the hose bibs. All the hose bibs shall be in a locked boxes, and may be supplied from a single RPZ, and the piping and locked boxes themselves shall be labeled "NON-POTABLE CITY WATER - DO NOT DRINK." All hose bib boxes and the water valves themselves shall require a special key for access and operation.

2.3.5. Cross Connection Inspections and Testing Requirements for Sites With Both City Potable Water and Auxiliary Water

The inspections and testing required to confirm the separation of or discover the cross connection between an auxiliary water system and the City's potable water system shall be conducted by City potable water customers upon installation of reclaimed water or other auxiliary water sources used to supply private pressurized water systems inside or outside buildings on sites where City potable water is used for any purpose.

These inspections and tests shall be conducted as follows:

- A. Reclaimed and other auxiliary water piping shall be tested as outlined in this manual.
- B. Inspecting and testing systems. An initial inspection prior to receiving reclaimed water service or the start-up of any auxiliary water system and subsequent periodic cross connection inspections and tests shall be performed in addition to a Customer Service Inspection as prescribed by the Texas Commission on Environmental Quality (TCEQ) in TAC 30 Chapter 290 Subchapter D §290.46(j).

The City water customer requesting to use or continue to use reclaimed or any auxiliary water system in addition to City potable water on a site shall employ, at their own expense, a licensed Water Supply Protection Specialist (WSPS) or Customer Service Inspector (CSI) registered with the Austin Water Utility to schedule and perform the customer service inspection prescribed on both the potable and reclaimed and/or auxiliary water systems as follows:

1. Visual System Inspection. Prior to commencing the cross-connection testing, a dual system inspection shall be conducted by the WSPS or CSI, (terms hereafter to mean the same as "customer" or "applicant") with direction and oversight of the Authority Having Jurisdiction (as defined in the 2009 Uniform Plumbing Code section 203.0) and other Authorities Having Jurisdiction.

- a. Source locations of the auxiliary water lines and meter locations of the reclaimed water and potable water lines shall be checked to verify that no modifications were made, or cross-connections are visible.

- b. All pumps and equipment, equipment room signs, and exposed piping in equipment room shall be checked.

- c. All valves shall be checked to ensure that valve lock seals are still in place and intact. All valve control door signs shall be checked to verify that no signs have been removed.

2. Cross-Connection Test. After all on-site piping has been completed and pressure and flow-tested, the following procedure shall be followed by the applicant with direction and oversight of the Authority Having Jurisdiction and other Authorities Having Jurisdiction to determine if a cross-connection occurred.

- a. All water systems shall be activated and pressurized as follows:

- i. For the initial charging and testing, reclaimed and auxiliary water systems shall not be connected to the auxiliary source until the initial cross connection test has been successfully performed, (i.e., proof there is no cross connection). Water source for testing auxiliary water piping shall be from a potable water supply protected with an installed, tested and reported reduced pressure zone (RPZ) backflow prevention assembly. Since all the piping downstream of the potable water containment backflow

preventer will be subjected to this test, the source of potable water must be taken either from the section between the potable water meter and the containment backflow preventer or from a totally separate source such as a temporary fire hydrant meter and in every case these sources must be backflow protected with an RPZ.

ii. For both initial and periodic testing, the auxiliary water system shall be shut down at the property owner's system supply cutoff (POSSCO) valve and, in the case of reclaimed water, at the property owner's cut off (RWPOCO) valve. A tee (line size up to 2") shall be provided downstream of the containment backflow preventers in the case of reclaimed water, and the POSSCO valves in the case of all other auxiliary waters (AWFPBV) with a line size (up to 2") full port ball valve for flushing, sampling, and troubleshooting. All water systems' sectional, isolation, and automated control valves shall be in the fully open position throughout this test.

b. The potable water system shall remain pressurized for a minimum period of time specified by the Authority Having Jurisdiction while the auxiliary water systems are down being examined. The minimum period the auxiliary water system is to remain under test shall be determined on a case-by-case basis, taking into account the size and complexity of the potable and auxiliary water distribution systems, but in no case shall that period be less than one hour.

c. At this time, the AWFPBV and other auxiliary water system drain valves shall be fully opened in order to drain the auxiliary water systems.

d. All potable fixtures and outlets shall be tested and inspected for flow and the time and location of each test shall be logged. Low or no flow from a potable water outlet would indicate that fixture or outlet may be connected to an auxiliary water system.

e. All auxiliary water fixtures, irrigation sprinkler zones, etc. shall be tested and inspected for flow. Flow from any auxiliary water system outlet shall indicate a cross connection.

f. While the procedures in Section [2.3.5.B.2.d.](#) above are being performed, periodic checks of all auxiliary water drain openings shall be made looking for the appearance of water. This section of the test is completed and passed if, after completion of the required test period, no unexpected appearance of water is found at the auxiliary water service points (points of use) or at any drains,

g. For initial tests, secure all drains and refill the auxiliary water systems using the temporary water source established for this purpose in Section [2.3.5.B.2.a.i.](#) above and then purging the air while leaving all (POSSCO) and (RWPOCO) valves shut. For periodic tests, open these valves and start up the auxiliary water systems.

h. The potable water system shall then be shut down at the #1 Shut-off Valve of the containment backflow preventer. A tee shall be provided downstream of the containment backflow preventer with a line size (up to 2") full port ball valve (PWFPBV) for flushing, sampling, and troubleshooting. All water meters should be read and the readings and times recorded.

i. At this time, the PWFPBV and other potable water system drain valves shall be fully opened in order to drain the potable water system.

j. The auxiliary water systems shall remain pressurized for a minimum period of time specified by the Authority Having Jurisdiction. The minimum period the potable water system is to remain depressurized shall be determined on a case-by-case basis, but in no case shall that period be less than one hour.

k. All auxiliary water fixtures, irrigation sprinkler zones, etc. shall be tested and inspected for flow. No flow from an auxiliary water outlet would indicate the auxiliary water system may be connected to the potable water system. Likewise, test all potable water outlets to confirm no flow and no appearance of water at the potable water PWF/PBV and other drains.

l. If unexpected flows or no-flows are detected, resolve cause.

m. This cross connection test is considered complete and passing if there is no unexpected flow detected in any of the fixtures or water at the drains, which would have indicated a cross connection. The potable water system may now be repressurized and the system returned to normal.

n. If this was an initial test, the site is now approved for setting reclaimed meter and/or connection to, and startup of, the auxiliary water systems.

3. In the event that a cross connection is discovered, the following procedure shall be activated immediately in the presence of the Authority Having Jurisdiction:

a. Reclaimed water piping shall be shut down at the reclaimed RW/POCO valve at the meter, or auxiliary water at the POSSCO valve, and riser shall be drained.

b. All potable water sources to the building shall be shut down at the meter/service connection

c. The cross connection shall be uncovered and disconnected.

d. The site water piping shall be retested following procedures listed in subsections 2.3.5. B.1. and 2.3.5. B.2. above.

e. The potable water system shall be chlorinated with at least fifty (50) ppm chlorine for twenty-four (24) hours.

f. The potable water system shall be flushed after twenty-four hours and a standard bacteriological test shall be performed. If test results are acceptable, the potable water system may be recharged.

C. An annual inspection of the reclaimed water system following the procedures listed in Sections [2.3.5.B.1.](#) and [2.3.5.B.2.](#) shall be required by the Authority Having Jurisdiction.

D. A periodic (other than annual) inspection of auxiliary water systems other than reclaimed water following the procedures listed in Sections [2.3.5.B.1.](#) and [2.3.5.B.2.](#) may be approved by the Authority Having Jurisdiction. The frequency shall be determined and may be changed based on system complexity, exposure for modifications, hidden or visible piping, hazardous materials used or stored, history of compliance, etc.

E. Drawings and Specifications. The Authority Having Jurisdiction may require any or all of the following information to be included with or in the plot plan before a permit is issued for installation and/or operation of a reclaimed or auxiliary water system and for the planning and execution of the periodic inspection and testing of systems.

1. A plot plan drawn to scale and completely dimensioned, showing lot lines and structures, location of all present and proposed potable water supplies and meters, water wells, streams, auxiliary water supply and systems, reclaimed water supply and meters, drain lines, and locations of private sewage disposal systems and one hundred percent expansion areas or building sewer connected to the public sewer.

2. Details of construction including riser diagrams or isometrics and a full description of the complete installation, including installation methods, construction, and materials as required by the Authority Having Jurisdiction. To the extent permitted by structural conditions, all reclaimed and auxiliary water risers within the toilet room, including appurtenances such as air/vacuum relief valves, pressure reducing valves, etc. shall be installed in the opposite end of the room containing the served fixtures from the potable water risers or opposite walls, as applicable. To the extent permitted by structural conditions, reclaimed and auxiliary water headers and branches off risers shall not be run in the same wall or ceiling cavity of the toilet room where potable water piping is run.

F. Periodic inspections shall recur from the month of the auxiliary water system startup. Requests for changes to this schedule must be in writing. At no time may a change of schedule be used to avoid a scheduled Customer Service Inspection.

G. Alternate methods for inspection and testing which will confirm separation of, or discover the cross connection between, auxiliary water systems and City potable water supplied systems may be submitted to the Authority Having Jurisdiction and must comply with the requirements set forth in Chapter 301.2 of the Austin Plumbing Code.

H. The performance, witnessing and certification of the inspection and test of Austin Water sites utilizing reclaimed and/or auxiliary water systems shall be treated as Customer Service Inspections as described in the Rules and Regulations for Public Water Systems, 30 TAC Chapter 290 Subchapter D § 290.46(j).

1. A customer service inspection certificate as described and found in the Rules and Regulations for Public Water Systems, 30 TAC Chapter 290 Subchapter D § 290.47(b) shall be completed and delivered to the Austin Water Utility. Additional report on the cross connection inspection and test containing site specific documentation, test data, gauge and meter readings, test preparations and results, etc. may be required.

2. Individuals with the following credentials shall be recognized as capable of conducting a customer service inspection certification.

a. Plumbing Inspectors and Water Supply Protection Specialists licensed by the Texas State Board of Plumbing Examiners.

b. Customer Service Inspectors who have completed a Texas Commission on Environmental Quality (TCEQ) approved course, passed an examination administered by TCEQ, and hold current professional certification or endorsement as a Customer Service Inspector.

c. Persons wishing to perform Customer Service Inspections for City water customers must first meet with the Austin Water Utility to register, and learn the process, procedures, reporting expectations, and other requirements.

ORDINANCE NO. 20100624-146

AN ORDINANCE REPEALING AND REPLACING ARTICLE 6 OF CITY CODE CHAPTER 25-12 TO ADOPT THE 2009 UNIFORM PLUMBING CODE AND LOCAL AMENDMENTS.

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF AUSTIN:

PART 1. City Code Chapter 25-12 is amended to repeal Article 6 (*Plumbing Code*) and replace it with a new Article 6 to read as follows:

ARTICLE 6. PLUMBING CODE

§ 25-12-151 PLUMBING CODE.

- (A) The Uniform Plumbing Code, 2009 edition, published by the International Association of Plumbing and Mechanical Officials (2009 Uniform Plumbing Code) is adopted and incorporated into this section, including all appendices except Appendices F and K, with deletions and amendments in Subsection (B) and Section 25-12-153 (*Local Amendments to the Plumbing Code*).
- (B) The following provisions of the 2009 Plumbing Code are deleted. All subsections contained within a deleted section or subsection are also deleted, even if not specifically listed below.

101.4.1.3	101.5.3	103.1.1
103.1.2	103.1.3	103.3.4
103.4	Table 1-1	313.7
320.0	402.2	402.3
411.2	Table 5-1	501.0
507.1.1	508.4	509.4
601.1	601.2.2	Table 6-2
603.1	603.3.4	603.4.6.1
603.4.12	608.2	704.3
707.4	710.3.3	712.0
713.4	713.6	715.1
723.0	801.3	804.1

807.4	905.3	909.0
Table 10-2	Table 10-3	1007.0
1009.2	1010.0	1011.0
1012.0	1013.0	1014.1
1014.2	1014.3.3	1014.3.6
1014.3.7	1015.0	1016.0
1017.0	Table 11-3	1101.1
1101.3	1101.4	1101.5
1101.6	1101.9	1101.10
1104.3	1106.3	1109.0
1204.3.1	1204.3.2	1204.4
1205.2	1209.5.3.2	1211.3.2
1213.0	1214.0	Table 12-5
Table 12-6	Chapter 13	1501.1
1507.1	Chapter 16 Part II	

- (C) The city clerk shall file a copy of the 2009 Plumbing Code with the official ordinances of the City.

25-12-152 CITATIONS TO THE PLUMBING CODE.

In the City Code, "Plumbing Code" means the 2009 Plumbing Code adopted by Section 25-12-151 (Plumbing Code), as amended by Section 25-12-153 (*Local Amendments to the Plumbing Code*).

25-12-153 LOCAL AMENDMENTS TO THE PLUMBING CODE.

The following provisions are local amendments to the 2009 Plumbing Code. Each provision in this section is a substitute for the identically numbered provision deleted by Section 25-12-151(B) (*Plumbing Code*) or is an addition to the 2009 Plumbing Code.

101.4.1.3 Existing Construction. No provision of this Code shall be deemed to require a change in any portion of a plumbing or drainage system or any other work regulated by this Code in or on an existing building or lot when such work was installed and is maintained in accordance with law in effect before the effective date of this Code, except when any such plumbing or drainage system or other work regulated by this Code is

determined by the Authority Having Jurisdiction to be dangerous, unsafe, unsanitary, or a nuisance and a menace to life, health, or property, or where retrofit is required by Chapter 6-4, Article 1 (*Plumbing Fixture Retrofit*) of the City Code.

101.5.3 Existing Installation. Plumbing systems lawfully in existence at the time of the adoption of this Code may have their use, maintenance, or repair continued if the use, maintenance, or repair is in accordance with the original design and location and no hazard to life, health, or property has been created by such plumbing system unless retrofit is required by Chapter 6-4, Article 1 (*Plumbing Fixture Retrofit*) of the City Code.

103.1.1 Permits Required. It shall be unlawful for any person, firm, or corporation to make any installation, alteration, repair, replacement, or to remodel any plumbing system regulated by this code except as permitted in section 103.1.2, or to cause the same to be done without first obtaining a separate plumbing permit for each separate building, structure, or on-site plumbing or non-potable water reuse system.

103.1.1.1 Persons Authorized to Obtain Permits. A master plumber licensed by the State of Texas and registered with the City may obtain permits required by this Code.

Exception: A permit may be issued to an unlicensed person for plumbing work that under state law may be done by an unlicensed person.

103.1.2 Exempt Work. A plumbing permit is not required for the following:

103.1.2.1 The stopping of leaks in drains, soil pipe, waste pipe or vent pipe, provided, however, that the removal or replacement of a defective concealed trap, drain pipe, soil pipe, waste pipe or vent pipe is new work and a permit shall be procured and inspection made as provided in this Code.

103.1.2.2 The clearing of stoppages, the repair of leaks in pipes, valves or fixtures, or the removal and reinstallation of water closets, if the repairs do not involve or require the replacement or rearrangement of valve, pipes, or fixtures. The installation or replacement, of backflow prevention assemblies, or devices are not exempt from plumbing permit and plumbing licensing requirements.

103.1.2.3 Repairs or replacement of fixtures and replacement of traps, continuous waste piping, water shut-off valves, faucets, are exempt from permit requirements if the work is performed in accordance with the requirements of the Plumbing Code, and does not involve other city departments or inspections from other trades. Exemption from the permit requirements of this Code is not authorization for the work to be done in violation of this Code or other laws or ordinances of the City.

103.1.3 Homestead Permit. A person who is not licensed to perform plumbing work may perform plumbing work within a residence and on property owned by the person if the requirements of this section are met.

- (1) The residence is the person's homestead.

- (2) The work does not include plumbing work that involves natural gas or liquefied petroleum plumbing systems.
- (3) The residence is the person's principal residence.
- (4) The person has not secured a homestead permit for another residence within the prior 12 month period.
- (5) The person must have owned and occupied the property as of January 1 of the tax year in which the person applies for a homestead permit.
- (6) A person must obtain a homestead permit and pay required permit fees before beginning any electrical, mechanical, or plumbing work. A person must apply for a homestead permit in person and must file an affidavit stating that the location at which the work is to be done is the person's homestead.
- (7) A person who has obtained a homestead permit may not allow or cause any person to perform plumbing work under the permit. The building official may suspend or revoke a homestead permit if work done under the permit is performed by anyone other than the person who obtained the permit.
- (8) A person may not transfer a permit to another person.
- (9) A person performing plumbing work under a homestead permit shall present a picture identification to verify that the person is authorized to perform work under the homestead permit, when requested by the building official or his designee.
- (10) A homestead permit shall not be issued for plumbing work on a mobile, modular or manufactured home unless the homeowner owns the land on which the mobile, modular or manufactured home is located. A homestead permit shall not be issued if the mobile, modular or manufactured home is located in a mobile home park, mobile home community or other commercial premises.
- (11) A homestead permit shall not be issued for any auxiliary water system.

103.1.3.4. Registered Industrial Plant Program. A licensed plumber may perform the following plumbing installations in a Registered Industrial Plant, as defined by this Code and the Building Code:

Installation, repair, and replacement of fixtures, traps, shut-off valves, water distribution piping, drains, building waste piping, vent stacks and water heaters with a capacity of 100 gallons or less and a rating of 75,000 BTU or less, provided the work does not require approval of the Austin Travis County Health Department, the City of Austin Water Utility, or the Texas Department of Licensing and Regulation.

No plan review fee or permit fee shall be required if records are maintained in accordance with the registered industrial plant program established in the Building Code.

103.1.4 Licensing. Every person who enters into a contract for the installation or repair of plumbing systems covered by this Code for which a permit is required shall comply with licensing regulation of the State of Texas.

103.1.4.1 Registration of Plumbers. A plumber shall register with the City before performing any work regulated by this Code.

103.1.4.2 Landscape Irrigation. A person licensed by the Texas Commission on Environmental Quality to install irrigation systems shall register with the City. A plumbing permit shall be purchased before installing landscape irrigation or a yard sprinkler system. A registration fee is required when a license is presented for initial registration, after a license suspension, or after license expiration. A new fee shall not be required for a renewal of a license before expiration.

103.1.5 Special Inspections Program. The building official may establish by rule an inspection program of plumbing components identified in this section in buildings within the zoning jurisdiction of the City and outside of the zoning jurisdiction under agreement with a municipal utility district or where the City provides water or wastewater service of the City. Under the program the building official shall inspect work performed under one out of five of the applications submitted. The special inspection program applies to the replacement of existing:

- (1) water heaters not exceeding 100 gallons or 75,000 BTU's; and
- (2) backflow devices.

103.2.1.7 Application for a permit shall contain the name of the master plumber licensed by the State of Texas Board of Plumbing Examiners, and registered with the City.

103.3.4.1 Permit Expiration and Reactivation. Requirements for permit expiration and reactivation, including an enhanced fee for expired permits, are set forth in Chapter 25-12, Article 13 (*Administration of Technical Codes*).

103.4 Fees.

103.4.1 Permit and Plan Review Fees. Permit and plan review fees shall be established under separate ordinance by action of the City Council.

103.9 Solar Heating Systems. A solar water heater or a solar recreational and therapeutic water-heating system shall be installed in accordance with the requirements of this Code and the Solar Code. A public solar recreational and therapeutic water heating system shall be installed in accordance with the requirements of this Code, the Solar Code, and the Health Authority.

104.0 Private Sewage Systems. The Austin Water Utility regulates private sewage disposal systems covered by this Code. Regulations regarding on-site sewage facilities are found in Chapter 15-5 of the City Code.

105.0 Mechanical, Plumbing and Solar Board. Regulations regarding the Mechanical, Plumbing and Solar Board are found in Chapter 2-1 of the City Code.

106.0 Qualified Inspectors. An inspector who performs inspections under this code must meet the following qualifications.

106.1 Plumbing/Mechanical Inspector Supervisor.

- (1) The Plumbing/Mechanical Inspection Supervisor must:
 - (a) be an employee of the City;
 - (b) maintain a current plumbing inspector license issued by the Texas State Board of Plumbing Examiners;
 - (c) maintain a current certification as a mechanical and plumbing inspector under the certification program established by the International Code Conference or International Association of Plumbing and Mechanical Officials; and
 - (d) have at least ten years of experience as a licensed master plumber or equivalent experience as a City or state licensed air conditioning and refrigeration contractor, at least three years of which must be in a responsible supervisory capacity.
- (2) Five years of inspection experience may be substituted for five years of craft experience required in Subsection 1(d) above.

106.2 A plumbing inspector must:

- (1) be an employee of the City;
- (2) maintain a current plumbing inspector license issued by the Texas State Board of Plumbing Examiners;
- (3) maintain a current certification as a plumbing inspector under the certification program established by the International Code Conference or the International Association of Plumbing and Mechanical Officials; and
- (4) have a least five years of experience as a state licensed master or journeyman plumber, one year of which must be in a responsible supervisory capacity.

106.3 A person hired by the City as a commercial plumbing inspector after the effective date of this Code must become certified through the certification program established by the International Code Conference or the International Association of Plumbing and Mechanical Officials not later than one year after the date of employment.

218.1 Definition of “plumbing system.” The following definition supercedes the definition included in Section 218 of the Uniform Plumbing Code, which applies to all other defined terms:

Plumbing System: includes all potable water, building supply, and distribution pipes; all plumbing fixtures and traps; all drainage and vent pipes; and all building drains and building sewers, including their respective joints and connections, devices, receptors, and appurtenances within the property lines of the premises and shall include potable water piping, nonpotable water reuse systems, irrigation systems, potable water treating or using equipment, medical gas and medical vacuum systems, liquid and fuel gas piping, and water heaters and vents for same.

220.1 Definition of “Restricted Use Restroom.” The following definition supplements the definitions in Section 220.0:

Restricted Use Restrooms: A restricted use restroom is a restroom that is immediately accessible only through one or more single occupant offices and that are located on a floor where adequate public restroom facilities are also available. A restricted use restroom is not a public restroom for purposes of this Code.

222.1 Definition of “Trap, Deep Seal P-trap.” The following definition supplements the definitions in Section 222.0:

Trap, Deep Seal P-trap. A fixture trap having a water seal of at least four inches, but not more than twice the diameter of the trap arm, and not to exceed twelve (12) inches. A trap shall set true with respect to its water seal, and, where necessary, it shall be protected from freezing.

305.2.1 Sewage System Connection Required. The drainage system of every house or building shall be separately and independently connected to a public sewage disposal system if any part of the lot or tract that contains the house or building is within 100 feet in horizontal distance (measured on the closest practicable access route) of a public sewage disposal system. Connection to a public sewage disposal system is not required if any one of the following applies:

- (1) The property owner has received a written denial of service from the owner or governing body of the public sewage disposal system.
- (2) The property owner has received a written determination from the Austin Water Utility that it is not feasible for the building to be connected to the public sewage disposal system.
- (3) The property is served by an existing private sewage facility and the Austin Water Utility has determined that the private sewage facility may continue to be used based on factors such as the type of facility served, the age, condition, and capacity of the private sewage facility, and the availability of records regarding the system, changes to the system, or the generating unit.

- (4) A composting toilet serves the property; and the Austin Water Utility has approved the disposal of liquid wastes in a private on-site sewage facility.

313.7 Piping penetrations of fire resistance rated walls; partitions, floors, floor/ceiling assemblies, roof/ceiling assemblies, or shaft enclosures shall be protected in accordance with the requirements of the Building Code.

320.0 Medical Gas and Vacuum Systems. The installation of any medical gas and vacuum system used in conjunction with human health care purposes shall comply with all requirements of the current edition of the National Fire Protection Association (NFPA) 99C, entitled "*Medical Gas and Vacuum Systems*". The latest edition of the ANSI/ASSE Series 6000 titled "*Professional Qualifications Standards for Medical Gas Systems Installers, Inspectors, Verifiers, Maintenance Personnel and Instructors*" shall also be applicable except that which conflicts with the Texas State Board of Plumbing Examiners *Plumbing License Law* requirements. Medical gas installations for Non-Human Use shall conform to section 1304.0 in its entirety.

321.0 Requirements for Flood Plain Areas.

321.1 Definitions.

- (1) Regulatory Flood Datum (RFD) means an established plane of reference from which elevations and depth of flooding may be determined for specific locations of the flood plain in accordance with the Building Code.
- (2) W-1 spaces means spaces that must remain completely dry during flooding to the RFD. Walls must be impermeable to water and water vapor in accordance with the Building Code.
- (3) W-2 spaces means spaces that remain essentially dry during flooding to the RFD. Walls must be impermeable to water, but may pass some water vapor or seep slightly in accordance with the Building Code.

321.2 For the purpose of this section, plumbing systems shall include sanitary and storm drainage, sanitary facilities, water supply, and storm water disposal systems.

321.3 Sanitary sewers and storm drainage systems that have openings below the RFD shall be provided with automatic backwater valves or other automatic backflow devices that are installed in each discharge line passing through a building exterior wall. In W-1 spaces, manually operated shut-off valves that can be operated from a location above the RFD shall also be installed on the lines to serve as supplementary safety provisions for preventing backflow if the automatic backflow device fails.

321.4 If the dryness of a space depends on sump pump systems, all interior storm water drainage or seepage, appliance drainage, and under slab drain tile systems shall be directly connected to a sump pump and discharged at an elevation of five feet above the RFD.

321.5 Septic tanks and disposal beds are not permitted in the 25-year flood hazard area. In other areas within the flood hazard areas, the use of septic tanks and disposal beds for sewage disposal is subject to the approval of Austin Water Utility.

321.6 Potable water supply systems that are located in the flood hazard area shall be designed and installed in a manner that prevents contamination from floodwaters up to the RFD.

321.7 Approved backflow preventers or devices shall be installed on main water service lines to building entry locations to protect the system from backflow or back siphonage of waters or other contaminants in the event of a line break. Devices shall be installed at accessible locations and shall be maintained in accordance with this Code.

321.8 Establishment of Flood Hazard Areas. Flood hazard areas are established to include the following:

- (1) The flood hazard areas identified by the Federal Emergency Management Agency in a scientific and engineering report entitled, "The Flood Insurance Study for Austin, Texas," dated September 26, 2008, with accompanying Flood Insurance Rate Maps and Flood Boundary-Floodway Maps (FIRM and FBFM) and related supporting data along with any amendments or revisions thereto are hereby adopted by reference and declared to be a part of this section.
- (2) The 100-year and 25-year floodplains based on projected frill development as specified in the Austin City Code and Drainage Criteria Manual are adopted by reference and declared to be part of this section.

322.0 Elevator Sump Pumps. Pumps and associated piping and materials required for elevators installed under the rules of the Texas Administrative Code, Title 16, Part 4, Chapter 74 shall also comply with sections 322.1 thru 322.4.

322.1 Acceptable Discharge Location. Pumps shall discharge to the storm system outside the building, detention pond or other location approved by the Authority Having Jurisdiction.

322.2 Discharge Piping. Piping shall be a minimum of one and a half inch (1 ½") NPS. Piping shall be independent and not connect to the storm or sub-soil piping within the building. Discharge piping shall conform to section 710.4 of this code. If an elevator sump pump is located below the 100 year flood plain its piping shall rise above the 100 year flood plain elevation before connecting to a gravity drainage system. Piping shall be labeled as required in section 610.2.2 of this code.

322.3 Materials. Piping materials for elevator sump pump piping shall be of galvanized steel, galvanized wrought iron, copper or other material approved by the Authority Having Jurisdiction.

322.4 Sample Port. A sample port shall be installed outside the building on private property or other locations approved by the Authority Having Jurisdiction. Acceptable sample ports include single riser two way cleanouts, open grate catch basins or other approved fittings/receptors with the ability to visually see the flow line and retrieve samples.

402.2 Water Closets. Effective May 1st, 2010, water closets, including flush tank, flushometer tank, and flushometer valve operated, shall have an average consumption of a maximum of 1.28 gallons of water per flush.

402.3 Urinal Flushometer. New installation of a flushometer valve shall have a maximum discharge of (1/2) one-half gallon per flush.

402.3.1 Nonwater Urinals. Nonwater urinals shall be listed and comply with the applicable standards referenced in Table 14-1. Nonwater urinals shall have a barrier liquid sealant to maintain a trap seal. Nonwater urinals shall permit the uninhibited flow of waste through the urinal to the sanitary drainage system. Nonwater urinals shall be cleaned and maintained in accordance with the manufacturer's instructions after installation. Where nonwater urinals are installed they shall have a water distribution line rough-in to the urinal location to allow for the installation of an approved backflow prevention device in the event of a retrofit. Nonwater urinals that are determined by the Authority Having Jurisdiction to have been maintained contrary to the manufacturer's instructions, and determined to be a health hazard or detrimental to public health and safety shall be retrofitted by a flushometer type urinal complying with Section 402.3. The Building Official shall establish the timeline for a retrofit if public health is compromised.

402.7 Compliance with State Water Conservation Standards. Water saving performance standards for all plumbing fixtures must comply with ANSI A112.18.1-Plumbing Fixtures (Flow Capacity) and Chapter 372 of the Health and Safety Code of the State of Texas, whichever is more restrictive.

408.1.1 Water Closet Enclosure. Each water closet that will be used by the public or employees shall be separated by walls or partitions and a door to maintain privacy.

Exception: Water closet enclosures shall not be required in single occupant toilet facilities which contain a lockable door.

408.4.6 Fixtures, brackets and flanges shall be set on finished walls and floors.

Exception: Water closets in carpeted bathrooms.

Table 4-1.1 Minimum Plumbing Facilities for Certain Occupancies. Table 4-1.1 includes the minimum fixture requirements for the following types of occupancies:

- (1) Office or Public Buildings for Employee Use (5000 square feet, or less)

- (2) Retail or Wholesale
- (3) Exercise and Health Spas
- (4) Restaurants, Pubs and Lounges (4500 square feet, or less).
- (5) Libraries
- (6) Workshops
- (7) Warehouses

TABLE 4-1.1

Minimum Plumbing Facilities

Each building shall be provided with sanitary facilities, including provisions for the physically handicapped as prescribed by the Department having jurisdiction. For requirements for the handicapped, Texas Accessibility Standards shall be used.

The total occupant load shall be determined by minimum exiting requirements. The minimum number of fixtures shall be calculated at fifty (50) percent male and fifty (50) percent female based on the total occupant load.

Type of Building Or Occupancy	Water Closets (Fixtures per Person)		Urinals (Fixtures per Person)	Lavatories (Fixtures per Person)		Drinking Fountains (Fixtures per Person) Note: (2)
	Male	Female		Male	Female	
Offices or Public Buildings for employee use (For Use with 5000 Total Square Foot or less using 100 Square Feet per person.)	Male 1:1-15 2:16-25	Female 1:1-15 2:16-25	Male 0:1-15 1:16-50	Male 1per40	Female 1per40	See note (2) for Offices.
Retail or Wholesale Stores (use 200 square feet per occupant for the minimum number of plumbing fixtures)	Male 1:1-50 2:51-100 3:101-400 Over 400, add one for each additional 500 males	Female 1:1-50 2:51-100 3:101-200 4:201-300 5:301-400 Over 400, add one for each additional 150 females	No urinals required	One for each two water closets.		See note (2) for Retail.
Exercise and Health Spas (use 50 square feet per occupant for the minimum number of plumbing fixtures)	Male 1:1-30 2:31-60 Over 60 add 1 fixtures for each 40 males	Female 1:1-30 2:31-60 Over 60 and 2 fixtures for each 40 females	No urinals required	Male 1: 1-60 2: 61-120 Add 1 fixture for each addition 60 persons No urinals required	Female 1:1-60 2:61-120 Add 1 fixture for each addition 60 persons	One drinking fountain for the first 150 person, and one additional fountain for each additional 300 persons thereafter.
Restaurants, Pubs and Lounges (for use with up to 4500 square feet of space.)	Male 1:1-50 2:51-150	Female 1:1-25 2:26-50 3:51-150	Male 1:1-150	Male: 1:151-200 2:151-200	Female 1:1-150 2:151-200	None required.
Libraries	Male 1:1-50 2:51-300 Over 300 add 1 fixture for each additional 300 males	Female 1:1-50 2: 51-300 2 fixtures for each 300 additional females.	No urinals required	Male 1:1-100 2:100-300 Over 300, add 1 fixture for each additional 300 males	Female 1:1-100 2:100-300 Add 2 fixtures for each 300 additional females	One drinking fountain for the first 150 persons, and one additional fountain for each additional 300 persons thereafter. A minimum of one fountain per floor is required.

Workshops and Foundries (Use 2000 Square feet per occupant for the minimum number of plumbing fixtures)	Male 1:1-10 2:11-15 3:25-50 4:51-75 5:76-100 Over 100 persons, add one fixture for each additional 300 males and females.	Female 1:1-10 2:11-15 3:25-50 4:51-75 5:76-100 Over 100 persons, add one fixture for each additional 300 females.	No urinals required.	One for each two water closets.	One drinking fountain for the first 150 persons, and one additional fountain for each additional 300 persons thereafter.
Warehouses (Use 5000 Square feet per occupant for the minimum number of plumbing fixtures)	Male 1:1-10 2:11-15 3:25-50 4:51-75 5:76-100 Over 100 persons, add one fixture for each additional 300 males.	Female 1:1-10 2:11-15 3:25-50 4:51-75 5:76-100 Over 100 persons, add one fixture for each additional 300 females.	No urinals required	One per 40 occupants of each sex.	One drinking fountain for the first 150 persons, and one additional fountain for each additional 300 persons thereafter See Note (2)

Table 4-1.1 Footnotes.

- (1) Location and quantity of hand washing facilities (lavatory or hand sink) shall meet the requirements of the Health Department.
- (2) Mercantile and Business occupancies consisting of 5000 square feet or less shall have one drinking fountain, or an accessible break room sink for public and employee use. Each floor occupied shall have one accessible drinking fountain and/or a break room sink.

411.2 Location of Floor Drains. Floor drains shall be installed in the following areas:

411.2.1 Toilet rooms containing two (2) or more water closets or a combination of one (1) urinal, except in a dwelling unit.

411.2.2 Commercial kitchens.

411.2.3 Laundry rooms in commercial buildings and common laundry facilities in multi-family dwelling buildings.

411.6.1 Accessible Shower Stalls. A room that contains an accessible shower which has a threshold or curb which is less than ½ inch in height and all roll-in accessible showers shall be equipped with a Code-approved emergency floor drain.

501.0 General. The regulations of this chapter shall govern the construction, location, and installation of fuel burning and other water heaters heating potable water, together with all chimneys, vents, and their connectors.

All design, construction, and workmanship shall be in conformity with accepted engineering practices, manufacturer's installation instructions, and applicable standards

and shall be of such character as to secure the results sought to be obtained by this Code. No water heater shall be hereinafter installed which does not comply in all respects with the type and model of each size thereof approved by the Administrative Authority. A list of accepted gas equipment standards is included in Table 14-1.

501.1 Water Heater Location. The total developed length of water piping from the outlet of the water heater to the inlet of the furthest fixture served by the water piping may not be greater than 70 feet, unless the water heater is installed with a gravity flow design system or a mechanical pump to provide continuous hot water to the fixture or with additional water heaters.

501.1.2 Compliance with the Energy Code Required. Water heaters installed after the effective date of this Code in sites served by the City's Electric Utility shall comply with the Energy Code. All replacement electrical equipment must comply with the Energy Code.

507.1.1. Air for combustion, ventilation, and dilution of flue gases for gas utilization appliances installed in buildings shall be obtained by application of one (1) of the methods covered in Sections 507.2.1 through 507.7. Gas utilization appliances of other than natural draft and Category I vented appliances shall be provided with combustion, ventilation, and dilution air in accordance with the appliance manufacturer's instructions. Where infiltration does not provide the necessary air, outdoor air shall be introduced in accordance with methods covered in Sections 507.4 through 507.7. [NFPA 54:9.3.1.1]

Exception No. 1: This provision shall not apply to direct-vent appliances.

Exception No. 2: Type 1 clothes dryers that are provided with make-up air in accordance with section NFPA 54:10.4.3.

Exception No. 3: Outside air shall not be obtained by any means that violates the City adopted energy code.

507.1.1.1 Clothes Dryer. A device used to dry wet laundry by means of heat derived from the combustion of fuel gases. [NFPA 54.3.3.18]

5.7.1.1.2 Clothes Dryer, Type 1. Primarily used in family living environment. May or may not be coin-operated for public use. [NFPA 54.3.3.18.1]

5.7.1.1.3 Exhausting to the Outdoors. Type 1 and Type 2 clothes dryers shall be exhausted to the outside air. [NFPA 54:10.4.2]

5.7.1.1.4 Provisions for Make-Up Air. Make-up air shall be provided for Type 1 clothes dryers in accordance with the manufacturer's installation instructions. [NFPA 54:10.4.3.1]

508.4 Protection From Damage. When a water heater is located in an attic or furred space where damage may occur from a leaking water heater, a watertight pan of corrosion resistant materials shall be installed beneath the water heater with a minimum three-quarter (3/4) inch diameter drain to an approved location. The water heater pan shall have a depth of two (2) inches and have a diameter that is two (2) inches larger than the water heater.

509.4 Appliances in Attics. An attic in which a water heater is installed shall be designed to support the weight of the water heater. A water heater installation shall be accessible for inspection, repair, or replacement. The appliance space shall be provided with an opening or doorway of sufficient size to remove the water heater. The opening or doorway must be at least twenty-four (24) inches in width and three (3) inches higher than the water heater to be installed. The access shall be continuous and shall be accomplished by one or more of the methods described in this section:

509.4.1 By an opening or door, the passageway not less than twenty-four (24) inches in width and large enough to permit removal of the water heater, but not less than thirty (30) inches in height. Stairways and ramps that lead to or are a part of the passageway shall comply with the Building Code.

509.4.2 For an attic, roof, mezzanine, or platform that is more than eight (8) feet above ground level or floor level, by a stairway or ladder permanently fastened to the building. The ladder or stairway may not be more than eighteen (18) feet in length between landings and not less than fourteen (14) inches in width. The ladder shall have rungs spaced not more than fourteen (14) inches center to center and not less than six (6) inches from the face of the wall. Each stile shall extend thirty (30) inches above the surface to be reached or as high as possible if height is limited. Permanent ladders for water heater accesses are not required at parapets or walls less than thirty (30) inches in height.

Exception: Permanent ladders or platforms are not required for electric water heaters with a capacity of seventeen (17) gallons or less.

509.4.3 By a trap door or opening and passageway not less than thirty (30) inches by thirty (30) inches in size, but in no case smaller than the water heater. The unobstructed passageway shall be continuous from the trap door or opening to the water heater. The catwalk shall be level and free of any obstruction to allow safe removal of the water heater. The trap door or opening shall be located not more than twenty (20) feet from the water heater.

509.4.4 Lighting and Convenience Outlet. A permanent 120-volt receptacle outlet and a lighting fixture shall be installed near the water heater. The switch controlling the lighting fixture shall be located at the entrance to the passageway.

601.1 Plumbing Fixture Water Required. Except where not deemed necessary for safety or sanitation by the Authority Having Jurisdiction, each plumbing fixture shall be provided with an adequate supply of potable running water piped thereto in an approved

manner, so arranged as to flush and keep it in a clean and sanitary condition without danger of backflow or cross-connection. Water closets and urinals shall be flushed by means of an approved flush tank or flushometer valve. In areas where an auxiliary water system is available, structures may be provided with auxiliary water for indoor use to provide non-potable water to water closets, urinals and trap primers as regulated by the water utility and Chapter 16 of this Code.

601.1.1 Hot and Cold Water Required. In occupancies where plumbing fixtures are installed for private use, hot and cold potable water shall be required for bathing, washing, laundry, cooking purposes, dishwashing, or maintenance. In occupancies where plumbing fixtures are installed for public use, hot water shall be required for bathing and washing purposes. This requirement shall not supersede the requirements for individual temperature control limitations for public lavatories, bathtubs, whirlpool bathtubs and shower control valves, nor shall it supersede the requirements for hot water by the Health Authority.

Exception: A permitted composting toilet approved by the Austin Water Utility serves the property.

601.1.2 Water System Connection Required. The water system of every house or building shall be separately and independently connected to a state licensed public potable water system if any part of the lot or tract that contains the house or building is within 100 feet in horizontal distance (measured on the closest practicable access route) of the public water system. Connection to the public water system is not required if any of the following apply:

- (1) The property owner has received a written denial of service from the owner or governing body of the public water system.
- (2) The property owner has received a written determination from the water utility that it is not feasible for the building to be connected to the potable water system.
- (3) The property is served by an existing private potable water system and the water utility has determined that the private potable water system may continue to be used based on factors such as the type of facility served, the age, condition, and capacity of the private potable water system, and the availability of records regarding the system, changes to the system, or the system demand.

601.1.3 If a state licensed public potable water system is unavailable within the full purpose jurisdiction of the City of Austin, then any alternative source used for potable water shall be installed per the provisions of this code. Rain water collection systems utilized for potable water shall comply with the latest edition of the Texas Manual on Rainwater Harvesting by the Texas Water Development Board and any other applicable state laws.

601.2.2 Color and Information. Each system shall be identified with a colored pipe or band and coded with paints, wraps and materials compatible with the piping.

Except as required by Chapter 16, non-potable water systems shall have a yellow background with black uppercase lettering, with the words "CAUTION: NONPOTABLE WATER, DO NOT DRINK." Each nonpotable system shall be identified to designate the liquid being conveyed, and the direction of normal flow shall be clearly shown. The minimum size of the letters and length of the color field shall conform to Table 6-1.

The background color and required information shall be indicated every twenty (20) feet (6,096mm) but not less than once per room, and shall be visible from the floor level.

TABLE 6-2

Backflow Prevention Devices, Assemblies and Methods

Degree of Hazard

Device, Assembly, or Method	Applicable standards	Pollution (Low Hazard)		Contamination (High Hazard)		Installation ^{2,3}
		Back-Siphonage	Back-Pressure	Back-Siphonage	Back-Pressure	
Air gap	ASME A112.1.2	X		X		See Table 6-3 in this chapter.
Air gap fittings for use with plumbing fixtures, appliances and appurtenances	ASME A112.1.3	X		X		Air gap fitting is a device with an internal air gap and typical installation includes plumbing fixtures, appliances and appurtenances. The critical level shall not be installed below the flood level rim.
Atmospheric-type vacuum breaker (consists of a body, checking member and atmospheric port)	ASSE 1001 or CSA B 64.1.1	X		X		Upright position. No valve downstream. Minimum of six (6) inches (152 mm) or listed distance above all downstream piping and flood-level rim of receptor. ^{4,5}
Antisiphon fill valve (ballcocks) for gravity water closet flush tanks and urinal tanks	ASSE 1002 or CSA B 125.3	X		X		Installation on gravity water closet flush tank and urinal tanks with the fill valve installed with the critical level not less than 1 inch above the opening of the overflow pipe. ^{4,5}
Vacuum breaker wall hydrants, hose bibbs, frost resistant, automatic draining type	ASSE 1019 or CSA B 64.2.1.1	X		X		Installation includes wall hydrants and hose bibbs. Such devices are not for use under continuous pressure conditions (means of shutoff downstream of device is prohibited). ^{4,5}
Spill-Resistant Pressure-Type Backflow Prevention Assembly (single check valve with air inlet vent and means of field testing)	ASSE 1056	X		X		Upright position. Minimum of six (6) inches (152 mm) or listed distance above all downstream piping and flood-level rim of receptor. ⁵

Double Check Valve Backflow Prevention Assembly (two independent check valves and means of field testing)	ASSE 1015; AWWA C510; CSA B 64.5 or CSA B 64.5.1	X	X			Horizontal unless otherwise listed. Requires one (1) foot (305 mm) clearance at bottom for maintenance. May need platform/ladder for test and repair. Does not discharge water.
	ASSE 1048	X	X			Horizontal unless otherwise listed. Requires one (1) foot (305 mm) clearance at bottom for maintenance. May need platform/ ladder for test and repair. Does not discharge water. Installation includes a fire protection system and is designed to operate under continuous pressure conditions.
Pressure Vacuum Breaker Backflow Prevention Assembly (loaded air inlet valve, internally loaded check valve and means of field testing)	ASSE 1020 or CSA B 64.1.2	X		X		Upright position. May have valves downstream. Minimum of twelve (12) inches (305 mm) above all downstream piping and flood-level rim of receptor. May discharge water.
Reduced Pressure Principle Backflow Prevention Assembly (two independently acting loaded check valves, a pressure relief valve and means of field testing)	ASSE 1047	X	X	X	X	Horizontal unless otherwise listed. Requires one (1) foot (305 mm) minimum clearance at bottom for maintenance. May need platform/ladder for test and repair. May discharge water. Installation includes a fire protection system and is designed to operate under continuous pressure conditions.
	ASSE 1013; AWWA C511; CSA B64.4 or CSA B 64.4.1	X	X	X	X	Horizontal unless otherwise listed. Requires one (1) foot (305 mm) minimum clearance at bottom for maintenance. May need platform/ladder for test and repair. May discharge water.

¹ See description of devices and assemblies in this chapter.

² Installation in pit or vault requires previous approval by the Authority Having Jurisdiction.

³ Refer to general and specific requirement for installation.

⁴ Not to be subjected to operating pressure for more than twelve (12) hours in any twenty-four (24) hour period.

⁵ For deck-mounted and equipment-mounted vacuum breaker, see Section 603.4.15.

603.1 Approval of Devices or Assemblies. Before any device or assembly is installed for the prevention of backflow, it shall have first been approved by the Authority Having Jurisdiction. Devices or assemblies shall be tested for conformity with recognized standards or other standards acceptable to the Authority Having Jurisdiction. Backflow devices and assemblies shall comply with Chapter 15-1 of the City Code.

Devices or assemblies installed in a potable water supply system for protection against backflow shall be maintained in good working condition by the person or persons having control of such devices or assemblies. Such devices or assemblies shall be tested at the time of installation, repair, or relocation and on a schedule conforming to that of Chapter 15-1 of the City Code. If found to be defective or inoperative, the device or assembly shall be repaired or replaced. No device or assembly shall be removed from use or relocated or other device or assembly substituted, without the approval of the Authority Having Jurisdiction.

Testing shall be performed by a state licensed back-flow assembly tester registered with the City.

603.3.4 Backflow Prevention Assembly Installation Standards. Backflow prevention assemblies shall be installed as outlined in Austin Water Utilities Criteria Manual.

603.4.6.1 Potable water supplies to “non-health hazard” irrigation systems shall be protected with a DCVA. Potable water supplies to “health hazard” irrigation systems, those having pumps or connections for pumping equipment, or chemical injection or aspiration or provisions for chemical injection or aspiration, or septic or auxiliary water use on site shall be protected from backflow by an RPZ or air gap as required by the Authority Having Jurisdiction.

603.4.12 A separate backflow prevention assembly or device shall be installed on each high hazard appurtenance or fixture in high hazard situations where the water or product is intended for contact with humans either directly (consumption, bathing, medical uses, dental chairs, pharmaceuticals, etc.) or indirectly (sterilizers, autoclaves, washing dishes or bottles, canning, etc.).

Exception: Potable water supply to carbonators shall be protected by a listed reduced pressure principal backflow preventer as approved by the Authority Having Jurisdiction for the specific use. A single RPZ may be installed for multiple carbonators that are located in the same immediate physical area if all water piping from backflow preventer to carbonator is exposed. Copper piping downstream of backflow protection for carbonators is prohibited.

603.4.12.1 A single backflow prevention assembly or device may be installed for multiple high hazard appurtenances or fixtures where no human contact is intended. Each water line downstream of the backflow protection shall be properly labeled as required for non-potable water.

603.4.12.2 A single backflow prevention assembly or device may be installed in low hazard situations serving multiple like low hazards that are located in the same immediate physical area if all piping downstream of the backflow protection is exposed.

608.2 Excessive Water Pressure. If local static water pressure is in excess of sixty-five (65) pounds per square inch, an approved pressure regulator preceded by an adequate strainer shall be installed and the static pressure reduced to sixty-five (65) pounds per square inch or less. Pressure regulator(s) equal to or exceeding one and one-half (1-1/2) inches shall not require a strainer. Such regulator(s) shall control the pressure to all water outlets in the building unless otherwise approved by the Authority Having Jurisdiction. Each such regulator and strainer shall be accessibly located above ground or in a vault equipped with a properly sized and sloped bore-sighted drain to daylight, shall be protected from freezing, and shall have the strainer readily accessible for cleaning without removing the regulator or strainer body or disconnecting the supply piping. Pipe size determinations shall be based on eighty (80) percent of the reduced pressure when using Table 6-6 (Fixture Unit Table for Determining Water Pipe and Meter Sizes). An approved expansion tank shall be installed in the cold water distribution piping downstream of each such regulator to prevent excessive pressure from developing due to thermal expansion and to maintain the pressure setting of the regulator. The expansion tank shall be properly sized and installed in accordance with the manufacturer's instructions and listing. Systems designed by registered engineers shall be permitted to use approved pressure relief valves in lieu of expansion tanks provided such relief valves have a maximum pressure relief setting of one-hundred (100) pounds per square inch (698 kPa) or less.

609.1.1 Freeze Protection. The following list of plumbing installations is acceptable methods of providing freeze protection:

- (1) Shutoff Valves - Property owner shutoff valves located in the ground at the water meter shall meet American Water Works Association standards.
- (2) Insulated Exterior Walls - If the wall member is six (6) inches or greater in nominal width, the piping may be placed on the conditioned side of the wall insulation and no additional pipe insulation is required.
- (3) If the exterior wall is less than six inches nominal width, the piping shall be insulated with material that has an R-value of at least four (4). The water piping and the pipe insulation shall be placed on the conditioned side of the wall.
- (4) Uninsulated Exterior Walls, Attics and Crawl Spaces - All water piping installed in uninsulated exterior walls and unconditioned crawl spaces shall be protected by pipe Insulation with a minimum R-value of four (4). All water piping installed in unconditioned attics. Above the building insulation shall be protected with pipe insulation having an R-value of at least four (4).

- (5) Exterior Hose Bibs - Exterior hose bibs shall be of the self-draining and frost-resistant with an integral backflow preventer. Standard hose bibs shall be protected by adding pipe insulation with an R-value of a least four (4) up to the edge or wall flange of the hose bib.

609.1.2 Pipe Insulation wall thickness for domestic hot water run outs and circulation shall be in accordance with the energy code.

609.11 Private Fire Lines. Private fire lines shall be installed in accordance with the latest standards of the National Fire Protection Association (NFPA) 24 Standard for the Installation of Private Fire Service Mains and their Appurtenances, as adopted by the Austin Fire Department Fire Protection Criteria Manual. Private fire lines shall adhere to NFPA 25 Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems as required by the Austin Fire Department.

612.0 Plumbing for Multi-family Sub-meters. Each newly constructed multi-family housing unit and each newly constructed residential unit in a mixed-use facility, shall have a single cold water stub out supplying all fixtures in each dwelling unit supplied by the master meter. A City meter or privately-owned water meter shall be installed for each newly constructed unit at the time of construction. Each stub out shall have a shut off valve immediately ahead of the private meter location. The meter shall have a clearance of at least four (4) inches on all sides. The location of the private meter installation must be accessible for reading, testing, replacement, and inspection of the private meter.

Exceptions:

The following developments are not required to comply with this section:

- (1) a condominium development
- (2) a development that has a centralized hot water system

613.0 Cooling Towers. New and replaced cooling tower installations must include makeup and blowdown meter, conductivity controllers, overflow alarms, drift eliminators, and a minimum of 5 cycles of concentration.

614.0 Landscape Irrigation. Landscape irrigation shall conform to the rules set forth in Chapter 344, Title 30 of The Texas Administrative Code, Texas Commission on Environmental Quality rules and sections 614.1 through 614.3 of this code.

Definitions:

Hydrozoning is the practice of grouping sprinkler heads into zones with similar vegetation, soil types, slopes, and sunlight availability.

Isolation valve is a valve used for isolating all or part of the irrigation system for repairs, maintenance, or winter shut-down.

614.1 Requirements for New Commercial and Multi-family Landscape Irrigation.

A new commercial and multi-family irrigation system must be designed and installed so that:

- (1) the system does not include spray irrigation on areas less than six (6) feet wide (such as medians, buffer strips, and parking lot islands);
- (2) above-ground irrigation emission devices are set back at least six (6) inches from impervious surfaces;
- (3) the irrigation system has a master valve;
- (4) circuit remote control valves have adjustable flow controls;
- (5) serviceable in-head check valves are adjacent to paved areas where elevation differences may cause low head drainage;
- (6) the irrigation system has a City-approved weather based controller;
- (7) an automatic rain shut-off device shuts off the irrigation system automatically after not more than a one-half inch (1/2") rainfall;
- (8) zone valves and circuits are separated based on hydrozoning (plant water requirements).

614.2 Requirements for One and Two Family Dwelling Landscape Irrigation.

New irrigation systems for one-and two-family dwellings must be designed and installed so that:

- (1) the system does not include spray irrigation on areas less than six (6) feet wide (such as medians, buffer strips, and parking lot islands);
- (2) above-ground irrigation emission devices are set back at least six (6) inches from impervious surfaces;
- (3) the irrigation system has a master valve and must be installed on the discharge side of the backflow prevention device;
- (4) a working soil moisture sensor or an automatic rain shut-off device shuts off the irrigation system automatically after not more than a one-half inch (1/2") rainfall; and
- (5) zone valves and circuits are separated based on hydrozoning (plant water requirements).

614.3 Inspection.

At the time of final plumbing inspection the irrigation installer shall provide to the city:

- (1) a water budget including:
 - (a) a chart containing zone numbers, precipitation rate, and gallons per minute; and
 - (b) the location of the emergency irrigation system shut-off valve.
- (2) a report on the form provided by the Austin Water Utility Department certifying compliance with Section 614.1 (*Requirements for New Commercial and Multi-family Landscape irrigation*) or Section 614.2 (*Requirements for One and Two Family Dwelling Landscape Irrigation*); and
- (3) proof that a laminated copy of the water budget is permanently installed inside the irrigation controller door.

615.0 Food waste and garbage disposal unit installations shall be prohibited in restaurants, cafeterias, and other commercial and institutional kitchens and food preparation facilities.

704.3 Fixture Connections. Pot sinks, scullery sinks, and dishwashing sinks, silverware sinks, commercial dishwashing machines, silverware-washing machines, and other similar fixtures shall be connected indirectly to the drainage system.

707.4 Each horizontal drainage pipe shall be provided with a cleanout at its upper terminal, and each run of piping, that is more than one-hundred (100) feet (30,480 mm) in total developed length, shall be provided with a cleanout for each one-hundred (100) feet (30,480 mm), or fraction thereof, in length of such piping. An additional cleanout shall be provided in a drainage line for each aggregate horizontal change of direction exceeding 135 degrees (2.36 rad).

Exceptions:

- (1) Cleanouts shall be permitted to be omitted on a horizontal drain line less than five (5) feet (1,524 mm) in length unless such line is serving sinks or urinals.
- (2) Cleanouts shall be permitted to be omitted on any horizontal drainage pipe installed on a slope of 72 degrees (1.26 rad) or less from the vertical angle (one-fifth (1/5) bend).
- (3) Excepting the building drain and its horizontal branches, a cleanout shall not be required on any pipe or piping that is above the floor level of the lowest floor of the building.

- (4) An approved type of two-way cleanout fitting, installed inside the building wall near the connection between the building drain and the building sewer or installed outside of a building at the lower end of a building drain and extended to grade may be substituted for an upper terminal cleanout.
- (5) A two-way tee with a maximum eighteen (18) inch extension may be installed as a cleanout on a four (4) inch sewer line.

710.3.3 Ejectors and Sumps. Unless otherwise approved by the Authority Having Jurisdiction, in other than single-family and two-family dwelling units located on a single lot, the ejector or pump shall be capable of passing a two (2) inch diameter solid ball and the discharge piping of each ejector or pump shall have a backwater valve and gate valve, and be a minimum of two (2) inch in diameter.

710.7.1 Fitting Allowance. The installation of schedule 40 polyvinyl chloride pressure wyes, schedule 40 polyvinyl chloride pressure couplings and schedule 40 polyvinyl chloride pressure 45 degree bends shall be allowed for drainage of the discharge line from an ejector, pump, or other mechanical devices.

710.9.1 Single Sumps. A one and two-fixture unit fixture that is not a required plumbing fixture under this Code, may be served by a single pump ejector system.

Exception 1: A single pump ejector system serving an accessible break room sink with a one-and-one-half (1-1/2) inch outlet and a one-and one-half (1-1/2) inch inlet shall be allowed.

Exception 2: A one-and-one-half (1-1/2) inch outlet service sink is allowed to be drained by means of a single pump ejector system.

712.0 Testing.

712.1 Media. The piping of the plumbing, drainage, and venting systems shall be tested with water or air. The level of the water shall be filled to the top and be visible so that an inspector may mark the level of the water. The Authority Having Jurisdiction may require the removal of any cleanouts, etc., to ascertain whether the pressure has reached all parts of the system.

712.2 Testing Procedures for Drain, Waste and Vent Piping.

- (1) The waste and drainage system may be tested with a water test, or an air test.
- (2) When moisture conditions make it impractical to verify tightness of joints in a drainage system with a water test, the system shall be tested with air using a Class 1A diaphragm test gauge calibrated to an accuracy of $\pm 1\%$ of the span. Refer to *Section 319.0 (Test Gauges) of this Code for gauge requirements.*

- (3) A water and or air test shall be maintained at least fifteen (15) minutes prior to the start of the inspection.
- (4) The entire portion of the system tested shall be subjected to a three (3) pound per square inch air test for fifteen (15) minutes.
- (5) Any leaks detected from water or air test shall be corrected, re-tested and inspected until work is found to be tight and conforms to this Code. To test with a water test in a single story building, soil and waste stacks shall be plugged and filled with water to provide a minimum of five foot head-pressure at a point where the house sewer connects to the house drain. Risers shall not be capped until the entire system is full.
- (6) In a multistory building, sanitary drainage and vent stacks shall be plugged and filled to a point at least 6 inches above the re-vent of the uppermost floor. Provision must be made for the plumbing inspector to see the water level.
- (7) A person may not use cement, sealing wax, resin, paint, tallow, or other materials that may prevent the detection of cracks, holes or other imperfections on any material used in the plumbing system.
- (8) When a floor drain, floor sink, or other indirect waste receptor has a piping connection below ground floor level that was not tested on the initial rough-in test, the following requirements shall be met:
 - (a) A water test shall be re-administered for the portion of the drain waste and vent system below ground floor level.
 - (b) The drain shall be filled to a point of overflow.
 - (c) Sinks shall be tested by filling the drain to the point of overflow at the time that the plumbing copper inspection and before the slab is poured.

712.3 Trench Drains. All pre-manufactured trench drains shall be tested in place to assure the tightness of the drain by plugging the drain and filling the drain with water to the overflow of the trench drain. This test shall be performed before the concrete is poured in place.

713.4. Austin Water Utility shall determine the availability of the public sewer for any proposed building or exterior drainage facility on any lot or premises, which abuts and is served by such sewer.

713.6 On every lot or premises hereafter connected to a public sewer, all plumbing and drainage systems or parts thereof on such lot or premises shall be connected with such public sewer.

Exception No. 1: Single-family dwellings and buildings or structures accessory thereto that were connected to an approved private sewage disposal system before the premises were connected to the public sewer may remain connected to the private sewer disposal system if: (a) the dwellings or buildings have been continuously served by the private sewer disposal system; (b) no hazard, nuisance, or unsanitary condition exists; (c) insufficient grade or fall exists to permit drainage to the sewer by gravity; and (d) written permission has been obtained from the Austin Water Utility.

Exception No. 2: Austin Water Utility shall regulate existing private sewage disposal systems.

715.1 The building sewer, beginning two (2) feet (610 mm) from any building or structure, shall be of such materials as prescribed in this code.

Exception. For sewer lines that are smaller than four inches in diameter, the sewer pipe materials shall be of the same material required for under or within the building.

723.0 Building sewers shall be tested by plugging the end of the building sewer at its points of connection with the public sewer or private sewage disposal system and completely filling the building sewer with water from the lowest to the highest point thereof, or by approved equivalent low-pressure air test. The building sewer shall be water tight at all points.

723.1 Manhole Test. Manholes shall be tested with water by plugging all outlets and filling the manhole to the overflow. Water test must be performed when the manhole is fully exposed with no visible leakage. Manholes may be vacuum tested by plugging all inlets and outlets and testing with five (5) inches of vacuum for five (5) minutes with no loss.

801.3 Bar and Fountain Sink Traps. Where the sink in a bar, soda fountain or counter is so located that the trap serving the sink cannot be vented, the sink drain shall discharge through an air gap or air break (see Section 801.2.3) into an approved receptor which is vented. The developed length from the fixture outlet to the receptor shall not exceed fifteen (15) feet.

804.1 Plumbing fixtures or other receptors receiving the discharge of indirect waste pipes shall be approved for the use proposed and shall be of such shape and capacity as to prevent splashing or flooding and shall be located where they are readily accessible for inspection and cleaning. No standpipe receptor for any clothes washer shall extend more than thirty (30) inches (762 mm), or not less than eighteen (18) inches (457 mm) above its trap. No trap for any clothes washer standpipe receptor shall be installed below the floor, but shall be roughed in not less than six (6) inches (152 mm) and not less than eighteen (18) inches (457 mm) above the floor. No indirect waste receptor shall be installed in any toilet room, closet, cupboard, or storeroom, nor in any other portion of a

building not in general use by the occupants thereof; except standpipes for clothes washers shall be permitted to be installed in toilet and bathroom areas when the clothes washer is installed in the same room.

Exception: Hub drains receiving the discharge from water heater temperature and pressure valve drains, pan drains, condensation drains and other similar drains may be located under kitchen sink cabinets, water heater closets, walk-in storage rooms and other similar accessible locations.

807.4 Domestic Dishwashing Machines. A domestic dishwashing machine may not be directly connected to a drainage system or food waste disposal:

- (1) unless an approved dishwasher air-gap fitting is used on the discharge side of the dishwashing machine; or
- (2) if the discharge line from the dishwasher may be looped up and securely fastened to the underside of the counter, then the discharge may be connected either to the chamber of the food waste grinder or to a wye fitting between the food waste grinder outlet and the trap inlet or to a branch tailpiece fitting above the trap inlet.

905.3 Vent Pipe Grades and Connections. Unless prohibited by structural conditions, each vent shall rise vertically to a point not less than six inches above the flood level rim of the fixture served before offsetting horizontally, and whenever two or more vent pipes converge, each such vent pipe shall rise to a point at least six inches in height above the flood level rim of the plumbing fixture it serves before being connected to any other vent. Vents that offset horizontally below the flood level rim of the fixture shall be installed with approved drainage fittings and materials, shall be graded to a drain and shall be served with a cleanout.

Exception: Horizontal wet venting may be installed in accordance with Section 908.2 (Horizontal Wet Venting) when shown on the approved plans.

908.2.4 Horizontal Wet Venting. (Additional Requirements) Horizontal wet vented pipe shall be served with a minimum two inch cleanout on the dry vent, and all horizontal fixture drains or trap arms must connect to the wet vented horizontal branch drain above the centerline of the wet vented horizontal branch drain.

908.2.5 Water closets, floor drains, and indirect waste receptors may be horizontally wet vented with fixtures that are not more than one or two fixture units in size except for kitchen sinks and urinals. No more than two fixtures may be located on the horizontal wet vented section of the water closet, floor drain, or indirect waste receptors.

909.0 Special Venting for Island Fixtures.

Traps for island sinks and similar equipment shall be roughed in above the floor and shall be permitted to be vented by extending the vent as high as possible, but not less than the

drainboard height and then returning it downward and connecting it to the horizontal sink drain immediately downstream from the vertical fixture drain. The return vent shall be connected to the horizontal drain through a wye branch fitting and shall, in addition, be provided with a foot vent taken off the vertical fixture vent by means of a wye branch immediately below the floor and extending to the nearest partition and then through the roof to the open air, or shall be permitted to be connected to other vents at a point not less than six (6) inches (152 mm) above the flood-level rim of the fixtures served. Drainage fittings shall be used on all parts of the vent below the floor level, and a slope of not less than one-fourth (1/4) inch per foot (20.8 mm/m) back to the drain shall be maintained. The return bend used under the drainboard shall be a one (1) piece fitting or an assembly of a 45 degree (0.79 rad), a 90 degree (1.6 rad), and a 45 degree (0.79 rad) elbow in the order named. Pipe sizing shall be as elsewhere required in this code. The island sink drain, upstream of the returned vent, shall serve no other fixtures. An accessible cleanout shall be installed in the vertical portion of the foot vent.

Exception: Deep seal P-traps may be installed under the floor of island fixtures if the trap and trap vent are at least two inches in diameter and the trap vent is located in the nearest partition wall. The vent riser shall contain a cleanout and the vent shall continue through the roof to open air. The vent shall take off no more than three feet downstream from the trap being served. Pipe sizing for island fixtures shall be in accordance with this Code.

1007.0 Trap Seal Protection. Floor drains or similar traps directly connected to the drainage system and subject to infrequent use shall be protected with a trap seal primer, except where not deemed necessary for safety or sanitation by the Authority Having Jurisdiction. When structurally feasible, traps for floor drains and similar fixtures shall be primed by methods utilizing gravity flow wastewater from acceptable plumbing fixtures. Fixtures used for grease or food particle wasting shall not be used for trap seal priming. Trap seal primers shall be accessible for maintenance.

1009.2 Approval. Austin Water Utility shall approve the size, design, type, and location of each interceptor or separator. Except as otherwise specifically permitted in the City Code, no wastes other than those requiring treatment or separation, shall be discharged into any interceptor. A grease, sand, or other gravity interceptor shall be field tested by applying a minimum of a one-inch (1") water column above the lid seal of the interceptor.

Exception: Interceptors or separators on a septic system must meet requirements established by the Health Authority.

1010.0 Slaughterhouses, Packing Establishments, etc. Every fish, fowl, and animal slaughterhouse or establishment; every fish, fowl, and meat packing or curing establishment; every soap factory, tallow-rendering, fat-rendering, and hide-curing establishment shall be connected to and shall drain or discharge into an approved grease interceptor (clarifier) or other pretreatment system as necessary to comply with the

requirements in Chapter 15-10 of the City Code and as authorized by Austin Water Utility.

1011.0 Minimum Requirements for Auto Wash Racks. Every private or public wash rack and / or floor or slab used for cleaning machinery or machine parts shall be adequately protected against storm or surface water and shall drain or discharge into an approved mud box and then into an interceptor (clarifier) of an approved design. Additional pretreatment shall be required if the effluent quality does not meet City standards.

1011.2 Car Wash Equipment. New installation of car wash equipment except for self service (spray wand) type systems shall be sleeved or piped under the slab to accommodate future reuse equipment that can be easily installed underground and run to an area where a water reclaim system would be anticipated to be installed. The sleeve or piping shall extend approximately 24 inches past the exterior wall from the car wash equipment room and 18 inches from the interior wall. Both ends of the sleeve or piping shall be equipped with a cleanout extended to grade.

1011.2.1 Automatic commercial vehicle wash conveyor washes shall be limited to 40 gallons of water use or less per vehicle.

1011.2.2 In-bay passenger vehicle washes are limited to 55 gallons of water use or less per vehicle.

1011.2.3 Large Vehicle (bus or large truck) washes are limited to 75 gallons of water use or less per vehicle.

1011.2.4 Hand wash nozzles shall not use more than 3 gallons per minute.

1012.0 Commercial and Industrial Laundries. Laundry equipment in commercial and industrial buildings shall discharge into an interceptor or other pretreatment system as necessary to comply with the requirements in Chapter 15-10 of the City Code and as authorized by Austin Water Utility.

1013.0 Bottling Establishments. Bottling plants shall discharge their process wastes into an interceptor or other pretreatment system that will provide for the separation of broken glass or other solids, before discharging liquid wastes into the drainage system, and as necessary to comply with the requirements in Chapter 15-10 of the City Code and as authorized by the Austin Water Utility.

1014.1 When pretreatment is required, an approved type grease interceptor complying with Austin Water Utility regulations shall be installed in the waste discharge leading from sinks, drains, and other fixtures or equipment. Grease interceptors are required in commercial or institutional food preparation facilities, including, food processors, bakeries, restaurants, cafeterias, schools, hospitals, retirement homes, assisted living centers, grocery stores, or other commercial or institutional food preparation facilities where grease may be introduced into the drainage or sewage system in quantities that can

effect line stoppage or hinder sewage treatment or private sewage disposal. A combination of hydromechanical, gravity grease interceptors and engineered systems may be allowed in certain cases when space or existing physical constraints of existing buildings necessitate such installations in order to meet this code and upon approval by the Austin Water Utility. A grease interceptor is not required for one-and-two-family dwelling units. Water closets, urinals, and other plumbing fixtures conveying human waste shall not drain into or through the grease interceptor.

1014.1.1 Each fixture discharging into a grease interceptor shall be individually trapped and vented in an approved manner.

1014.1.2 All grease interceptors shall be maintained in efficient operating condition by periodic removal of the accumulated grease and latent material. No such collected grease shall be introduced into any drainage piping or public or private sewer. If the Authority Having Jurisdiction determines that a grease interceptor is not being properly cleaned or maintained, the Authority Having Jurisdiction shall have the authority to mandate the installation of additional equipment or devices and to mandate a maintenance program.

1014.1.3 Food Waste Disposal Units and Dishwashers. Food waste and garbage disposal unit installations in restaurants, cafeterias, and other commercial and institutional kitchens and food preparation facilities are prohibited by Section 615.0 of this code. Food waste and garbage disposal units that were installed in restaurants, cafeterias, and other commercial and institutional kitchens and food preparation facilities prior to this prohibition shall be connected to or discharge into a grease interceptor. Unless specifically exempted by the Austin Water Utility, dishwashers in commercial or institutional food preparation facilities shall be connected to or discharge into a grease interceptor.

1014.2 Hydromechanical Grease Interceptors. Hydromechanical grease interceptors or separators shall be of a size, standard, design, type, and installed in a location approved by the Austin Water Utility.

1014.3.3 Design.

1014.3.3.1 Gravity Interceptors shall be constructed in accordance with the design approved by the Austin Water Utility.

1014.3.6 Sizing Criteria.

1014.3.6.1 Sizing. The size and volume of the interceptor shall be determined according to the Austin Water Utility's interceptor sizing criteria.

1014.3.7 Abandoned and Discontinued Use Gravity Grease Interceptors. Grease interceptors that have been abandoned or discontinued from use shall be pumped and filled as required for abandoned sewers and sewage disposal facilities in Section 722.0.

1015.0 Fats, Oils, and Greases (FOG) Pretreatment and Disposal System.

1015.1 Purpose. The purpose of this section is to provide the necessary criteria for the sizing, application, and installation of FOG pretreatment and disposal systems designated as a pretreatment or discharge water quality compliance strategy in accordance with the requirements in this code and Chapter 15-10 of the City Code.

1015.2 Scope. FOG pretreatment and disposal systems shall be considered engineered systems and shall comply with the requirements of Section 301.4 of this code and Chapter 15-10 of the City Code.

1015.3 Components, Materials, and Equipment. FOG pretreatment and disposal systems, including all components, materials, and equipment necessary for the proper function of the system, shall comply with Sections 301.1.3 or 301.2 of this code and Chapter 15-10 of the City Code.

1015.4 Sizing Application and Installation. FOG pretreatment and disposal systems shall be engineered, sized, and installed in accordance with the manufacturers' specifications and as specified in ASME A112.14.6, as listed in Chapter 14, Table 14-1 of this code and Chapter 15-10 of the City Code.

1015.5 Performance. FOG pretreatment and disposal systems shall be tested and certified as listed in Chapter 14, Table 14-1 of this code, and other national consensus standards applicable to FOG disposal systems as discharging an effluent not to exceed the standards and requirements in Chapter 15-10 of the City Code.

1016.0 Sand Interceptors.

1016.1 Where Required.

1016.1.1 When pretreatment is required, an approved type sand interceptor complying with Austin Water Utility regulations shall be installed in the waste discharge leading from a fixture or drain containing solids or semi-solids heavier than water that would be harmful to a drainage system, cause a stoppage within the system, or as otherwise required by Chapter 15-10 of the City Code. Multiple floor drains shall be permitted to discharge into one sand interceptor. Additional pretreatment shall be required if the effluent quality does not meet City standards.

1016.1.2 Sand interceptors are required whenever the Austin Water Utility deems it necessary to have a sand interceptor to protect the drainage system.

1016.2 Construction and Size. Sand Interceptors shall be constructed in accordance with the design approved by the Austin Water Utility.

1016.3 Separate Use. Sand and similar interceptors for every solid shall be so designed and located as to be readily accessible for cleaning, shall have a water seal of not less than six (6) inches (152 mm), and shall be vented.

1017.0 Petroleum-Based Oil and Flammable Liquid Interceptors and Pretreatment.

Any operation that generates a discharge that contains petroleum-based oily, flammable, or both types of wastes shall be required to install and maintain an interceptor, hold haul tank, or other pretreatment system in accordance with the requirements in Chapter 15-10 of the City Code and as authorized by the Austin Water Utility. The interceptor or other pretreatment system, tanks, and pumps installed shall be accessible and shall be vented to the atmosphere in a Code approved manner.

1101.1 Where Required. Roofs and courtyards shall be drained into a separate storm sewer system or to some other place of disposal, satisfactory to the authority having jurisdiction. For one and two family dwellings, storm water may be discharged on flat areas such as streets or lawns so long as the storm water shall flow away from the building and away from adjoining property and shall not create a nuisance.

1101.3 Materials for Rainwater Piping. Rainwater piping placed within the interior of a building or run within a vent or shaft shall be of cast iron, galvanized steel, wrought iron, brass, copper, lead, Schedule 40 ABS, Schedule 40 PVC, DWV, stainless steel 304 or 316L (stainless steel 304 pipe and fittings shall not be installed underground and shall be kept not less than six (6) inches (152 mm) above ground), or other approved materials, and changes in direction shall conform to the requirements of Section 706.0. ABS and PVC, DWV piping installations shall be installed in accordance with IS. #5 and IS. #9. Fire stopping for ABS and PVC shall comply with the Building Code. Except for individual single-family dwelling units, materials exposed within ducts or plenums shall have a flame-spread index of a maximum of twenty-five (25) and a smoke-developed index of a maximum of fifty (50), when tested in accordance with the *Test for Surface-Burning Characteristics of the Building Materials* (see the Building Code standards based on ASTM E84 and UL 723.).

1101.5 Subsoil Drains. When required by the Authority Having Jurisdiction, subsoil drains shall be provided around the perimeter of buildings having basements, cellars, or crawl spaces or floors below grade. Such subsoil drains may be positioned inside or outside of the footing, shall be of perforated, or open jointed approved drain tile or pipe not less than three (3) inches (80 mm) in diameter, and shall be laid in gravel, slag, crushed rock, approved three-quarter (3/4) inch (19.1 mm) crushed recycled glass aggregate, or other approved porous material with a minimum of four (4) inches (102 mm) surrounding the pipe on all sides. Filter media shall be provided for exterior subsoil piping.

1106.5 Sizing of Rain Piping. Sizing of rainwater piping is based upon maximum of five inches (5") of rainfall per hour falling upon a given roof area in square feet. Five inches per hour shall be used for sizing both primary rainwater systems and overflow or emergency rainwater systems.

1108.3 Window Areaway Drains. Window areaway drains must terminate to an approved location as approved by the Authority Having Jurisdiction. Window areaways

not exceeding ten (10) square feet in area may discharge to the subsoil drain through a two (2) inch discharge pipe. However, areaways exceeding ten (10) square feet in area shall be drained to an approved storm drainage system.

1109.2 Methods of Testing Storm Drainage Systems. Except for outside leaders and perforated or open jointed drain tile, the piping of storm drain systems shall be tested upon completion of the rough piping installation by water or air, and proven tight. The Authority Having Jurisdiction may require the removal of any cleanout plugs to ascertain if the pressure has reached all parts of the system. Either of the following test methods shall be used:

1109.2.1 Test Procedures for Material other than Polyvinyl Chloride (PVC) Drainage Piping. This section applies to material other than PVC drainage piping (for example, cast iron).

- (1) The storm drainage system may be tested with a water test, or an air test.
- (2) When utilizing a water test, the level of the water shall be visible so that an inspector may mark the level of the water unless the system is filled to the point of overflow.
- (3) A water and or air test shall be maintained at least fifteen (15) minutes prior to the start of the inspection.
- (4) If tested with air, the entire portion of the system tested shall be subjected to a five (5) pound per square inch air test for fifteen (15) minutes.
- (5) When moisture or wet conditions make it impractical to verify tightness of joints in a drainage system with a water test, the system shall be tested with air using a Class 1A diaphragm test gauge calibrated to an accuracy of $\pm 1\%$ of the span. Refer to *Section 319.0 (Test Gauges)* of this Code for gauge requirements.
- (6) To test with a water test in a single story building, storm water system stacks shall be plugged and completely filled with water to provide a minimum of ten (10) foot head-pressure at the highest portion of the system being tested, or to a point of roof drain overflow.
- (7) In a multistory building storm water system stacks shall be plugged and filled to a point of overflow at the roof drain, or in sectional test. The roof drainage system shall be tested with a minimum of a ten (10) foot head of water or a five (5) pound per square inch air test for fifteen (15) minutes.
- (8) Any leaks detected from water or air test shall be corrected, re-tested and inspected until work is found to be tight and conforms to this Code.

- (9) A person may not use cement, sealing wax, resin, paint, tallow, or other materials that may prevent the detection of cracks, holes or other imperfections on any material used in the plumbing system.

1109.2.2 Testing Procedures for Plastic Roof Drainage Piping.

- (1) A PVC drainage system shall be tested utilizing water or air.
- (2) The level of the water shall be visible so that an inspector may mark the level of the water.
- (3) To test with a water test in a single story building, storm water system stacks shall be plugged and completely filled with water to provide a minimum of ten (10) foot head-pressure at the highest portion of the system being tested, or to a point of roof drain overflow.
- (4) In a multistory building the storm water system stacks shall be plugged and filled to a point of overflow at the roof drain, or a sectional test of the roof drainage system shall be allowable when tested with a minimum of a ten (10) foot head of water, or a three (3) pound per square inch air test for fifteen (15) minutes.
- (5) When moisture or wet conditions make it impracticable to verify tightness of joints in a drainage system with a water test, the system shall be tested with air using a Class 1A diaphragm test gauge calibrated to an accuracy of $\pm 1\%$ of the span. Refer to *Section 319.0* this Code for gauge requirements.
- (6) A water and or air test shall be maintained at least fifteen (15) minutes prior to the start of the inspection.
- (7) The entire portion of the system tested shall be subjected to a three (3) pound per square inch air test for fifteen (15) minutes.
- (8) Any leaks detected from a water or air test shall be corrected, re-tested and inspected until work is found to be tight and conforms to this Code.
- (9) A person may not use cement, sealing wax, resin, paint, tallow, or other materials that may prevent the detection of cracks, holes or other imperfections on any material used in the plumbing system.

1204.3.1 Top Out Inspection. This inspection shall be made after all piping authorized by the permit has been installed, before the portions of the piping that are to be covered or concealed are concealed, and before any fixture, appliance or shutoff valve has been attached to the pipe.

- (1) **Low Pressure Gas Test.** This inspection shall include an air, carbon dioxide, or nitrogen pressure test. The test pressure for gas piping may not be less than fifteen (15) pounds per square inch gauge pressure. Test pressures

shall be held for at least fifteen (15) minutes with no perceptible drop in pressure or for a longer time if determined necessary by the Building Official. A Bourdon tube (“Spring”) gage may be utilized for this test. Refer to *Code Section 319.0* (Test Gauges) of this Code for gauge requirements.

- (2) **Medium Pressure Gas Test.** For welded piping and for piping that carries gas at pressures of more than fourteen (14) inches water column pressure, the test pressure may not be less than sixty (60) pounds per square inch and shall be continued for a length of time satisfactory to the Building Official, but in no case for less than thirty (30) minutes. These tests shall be made using air, carbon dioxide, or nitrogen pressure only, and shall be made in the presence of the inspector. All necessary apparatus for conducting tests shall be furnished by the permittee. Test pressures shall be held for at least fifteen (15) minutes with no perceptible drop in pressure or for a longer time if determined necessary by the Building Official. A Bourdon tube (“Spring”) gage may be utilized for this test. Refer to *Code Section 319.0* (Test Gauges) of this Code for gauge requirements.

1204.3.2 Final Gas Inspection. The final test on the gas piping shall be made after the water heaters, floor furnaces, and gas appliance shutoff valves have been installed. Whenever changes or extensions are made to any existing gas piping from a point where no gas stop valve has been provided in the original gas system, the responsible plumber or responsible person shall prepare the entire system for inspection and testing.

- (1) **Low Pressure Final Gas Test.** A low-pressure gas distribution system shall be tested with a minimum of five (5) pounds of air, carbon dioxide, or nitrogen pressure for ten (10) minutes using a *Class 1A* diaphragm test gauge calibrated to an accuracy of $\pm 1\%$ of the span. Refer to *Section 319.0* of this Code for gauge requirements.
- (2) **Medium Pressure Final Gas Test.** A medium pressure gas distribution system shall be tested with a ten (10) pound per square inch test for the entire medium pressure gas system using a *Class 1A* diaphragm test gauge calibrated to an accuracy of $\pm 1\%$ of the span. The test shall hold tight for at least 30 minutes. Refer to *Code Section 319.0* of this Code for gauge requirements.
- (3) The permittee shall notify the plumbing inspector when the system is ready for final inspection and arrange for the buildings to be unlocked for the inspector to enter the buildings.
- (4) The testing equipment and labor necessary for making the required tests and inspections shall be furnished by the permittee.

1204.4 Pulled Meters, Gas Repair, and Remodeling.

1204.4.1 Definitions.

Pulled Gas Meter. A pulled meter is an active gas system that has been terminated by the gas supplier due to a code violation that will require a permit and inspection by the City to verify that the system meets the requirements of the Code before restoring gas service to the customer. Refer to the pulled gas meter procedures in Section 1204.4.2 (Pulled Natural Gas Meter Inspection Criteria).

1204.4.2 Pulled Natural Gas Meter Inspection Criteria. The following requirements must be met before the inspector may authorize a final inspection on a plumbing permit:

- (1) Pulled Meter Testing Pressure Requirements.
 - (a) **Low Pressure Test.** A five (5) pound per square inch test shall be made on the entire low-pressure natural gas system using a *Class 1A* diaphragm test gauge calibrated to an accuracy of $\pm 1\%$ of the span. The test shall hold tight for at least fifteen (15) minutes. Refer to *Section 319.0* (Test Gauges) of this Code for gauge requirements.
 - (b) **Medium Pressure Test.** A ten (10) pound per square inch test is required for the entire medium pressure gas system using a *Class 1A* diaphragm test gauge calibrated to an accuracy of $\pm 1\%$ of the span. The test shall hold tight for at least 30 minutes. Refer to *Section 319.0* (Test Gauges) of this Code for gauge requirements.
- (2) All natural gas piping, valves, connectors, and appliances that have been installed under a pulled meter plumbing permit must meet current Plumbing Code and Mechanical Code standards.
- (3) Existing gas valves no longer in use shall be capped if an adequate number of outlets are available to provide a temperature of 70 degrees three feet above the floor in habitable rooms. All existing valves that leak shall be replaced with listed valves and connectors.
- (4) All rubber hose gas connectors shall be replaced with listed connectors.
- (5) Existing single wall vent piping for gas appliances and water heaters may be retained if all of the following conditions are met:
 - (a) the vent is properly sized for the application serviced;
 - (b) the vent is properly connected for the appliance;
 - (c) the vent is not rusted or deteriorated; and
 - (d) the vent terminates above the roofline; and the vent has a minimum two-inch clearance from combustibles at all points.

- (6) Existing water heaters must have operable temperature and pressure relief valves and properly sized relief lines (where practical). If water heaters lack an opening for a properly sized temperature and pressure relief valve, a pressure relief valve shall be installed on the hot water side of the water heater.
- (7) All natural gas appliances shall be provided with combustion air in accordance with the product listing. If no combustion air is provided for an existing gas appliance, properly sized louvers in doors or ducts shall be placed in proper locations.
- (8) Except for enclosed water heaters located in existing closets with weather-stripped tight fitting doors, all existing or replacement gas water heaters located in garages shall be at least 18 inches above the finished floor level unless the water heater is listed to be located at finished floor level and is protected from damage in accordance with the code. Water heaters located in tight fitting closets must obtain combustion air from approved locations.
- (9) Battery operated smoke detectors shall be installed within three foot of the entrance of each sleeping room of the dwelling units.

1211.2.1.1 Piping. All exposed gas piping shall be kept at least six (6) inches above grade or structure. The term "building or structure" shall include structures such as porches and steps, whether covered or uncovered, breezeways, roofed porte-cocheres, roofed patios, carports, covered walls, covered driveways, and structures of similar appearance.

1211.3.2 Connections. Pipe connections such as elbows, tees, and couplings shall be used.

- (1) Where gas piping is to be concealed and where unions are necessary, right and left nipples and couplings shall be used.
- (2) Ground-joint unions may be used at exposed fixture, appliance, or equipment connections and in exposed exterior locations immediately on the discharge side of a building shutoff valve.

Heavy duty flanged type unions may be used in special cases, when first approved by the Administrative Authority. Bushings shall not be used in concealed locations.

Exception: Unions for emergency hood fire suppression systems, shut-off valves and regulators may be installed in accessible locations.

1213.0 Liquefied Petroleum Gas Systems. In addition to requirements of Texas State Board of Plumbing Examiners requirements for plumbing licenses, other regulatory authorities, including the State of Texas Railroad Commission and the Fire Department, may require additional certifications or licenses for the installation of gas piping and

appurtenances. These certifications may include certified welder, certified installer of factory designed gas piping systems, and certified or licensed LP Gas piping installer. On completion of the installation, alteration, repair, or testing of the gas piping system, the installer shall identify all piping installations requiring such certified or licensed personnel. The installer shall attach to the end of the piping nearest the service entrance; a decal or tag of metal or other permanent material indicating the following information:

- (1) The installer's name;
- (2) The license and/or certification number; and
- (3) The date the piping was installed, altered, repaired or tested.

1213.1 Liquified Petroleum Approval. The City of Austin Fire Department shall approve the Liquified Petroleum gas container size, location and service line to the building.

1214.0 Detection of Leaks and Defects.

1214.1 The piping system shall withstand the test pressure specified without showing any evidence of leakage or other defects. Any reduction of test pressures as indicated by pressure gauges shall be deemed to indicate the presence of a leak unless such reduction can be readily attributed to some other cause.

1214.2 The leakage shall be located by means of an approved gas detector, a non-corrosive leak detection fluid, or other approved leak detection methods. Matches, candles, open flames, or other methods that provide a source of ignition shall not be used.

1218.0 Multiple Buildings on a single lot. A business or apartment complex with more than one building on a single lot or one master gas meter serving a single lot must secure separate permits for each building (for example, an apartment complex with 20 separate buildings will need 20 separate permits).

- (1) Buildings with multiple meters must have each meter identified.
- (2) Existing life-safety conditions that are unsafe and that violate this Code shall be corrected before a gas plumbing system is approved.
- (3) Existing conditions created by installations made under prior regulations that do not create life-safety hazards may remain.

1301.0 Medical Gas and Vacuum Piping Systems. The Medical Gas Installer shall present a copy of his Medical Gas Endorsement to the Plumbing Inspector before the first inspection.

1302.0 Medical Gas Plan Review and Permits. Plans shall be submitted for review of a new or revised medical gas system. An engineer licensed with the State of Texas shall design plans for medical gas systems installed for human uses. After approval of the medical gas plan, a master plumber licensed by the State of Texas with a current medical

gas endorsement shall secure a medical gas permit. This permit shall be for all medical gas installations and alterations of a medical gas system

1303.0 Liquid Ring Surgical and Dental Vacuum Pump Installations. Liquid ring surgical and dental vacuum pump installations are prohibited in the City's jurisdiction.

1304.0 Medical Gas For Non-Human Uses.

1304.1 Piping Materials For Field-Installed Medical Gas And Vacuum Systems For Non-Human Uses.

(1) Hard drawn seamless copper tube:

- (a) ASTM B 88, Standard Specification for Seamless Copper Water Tube, copper tube (K,L,M)
- (b) ASTM B 280, Standard Specification for Seamless Copper Tubing for Air Conditioning and Refrigeration Field Service, copper ACR tube
- (c) ASTM B 819, Standard Specification for Seamless Copper Tube for Medical Gas Systems, copper medical gas tubing (K or L)

(2) Stainless steel tube

Exception: Piping for field installed vacuum systems for non-human use may be installed with schedule 40 polyvinylchloride (PVC).

1304.2 Testing Requirements.

1304.2.1 The test pressure for positive-pressure gas piping installed in medical gas systems for non-human uses shall be 1.5 times the system working pressure, but not less than a gauge pressure of 1035 kpa (150 psi).

1304.2.2 The test pressure for copper vacuum systems installed for non-human uses shall be a gauge pressure of 105 kpa (15 psi).

1304.2.3 Piping for field installed vacuum systems using PVC pipe and fittings for non-human uses shall be subjected to a vacuum of not less than 485mm (19in.) gauge HgV, using either the vacuum source equipment or a test pump.

1508.0 Conflicts. If there is a conflict between the Plumbing Code, Fire Code or Building Code regarding firestop protection, the most stringent code requirement shall prevail.

1600.0 The provisions of Chapter 16 are strictly voluntary and optional. The Authority Having Jurisdiction shall not require the installation of a gray-water, reclaimed water or any other auxiliary water system. However if a gray-water, reclaimed water or auxiliary water system is installed, it shall comply with the requirements of Chapter 16.

Part II

1613.0 Commercial, Institutional and Industrial Gray-water Systems.

- (1) The provisions of Part II of this chapter shall apply to the installation, construction, alteration, and repair of gray-water systems for commercial, institutional and industrial properties intended to supply uses such as water closets, urinals, trap primers for floor drains, floor sinks, irrigation, industrial processes, water features and other uses approved by the Authority Having Jurisdiction. Potable water supplied as makeup water in these systems shall be protected against back-pressure and back-siphonage in accordance with Sections 602.0 and 603.0 and Table 16-3. If gray-water systems are utilized on the premises, all potable supplies shall be provided with appropriate backflow protection, as required by the Authority Having Jurisdiction and Table 16-3.
- (2) No commercial construction permit for any gray-water system shall be issued until complete plumbing plans, with appropriate data satisfactory to the Authority Having Jurisdiction, have been submitted and approved. No changes or connections shall be made to either the gray-water system or the potable water system within any site containing a gray-water system without approval by the Authority Having Jurisdiction.
- (3) Before a building may be occupied on a site using gray water, the installer shall perform the initial cross-connection testing and inspection in accordance with section 1620.0 of this code and in accordance with Section 2.3.6 Cross Connection Inspections and Testing of Auxiliary Water Use Sites of the City of Austin Utilities Criteria Manual, with direction and oversight of the Authority Having Jurisdiction and other authorities having jurisdiction. The test shall be ruled successful by the Authority Having Jurisdiction before final approval is granted.
- (4) A gray-water system for commercial applications shall be designed by a person registered or licensed to perform plumbing design work.

1614.0 Definitions.

Gray water for Industrial, Commercial or Institutional properties. Wastewater from bathtubs, showers, bathroom wash basins, clotheswashers, laundry tubs and other clear water wastes approved by the Authority Having Jurisdiction that has been treated to:

BOD 5 or CBOD 5mg/l

Turbidity 3NTU

Fecal coliform 20CFU/100ml (geometric mean)

Fecal coliform (not to exceed) 75CFU/100ml (single grab sample)

1615.0 Permit. It shall be unlawful for any person to construct, install, alter, or cause to be constructed, installed, or altered any gray-water system within a building or on a premises without first obtaining a permit to do such work from the Authority Having Jurisdiction.

1616.0 Drawings and Specifications. The Authority Having Jurisdiction shall be permitted to require any or all of the following information to be included with or in the plot plan before a permit is issued for a gray-water system.

- (1) A plot plan drawn to scale and completely dimensioned, showing lot lines and structures, location of present and proposed potable water supplies and meters, water wells, streams, gray-water and/or auxiliary supply and systems, reclaimed water supply and meters, drain lines, locations of private sewage disposal systems and 100 percent expansion areas or building sewer connected to the public sewer.
- (2) Details of construction including riser diagrams or isometrics and a full description of the complete installation, including installation methods, construction, and materials as required by the Authority Having Jurisdiction. To the extent permitted by structural conditions, gray-water risers within the toilet room, including appurtenances such as air/vacuum relief valves, pressure reducing valves, etc., shall be installed in the opposite end of the room containing the served fixtures from the potable water risers or opposite walls, as applicable. To the extent permitted by structural conditions, gray-water headers and branches off risers shall not be run in the same wall or ceiling cavity of the toilet room where potable water piping is run.
- (3) Detailed initial and annual or periodic testing requirements as outlined elsewhere in this chapter.

1617.0 Pipe Material/Pipe Identification. Gray-water systems shall comply with Sections 1617.1 and 1617.2.

1617.1 Pipe Materials. Gray-water pipe, valves and fittings shall conform to the requirements of Sections 604.0, 605.0 and 606.0.

1617.2 Color and Information. Gray-water systems shall have a purple background with black uppercase lettering with the words "CAUTION: NONPOTABLE GRAY WATER, DO NOT DRINK." The minimum size of the letters and length of the color field shall conform to Table 6-1. Where used, a colored identification band shall be indicated every five (5) feet (6,096 mm) not less than once per room, and shall be visible from the floor level. Marking is not required for pipe manufactured with purple color integral to the pipe and marked with black uppercase lettering to read "CAUTION: NONPOTABLE RECLAIMED WATER, DO NOT DRINK" in intervals not to exceed five (5) feet (1,524 mm). All valves, except fixture supply control valves shall be

equipped with a locking feature. All mechanical equipment that is appurtenant to the gray-water system shall be painted purple.

1618.0 Installation.

- (1) Hose bibbs shall not be allowed on a gray-water piping system.
- (2) The gray-water system and the potable water system within the building shall be provided with the required appurtenances (valves, air/vacuum relief valves, etc.) to allow for deactivation or drainage as required for cross connection test in Section 1620.0.
- (3) Gray-water pipes shall not be run or laid in the same trench as potable water pipes. A ten (10) foot (3,048 mm) horizontal separation shall be maintained between pressurized, buried gray water and potable water piping. Buried potable water pipes crossing pressurized gray-water pipes shall be laid not less than twelve (12) inches (305 mm) above the gray-water pipes. Gray-water pipes laid in the same trench or crossing building sewer or drainage piping shall be installed in compliance with Sections 609.0 and 720.0 of this code. Gray-water pipes shall be protected similar to potable water pipes.

1618.1 Specific Installation Requirements for Commercial, Institutional and Industrial Gray-water Systems.

- (1) All drain, waste and vent piping associated with gray-water systems shall be installed in full compliance with this code.
- (2) Gray water shall be collected in an approved reservoir constructed of durable, nonabsorbent and corrosion-resistant materials. The reservoir shall be a closed and gas-tight vessel. Access openings shall be provided to allow inspection and cleaning of the reservoir interior. The holding capacity of the reservoir shall be a minimum of twice the volume of water required to meet the daily flushing requirements of the fixtures supplied with gray water.
- (3) Gray-water storage tanks shall be permitted to be installed above or below grade.
 - (a) **Above Grade.** Above grade storage tanks shall be of an opaque material, approved for above-ground use in direct sunlight or shall be protected from direct sunlight. Tanks shall be installed in an accessible location to allow for inspection and cleaning. The tank shall be installed on a foundation or platform that is constructed to accommodate all loads in accordance with the building code.
 - (b) **Below Grade.** Auxiliary water storage tanks installed below grade shall be structurally designed to withstand all anticipated earth or other loads. All holding tank covers shall be capable of supporting an earth

load of not less than three hundred (300) pounds per square foot (1464.6 kg/m²) when the tank is designed for underground installation. Below grade auxiliary water tanks installed underground shall be provided with manholes. The manhole opening shall be located a minimum of 4 inches above finished grade. The surrounding grade shall be sloped away from the manhole. Underground tanks shall be secured to prevent the tank from floating out of the ground when empty.

- (4) gray water entering the reservoir shall pass through an approved filter such as a media, sand or diatomaceous earth filter.
- (5) gray water shall be disinfected by an approved method that employs one or more disinfectants such as chlorine, iodine or ozone.
- (6) Devices and equipment used to treat gray water to maintain the minimum water quality requirements determined by the Authority Having Jurisdiction shall be listed or labeled (third-party certified) by a listing agency (accredited conformity assessment body) and approved for the intended application.
- (7) Potable water shall be supplied as a source of makeup water for the gray-water system if the system is utilized for water closet and urinal flushing. The potable water supply shall be protected against back flow in accordance with Section 603. There shall be a full-open valve on the makeup water supply line to the reservoir.
- (8) The collection reservoir shall be equipped with an overflow pipe of the same diameter as the influent pipe for the gray water.
- (9) A drain shall be located at the lowest point of the collection reservoir. The drain shall be the same diameter as the overflow pipe required by (H) and shall be provided with a full-open valve.
- (10) The reservoir shall be provided with a vent sized in accordance with Chapter 9 based on the size of the reservoir influent pipe. If the reservoir is indirectly wasted to the sanitary sewer then the vent pipe must be independent thru the roof and cannot be combined with sanitary connected vent pipes.

1618.2 Pumps. All pumps serving auxiliary water systems shall be listed. All pumps supplying water to water closets, urinals, trap primers shall be capable of delivering a minimum (15) pounds per square inch (103.4 kPa) residual pressure at the highest and most remote outlet served. Where the water pressure in auxiliary water supply system within the building exceeds (65) pounds per square inch (552 kPa), a pressure reducing valve reducing the pressure to (65) pounds per square inch (552 kPa) or less to all water outlets in the building shall be installed in accordance with the plumbing code.

1618.3 Certificate of Occupancy. No certificate of occupancy or temporary certificate of occupancy will be issued for any building containing a gray-water system for non-potable uses until a water sample has been taken and third party certified to meet the standards referenced in section 1614.0.

1619.0 Signs.

(1) **Commercial, Industrial and Institutional Room Entrance Signs.**

All rooms in commercial, industrial, and institutional occupancies using gray water for water closets and/or urinals shall be identified with signs. Each sign shall contain one-half (1/2) inch (12.7 mm) letters of a highly visible color on a contrasting background. The location of the sign(s) shall be such that the sign(s) shall be visible to all users. The number and location of the signs shall be approved by the Authority Having Jurisdiction and shall contain the following text:

**TO CONSERVE WATER, THIS BUILDING USES NONPOTABLE
GRAY WATER TO FLUSH TOILETS AND URINALS.**

(2) **Room Signs.** Each room containing gray-water equipment shall have a sign posted with the following wording in one (1) inch (25.4 mm) letters on a purple background:

**CAUTION
NONPOTABLE GRAY WATER, DO NOT DRINK.
DO NOT CONNECT TO DRINKING WATER SYSTEM.**

**NOTICE
CONTACT BUILDING MANAGEMENT BEFORE PERFORMING
ANY WORK ON THIS WATER SYSTEM.**

This sign shall be posted in a location that is visible to anyone working on or near gray-water equipment.

(3) Where tank-type water closets are flushed with gray water, the tank shall be labeled:

**NONPOTABLE GRAY WATER,
DO NOT DRINK**

(4) **Valve Access Door Signs.** Each gray-water valve within a wall shall have its access door into the wall equipped with a warning sign approximately six (6) inches by six (6) inches (152 mm x 152 mm) with wording in one-half (1/2) inch (12.7 mm) letters on a purple background. The size, shape, and format of the sign shall be substantially the same as that specified in subsection (B) above. The signs shall be attached inside the access door frame and shall hang in the center of the access door frame. This sign requirement shall be

applicable to any and all access doors, hatches, etc., leading to gray-water piping and appurtenances.

1620.0 Inspection and Testing.

- (1) Gray-water piping shall be inspected and tested as outlined in this code for testing of potable water piping.
- (2) An initial inspection and test shall be performed on both the potable and gray-water systems. In addition to this an initial and subsequent periodic Customer Service Inspection as prescribed by TCEQ TAC 30 Chapter 290 Subchapter D 290.46(j) shall be performed. The Austin Water Utility Customer requesting to use or continuing to use gray water on a site where Austin Water Utility potable water is used shall employ, at their own expense, a licensed individual registered with the Austin Water Utility to schedule and perform the customer service inspection. The potable and gray-water system shall be isolated from each other and independently inspected and tested to ensure there is no cross-connection as follows and as described in the Austin Water Utilities Criteria Manual. In the event of conflict the most stringent rule will apply:
 - (a) **Visual Dual System Inspection.** Prior to commencing the cross-connection testing, a dual system inspection shall be conducted by the Authority Having Jurisdiction and other authorities having jurisdiction.
 - (i) Meter locations of the reclaimed water and potable water lines and sources of other gray-water lines shall be checked to verify that no modifications were made, and that no cross-connections are visible.
 - (ii) Pumps and equipment, equipment room signs, and exposed piping in the equipment room shall be checked.
 - (iii) Valve control door signs shall be checked to verify that no signs have been removed.
 - (b) **Cross-Connection Test.** The following procedure shall be followed by the applicant in the presence of the Authority Having Jurisdiction and other authorities having jurisdiction to determine whether a cross connection occurred.
 - (i) The potable water system shall be activated and pressurized. The gray-water system shall be shut down and completely drained.
 - (ii) The potable water system shall remain pressurized for a minimum period of time specified by the Authority Having Jurisdiction while the gray-water system is empty. The

minimum period the gray-water system is to remain depressurized shall be determined on a case-by-case basis, taking into account the size and complexity of the potable and gray-water distribution systems, but in no case shall that period be less than one (1) hour.

- (iii) Fixtures, potable and gray water, shall be tested and inspected for flow. Flow from any gray-water system outlet shall indicate a cross-connection. No flow from a potable water outlet would indicate that it is connected to the gray-water system.
 - (iv) The drain on the gray-water system shall be checked for flow during the test and at the end of the period.
 - (v) The potable water system shall then be completely drained.
 - (vi) The gray-water system shall then be activated and pressurized.
 - (vii) The gray-water system shall remain pressurized for a minimum period of time specified by the Authority Having Jurisdiction while the potable water system is empty. The minimum period the potable water system is to remain depressurized shall be determined on a case-by-case basis, but in no case shall that period be less than one (1) hour.
 - (viii) Fixtures, potable and, gray water, shall be tested and inspected for flow. Flow from any potable water system outlet shall indicate a cross-connection. No flow from a gray-water outlet would indicate that it is connected to the potable water system.
 - (ix) The drain on the potable water system shall be checked for flow during the test and at the end of the period.
 - (x) If there is no flow detected in any of the fixtures that would have indicated a cross-connection, the potable water system shall be re-pressurized.
- (c) **Cross-Connection Discovered.** In the event that a cross-connection is discovered, the following procedure, in the presence of the Authority Having Jurisdiction, shall be activated immediately:
- (i) Gray-water piping would be shut off at the source, and the gray-water riser shall be drained.
 - (ii) Potable water piping to the building shall be shut down at the meter.
 - (iii) The cross-connection shall be uncovered and disconnected.

- (iv) The building shall be retested following procedures listed in subsections (B)(1) and (B)(2) above.
 - (v) The potable water system shall be chlorinated with fifty (50) ppm chlorine for twenty-four (24) hours.
 - (vi) The potable water system shall be flushed after twenty-four (24) hours, and a standard bacteriological test shall be performed. If test results are acceptable, the potable water system shall be permitted to be recharged.
- (3) A periodic inspection of gray-water systems, following the procedures listed in subsection 1620.0 (B) (1), shall be required. Periodic testing of gray-water systems, following the procedures listed in subsection 1620.0 (B) (2), shall be required by the Authority Having Jurisdiction, unless site conditions do not require it. In no event shall the test occur less often than once in four (4) years. Alternate testing requirements shall be permitted by the Authority Having Jurisdiction.

1621.0 Sizing. Gray-water piping shall be sized as outlined in this code for sizing potable water piping.

Part III

1622.0 Reclaimed Water and other Auxiliary Water Systems – General.

- (1) The reclaimed water provisions of Part III of this chapter shall apply to the installation, construction, alteration, and repair of reclaimed water systems intended to supply uses such as water closets, urinals, and trap primers for floor drains and floor sinks, irrigation, industrial processes, water features and other uses approved by the Authority Having Jurisdiction. Use of reclaimed water inside a building is limited to new construction only. Use of reclaimed water outside a building (irrigation) requires that all materials used be identified as required by this chapter (no re-use of existing irrigation or other concealed piping). Potable water on sites using reclaimed water shall be protected against back-pressure and back-siphonage in accordance with Sections 602.0 and 603.0 of this code and water protection provisions of the Austin Water Utility Criteria Manual 2.3.0 and Cross Connection Control ordinance 15-1. If reclaimed water is utilized on the premises, all potable supplies shall be provided with appropriate backflow protection, as required by the Authority Having Jurisdiction and Table 16-3.
- (2) The auxiliary water provisions of Part III of this chapter shall apply to the installation, construction, alteration, and repair of auxiliary water systems other than reclaimed water intended to supply uses such as water closets, urinals, trap primers for floor drains, floor sinks, irrigation, industrial

processes, water features and other uses approved by the Authority Having Jurisdiction. Potable water supplied as makeup water in these systems shall be protected against back-pressure and back-siphonage in accordance with Sections 602.0 and 603.0 and Table 16-3. If auxiliary water systems are utilized on the premises, all potable supplies shall be provided with appropriate backflow protection, as required by the Authority Having Jurisdiction and Table 16-3. If a property is connected to Austin Water Utility's public potable water supply and has a rainwater harvesting system or other auxiliary water system for indoor use, the property must have appropriate cross-connection safeguards and the rainwater harvesting system or auxiliary water system may be used only for non-potable indoor purposes.

- (3) No commercial construction permit for any reclaimed water or other auxiliary water system shall be issued until complete plumbing plans, with appropriate data satisfactory to the Authority Having Jurisdiction, have been submitted and approved. Residential plan review is not required and the project will be inspected as a "field inspect" project. No changes or connections shall be made to either the reclaimed water or other auxiliary water system or the potable water system within any site containing a reclaimed water or other auxiliary water system without approval by the Authority Having Jurisdiction.
- (4) Before a building may be occupied on a site using reclaimed water or other auxiliary water, the installer shall perform the initial cross-connection testing and inspection in accordance with Section 1629.0 of this code and in accordance with Section 2.3.6 Cross Connection Inspections and Testing of Auxiliary Water Use Sites of the City of Austin Utilities Criteria Manual, with direction and oversight of the Authority Having Jurisdiction and other authorities having jurisdiction. The test shall be ruled successful by the Authority Having Jurisdiction before final approval is granted.
- (5) A reclaimed water or other auxiliary water system shall be designed by a person registered or licensed to perform plumbing design work for commercial applications.

1623.0 Definitions.

- (1) Reclaimed Water - Nonpotable water that meets or as a result of treatment, meets federal requirements for its intended uses. The level of treatment and quality of the reclaimed water shall be approved by the TCEQ and the Authority Having Jurisdiction.
- (2) Auxiliary Water- any pressurized water supply on or available to the premises other than the Austin Water Utility's approved public potable water supply. These auxiliary waters may include water from another water purveyor's public water supply or any natural source(s) , including without

limitation, rain, a well, lake, spring, river, stream, harbor, and so forth; or ground water, surface water, ponded water for detention, retention or re-irrigation, or used waters, reclaimed water, recycled water, air conditioning condensate, or industrial fluids but does not include forced sewer mains or any pumped sewage that is piped to City of Austin sewer or on site sewage facility system.

1624.0 Permit. It shall be unlawful for any person to construct, install, alter, or cause to be constructed, installed, or altered any reclaimed water or other auxiliary water system within a building or on a premises without first obtaining a permit to do such work from the Authority Having Jurisdiction. No Homeowner/Homestead Plumbing Permits will be issued for installation of auxiliary water systems.

1625.0 Drawings and Specifications. The Authority Having Jurisdiction shall be permitted to require any or all of the following information to be included with or in the plot plan before a permit is issued for a reclaimed water or other auxiliary water system. Residential One and Two Family Dwelling auxiliary water systems are exempt from plan review.

- (1) A plot plan drawn to scale and completely dimensioned, showing lot lines and structures, location of present and proposed potable water supplies and meters, water wells, streams, auxiliary water supply and systems, reclaimed water supply and meters, drain lines, locations of private sewage disposal systems and 100 percent expansion areas or building sewer connected to the public sewer.
- (2) Details of construction including riser diagrams or isometrics and a full description of the complete installation, including installation methods, construction, and materials as required by the Authority Having Jurisdiction. To the extent permitted by structural conditions, reclaimed water and other auxiliary water risers within the toilet room, including appurtenances such as air/vacuum relief valves, pressure reducing valves, etc., shall be installed in the opposite end of the room containing the served fixtures from the potable water risers or opposite walls, as applicable. To the extent permitted by structural conditions, reclaimed and other auxiliary water headers and branches off risers shall not be run in the same wall or ceiling cavity of the toilet room where potable water piping is run.
- (3) Detailed initial and annual or periodic testing requirements as outlined elsewhere in this chapter.

1626.0 Pipe Material/Pipe Identification. Reclaimed and other auxiliary water systems shall comply with Sections 1626.1 and 1626.2.

1626.1 Pipe Materials. Reclaimed water and other auxiliary water pipe, valves and fittings shall conform to the requirements of Sections 604.0, 605.0 and 606.0.

1626.2 Color and Information. Reclaimed water systems shall have a purple background with black uppercase lettering with the words "CAUTION: NONPOTABLE RECLAIMED WATER, DO NOT DRINK." The minimum size of the letters and length of the color field shall conform to Table 6-1. Where used, a colored identification band shall be indicated every five (5) feet (6,096 mm) not less than once per room, and shall be visible from the floor level. Marking is not required for pipe manufactured with purple color integral to the pipe and marked with black uppercase lettering to read "CAUTION: NONPOTABLE RECLAIMED WATER, DO NOT DRINK" in intervals not to exceed five (5) feet (1,524 mm). All valves, except fixture supply control valves shall be equipped with a locking feature. All mechanical equipment that is appurtenant to the reclaimed water system shall be painted purple. Piping for auxiliary waters other than reclaimed water (rainwater, well, lake, stream, river, pond, etc.) installed below ground shall have a purple background with the words "CAUTION: NONPOTABLE WATER, DO NOT DRINK" in black uppercase lettering. The minimum size of the letters and length of the color field shall conform to Table 6-1. Where used, a colored identification band shall be indicated every five (5) feet (6,096 mm). Marking is not required for pipe manufactured with purple color integral to the pipe and marked with black uppercase lettering to read "CAUTION: NONPOTABLE WATER, DO NOT DRINK" in intervals not to exceed five (5) feet (1,524 mm). Piping for auxiliary waters other than reclaimed water (rainwater, well, lake, stream, river, pond, etc.) installed above ground shall be labeled as non-potable per section 601.2.2.

1627.0 Installation.

- (1) Hose bibbs shall not be allowed on reclaimed water or other auxiliary water piping systems.
- (2) The reclaimed water or other auxiliary water system and the potable water system within the building shall be provided with the required appurtenances (valves, air/vacuum relief valves, etc.) to allow for deactivation or drainage as required for cross connection test in Section 1629.0.
- (3) Reclaimed water or other auxiliary water pipes shall not be run or laid in the same trench as potable water pipes. A ten (10) foot (3,048 mm) horizontal separation shall be maintained between pressurized, buried reclaimed water or other auxiliary water and potable water piping. Buried potable water pipes crossing pressurized reclaimed water or other auxiliary water pipes shall be laid not less than twelve (12) inches (305 mm) above the reclaimed water or other auxiliary water pipes. Reclaimed water or other auxiliary water pipes laid in the same trench or crossing building sewer or drainage piping shall be installed in compliance with Sections 609.0 and 720.0 of this code. Reclaimed water or other auxiliary water pipes shall be protected similar to potable water pipes.

1627.1 Specific Installation Requirements for Auxiliary Water Systems other than Reclaimed Water.

1627.1.1 Auxiliary Water Storage Tanks. Auxiliary water storage tanks shall be constructed and installed in accordance with Sections 1627.1.1.1 through 1627.1.1.7.

1627.1.1.1 Construction. Auxiliary water storage tanks shall be constructed of solid, durable materials not subject to excessive corrosion or decay and shall be watertight. Storage tanks shall be approved by the Authority Having Jurisdiction, provided such tanks comply with approved applicable standards.

1627.1.1.2 Location. Auxiliary water storage tanks shall be permitted to be installed above or below grade.

1627.1.1.3 Above Grade. Above grade storage tanks shall be of an opaque material, approved for above-ground use in direct sunlight or shall be protected from direct sunlight. Tanks shall be installed in an accessible location to allow for inspection and cleaning. The tank shall be installed on a foundation or platform that is constructed to accommodate all loads in accordance with the building code.

1627.1.1.4 Below Grade. Auxiliary water storage tanks installed below grade shall be structurally designed to withstand all anticipated earth or other loads. All holding tank covers shall be capable of supporting an earth load of not less than three hundred (300) pounds per square foot (1464.6 kg/m²) when the tank is designed for underground installation. Below grade auxiliary water tanks installed underground shall be provided with manholes. The manhole opening shall be located a minimum of 4 inches above finished grade. The surrounding grade shall be sloped away from the manhole. Underground tanks shall be secured to prevent the tank from floating out of the ground when empty.

1627.1.1.5 Drainage and Overflow. Auxiliary water storage tanks shall be provided with a means of draining and cleaning. The overflow drain shall not be equipped with a shutoff valve. The overflow outlet shall discharge as required by the plumbing code. Where discharging is to the storm or other drainage or collection system, the overflow drain shall be protected from backflow of the storm or other drainage or collection system by a backwater valve or other approved method.

1627.1.1.5.1 Overflow Outlet Size. The overflow outlet shall be sized to accommodate the flow of the auxiliary water entering the tank and not less than the aggregate cross-sectional area of all inflow pipes.

1627.1.1.6 Opening and Access Protection.

1627.1.1.6.1 Animals and Insects. All auxiliary water tank openings shall be protected to prevent the entrance of insects, birds and rodents into the tank with a screen having openings no greater than 1/32 inches (0.8 mm).

1627.1.1.6.2 Human Access. Auxiliary water tank access openings 12 inches (305 mm) in diameter and larger shall be secured to prevent tampering and unintended entry by either a lockable device or other approved method.

1627.1.1.6.3 Exposure to Sunlight. Auxiliary water tank openings shall not be exposed to direct sunlight.

1627.1.1.7 Marking. Auxiliary water tanks shall be permanently marked with the capacity and the language: "NONPOTABLE AUXILIARY WATER." Where openings are provided to allow a person to enter the tank, the opening shall be marked with the following language:

"DANGER - CONFINED SPACE"

1627.1.2 Pumps. All pumps serving auxiliary water systems shall be listed. All pumps supplying water to water closets, urinals, trap primers shall be capable of delivering a minimum (15) pounds per square inch (103.4 kPa) residual pressure at the highest and most remote outlet served. Where the water pressure in auxiliary water supply system within the building exceeds (65) pounds per square inch (552 kPa), a pressure reducing valve reducing the pressure to (65) pounds per square inch (552 kPa) or less to all water outlets in the building shall be installed in accordance with the plumbing code.

1627.1.3 Water Quality Devices and Equipment. Devices and equipment used to treat auxiliary water to maintain the minimum water quality requirements determined by the Authority Having Jurisdiction shall be listed or labeled (third-party certified) by a listing agency (accredited conformity assessment body) and approved for the intended application.

1627.1.4 Auxiliary water for non-potable uses inside a building shall meet the following standards for treatment:

BOD 5 or CBOD 5mg/l

Turbidity 3NTU

Fecal coliform 20CFU/100ml (geometric mean)

Fecal coliform (not to exceed) 75CFU/100ml (single grab sample)

1627.2 Certificate of Occupancy. No certificate of occupancy or temporary certificate of occupancy will be issued for any building containing a auxiliary water system for non-potable uses until a water sample has been taken and third party certified to meet the standards referenced in section 1627.1.4.

1628.0 Signs.

(1) **Commercial, Industrial and institutional Room Entrance Signs.**

All rooms in commercial, industrial, and institutional occupancies using reclaimed water or other auxiliary water for water closets and/or urinals shall be identified with signs. Each sign shall contain one-half (1/2) inch (12.7 mm) letters of a highly visible color on a contrasting background. The location of the sign(s) shall be such that the sign(s) shall be visible to all users. The number and location of the signs shall be approved by the Authority Having Jurisdiction and shall contain the following text:

TO CONSERVE WATER, THIS BUILDING USES NONPOTABLE RECLAIMED WATER TO FLUSH TOILETS AND URINALS.

- (2) **Room Signs.** Each room containing reclaimed water or other auxiliary water equipment shall have a sign posted with the following wording in one (1) inch (25.4 mm) letters on a purple background:

**CAUTION
NONPOTABLE RECLAIMED WATER, DO NOT DRINK.
DO NOT CONNECT TO DRINKING WATER SYSTEM.**

**NOTICE
CONTACT BUILDING MANAGEMENT BEFORE PERFORMING
ANY WORK ON THIS WATER SYSTEM.**

This sign shall be posted in a location that is visible to anyone working on or near reclaimed water or other auxiliary water equipment.

- (3) Where tank-type water closets are flushed with reclaimed water or other auxiliary water, the tank shall be labeled:

**NONPOTABLE RECLAIMED WATER,
DO NOT DRINK**

- (4) **Valve Access Door Signs.** Each reclaimed water or other auxiliary water valve within a wall shall have its access door into the wall equipped with a warning sign approximately six (6) inches by six (6) inches (152 mm x 152 mm) with wording in one-half (1/2) inch (12.7 mm) letters on a purple background. The size, shape, and format of the sign shall be substantially the same as that specified in subsection (B) above. The signs shall be attached inside the access door frame and shall hang in the center of the access door frame. This sign requirement shall be applicable to any and all access doors, hatches, etc., leading to reclaimed water or other auxiliary water piping and appurtenances.
- (5) Auxiliary Waters other than reclaimed water (rainwater, well, river, stream, lake, etc) are not required to have the word "Reclaimed" in their signage.

1629.0 Inspection and Testing.

- (1) Reclaimed water and other auxiliary water piping shall be inspected and tested as outlined in this code for testing of potable water piping.
- (2) An initial inspection and test shall be performed on both the potable and reclaimed water or other auxiliary water systems. In addition to this an initial and subsequent periodic Customer Service Inspection as prescribed by TCEQ 30 TAC Chapter 290, Subchapter D 290.46(j) shall be performed. The Austin Water Utility Customer requesting to use or continuing to use reclaimed water or other auxiliary water on a site where Austin Water Utility potable water is used shall employ, at their own expense, a licensed individual registered with the Austin Water Utility to schedule and perform the customer service inspection. The potable and reclaimed water or other auxiliary water system shall be isolated from each other and independently inspected and tested to ensure there is no cross-connection as follows and as described in the Austin Water Utilities Criteria Manual. In the event of conflict the most stringent rule will apply.
 - (a) **Visual Dual System Inspection.** Prior to commencing the cross-connection testing, a dual system inspection shall be conducted by the Authority Having Jurisdiction and other authorities having jurisdiction.
 - (i) Meter locations of the reclaimed water and potable water lines and sources of other auxiliary water lines shall be checked to verify that no modifications were made, and that no cross-connections are visible.
 - (ii) Pumps and equipment, equipment room signs, and exposed piping in the equipment room shall be checked.
 - (iii) Valve control door signs shall be checked to verify that no signs have been removed.
 - (b) **Cross-Connection Test.** The following procedure shall be followed by the applicant in the presence of the Authority Having Jurisdiction and other authorities having jurisdiction to determine whether a cross connection occurred.
 - (i) The potable water system shall be activated and pressurized. The reclaimed water or other auxiliary water system shall be shut down and completely drained.
 - (ii) The potable water system shall remain pressurized for a minimum period of time specified by the Authority Having Jurisdiction while the reclaimed water or other auxiliary water system(s) is(are) empty. The minimum period the reclaimed

water or other auxiliary water system is to remain depressurized shall be determined on a case-by-case basis, taking into account the size and complexity of the potable and reclaimed water or other auxiliary water distribution systems, but in no case shall that period be less than one (1) hour.

- (iii) Fixtures, potable and reclaimed water or other auxiliary, shall be tested and inspected for flow. Flow from any reclaimed water or other auxiliary water system outlet shall indicate a cross-connection. No flow from a potable water outlet would indicate that it is connected to the reclaimed water or other auxiliary water system.
 - (iv) The drain on the reclaimed water or other auxiliary water system shall be checked for flow during the test and at the end of the period.
 - (v) The potable water system shall then be completely drained.
 - (vi) The reclaimed water or other auxiliary water system shall then be activated and pressurized.
 - (vii) The reclaimed water or other auxiliary water system shall remain pressurized for a minimum period of time specified by the Authority Having Jurisdiction while the potable water system is empty. The minimum period the potable water system is to remain depressurized shall be determined on a case-by-case basis, but in no case shall that period be less than one (1) hour.
 - (viii) Fixtures, potable and ,reclaimed water or other auxiliary, shall be tested and inspected for flow. Flow from any potable water system outlet shall indicate a cross-connection. No flow from a reclaimed water or other auxiliary water outlet would indicate that it is connected to the potable water system.
 - (ix) The drain on the potable water system shall be checked for flow during the test and at the end of the period.
 - (x) If there is no flow detected in any of the fixtures that would have indicated a cross-connection, the potable water system shall be re-pressurized.
- (c) **Cross-Connection Discovered.** In the event that a cross-connection is discovered, the following procedure, in the presence of the Authority Having Jurisdiction, shall be activated immediately:

- (i) Reclaimed water piping to the building shall be shut down at the meter, and the reclaimed water riser shall be drained. Other auxiliary water piping would be shut off at the source, and the auxiliary water riser shall be drained.
 - (ii) Potable water piping to the building shall be shut down at the meter.
 - (iii) The cross-connection shall be uncovered and disconnected.
 - (iv) The building shall be retested following procedures listed in subsections (B)(1) and (B)(2) above.
 - (v) The potable water system shall be chlorinated with fifty (50) ppm chlorine for twenty-four (24) hours.
 - (vi) The potable water system shall be flushed after twenty-four (24) hours, and a standard bacteriological test shall be performed. If test results are acceptable, the potable water system shall be permitted to be recharged.
- (3) An annual inspection of the reclaimed water system and periodic inspection of other auxiliary water systems, following the procedures listed in subsection 1629.0 (B)(1), shall be required. Annual cross-connection testing of reclaimed water and periodic testing of other auxiliary water systems, following the procedures listed in subsection 1629.0 (B)(2), shall be required by the Authority Having Jurisdiction, unless site conditions do not require it. In no event shall the test occur less often than once in four (4) years. Alternate testing requirements shall be permitted by the Authority Having Jurisdiction.

1630.0 Sizing. Reclaimed water and other auxiliary water piping shall be sized as outlined in this code for sizing potable water piping.

Table 16-3

List of Pressurized Auxiliary Water Sources and Uses (1)	Containment Backflow Protection Required At			Isolation Backflow Protection Required at Point of Supply	
	Domestic Water Meter (2), (3)	Irrigation Water Meter (3)	City Service to Private Fire Mains (4), (5), (6)	Where Austin is used as Back-up to Auxiliary Water Source	
Lake/River Water	RP	RP	RP	RP	
Well Water	RP	RP	RP	RP	
Rainwater Harvesting	RP	RP	RP	RP	
Reclaimed Water	used on property	RP	RP	DC	AG
	used in building	RP	RP	RP	AG
Gray water, Re-Irrigation, Disposal	RP	RP	RP	AG	
Other Water Supply (7)	RP	RP	RP	AG	

Table Notes

RP= Reduced Pressure Zone Backflow Prevention Assembly

DC= Double Check Backflow Prevention Assembly

AG= Air Gap

- (1) All auxiliary water use sites are required to have Customer Service Inspection performed in addition to the annual operational test of the backflow assemblies.*
- (2) Backflow prevention assemblies installed at potable water meters require attention to thermal expansion.*
- (3) Backflow prevention assemblies installed at potable and irrigation water meters in conjunction with an auxiliary water source are required to have an annual backflow assembly operational test.*
- (4) New backflow prevention assemblies installed in existing fire systems may result in the need to re-calculate fire system design specifications due to backflow preventer pressure losses.*
- (5) Backflow prevention assemblies installed in un-metered fire systems are required to be detector assemblies.*
- (6) DCs installed on fire systems at reclaimed water use sites are required to have a semiannual operational test*
- (7) Other includes any and all other defined auxiliary waters not listed in this chart and/or any combination of 2 or more auxiliary waters*

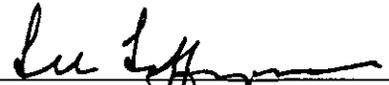
Appendix E, Section E3.1

This Code applies to mobile home parks and recreational vehicle parks within the zoning jurisdiction of the City and to mobile home parks or recreational vehicle parks connected to the City water or sewage system.

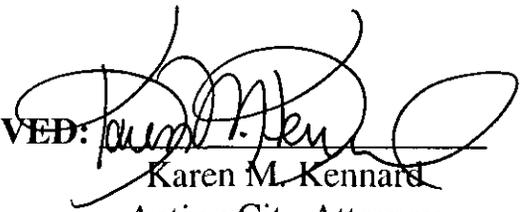
PART 2. This ordinance takes effect on October 1, 2010.

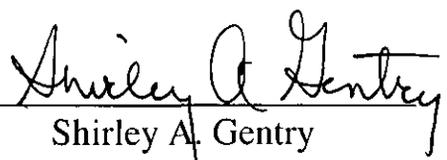
PASSED AND APPROVED

_____ June 24 _____, 2010 §
 §
 §



Lee Leffingwell
Mayor

APPROVED: 
Karen M. Kennard
Acting City Attorney

ATTEST: 
Shirley A. Gentry
City Clerk