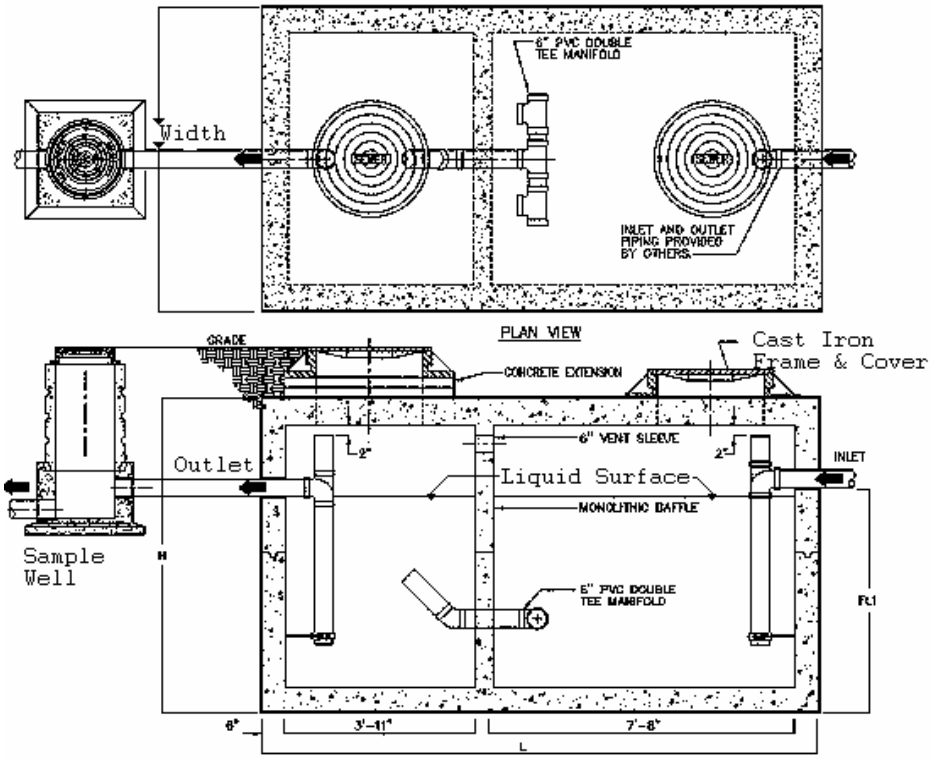
FORT WORTH
WATER

GUIDANCE DOCUMENT
FOR SIZING AND INSTALLATION
OF GREASE TRAPS AND INTERCEPTORS



Part I: Guidance for Grease Trap Sizing and Design Criteria

A. Introduction:

Information contained within this document is based on standard industry practices and guidance found in both the 1997 International Plumbing Code (IPC) Commentary and the Uniform Plumbing Code (UPC), Appendix H. Size, type, and location of grease traps shall be in accordance with the manufacturers instructions, the requirements of City of Fort Worth Environmental Ordinance #12274 and Plumbing Ordinance #13521.

B. Applicability:

These requirements are applicable to all commercial food service establishments, including those that are undergoing:

1. New construction
2. Interior remodeling to accommodate expansion or operational modifications
3. Changes of ownership/occupancy
4. Facilities which may be experiencing difficulty in achieving compliance with maintenance and/or wastewater discharge limitations

C. Sizing Requirements:

Sizing methods described herein are intended as guidance in determining grease trap/interceptor sizes that will afford the City's sanitary sewer system a minimum degree of protection against grease and other obstructing materials. Sizing determinations are based on operational data provided by business owners or their contractors. In approving a customer's plumbing or grease interceptor design, the City does not accept liability for the failure of a system to adequately treat wastewater to achieve effluent quality requirements specified under Ordinance 12274. It is the responsibility of the generator and/or contractors to insure the appropriate level of treatment necessary for compliance with environmental and wastewater regulations.

Minimum acceptable grease trap/interceptor sizing shall be accomplished as follows:

a. Sizing according to formulas found in Section D below.

b. Where sizing formulas result in determination of a grease trap less than 750 gallons in capacity, this minimum size is recommended for all restaurant applications. However, under no circumstances should exterior grease traps less than 500 gallons be utilized.

D. Grease Trap Sizing Formulas:

It is the responsibility of the generator and his/her contractors to ensure that the wastewater discharged from their facility is in compliance with the City's discharge limitations. For the purpose of plans review, a general assessment of grease trap/interceptor design and size will be performed using the following formulas. (These formulas have been demonstrated as industry standards capable of achieving the City's discharge criteria when systems are maintained in proper condition.)

Method 1: Uniform Plumbing Code, Appendix H

Number of meals Per peak hour (1)	x	waste flow rate (2)	x	retention time (3)	x	storage factor (4)	=	Size Requirement (liquid capacity)

Factors:

1) Number of meals served at peak operating hour (Seating Capacity) x Peak Factor
    a. Where Peak Factor for Fast Food Restaurant is……...1.33
    b. And, Peak Factor for all other food service types is….1.00

2) Waste Flow Rate:
    a. With Dishwasher……6 gallon flow
    b. Without Dishwasher……...5 gallon flow
    c. Single Service kitchen……..……. 2 gallon flow
    d. Food waste disposer…….. 1 gallon flow
3) Retention Times
    a. Commercial kitchen waste/dishwasher……2.5 hours
    b. Single service kitchen/single serving……1.5 hours
4) Storage Factors
    a. Fully equipped commercial kitchen …..8 hr operation…1
    b. ……..16 hr operation…2
    c. ……..24 hr operation…3
    d. Single Service Kitchen…….……1.5

The Uniform Plumbing code includes a built-in safety factor that can yield very large grease trap size specifications. At this time, the City is not requiring traps larger than 4,000 gallons. However, the decision to use a trap smaller than that specified by the formula and calculations above is to be addressed in the plan submission.

Method 2: Five (5) Hour Detention/Peak Flow

A. Gallons of water used per hour of operation
B. A x 0.75 = average "gray water" flow per hour
C. B x 1.9 peak flow factor
D. C x 5 hours detention = volume of trap

Required volume of trap = A x B x C x D

E. Alternate Sizing Formulas / Proposals

Food service establishments that propose the use of alternate sizing techniques and/or procedures that result in specifications that differ from calculated requirements (or are less than the MIMIMUM 750 gallon recommendation), must submit formulas and other bases to support proposed grease trap size/ installation. Submission should also provide documentation of ability to meet effluent quality requirements. This proposal must be signed by a licensed plumbing contractor or professional engineer. Under no circumstances will a grease trap smaller than 500 gallon be accepted.

Alternate procedures for grease removal (i.e. API Industries ECHO2, Big Dipper, etc.) must be approved on an individual basis.

F. Construction/Installation:

All permitting, construction, and inspection activities must be completed in accordance with the Fort Worth Plumbing Code #13521. Additionally, the following specifications must be incorporated into grease trap design.

a. The grease interceptor shall be constructed with a minimum of two baffles.

b. Grease traps are to be installed at a minimum distance of 10 ft. from sinks and dishwashers to allow for adequate cooling of the wastewater. Water temperatures must be less than 120 degrees prior to entering grease trap.

c. All grease bearing waste streams should be routed through an appropriate grease trap/interceptor, including: three-compartment sinks, pot/pan sinks, soup kettles, hand-washing sinks, dishwashers, mop sinks and floor drains. *Notable Exceptions:* Drains that receive "clear waste" only, such as from ice machines, condensate from coils and drink stations, may be plumbed to the sanitary system without passing through the grease interceptor with the condition that the receiving drain is a "hub" type that is a minimum of two inches above the finished floor.

d. Kitchens that utilize Garbage Disposals shall be required to use an interceptor twice the size calculated in Part I, Section D, above.

e. All exterior or recessed Grease Traps and Interceptors are to be installed with an Effluent Sampling Well, equivalent to: a. Parks Equipment Services *Sample Well SWB-9*; b. American Industrial Pre-Cast Products *Test Well;* or c. PW Eagle (formerly Uponor) *Sample Well*. Sample wells will have a minimum 12" diameter access cover and a minimum 4" drop from inlet to outlet piping through the sampling well. Mechanical Traps and Interceptors that are installed above ground must be equipped with an influent flow regulator and an effluent valve assembly that allows for sample collection.

G. Customer (Generator) Responsibilities:

It is the responsibility of the customer (waste generator) to insure compliance with the City of Fort Worth's discharge limitations specified in Environmental Ordinance #12274.

G. Customer (Generator) Responsibilities: (continued)

Hazardous wastes, such as acids, strong cleaners, pesticides, herbicides, paint, solvents, or gasoline should not be disposed of where they would go through grease or grit traps. If commercial dishwashers are discharged through a grease interceptor, care must be taken in system design. Dishwashers use detergents and elevated water temperatures that will melt grease. If the interceptor is either too small or too close to the commercial dishwasher, grease may pass through the interceptor and into the collection system.

Generators are responsible for maintaining grease traps in continuous proper working condition. Further, generators are responsible for inspecting, repairing, replacing, or installing apparatus and equipment as necessary to ensure proper operation and function of grease traps and compliance with discharge limitations at all times.

The generator must have grease traps serviced (pumped, cleaned, and inspected) by a City of Fort Worth permitted waste hauler, at a minimum frequency of every 90 days **or more often as necessary**, to ensure proper function. Records of maintenance are required to be maintained on site for five (5) years. (90 day maintenance frequency assumes proper sizing and installation consistent with this guidance).

Enzymes, solvents, and emulsifiers are not permitted as they will only change the form of grease, allowing it to be carried out of the trap with the wastewater and deposited in the collection system. Biological treatment systems must be pre-approved by the Pretreatment Services Division. These systems <u>will not</u> alleviate the necessity for inspection and proper maintenance.

Part II: Other types of Interceptors and sizing requirements

Interceptors are required for oil, grease, sand and other substances harmful or hazardous to the building drainage system, the public sewer or sewage treatment plant. Design, size, and location of pretreatment devices must be submitted by a licensed plumbing contractor or professional engineer for review and approval.

A. Laundries

Commercial Laundries, Laundromats, and dry-cleaners shall be equipped with an interceptor in order to reduce the quantity of lint and silt that enter the collection system. The system must be of adequate size and design to allow for cool-down of wastewater so that separation can be more readily achieved. The interceptor must be installed with a wire basket or similar device, removable for cleaning, that prevents passage into the drainage system of solids ½ inch (12.7 mm) or larger in size, string, rags, buttons or other materials detrimental to the public sewerage system.

Sizing must be in accordance with guidance found in the Uniform Plumbing Code (UPC), Appendix H which uses the following formula:

(TGC) x (CPH) x (RT) x (ST) = Size of Lint Interceptor (gallons)

A. Laundries (continued)

Where:
TGC = Total Gallons per Cycle
CPH = Cycles per hour
RT = Retention time
2.5 for Institutional Laundry
2.0 for Standard Commercial Laundry
1.5 Light Commercial Laundry
ST = Storage Factor, based on hours of operation;
1.0 for 8 hours of operation
1.5 for 12 or more hours

Currently, no effluent sample well is required for small commercial laundries. However, large and/or industrial laundries may be subject to Federal Pretreatment regulations. For more information please contact the Fort Worth Water Department, Pretreatment Services Division, at (817)871-8305.

B. Car Washes

Where automobiles are washed (including detail shops utilizing hand-wash practices), separators shall have a minimum capacity of 1000 gallons for the first bay, with an additional 500 gallons of capacity for every other bay.

Additionally, wash racks must be constructed to eliminate or minimize the impact of run-off from rain/storm events. Minimum requirements are roofed structures with at least two walls and appropriate grading to prevent stormwater infiltration into the sanitary sewer.

An effluent sampling well is required, per specifications listed in Part 1, Section F, Subsection d.

C. Automotive Repair Facilities (Garages and Service Stations)

Where automobiles are serviced, greased, or repaired or where gasoline is dispensed, oil/water separators shall have a minimum capacity of 500 gallons for the first 1000 square feet of area to be drained, plus 250 gallons for each additional 1000 square feet of area to be drained into the separator.

An effluent sampling well is required, per specifications listed in Part 1, Section F, Subsection d.

Note: Parking garages in which servicing, repairing, or washing is not conducted, and in which gasoline is not dispensed, shall not require a separator. Areas of commercial garages utilized only for storage of automobiles are not required to be drained through a separator.

Figure 1, Typical plumbing layout

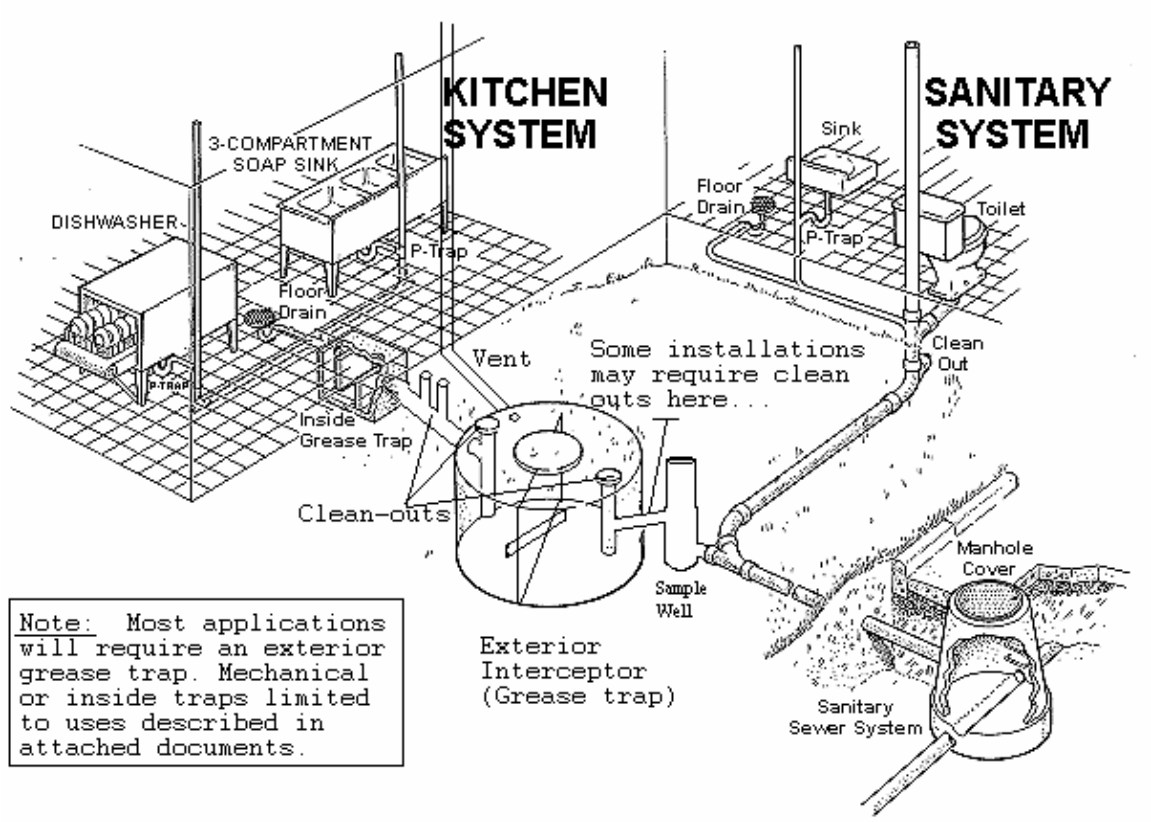


Figure 2, Typical Grease Interceptor Schematic

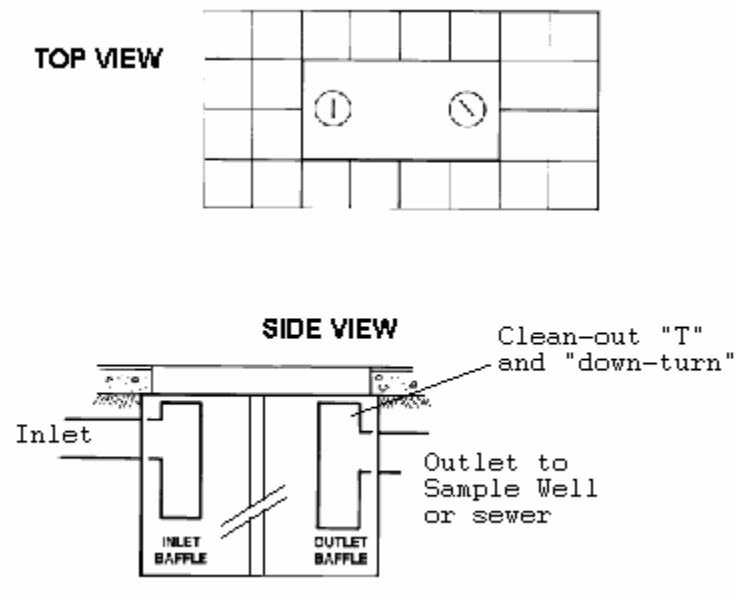


Figure 3, Typical Sampling Well, *Courtesy Park Env. Equipment Co.*

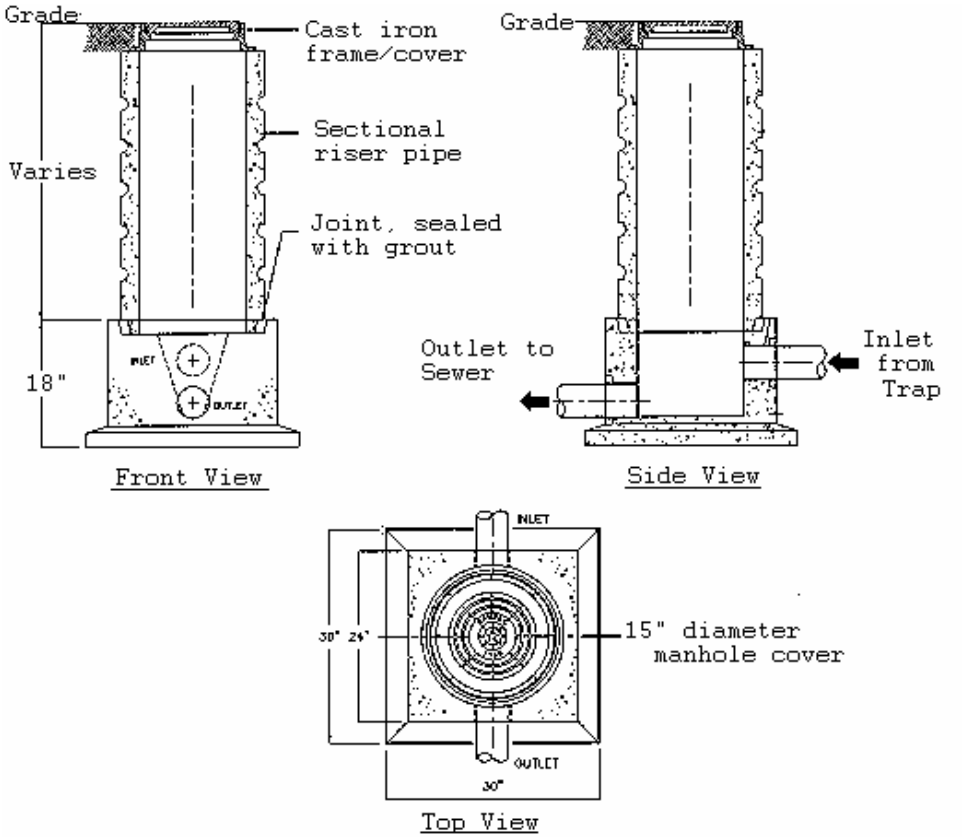
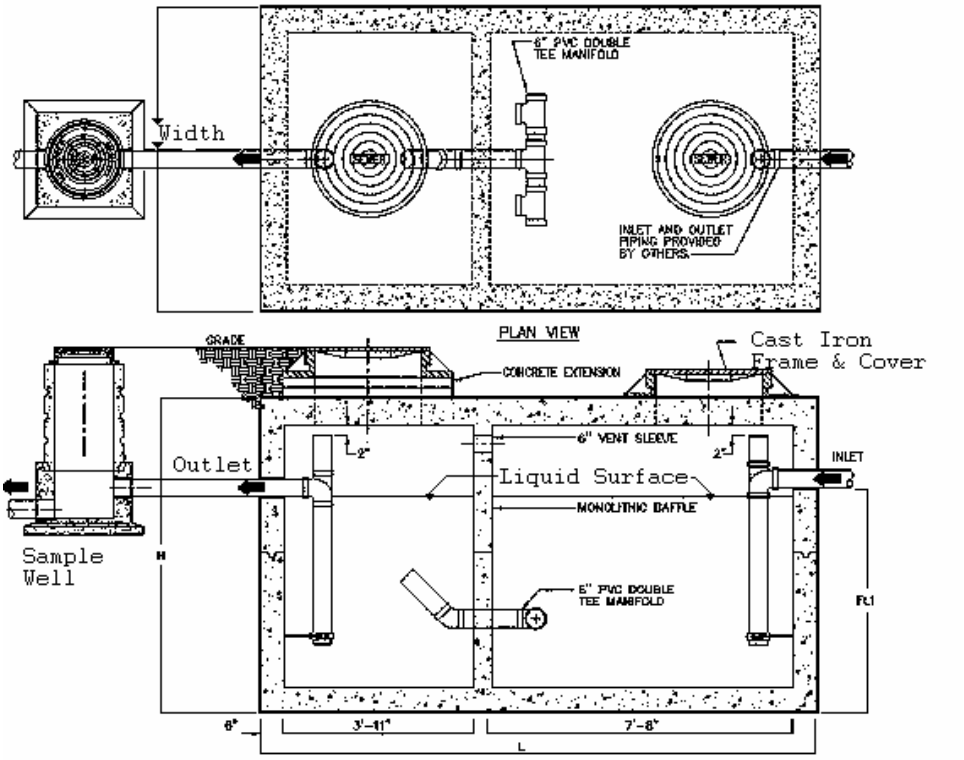


Figure 4: Typical Grease Trap / Sample Well Installation, *Courtesy Park Env. Equipment Co.*



Known Vendors:

Company	Phone	Products
American Industrial Precast (Hughes Supply) Alvarado, Texas	(817)477-5286	Grease Traps, Interceptors, Sample Test Wells
API Industries Tulsa, OK	(918)664-4010 www.apiindustriesinc.org	Alternative Grease Removal Systems
CPI Hewitt, Texas	(800)613-8274	Grease Traps, Interceptors, Sample Test Wells
Josam	(800)-3656726 www.josam.com	Alternative Grease Removal Systems, Mechanical Traps
Old Castle Precast	(817)477-2915	Grease Traps, Interceptors, Sample Test Wells
Park Env. Equipment Co. Houston, Texas	(800)256-8041 www.park-usa.com	Grease Traps, Interceptors, Sample Test Wells Lint Traps, Oil/Water Sep.
PW Eagle (via Montgomery Sales) Formerly Uponor, ETI Plano, Texas	(972)712-6418 cell (972)467-9084 cell (214)668-6685	Molded Wastewater Access Chamber and Clean-out Sampling Chamber
Thermaco (Big Dipper)	(800)633-4204 www.big-dipper.com	Alternative Grease Removal Systems