



## **CITY OF TACOMA**

### **Environmental Services**

### **Grease Interceptor Sizing & Installation Policy**

#### **Purpose:**

The purpose of this policy is to aid in the selection of proper grease interceptor devices for those facilities that have the potential to discharge wastewater containing fats, oil, and grease (FOG) in quantities that may or will cause obstruction to the flow of wastewater or interfere with the operation of the municipal sewer system in violation of TMC 12.08C.500. These facilities include restaurants, cafes, catering facilities, commissaries, hotels, cafeterias, convenience stores, full service grocery stores, schools, hospitals, and food manufacturing plants.

Grease interceptors are installed on "gray" water drain lines and are designed to remove FOG from wastewater. FOG wastes must be regularly removed or pumped out of the interceptor. The maintenance frequency will vary for each facility, but the grease interceptor must be cleaned whenever 25 percent of its collection chamber becomes filled with FOG or solids or when visible grease is seen discharging through the outlet tee (See, TMC 12.08C.500 5.a.).

#### **Definitions:**

**Hydromechanical Grease Interceptors (HGIs)** can be located inside or outside the facility, may contain weirs or diffusers, and are required to have flow restrictors. Flow restrictors slow the flow of water entering the interceptor. Each fixture discharging to an HGI must have an approved type of vented flow restrictor. Alternatively, if approved, a single flow restrictor may be installed ahead of the HGI, as long as FOG producing plumbing fixtures and appliances discharge through it. At no time shall the total flow through any flow restrictor(s) going to an HGI be greater than the rated flow of the interceptor. Also, the total capacity of the fixtures discharging into an HGI, in gallons, shall not exceed two and one-half (2 ½) times the certified gallons-per-minute flow rate of the interceptor.

**Gravity Grease Interceptors (GGIs)** are generally installed in the ground outside the facility, upstream from the "black" water (sanitary waste) drain line, and are at least 500 gallons in capacity.

Both types of interceptors must be trapped and vented in accordance with the Uniform Plumbing Code (UPC) 1013.0 which the City of Tacoma adopted in TMC 2.06. Alternatively engineered HGI and GGI systems will be considered as provided in section 301.2 of the UPC.

A **Drainage Fixture Unit (DFU)** is a unit of measure for the load-producing effects on a plumbing system from different kinds of plumbing fixtures. The number of DFUs assigned to a particular fixture is based upon Chapter 7 of the UPC. A list of examples is included below at page 5.

The number of **Meals per peak hour** is determined by multiplying the number of seats by 60, and dividing by the estimated time it takes for a patron to eat. Cash register receipts may also be used to establish this number. The number of peak meals may be estimated as being equal to 100 percent of the seating capacity of the dining area and 20 percent of the seating capacity in the lounge. For facilities with drive-through service, the estimated drive-through service rate at the peak hour should be included. For rest homes, camp kitchens, and other similar facilities, the peak meals are equal to the occupant load.

### **Interceptor Type and Size Selection:**

Please refer to the attached decision tree diagram on page 7 for assistance.

While not preferred, for those facilities that have 40 seats or less and serve 40 or fewer meals per peak hour, an HGI, sized for the number of DFUs flowing to it, is allowed. A dishwasher, if approved by the Director, may discharge to an HGI. A food waste disposal unit (garbage grinder) may not discharge to an HGI.

For those facilities that have more than 40 seats or serve more than 40 meals per peak hour, an interceptor, sized for the number of DFUs flowing to it, is required. Dishwashers and food preparation sinks at these facilities are required to discharge to the interceptor. Food waste disposers may discharge to a GGI, however, this will require an increase to one size larger than would otherwise be required by Table 5 of this policy.

For those facilities that have more than 40 seats or serve more than 40 meals per peak hour, but do not have the space or have other physical constraints that prohibit the installation of a GGI, an exception can be requested. To file an exception please see the Exception Process detailed below.

A food waste disposal unit that has no potential of receiving FOG bearing wastes, such as produce preparation areas in grocery stores, may be installed to discharge directly to the building's sewer system. These disposal units must still meet the requirements of Tacoma Municipal Code Chapter 12.08.060.

Grease protection for industrial food manufacturing facilities shall be based upon the DFU count of fixtures installed, flow rates from the manufacturing equipment, drainage pipe size, or shall be an engineered system.

### **Determining the Number of DFUs:**

First, evaluate which fixtures in the facility have the potential to discharge FOG-bearing waste. Typically, these fixtures will include three-compartment sinks, dishwasher pre-rinse sinks, floor drains in cooking and food preparation areas, mop sinks, trench drains for soup kettles and braziers, and sinks that serve wok stations and similar fixtures and appliances. Fixtures that have the potential to discharge FOG-bearing waste must be fitted to a grease interceptor device(s).

Once the FOG bearing fixtures have been identified, determine how many DFUs each fixture should be assigned. Please refer to Tables 1 and 2 below to determine the DFUs for the most common kitchen fixtures. If the DFUs cannot be determined because a kitchen plan is not available, the size of an interceptor shall be determined based upon the maximum DFUs

allowed for the pipe size connected to the inlet of the interceptor. See Table 3 on page 6 below to use this method.

<b>Table 1</b>		
<b>Type of Fixture</b>	<b># of DFUs</b>	<b>Comments</b>
3-compartment sink	9	
2-compartment sink	Use floor sink criteria based upon drain size or number of sinks, whichever is larger	Each compartment is 3 DFUs.
Floor sinks	DFUs based upon sink drain size*	See table 2 below or section 702.1 in the UPC. *Floor sinks that receive only ice machine and cooler condensate are not counted.
Mop sink	3	If cooking meat, then new mop sinks must be connected to grease protection.
Wok sink	3	
Floor drains	2	
Trench drains	2 DFUs per lineal foot of drain	
Soup Kettle	2 DFUs per lineal foot of trench drain	
Braziers	2 DFUs per lineal foot of trench drain	
Steam tables	Use floor sink or trench drain criteria, whichever is appropriate.	
Dishwasher pre-rinse sink	3	
Dishwashers	Use floor sink criteria	
Food waste disposers, including pulpers	Use next larger size of GGI than would otherwise be required	FOG bearing food waste disposers can only discharge to properly sized GGIs

For fixtures not listed above please refer to Table 7-3 and section 702.1 of the 2009 UPC. A copy of section 702.1 is listed below in Table 2.

<b>Table 2</b>	
<b>Fixture Unit Equivalents from section 702.1 of the UPC</b>	
<b>Drain Size in Inches</b>	<b>DFUs</b>
<u>1-1/4</u>	<u>1</u>
<u>1-1/2</u>	<u>3</u>
<u>2</u>	<u>4</u>
<u>3</u>	<u>6</u>
<u>4</u>	<u>8</u>

### **Examples:**

#### **A service station deli that cooks teriyaki style meals:**

The deli serves up to 10 meals per peak hour; all of it “take-out.” The deli has a 3-compartment sink, a 2-compartment vegetable and meat prep sink, a mop sink, a wok sink, and a handwash sink. FOG bearing fixtures include the 3-compartment sink (9 DFUs), the wok sink (3 DFUs), the 2-compartment food prep sink (6 DFUs) and the mop sink (3 DFUs). Because the deli has less than 40 seats and serves less than 40 meals per peak hour it can install an HGI. In this example, the deli has  $9+3+3+6 = 21$  FOG bearing DFUs. Table 4 of this policy (see page 6) would require the deli to install a 75 gallon per minute (gpm) HGI to protect all of its fixtures.

#### **A neighborhood café has 40 seats, is expected to serve 40 meals per hour or less, and will serve a wide variety of foods on plates:**

The café has a 3-compartment sink, a 2-compartment food prep sink, a mop sink, a handwash sink, a pre-rinse sink, and a dishwasher. Because the café has 40 seats and serves less than 40 meals per hour, it can install an HGI. The dishwasher may by-pass the HGI, but the dishwasher pre-rinse sink must be connected to grease protection. This facility has  $9+3+3+6 = 21$  FOG bearing DFUs, which would require installation of a 75 gpm HGI to protect all of its fixtures.

#### **A fast food restaurant has 40 seats but serves up to 120 meals per peak hour:**

The restaurant has a 3-comp sink, a 2-comp food prep sink, a mop sink, 3 hand wash sinks, 2 floor drains, and a dishwasher for cleaning the serving trays. The dishwasher discharges to a floor sink with a 2 inch drain. Because the restaurant serves over 40 meals per peak hour it is required to install a GGI, and all of the fixtures in the kitchen must drain to the interceptor. The fixtures include the 3-comp sink (9 DFUs), the 2-comp prep sink (6 DFUs), the mop sink (3 DFUs), 3 hand wash sinks (3 DFUs), 2 floor drains (4 DFUs), and the dishwasher floor sink (2" drain line for 4 DFUs). Therefore, this facility has  $9+6+3+3+4+4 = 29$  DFUs. Table 5 of this policy indicates a 1000 gallon GGI unit would be required.

#### **A commissary kitchen:**

The facility is used by a catering company that makes food to be delivered to clients. The kitchen has a 3-comp sink, a 2-comp food prep sink, 8 feet of trench drain, 4 floor drains, a mop sink, 3 hand wash sinks, a dishwasher pre-rinse sink and a dishwasher using a 2 inch line. Because it's a catering kitchen, the number of meals served per hour is not limited to onsite seating and is only limited by the amount and capacity of the kitchen. Because of this, it is required to discharge through a properly sized gravity grease interceptor

Sizing example for site; 3-comp sink = 9 DFUs, 2 compartment prep sink = 6 DFUs, 8 ft of trench drain = 16 DFUs, 4 floor drains = 8 DFUs, Mop sink = 3 DFUs, dishwasher pre-rinse sink = 3 DFUs, dishwasher = 4 DFUs. Therefore this facility has 49 DFUs. Table 5 of this policy indicates a 1250 gallon GGI unit would be required.

### **Additional Comments:**

Plans to install a grease interceptor must be submitted to the City of Tacoma for permitting and approval. The plans shall include the location of the grease interceptor, its capacity (in gpm or gallons), the connecting pipes, the capacities of the fixtures draining to the interceptor, and any other information deemed necessary.

Grease interceptors must be watertight, constructed of materials not subject to excessive corrosion or decay, and must be accessible for inspection and cleaning. See the attached drawing for City of Tacoma requirements for a single vault gravity grease interceptor.

Food waste disposal units may not be connected to hydro-mechanical grease interceptors.

The City of Tacoma reserves the right to consider alternatives to the standards found in this policy on a case by case basis.

This policy provides direction for proper sizing and use of grease interceptors. Additional equipment may be needed at certain locations to ensure proper conveyance of wastewater through the municipal sewer system. The City of Tacoma reserves the right to modify or reduce sizing requirements on interceptors that may cause septic conditions at certain facilities.

### **Technical Clarification on the Installation of grease interceptors:**

3-compartment sinks are required to be directly-connected to the sanitary waste system per UPC 704.3. However, this is only true when the 3-compartment sink is connected to the sewer-side of an adjacent floor drain. The purpose of this is to ensure sewer backflow cannot go up into the 3-compartment sink, contaminating cleaned cookware and utensils.

Larger restaurants require exterior and underground gravity grease interceptors (see decision tree on page 8 of 9 in this document). In those cases, the 3-compartment sinks must be directly connected to the sanitary waste system, by way of a connection to a floor drain waste line that discharges into to the grease interceptor.

In smaller food service establishments and coffee shops that are allowed to utilize an above ground hydro-mechanical grease interceptor there is no way to connect the 3-compartment sink to a floor drain that discharges up and into an above-floor interceptor. Therefore, 3-compartment sinks may discharge indirectly into the inlet of a hydro-mechanical grease interceptor.

The indirect drain connections to a grease interceptor must be equipped with flow limiting devices to prevent interceptor inlet overflow.

#### **UPC 414.3**

Commercial dishwashing machines, where allowed, shall discharge indirectly through an air gap.

#### **UPC 704.3**

**Commercial Sinks** - Pot sinks, scullery sinks, dishwashing sinks, silverware sinks and other similar fixtures shall be connected directly to the drainage system. A floor drain shall be provided adjacent to the fixture, and the fixture shall be connected on the sewer side of the floor drain trap, provided that no other drainage line is connected between the floor drain waste

connection and the fixture drain. The fixture and the floor drain shall be trapped and vented in accordance with this code.

### **UPC 801.3.3**

**Food-Handling Fixtures** - food-preparations sinks, steam kettles, potato peelers, ice cream dipper-wells, and similar equipment shall be indirectly connected to the drainage system by means of an air gap. Bins, sinks, and other equipment having drainage connections and used for the storage of unpackaged ice used for human ingestion, or used in direct contact with ready-to-eat food, shall be indirectly connected to the drainage system by means of an air gap. Each indirect waste pipe from food-handling fixtures or equipment shall be separately piped to the indirect waste receptor and shall not combine with other indirect waste pipes. The piping from the equipment to the receptor shall not be less than the drain on the unit and in no case less than 1/2 of an inch.

### **Exception Process:**

Exceptions to this policy may be requested in writing to the Environmental Services Department to allow a waiver or modification of a requirement prior to approval and construction. Exception requests shall be sent to:

City of Tacoma  
Environmental Services Director  
326 East D St.  
Tacoma, WA 98421

The applicant shall be required to submit a licensed engineer's report with the request for an exception.

The Director of the Environmental Services Department may grant an exception following a documented finding that:

- (i) The exception is likely to be equally protective to the environment, and both the public and private infrastructure as the requirement from which an exception is sought.

OR

- (ii) There are site-specific physical circumstances or conditions that provide a substantial reason to approve the exception request. An example would be where the requirement is not technically feasible to implement.

The decision to grant an exception to the Policies is at the sole discretion of the Director of the Environmental Services Department. The Director shall only approve an exception to the extent it is necessary.

The approval of an exception shall not be construed to be an approval of any violation of any of the other provisions of the Tacoma Municipal Code.

### Additional Tables

<b>Table 3</b>		
<b>Pipe Size, GPM, Maximum DFU Count</b>		
Pipe Size, Inches	Max. Full Pipe Flow (gpm)	Max. DFU Count
2	20	8
2-1/2	38.2	14
3	60	35
4	125	216
5	230	428
6	375	720

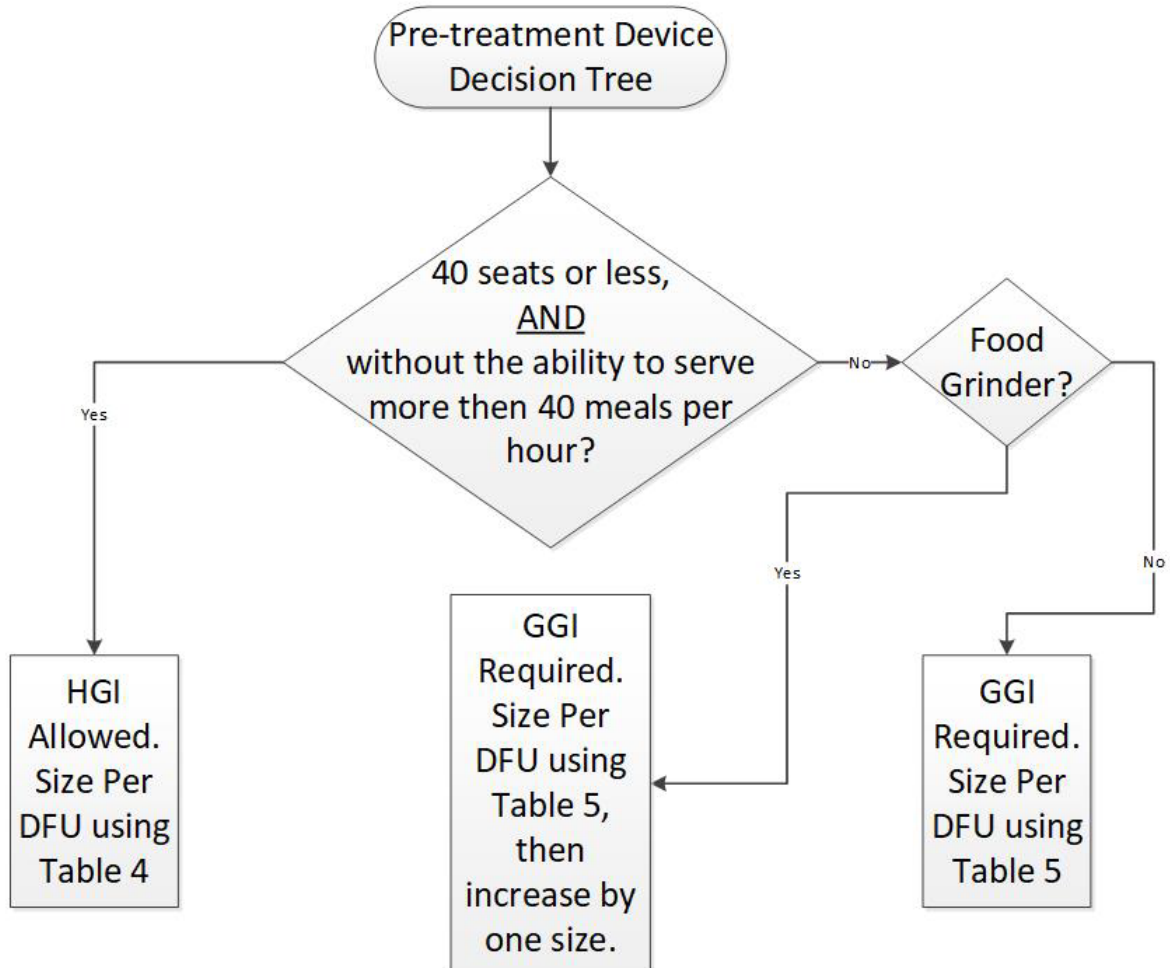
<b>Table 4</b>	
<b>Hydro mechanical Grease Interceptor (HGI) Sizing Chart</b>	
DFUs <sup>(1)</sup>	HGI Flow (gpm)
8	20
10	25
13	35
20	50
35	75
172	100
216	150
342	200
428	250
576	350
720	500

<b>Table 5</b>	
<b>Gravity Grease Interceptor (GGI) Sizing</b>	
DFUs <sup>(1)</sup>	GGI Volume
8	500 gallons
21	750 gallons
35	1,000 gallons
90	1,250 gallons
172	1,500 gallons
216	2,000 gallons
307	2,500 gallons
342	3,000 gallons
428	4,000 gallons
576	5,000 gallons
720	7,500 gallons
2112	10,000 gallons
2640	15,000 gallons

<sup>(1)</sup> The maximum allowable number of DFUs that can be connected to the grease interceptor.

The information in the above tables is from section 702.0 and tables 7-5, 10-2 and 10-3 of the Uniform Plumbing Code.

## Fats Oils and Grease (FOG) Pretreatment Device Decision Tree



**Systems that are approved with an HGI system can not be used in facilities wishing to expand operations to either a commissary kitchen or primary service through delivery kitchen, those sites require a properly sized GGI**

Key
HGI – Hydromechanical Grease Interceptor
GGI – Gravity Grease Interceptor
DFU – Drainage Fixture Unit

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