

# GREASE CONTROL DEVICE SIZING & INSTALLATION POLICY

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Developed by Spokane County  
Environmental Services Division



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# GREASE CONTROL DEVICE SIZING & INSTALLATION POLICY

## PURPOSE:

The purpose of this policy is to aid in the selection of proper grease control devices for those facilities that have the potential to discharge wastewater containing fats, oils, 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 Spokane Municipal Code 13.03 Article V – Grease Control Devices, Oil/Water Separators, Sand Traps. These facilities include restaurants, cafes, catering facilities, commissaries, hotels, cafeterias, convenience stores, full-service grocery stores, schools, hospitals, and food manufacturing facilities.

Grease control devices (GCD) are installed where sinks, floor drains, dishwashers, and other fixtures that are found in commercial businesses are plumbed to the sanitary sewer. These devices designed to remove FOG and food solids from wastewater. FOG and food solid wastes must be regularly pumped out of the device through routine maintenance. The maintenance frequency may vary for each facility, but the grease control device must be cleaned at the required frequency for the type of GCD, when the device reaches 25 percent FOG and solids, or when visible grease is seen discharging through the outlet or sample box (SMC 13.03.5080.B).



KEEP **GREASE** OUT OF THE SYSTEM

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## DEFINITIONS:

**HYDROMECHANICAL GREASE INTERCEPTORS (HGI) or GREASE TRAPS** 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 if the FOG-producing plumbing fixtures and appliances discharge ahead of the HGI. At no time shall the total flow through any flow restrictor(s) going to an HGI be greater than the rated flow of the device. Also, the total capacity of the fixtures discharging into an HGI, in gallons, shall not exceed 2 ½ times the certified gallons-per-minute flow rate of the interceptor.

**GRAVITY GREASE INTERCEPTORS (GGI)** are generally installed in the ground outside the facility, upstream from the “black” water (domestic sanitary waste) drain line and are at least 1000 gallons in capacity.

**Both types of interceptors must be trapped and vented** in accordance with the most current, adopted version of the Uniform Plumbing Code (UPC).

**DRAINAGE FIXTURE UNIT (DFU)** is a measure of the probable discharge into the sewer system by various types of plumbing fixtures. The number of DFUs assigned to a particular fixture is based on Chapter 7 of the UPC. A list of examples is included below at Table 1 (Page 5).

**GALLONS PER MINUTE (gpm)** a unit of measurement to determine how fast water moves.

**MEALS PER PEAK HOUR** is determined by multiplying the number of seats by 60 and dividing by the estimated time taken 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, commissary kitchens, and other similar facilities, the peak meals are equal to the occupant load.

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## INTERCEPTOR TYPE AND SIZE SELECTION

Please refer to the attached “Grease Control Device Decision” diagram on Page 12 for sizing assistance. Or call 311 and they will connect you with Business Development Services for free assistance. If you are calling from outside City limits, please call 509-755-2489.

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 **may not discharge** to an HGI. A food waste disposal unit (garbage grinder) **may not discharge** to an HGI.

For 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 a GGI 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 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 where there is **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.

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, dishwashers, 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 wastes must be fitted and drain to a grease control device(s).**

After all FOG-bearing fixtures have been identified for your business, determine how many DFUs each fixture should be assigned. Please refer to Table 1 (Page 5) and Table 2 (Page 6) below to determine the DFUs for the most common drainage fixtures. If the DFUs cannot be determined because a kitchen plan is not available, the sized grease interceptor shall be determined based upon the maximum DFUs allowed for the pipe size connected to the inlet of the interceptor (See Table 3 - Page 9 and Table 5 - Page 11) unless specific written permission is granted under the Exception Process (See Page 8).

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<b>TABLE 1</b>		
<b>TYPE OF FIXTURE</b>	<b>NUMBER 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 <sup>(1)</sup>	See Table 2 below or section 702.2 in the UPC
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 linear foot of drain	
Soup kettle	2 DFUs per linear foot of trench drain	
Braziers	2 DFUs per linear 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 grinders, 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

<sup>(1)</sup> Floor sinks that receive only ice machine and cooler condensate are not counted

For fixtures not listed above please refer to Table 7-3 and section 702.1 of the UPC. A copy of section 702.1 is listed below in Table 2 (Page 6).

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<b>TABLE 2</b>	
<b>FIXTURE UNIT EQUIVALENTS FROM SECTION 702.2 OF THE UPC</b>	
<b>DRAIN SIZE IN INCHES</b>	<b>DFUs</b>
1-1/4	1
1-1/2	3
2	4
3	6
4	8

## EXAMPLES

### A SERVICE STATION DELI THAT COOKS TERIYAKI STYLE MEALS:

The deli serves up to 10 meals per peak hour, all the meals are “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. The deli has less than 40 seats and serves less than 40 meals per peak hour, so an HGI can be installed.

FOG-bearing fixtures include:

- 3-comp sink (9 DFUs)
  - 2-comp food prep sink (6 DFUs)
  - mop sink (3 DFUs)
  - wok sink (3 DFUs)
  - handwashing sink (not connected)
- Total = 21 FOG-bearing DFUs.

Table 4 (see Page 10) of this policy would require the deli to install a 75 gallon-per-minute (gpm) HGI to protect all FOG-bearing fixtures.

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## 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 pre-rinse sink, and a dishwasher. Because the café has 40 seats and serves less than 40 meals per hour, an HGI can be installed. The dishwasher must by-pass the HGI, but the dishwasher pre-rinse sink must be connected to grease protection. FOG-bearing fixtures include:

- 3-comp sink (9 DFUs)
- 2-comp food prep sink (6 DFUs)
- mop sink (3 DFUs)
- pre-rinse sink (3 DFUs)
- dishwasher (not connected)
- Total = 21 FOG-bearing DFUs.

Table 4 (see Page 10) of this policy would require the deli to install a 75 gallon-per-minute (gpm) HGI/grease trap to protect all FOG-bearing fixtures.

## A BUSY RESTAURANT WITH 40 SEATS IS EXPECTED TO SERVE 120 MEALS PER HOUR AND WILL SERVE A WIDE VARIETY OF FOODS ON PLATES:

- 3-comp sink (9 DFUs)
- 2-comp food prep sink (6 DFUs)
- mop sink (3 DFUs)
- 3 hand washing sinks (3 DFUs)
- 2 floor drains (4 DFUs)
- dishwasher w/ 2" pipe to floor sink (2" drain line = 4 DFUs)
- Total = 29 FOG-bearing DFUs.

Table 4 (see Page 10) of this policy would require the deli to install a 75 gallon-per-minute (gpm) HGI/grease trap to protect all FOG-bearing fixtures, but the dishwasher would not be connected.

Alternately, all FOG-bearing fixtures including the dishwasher could be plumbed to a 1000 gallon GGI.

## ADDITIONAL COMMENTS

To install a grease control device, please call 311 and they will connect you with Business Development Services for free assistance. If you are calling from outside City limits, please call 509-755-2489.

All grease control devices must be watertight, constructed of materials not subject to excessive corrosion or decay, must be accessible for inspection and cleaning, and must meet all other installation and operational requirements that can be found in the current UPC Chapter 10/ANSI-Z1001, in addition to other guidelines in the [Side Sewer Installation Handbook](#).

**Food waste disposal units may not be connected to hydro-mechanical grease interceptors (HGIs) or grease traps.**

# GREASE CONTROL DEVICE SIZING & INSTALLATION POLICY

The City of Spokane reserves the right to consider alternatives to the standards found in this policy on a case-by-case basis following the Exception Process outlined below.

This policy provides direction for proper sizing and use of grease control devices. Additional controls may be needed at certain locations to ensure proper conveyance of wastewater through the City sewer system. The City of Spokane reserves the right to modify sizing requirements on grease control devices that may cause adverse conditions at certain facilities.

## EXCEPTION PROCESS

Exceptions to this policy may be requested in writing to the Public Works Department to allow a waiver or to request a modification of any requirement(s) prior to approval and construction.

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

The applicant shall be required to submit plans from licensed professional (i.e., engineer, plumber, architect) along with the request for the exception.

The Public Works Director may grant an exception following a documented finding that one of the following applies:

- ◇ The exception is likely to be equally protective to the environment, and to both public and private infrastructure as is the requirement from which an exception is sought.
- ◇ There are site-specific physical circumstances or conditions that demonstrate a substantial reason to approve the exception request. An example would be where the requirement is not technically feasible to implement (e.g. a physical site restriction to install a GGI and an exception is granted to install a series of HGIs).



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## ADDITIONAL TABLES

<b>TABLE 3</b>		
PIPE SIZE, GPM, MAXIMUM DFU COUNT		
<b>PIPE SIZE, INCHES</b>	<b>MAX. FULL PIPE FLOW (gpm)</b>	<b>MAX. DFU COUNT</b>
2	20	8
2-1/2	38.2	14
3	60	35
4	125	216
5	230	428
6	375	720

The information in the table above comes from Chapter 7, Section 703.0, Table 703.2, and Chapter 10, Section 1014.0, Table 1014.2.1 of the 2018 Uniform Plumbing Code (UPC). The specific table references are intended as an example, and the City will use the most current version of the UPC when working with your business.

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<b>TABLE 4</b>	
<b>HYDROMECHANICAL GREASE INTERCEPTOR (HGI) SIZING</b>	
<b>DFUs<sup>(2)</sup></b>	<b>HGI FLOW (gpm)</b>
$\leq 8$	20
$\leq 10$	25
$\leq 13$	35
$\leq 20$	50
$\leq 35$	75
$\leq 172$	100
$\leq 216$	150
$\leq 342$	200
$\leq 428$	250
$\leq 576$	300

<sup>(2)</sup> The maximum allowable number of DFUs that can be connected to the type of grease control device.

The information in the table above comes from Chapter 7, Section 703.0, Table 703.2, and Chapter 10, Section 1014.0, Table 1014.2.1 of the 2018 Uniform Plumbing Code (UPC). The specific table references are intended as an example, and the City will use the most current version of the UPC when working with your business.

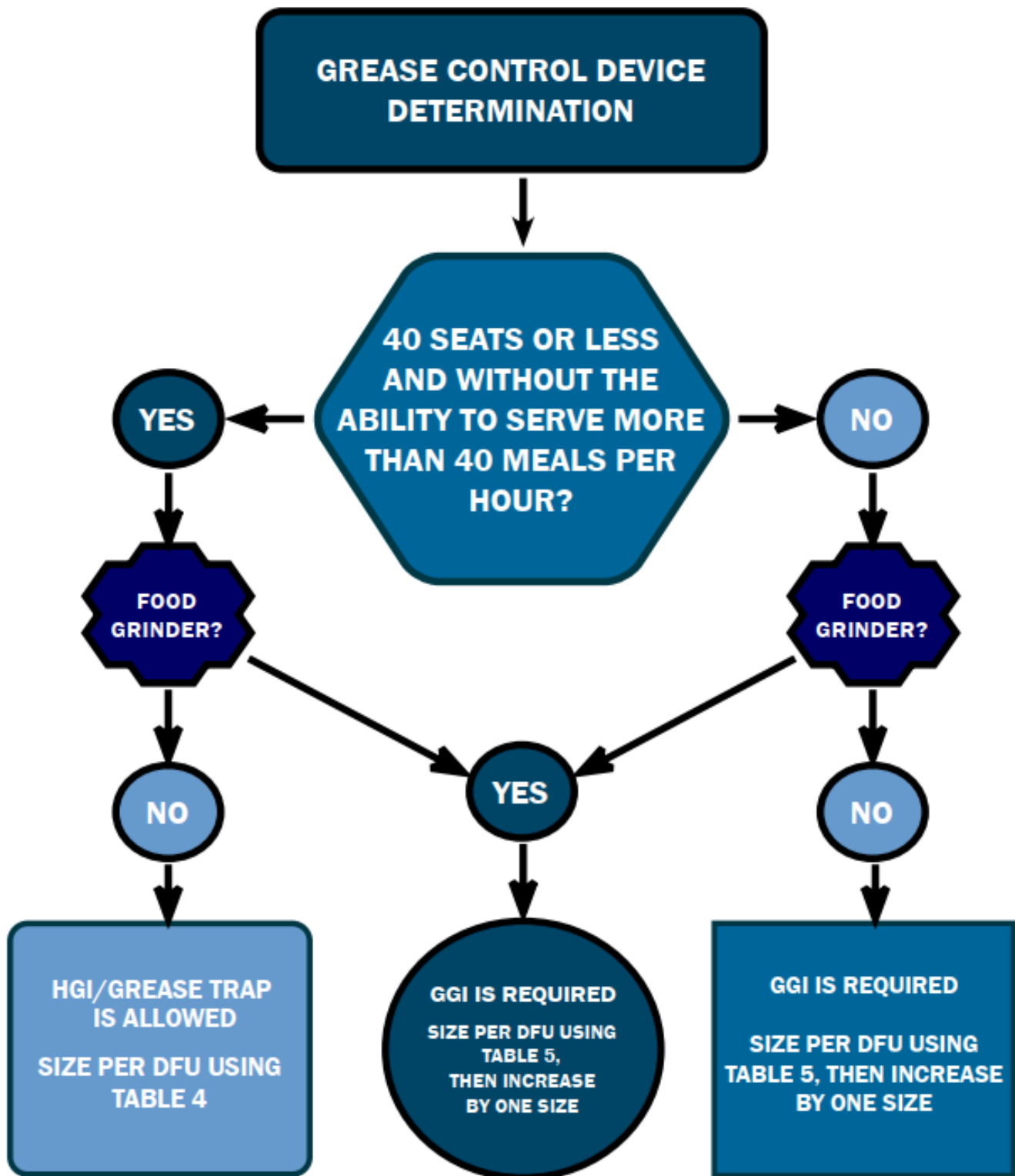
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<b>TABLE 5</b>	
<b>GRAVITY GREASE INTERCEPTOR (GGI) SIZING</b>	
<b>DFUs<sup>(2)</sup></b>	<b>GGI VOLUME (GALLONS)</b>
≤ 8	500
≤ 21	750
≤ 35	1000
≤ 90	1250
≤ 172	1500
≤ 216	2000
≤ 307	2500
≤ 342	3000
≤ 428	4000
≤ 576	5000
≤ 720	7500

<sup>(2)</sup> The maximum allowable number of DFUs that can be connected to the type of grease control device.

The information in the above table is from Section 1014.3.6 and Table 1014.3.6 of the 2018 Uniform Plumbing Code (UPC). The specific table references are intended as an example, and the City will use the most current version of the UPC when working with your business.

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Systems that are approved with an HGI system cannot be used in facilities expanding operations to either a commissary kitchen or primary service through delivery kitchen, those sites require a properly sized GGI.

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## GREASE CONTROL DEVICE EXAMPLES

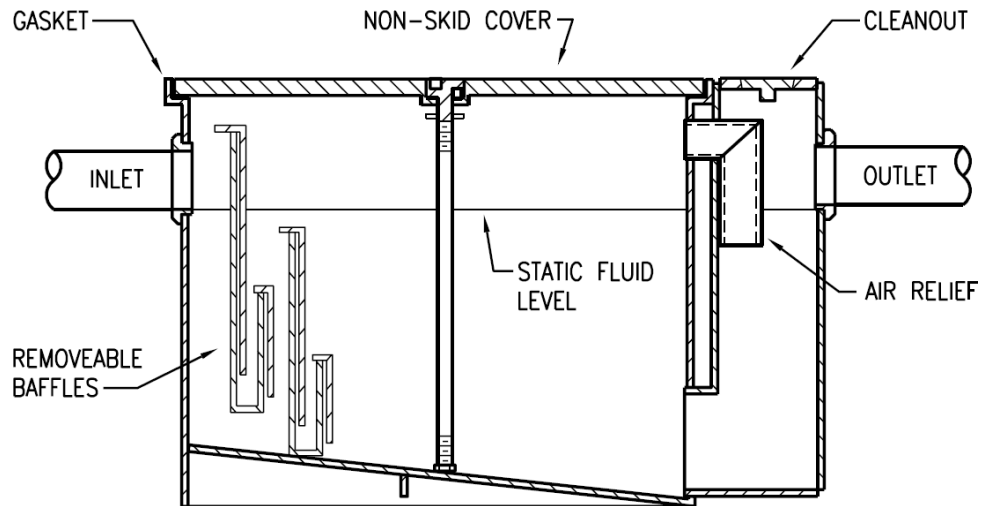
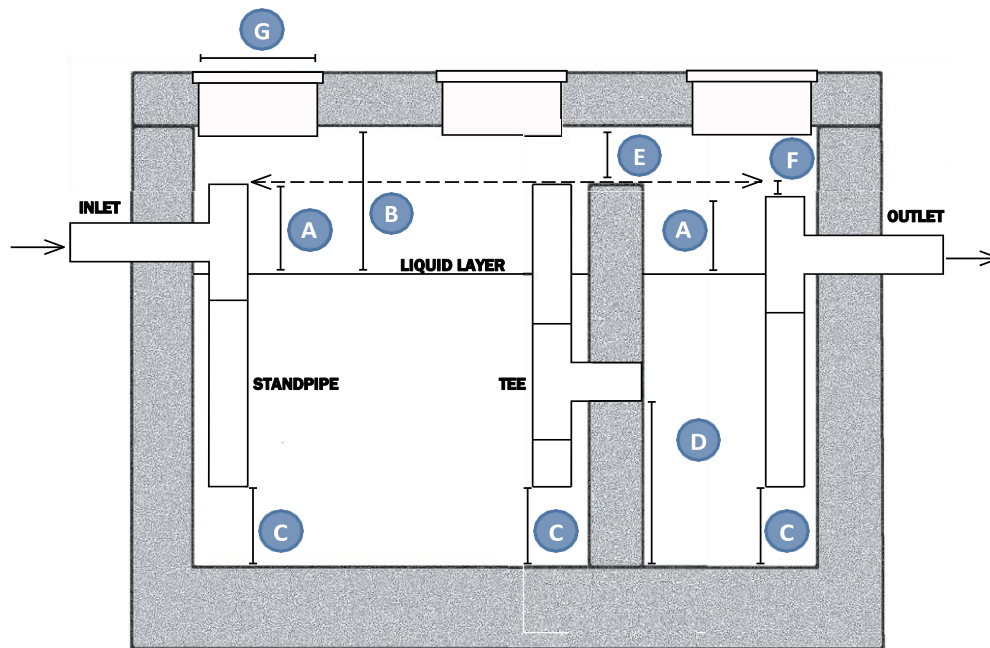


Image Source: ASPE Design Handbook, Vol. 4

## HYDROMECHANICAL GREASE INTERCEPTOR (HGI)



## GRAVITY GREASE INTERCEPTOR (GGI)

- A. TEES/STANDPIPES MUST BE AT LEAST 5" ABOVE LIQUID LAYER
- B. TOP OF GGI MUST BE AT LEAST 9" ABOVE LIQUID LAYER
- C. STANDPIPES MUST BE 12" FROM THE BOTTOM FLOOR OF GGI
- D. BAFFLE TEE MUST BE 30" FROM THE BOTTOM FLOOR OF GGI
- E. GAP BETWEEN BAFFLE AND TOP OF GGI MUST BE AT LEAST 1"
- F. OUTLET LINE MUST BE AT LEAST 2" LOWER THAN INLET LINE
- G. MANHOLES MUST BE AT LEAST 20" IN DIAMETER