# GREASE CONTROL DEVICE SIZING & INSTALLATION POLICY

## ENVIRONMENTAL SERVICES DIVISION

Spokane County
PUBLIC WORKS

NOVEMBER 20, 2024

# 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 SCC 8.03 Article 5000 – 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 interceptor 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 or solids, or when visible grease is seen discharging through the outlet or sample box (SCC 8.03.5080.B.2).


IMAGE COURTESY OF CITY OF SAN JOSE

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## DEFINITIONS:

**HYDROMECHANICAL GREASE INTERCEPTORS (HGI)** 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 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 (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 Uniform Plumbing Code (UPC) 1014.1.1 & 1014.2.2 that Spokane County adopted in SCC 8.03.5020. Alternatively engineered HGI and GGI systems will be considered as provided in section 301.2 of the 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 11 for sizing assistance.

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 the grease control device, is required. A dishwasher **may not discharge** to an HGI unless the device is a newer high-efficiency HGI and with prior approval. A food waste disposal unit (a 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 if best management practices (e.g., sink strainers/grates) are in place to minimize solids from entering the sewer.

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 8 and Table 5 - Page 10) unless specific written permission is granted under the Exception Process (See Pages 7 and 8).

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| TABLE 1 | | |
|---|---|---|
| **TYPE OF FIXTURE** | **NUMBER OF DFUs** | **COMMENTS** |
| 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[(1)] | See Table 2 below or section 702.2 in the UPC |
| Mop sink | 3 | If grease receiving, mop sinks must be connected to grease control device |
| 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 waster 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 |

[(1)] 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 2018 UPC. A copy of section 702.1 is listed below in Table 2 (Page 6).

| TABLE 2 | |
|---|---|
| **FIXTURE UNIT EQUIVALENTS FROM SECTION 702.2 OF THE UPC** | |
| **DRAIN SIZE IN INCHES** | **DFUs** |
| 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 hand-wash 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). The deli has less than 40 seats and serves less than 40 meals per peak hour, so an HGI can be installed.

- In this example, the deli has 9+3+6+3 = 21 FOG-bearing DFUs. Table 4 (see Page 9) of this policy would require the deli to install a 75 gallon-per-minute (gpm) HGI to protect all FOG-bearing 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 (9 DFUs), a 2-compartment food prep sink (6 DFUs), a mop sink (3 DFUs), a pre-rinse sink (3 DFUs), and a dishwasher. Because the café has 40 seats and serves less than 40 meals per hour, an HGI can be installed. The dishwasher may by-pass the HGI if used only as a sanitizer, but all other FOG-bearing fixtures must be connected to the grease control device.

- In this example, the facility has 9+6+3+3 = 21 FOG bearing DFUs, which would require installation of a 75 gpm HGI or 1000 gallon GGI to protect all FOG-bearing fixtures.

### A BUFFET RESTAURANT THAT COOKS VARIOUS MEAL TYPES:

The restaurant with 40 seats serves up to 120 meals per peak hour and is sit-down buffet. The restaurant has a 3-compartment sink, a 2-compartment prep sink, a mop sink, three hand-wash sinks, two floor drains, and a dishwasher that is plumbed to a floor sink. FOG-bearing fixtures include: the 3-compartment sink (9 DFUs), the 2-compartment food prep sink (6 DFUs), the mop sink (3 DFUs), three hand-wash sinks (3 DFUs), two floor drains (2 DFUs), and a dishwasher (4 DFUs) to floorsink (2 in.). The restaurant has 40 seats, but serves more than 40 meals per peak hour, and has a dishwasher, so a GGI must be installed.

- In this example, the restaurant has 9+6+3+3+4+4 = 29 FOG-bearing DFUs. Table 4 (see Page 7) of this policy and the >40 meals served per hour would require the restaurant to install a 1000 gallon GGI (or newer high-efficiency HGI with prior approval) to protect all FOG-bearing fixtures.

## ADDITIONAL COMMENTS

Prior to installation of a grease control device, plans from a licensed engineer and/or licensed plumber must be submitted through the Spokane County Plan Review Submittal page for permitting and approval. The plans must include the location of the GCD, capacity of device (in gpm and gallons), the connecting pipes and fixtures (internal and external), a DFU count with total, and the capacities of the fixtures draining to the GCD.

A GCD Sizing and Permitting Checklist has been prepared to assist in the permitting process and can be found on our website at: www.spokanecounty.org/FOG

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 2018 UPC 1014.0/ANSI-Z1001, in addition to other guidelines in the Sanitary Sewer Standards Manual.

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

Spokane County 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 control devices. Additional controls may be needed at certain locations to ensure proper conveyance of wastewater through the county sewer system. Spokane County 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. Exception requests shall be sent to: ESPretreatment@spokanecounty.org.

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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 county sewer system. Spokane County 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 along with the request for an 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 restrictions to install a GGI and an exception is granted to install a series of HGIs).

## ADDITIONAL TABLES

**TABLE 3**

PIPE SIZE, GPM, MAXIMUM DFU COUNT

| 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 |

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).

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| TABLE 4 | |
|---|---|
| **HYDROMECHANICAL GREASE INTERCEPTOR (HGI) SIZING** | |
| **DFUs[2]** | **HGI FLOW (gpm)** |
| ≤ 8 | 20 |
| ≤ 10 | 25 |
| ≤ 13 | 35 |
| ≤ 20 | 50 |
| ≤ 35 | 75 |
| ≤ 172 | 100 |
| ≤ 216 | 150 |
| ≤ 342 | 200 |
| ≤ 428 | 250 |
| ≤ 576 | 300 |

[2] 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).

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| TABLE 5 | |
|---|---|
| **GRAVITY GREASE INTERCEPTOR (GGI) SIZING** | |
| **DFUs[(2)]** | **GGI VOLUME (GALLONS)** |
| ≤ 8 | 500 |
| ≤ 21 | 750 |
| ≤ 35 | 1000 |
| ≤ 90 | 1250 |
| ≤ 172 | 1500 |
| ≤ 216 | 2000 |
| ≤ 307 | 2500 |
| ≤ 342 | 3000 |
| ≤ 428 | 4000 |
| ≤ 576 | 5000 |
| ≤ 720 | 7500 |

[(2)] 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).

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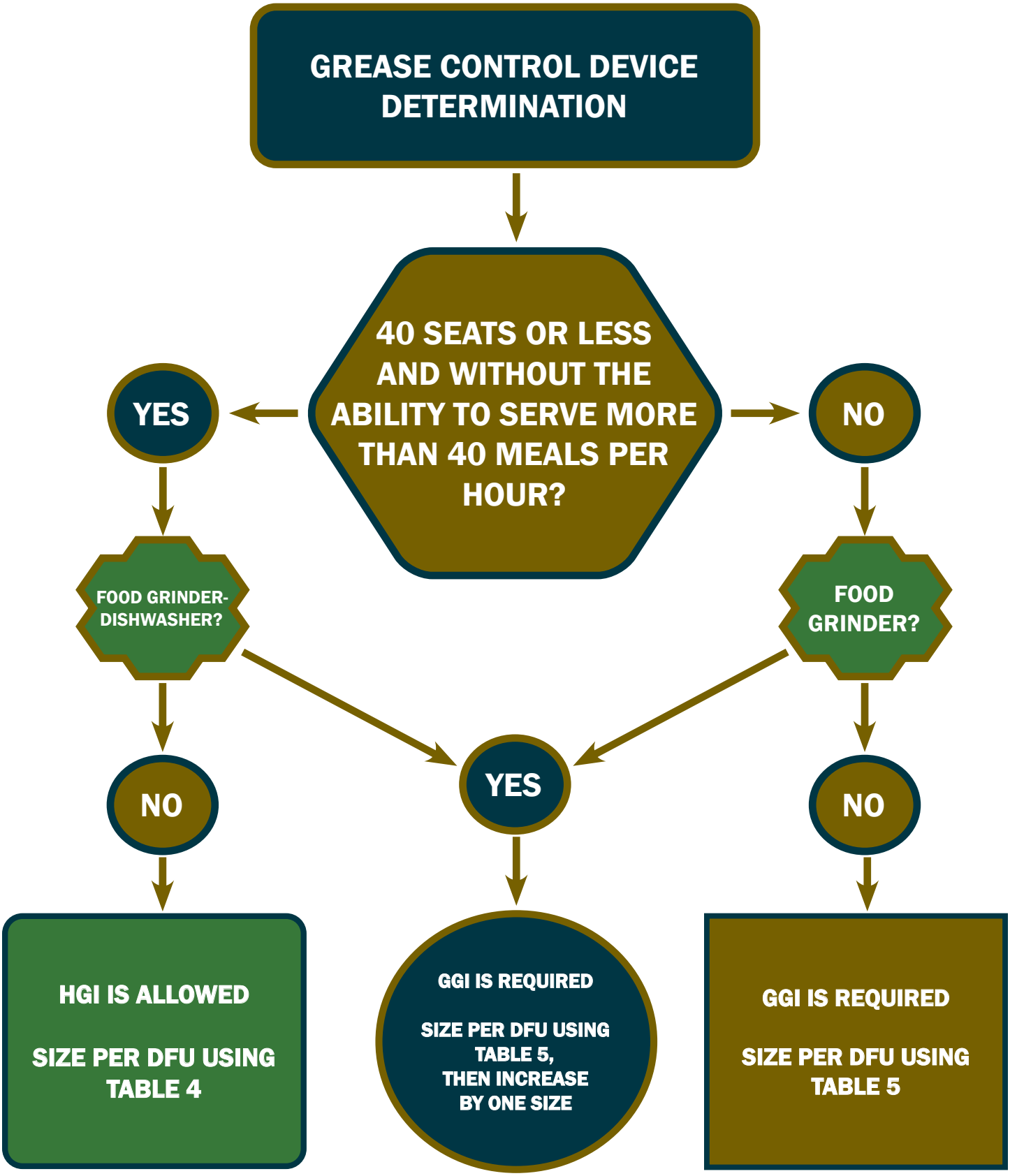


Systems that are approved with an HGI system cannot be used in facilities expanding operations to either a commissary kitchen or primary service through delivery kitchen, those sites require a properly sized GGI.

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## GREASE CONTROL DEVICE EXAMPLES

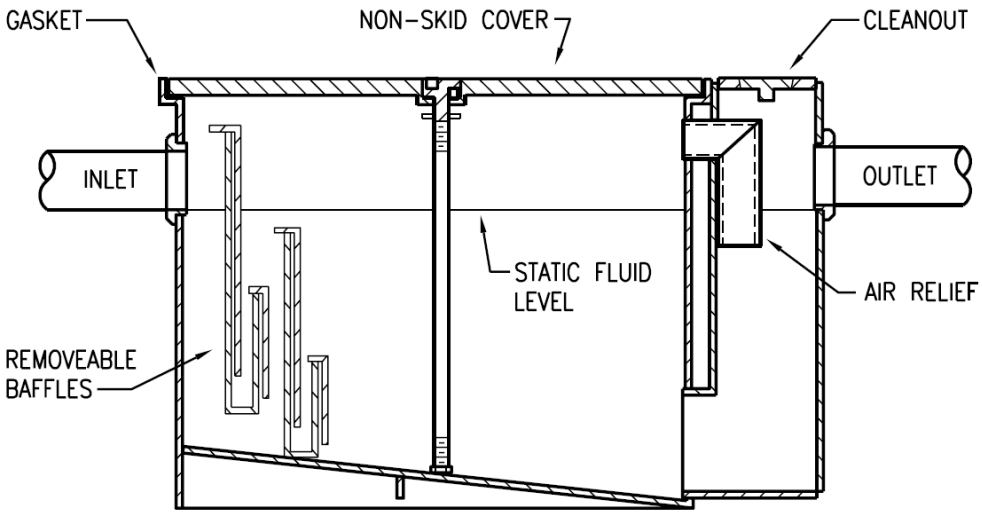
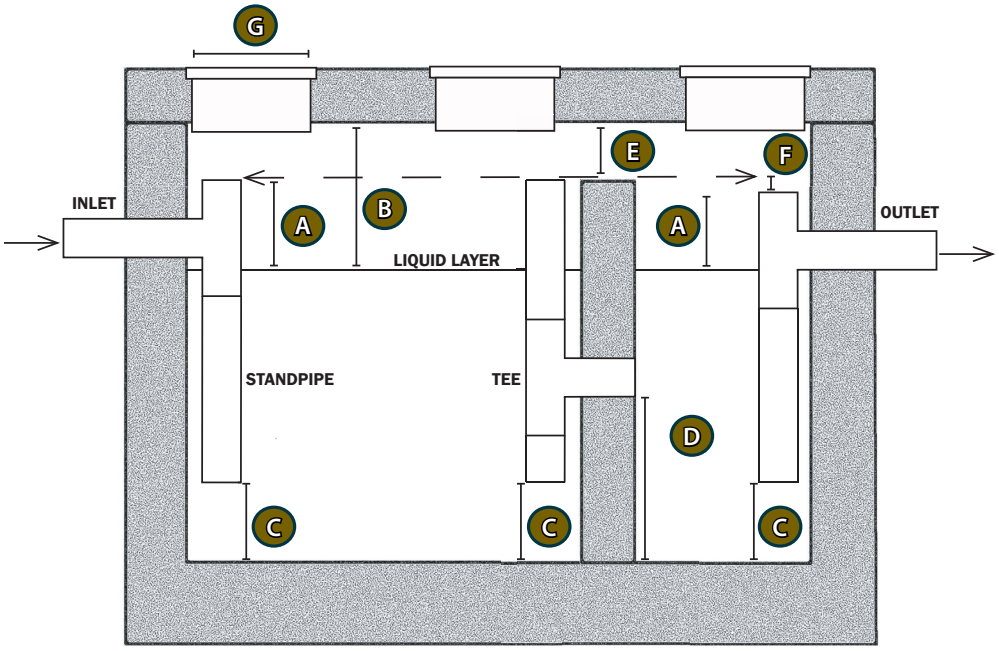



Image Source: ASPE Design Handbook, Vol. 4

### 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