

Grease Interceptors and Oil Separators

- 1) All food service establishments and vehicle maintenance facilities shall have devices installed for separating and retaining grease and oils known as grease interceptors or separators approved by the Public Utilities Department. Operators of establishments whose grease interceptors or oil separators are not adequately maintained to prevent floatable oils, fats, and grease from entering the sanitary sewer system shall be notified in writing of any noncompliance and required to take corrective action.
 - 2) All food service establishment and vehicle maintenance facility grease interceptors or oil separators shall be subject to review, evaluation, and inspection by City of Raleigh Public Utilities representatives.
 - 3) Food service establishment and vehicle maintenance facility operators who continue to violate the City of Raleigh grease program requirements will be subject to enforcement provisions of the Raleigh City Code.
 - 4) Food service establishment and vehicle maintenance facility operators whose operations cause or allow excessive grease and oil to discharge or accumulate in the City of Raleigh sanitary sewer collection system may be liable to the City of Raleigh for costs related to line blockages, line cleanings, line and pump repairs, etc., including all labor, materials, and equipment. Food service establishment and vehicle maintenance facility operators that fail to pay the related charges will be subject to enforcement provisions of the Raleigh City Code.
 - 5) Regularly scheduled maintenance of grease interceptors and oil separators is required to ensure adequate operation.
 - a. All grease interceptors shall be completely pumped out at a minimum frequency of once per thirty calendar days, unless a variance is allowed for less frequent pumping or a pretreatment discharge permit has been issued specifically for these devices.
 - b. For exterior grease interceptors the City of Raleigh recommends cleaning to be done when 75% of the retention capacity of the device has been reached. (Or when 25% of the total volume of the grease trap is comprised of grease and solids.)
- 1) The owner and leaseholder shall be responsible for ensuring that no waste or wastewater pumped from the grease interceptor or oil separator is reintroduced back into the device. This is a violation of the City of Raleigh Sanitary Sewer Use Ordinance and will result in enforcement action.
 - 2) Any food service establishment or vehicle maintenance facility whose grease interceptor or oil separator effluent discharges to the sanitary sewer collection system is determined by the City of Raleigh to cause interference in the conveyance or operation of the sanitary sewer collection system may be required to sample the wastewater discharge and have it analyzed for oil and grease at the expense of the owner and leaseholder. Results of such analyses shall be reported to the City of Raleigh Public Utilities Department.

- 3) All grease interceptors and oil separators shall be designed, installed, and maintained to allow for complete access for inspection and maintenance of the inner chamber(s) and sampling of effluent wastewater discharged to the sanitary sewer. (Landscaping shall not prevent or inhibit access to the grease interceptor or oil separator.)
- 4) Standards for New Facilities

All new food service establishments or vehicle maintenance facilities shall be required to install an adequately sized grease interceptor or oil separator. Below are the recommended sizing procedures. Other sizing criteria may be considered but should be justified. Variances to the tank size requirements may also be considered if the space available does not allow for the installation of the appropriate sized grease interceptor (see Variance Procedures below).

Sizing Procedure for Food Service Establishments (FSE's)

1) A minimum size shall be 1,000 Gallons.

2) The equation used to for sizing is:

$$\text{Volume of Grease Interceptor (gallons)} = [(A \times B) + C + D] \times F$$

“A” is GPM/fixture:
 These values are derived from the Manning’s Equation. The Manning’s Equation takes into account the slope; roughness of the pipe, and pipe diameter size. Listed below are the drainage rates of various pipe diameters using the Manning’s Formula:

Pipe diameter (inches)	GPM/Fixture
.5	.8
1.0	5.0
1.5	15
2.0	33
2.5	59
3.0	93

“B” is the Fixture Rating of Greasy Waste Streams
 Fixtures that have more grease in their waste stream received higher values while less grease corresponds to a lower rating. The table is shown below:

Table of Common Commercial Kitchen Fixtures and their Corresponding Rating:

Fixture	Rating
2 or 3 compartment pot sink	1.0
1 or 2 compartment meat prep sink	.75

Pre-rinse sink	.75
Wok/tilt kettle	1.0
1 or 2 compartment vegetable prep sink	.1
Floor Drain	0

“C” is the Direct Flow from Dishwashers, Sanitizers, Garbage Disposal, Food Waste Grinders, or Glass Washers – These flows must be added directly to the GPM flow.. The manufacturer’s peak discharge rate for flow in GPM must be used.

“D” is the Flow from Can Washes and Mop Sinks – Can washes and mop sinks are typically used intermittently. For the purpose of sizing, 7 GPM will be used for can washes and mop sinks.

“F” is the Twenty-four (24) Minute Retention Time

Example #1: A restaurant with the following fixtures (all fixtures have a 1.5” pipe dia.):

- (1) 3-comp pot sink
- (1) pre-rinse sink
- (1) 2- compartment vegetable prep sink
- (1) dishwasher that discharges 5 GPM
- (1) can wash

1) Use the above formula:

$$\text{Volume of Grease Interceptor (gallons)} = [(A \times B) + C + D] \times F$$

2) Solve for A,B,C, D and F

“A” is 15 GPM/Fixture because the pipe diameter is 1.5” (See table above)

“B” is the Fixture Rating

Fixture	Rating
2 or 3 compartment pot sink	1.0
Pre-rinse sink	.75
1 or 2 compartment vegetable prep sink	.1
Total (“B”) =	1.85

“C” is the Direct flow from Dishwashers etc.

The Dishwasher Discharges 5 GPM so “C” = 5GPM

“D” is the Flow From the Can Wash 7GPM

“F” is the 24 min Retention Time

3) Solve the Equation

$$\text{Volume of Grease Interceptor (gallons)} = [(15 \times 1.85) + 5 + 7] \times 24 \text{ minutes} = 954 \text{ gallons}$$

Round up to the minimum size of 1000 gallons.

Example #2: A restaurant with the following fixtures:

At 1.5 inch pipe diameter:

- (1) 3-comp pot sink
- (2) meat prep sinks
- (1) vegetable prep sink
- (1) pre-rinse sink
- (1) dishwasher that discharges 10 GPM
- (1) can wash

1) Use the above formula:

$$\text{Volume of Grease Interceptor (gallons)} = [(A \times B) + C + D] \times F$$

2) Solve for A,B,C, D and F

“A” is 15 GPM/Fixture because the pipe diameter is 1.5” (See table above)

“B” is the Fixture Rating

Fixture	Rating
3 comp pot sink	1
Meat prep sink	.75
Meat prep sink	.75
Vegetable prep sink	.1
Pre-rinse sink	.75
Total “B”=	3.35

“C” is the Direct flow from Dishwashers etc.

The Dishwasher Discharges 10 GPM so “C” = 10GPM

“D” is the Flow From the Can Wash 7GPM

“F” is the 24 min Retention Time

3) Solve the Equation

$$\text{Volume of Grease Interceptor (gallons)} = [(15 \times 3.35) + 10 + 7] \times 24 \text{ minutes} = 1,614 \text{ gallons}$$

Round up to the next available size: 2000 gallons.

Sizing Procedure for Single Fixture Only

When the space available does not allow for the installation of an exterior grease interceptor, sizing based on fixture size may be considered. A single fixture is considered a utensil wash sink, prep sink, culinary sink or other fixture where wastewater is discharged through a single outlet that contains fats, grease or oils.

Step 1 Determine the cubic contents of the fixture by multiplying length x width x depth.

Step 2 Determine the capacity in gallons. 1 gallon = 231 cubic inches.

Step 3 Determine the actual drainage load. The fixture is usually filled to about 75 percent of capacity with wastewater. The items to be washed displace

about 25 percent of the fixture content. Actual drainage load = .75 x (fixture capacity)

Step 4 Determine the drainage period (usually 1 or 2 min) and calculate the flow rate in GPM equal to or greater than 75 percent of the fixture capacity.

Step 5 Select the grease separation device that matches the calculated design flow rate.

Sizing Procedure for Vehicle Maintenance Facilities

The minimum size is 1,000 gallons

Where automobiles are serviced, greased, repaired, or washed or where gasoline is dispensed, oil/water separators shall have a minimum capacity of 6 cubic feet for the first 100 square feet of area to be drained, plus 1 cubic foot for each additional 100 square feet of area to be drained into the oil/water separator.

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

- (a) No new food service establishment or vehicle maintenance facility will be allowed to discharge wastewater to the City's collection system until an adequately sized grease interceptor, or oil/water separator is installed and approved by the Public Utilities Department.
- (b) All grease interceptors and oil/water separators must have each chamber directly accessible from the surface for servicing, maintaining, and sampling the device.
- (c) A basket, screen, trap, or other intercepting device shall prevent passage into the drainage system of solids one-half (1/2) inch or larger in size. The basket or device shall be removable for cleaning purposes.
- (d) All fixtures and drains receiving food service or vehicle maintenance wastewater shall pass through a grease interceptor or separator.
- (e) All new buildings or strip centers containing spaces designated for commercial enterprise are encouraged to provide a stub-out for a separate grease line to accommodate future grease interceptor or oil/water separator installation.
- (f) The owner of a new strip center shall provide suitable property space and sewer gradient that will be conducive for the installation of an exterior, in-ground grease interceptor(s) or oil/water separator(s) for any flex space contained within the strip center. Physical property restrictions and sewer gradient shall not be a defense for failure to install an exterior, in-ground grease interceptor or oil/water separator.
- (g) If a grease waste system is provided for a strip center a minimum 1,000 gallon capacity per food service establishment shall be added for the total size of the installed system. 4 food service establishments = a 4,000 gallon interceptor. A sizing calculation shall be provided for each potential food service establishment on the interior completion. A letter from the management company shall be provided on the plumbing plan sheet (8.5" x 11" attachments will not be accepted) accepting responsibility for the operation, maintenance, and any fines associated

with the grease interceptor(s). This agreement should follow in perpetuity to all property owners.

(h) All oil/water separators that are constructed of porous material must be coated with corrosion resistant epoxy to ensure that the tank will not leak. (Concrete oil separators must be coated with corrosion resistant epoxy.)

(i) Mobile food establishments in a vehicle, cart, or trailer are typically required by the local health department to service these vehicles, trailers, or carts at a regulated commissary kitchen. Please note, these commissary kitchens are considered to be food service establishments and must adhere to the same grease interceptor requirements.

5) Standards for Existing Facilities

(a) All existing food service establishments and vehicle maintenance facilities shall have grease interceptors or separators approved by the Public Utilities Director. Food service establishments and vehicle maintenance facilities without a grease interceptor or separator will be given a compliance deadline of six months from date of notification to have approved and installed a grease interceptor or separator. Failure to do so will be considered a violation of the City of Raleigh Sanitary Sewer Use Ordinance and may subject the facility to penalty assessments and/or service termination.

(b) In the event an existing food service establishment's and/or vehicle maintenance facility's grease interceptor or separator is either undersized or substandard in accordance with this ordinance, the owner and/or leaseholder will be notified of the deficiencies and required improvements, and given a compliance deadline of six months to conform to the requirements of this Ordinance. Failure to do so will be considered a violation of the City of Raleigh Sanitary Sewer Use Ordinance and may subject the facility to penalty assessments and/or service termination.

(c) For cases in which outdoor in-ground grease interceptors are infeasible to install, existing food service establishments will be required to install adequate interior grease traps approved by the Public Utilities Department for use on individual fixtures including dishwashers, sinks, and other fixtures and drains that potentially contain grease (See specifications section G.9. "Sizing Procedure for Single Fixture Only" above).

(d) Sizing of grease interceptors and separators shall be determined in accordance with procedures under specification section G.9.

(e) The exclusive use of enzymes, emulsifiers, etc., is not considered an acceptable grease interceptor or separator maintenance practice.

(f) All new and existing food service establishments or vehicle maintenance facilities shall comply with these provisions as well as all applicable NC State plumbing codes.

(g) Food Service Establishments or Vehicle Maintenance Facilities that are located in grease intensive areas or are out of compliance on a regular basis may be issued a pretreatment discharge permit with a mandated pumping frequency.

6) Maintenance, Reporting & Record Keeping

(a) Maintenance records shall be maintained onsite where the grease interceptor or oil/water separator is located for a period of three years.

(b) Grease interceptor maintenance records must include the following information.

FSE name and physical location

Date and time of grease interceptor service

Name of grease interceptor service company

Name and signature of person doing said service

Established service frequency and type of service (Example Full pump out, partial pump out, on site treatment, etc.)

Number and size of each grease interceptor serviced

Approximated amount, per best professional judgment, of grease and solids removed from each grease interceptor

Total volume of waste removed from each grease interceptor

Destination of removed wastes, food solids, and wastewater disposal

(c) Maintenance records that do not include all the above information will be considered incomplete. Incomplete records are considered a violation of the City of Raleigh Sanitary Sewer Use Ordinance and may subject the facility to penalty assessments and/or service termination.

(d) Facilities for which a specific pretreatment permit has been issued will follow the requirements for maintenance and record keeping as stated in the permit.

12) Variance to Tank Sizing Requirements

(a) Variance Requests are intended to give food service establishments and vehicle maintenance facilities an avenue to provide substantial evidence to reduce the size of the grease interceptor or oil separator. Said variance only applies to the size of the grease interceptor or separator. All other requirements of the City of Raleigh Sanitary Sewer Use Ordinance, NC plumbing code, or City of Raleigh Public Utilities Handbook remain in effect.

(b) Food service establishments and vehicle maintenance facilities shall provide a written explanation for the need to vary from the grease interceptor and/or separator requirements. All establishments requesting a variance shall agree to conform to the given variance stipulations. The City of Raleigh Public Utilities Department has the right to dismiss the variance at any time the grease separation device discharge adversely affects the sanitary sewer collection system and treatment works.

Correspondence from the Public Utilities Department must be obtained prior to plan submittal for a building permit.

(c) The variances request shall be made to the City of Raleigh Public Utilities Department regarding size and shall include at a minimum;

Facility location, menu items, seating capacity, facility square footage,

appliance/fixture inventory, service type (single or full service), hours of operation, sizing calculation based on G.9, general plumbing description, and site plan or description. In addition, all variance requests must include a detailed future operation and maintenance plan that identifies the operational constraints, maintenance schedule and oil and grease waste disposal procedures.

(d) Establishments that have been granted variances may be subject to having the allowed variance rescinded if the operation of the establishment changes in any way or if the wastewater discharge from the establishment begins to interfere with the sanitary sewer collection system.