

Best Practices for Operation and Maintenance of Precast Concrete Gravity Grease Interceptors





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Special thanks to the Gravity Grease Interceptor Subcommittee for creating this manual.

- Michael Kistner**, Kistner Concrete Products Inc., Chairman
- Steve Wolfe**, Evergreen Pre-Cast Inc., Board Liaison
- Charles Babbert**, E.C. Babbert Inc.
- Greg Barrett**, SI Precast Concrete
- Dan Brundage**, Press-Seal Corp.
- Allen Lee**, Lee’s Precast Concrete Inc.
- John Lendrum**, Norwalk Concrete Industries
- Nancy Mayer**, Mayer Precast Associates dba Mayer Bros. Inc.
- Michael Tidwell**, Bartow Precast Inc.

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The association of the manufactured concrete products industry.
1320 City Center Drive, Suite 200
Carmel, IN 46032
(800) 366-7731 | precast.org

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This manual does not claim or imply that it addresses any safety-related issues associated with its use. Operation and maintenance of precast concrete grease interceptors may involve the use of or exposure to hazardous materials, operations and equipment. It is the user’s responsibility to determine appropriate safety, health and environmental practices and applicable regulatory requirements associated with the use of this manual.

Use of this manual does not guarantee the proper function or performance of any grease interceptor operated or maintained in accordance with the requirements contained in the manual.

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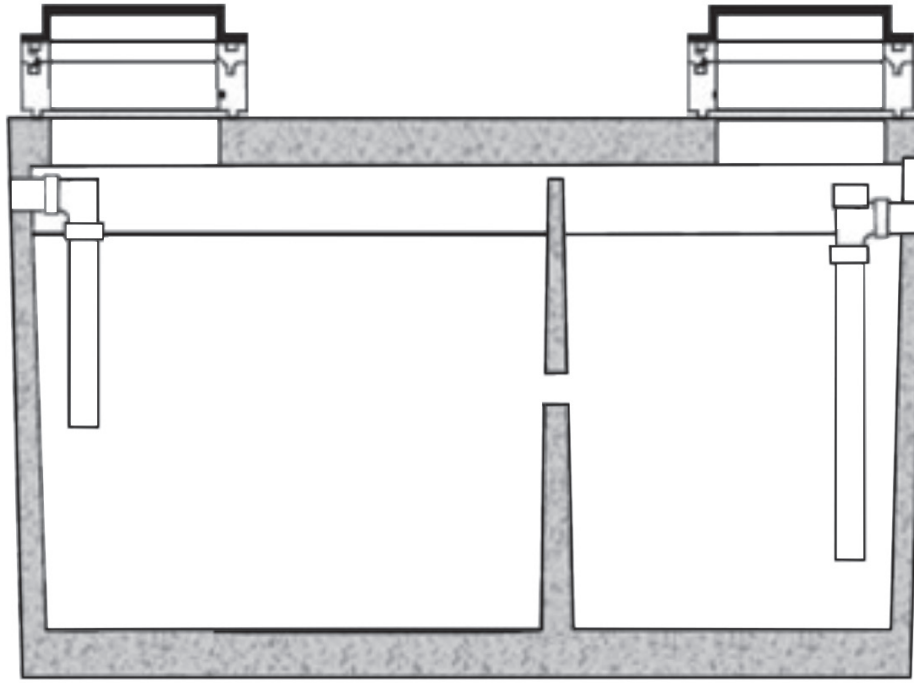


Figure 1: Typical Dual Compartment Gravity Grease Interceptor

Function of your Gravity Grease Interceptor

When fats, oils and grease (FOG) from preparing, cooking and processing different foods are discharged through dishwashing and other cleaning activities, the food service establishment (FSE) must effectively control those discharges to avoid clogging downstream sewer pipes. That is why applicable plumbing codes require a grease management device to prevent costly issues. A blockage caused by FOG can shut a business down for several days and cost thousands of dollars in lost profits and cleanup expenses.

A precast concrete gravity grease interceptor (GGI) is a large tank or series of tanks (typically between 500 to 3,000 gallons and larger in volume), installed underground outside of the FSE. The tank is designed to intercept the kitchen waste stream and retain it within the tank for a period of time that will allow the majority of the FOG to separate from the grey water and remain in the tank.

The GGI is a passive treatment device, meaning it contains no mechanical moving parts and operates strictly through hydrostatic and gravity principles. This type of interceptor is very effective at separating FOG from sewer-bound waste streams. However, the FSE must exercise kitchen best practices and follow recommended maintenance protocols to ensure the system works to its designed capacity.

Figure 1 depicts a generic design of a GGI. Your system may differ from this depending on applicable codes and manufacturer. GGIs are sized based on the kitchen waste stream flow data from the FSE, desired storage capacity and other factors. There are different sizing formulas that are specified and used. The waste stream enters the tank through the inlet tee. The tee extends downwards under the tank's waterline to prevent excessive turbulence at the water surface and enhance retention time.

Tanks can be single, dual or triple compartment, but dual compartments are the most common design. The first compartment is slightly larger than the second, allowing for most of the separation of food solids and FOG. Greases and oils have a lower specific gravity than water, so when a grease-laden mixture is left undisturbed, they will float to the surface while the sediment settles to the bottom. Grease interceptors use baffles and/or compartments to detain wastewater long enough for this process to occur.

Lighter materials such as oils will rise to the surface and form a layer commonly referred to as scum. Heavier materials will settle to the bottom and form a layer known as sludge. The middle portion of the wastewater detained in a GGI, known as grey water, which has now been separated from most of the solids and FOG, will then transfer into the second chamber through a transfer port or tee. This second chamber is smaller and serves as a clarification chamber, further separating remaining FOG and solids. The treated waste stream then goes through the bottom of the effluent tee in the final chamber and out to the sewer or subsequent treatment device.

Dual compartment tanks will generally have two access points, above the influent and effluent tees. Some dual compartment tanks, depending on size and design, may have a third access above the compartment separation wall. These access points serve to enable cleaning and maintenance.

The covers for the access points will generally be visible, especially in paved areas. If the tank is located in a non-paved area, the access covers may be exposed or slightly buried.

Kitchen Best Practices

Implementing kitchen best practices and effectively training FSE staff in those practices is essential to ensuring optimal FOG removal from the GGI. Most local regulating authorities require FSEs to use Best Management Practices (BMP) in their kitchens. Local applicable requirements on kitchen BMPs can be found here: _____

The following general kitchen practices will reduce interceptor maintenance costs and maximize GGI efficiency.

- Establish Best Management Practice standards in the kitchen to minimize FOG discharge. Post these somewhere where they can be easily accessed.
- Educate and train your staff on proper kitchen practices. Some regulatory agencies require proof that employees have been trained and comply with such practices.

- Keep records of maintenance on site. Most jurisdictional authorities require proof that the gravity grease interceptor has regular maintenance. See Appendix A for a sample maintenance log.
- Ensure employees never dump grease or oil down sink or floor drains or other plumbing fixtures. Post “No Grease” signs above sinks and other drainage fixtures. Appendix B contains sample signs that can be printed and used.
- Dry scrape or wipe pots, pans, plates and utensils into garbage or compost to remove excessive grease, oils and food residue prior to washing.
- Avoid using garbage disposals/food grinders as they could overload the interceptor with solids. Most regulatory agencies prohibit their use. Dispose of food waste into a solids waste container. Although the interceptor is designed to remove grease-laden food particles from the wastewater stream, it also increases the pump-out interval and could lead to potential odor and/or reactivity problems due to food particles breaking down biologically and releasing gases within the interceptor.
- Use in-sink strainers to capture any food scraps or other particles.
- Use a 3-sink system with separate sinks for washing, rinsing and sanitizing.
- Use dishwashing and general cleaning detergents that promote rapid oil/water separation. These detergents are formulated to release oil quickly so that the oil can rise to the water surface instead of remaining emulsified.
- Do not use additives such as enzymes, grease solvents or emulsifiers. Most regulatory agencies prohibit their use. Enzymes and solvents temporarily emulsify grease, allowing it to pass through the interceptor. The grease later coagulates on the inside walls of sewer pipes, restricting flow, which could result in sewage backups and blockages.
- Keep dry absorbents ready for any grease or oil spills.

- Do not use water that is hotter than necessary to clean and sanitize wash items. Use temperature settings recommended by the dishwasher manufacturer (Several agencies require water temperatures be limited to 140 degrees Fahrenheit.) Water temperatures in excess of this will cause longer separation times of FOG.
- Recycle waste cooking oils.
- Do not allow excessive use of corrosive agents to drain into the grease interceptor.

Odor Prevention

Odor issues with outdoor interceptors can be mitigated when a properly designed grease interceptor is incorporated into the building's plumbing/venting system. Most building codes require the interceptor to be vented back through the inlet plumbing and to a roof vent. In almost all cases odor problems are caused by improper venting of the building's plumbing system. This causes the gases to build up in the interceptor and allows them to escape, leading to odor problems.

Proper building ventilation and interceptor design along with gastight manhole covers and seals will prevent odors from escaping the interceptor and allow them to properly escape through the roof vents. Additionally, when precast concrete gravity grease interceptors will be dormant for more than 30 days (schools, churches, etc.), the preferred practice is to pump and refill the interceptor with clean water before the long period of inactivity.

Clean-Out & Maintenance

All interceptors require maintenance to ensure optimal operation. This requires a regular schedule of pumping and inspection. It is recommended that the FSE obtain and maintain a maintenance contract with a qualified waste removal business.

For new GGI installations, a monthly or bimonthly cleaning may be required until the maintenance company can establish a predictable level of FOG accumulation for that facility. Thereafter, required cleanings may be extended until an optimum pumping frequency is determined. The jurisdictional authority may also require notification from either the owner or the maintenance company when a scheduled cleaning is performed (or missed) or when a contract is not renewed.

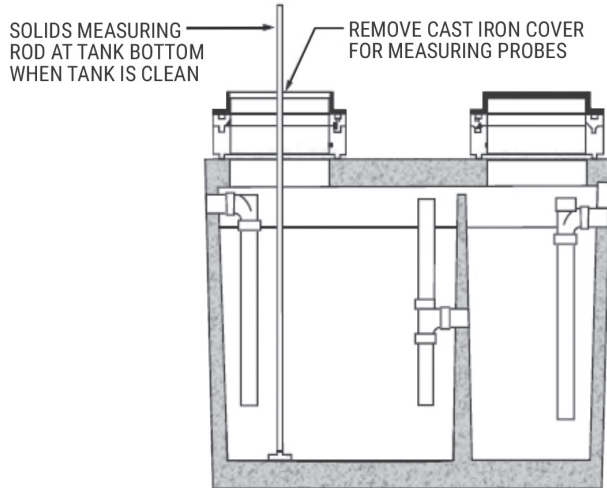
Automated monitoring systems are now available that monitor the levels of FOG in the tank. They provide an early warning to management that the grease interceptor is nearly full and needs pumping. In addition, the systems can minimize pumping cost by optimizing pump-out interval. Automated systems provide documentation for the jurisdictional authority and can even be monitored offsite. At a minimum GGI should be pumped out every three to six months, more frequently, depending on use.

Inspection

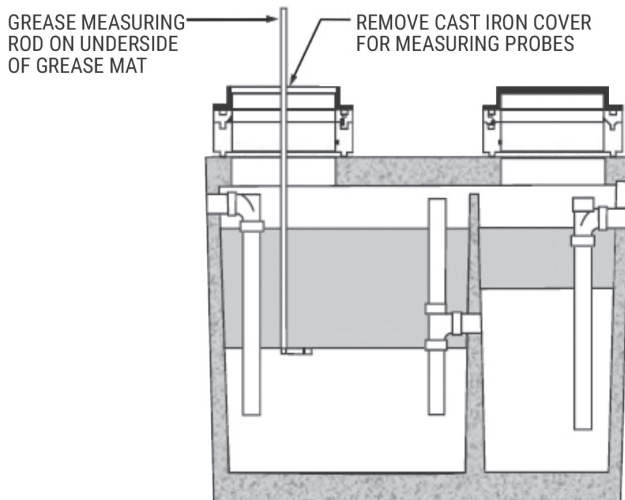
- Access covers should be inspected for defects or missing parts. (See Access Cover Safety on page 7) Check that the gasket (if equipped) is in place and not cracked or broken. Replace the gasket if needed.
- Before pump-out, notice the liquid level. An unexpectedly low level could indicate a leaky tank, while an unexpectedly high level (or signs of grease above the normal operation level) could indicate a plugged fitting, line or filter.
- Once the interceptor is pumped out, visually inspect all fittings, baffles and fixtures inside the interceptor to see that they are in good working condition and functioning properly.

Gravity Grease Interceptor Inspection Examples

1.) Obtain the FOG and/or solid levels using a “Sludge Judge” or a simple rod with a flat bottom piece to feel the accumulation levels within the recognized areas of separation, flotation and settling.

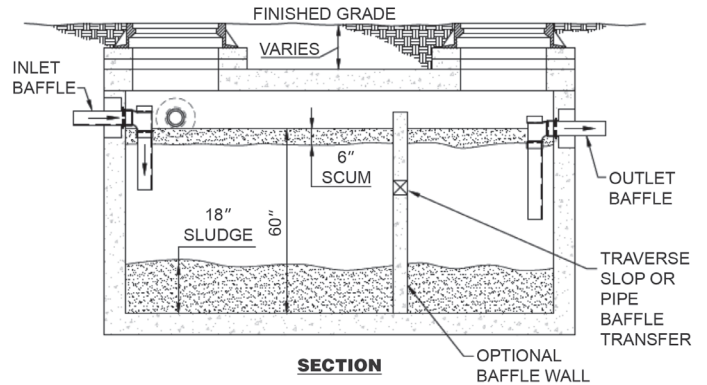


2.) Measure the depth of the grease.



3.) Measure the height of the solids. If the height of the solids and grease are greater than 25% of the liquid depth then the interceptor needs pumping.

GGI (GRAVITY GREASE INTERCEPTOR) CALCULATING % FULL - PUMP OUT RECOMMENDATIONS



$$\frac{[(\text{SLUDGE} + \text{SCUM}) / \text{TOTAL LIQUID DEPTH}] \times 100}{[18" + 6" / 60" \times 100 = 40\%}$$

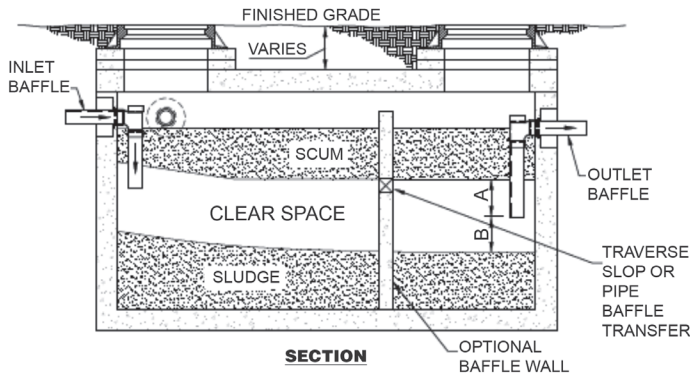
NOTE: The grease interceptor model shown is for illustrative purposes only. It is not the only option for gravity-type grease interceptors. Contact one or more manufacturers to obtain additional information on the available options and models.

Pump-Out

Follow the specified local municipality pump-out levels for FOG and sedimentation within the interceptor. On new installations, determining the pump-out interval will be difficult until the service company has monitored the accumulation rate enough to predict it. The FSE may use instruments or methods that will help determine when the interceptor needs pumping. If information is not available, pump out the interceptor when the combined FOG and solids accumulation is minimum 25% – but not in excess 40% of the total liquid depth.

GGI should be pumped out when 25% solids (sludge and FOG) accumulate or at a minimum every three to six months. Consult local jurisdictions if a more stringent schedule is required.

GGI (GRAVITY GREASE INTERCEPTOR) TANK PUMPING RECOMMENDATIONS



- TANK SHOULD BE PUMPED WHEN TOTAL SOLIDS REACH 25-33% OF TANK CAPACITY
- OR
- IF "A" IS LESS THAN 3"
- IF "B" IS LESS THAN 12"

With compartmentalized grease interceptors, be sure that each compartment is measured, cleaned and inspected at the time of pump-out.

It is important to scrape clean the side walls and baffles during pump-out to help maximize removal of greases from the interceptor during each cleaning. The settled materials should also be thoroughly vacuumed to prevent biological breakdown and the unwanted release of gases. If the interceptor is equipped with an effluent filter, make sure it is properly cleaned and maintained according to manufacturer's instructions.

WARNING: Do not enter the interceptor to perform maintenance.

Once the pump-out has been completed, be sure that the area has been cleaned up, the effluent filter (if applicable) has been reinstalled and that the access covers have been replaced and secured (if provided with bolts or other device).

Access Lid Safety

Many times, gravity grease interceptor access lids are brought to grade, which means they are visible. This increases the risk of falling into the tank due to improperly secured or compromised access lids. Maintenance providers are one of the first lines of defense against these tragic occurrences.

When servicing a gravity grease interceptor, first inspect the access lids for signs of damage, missing components or if the access was left unlocked. If access lid is compromised, secure the area immediately and remedy the safety risk. Facility management should also be instructed on how to inspect access covers regularly.

Consider installing a secondary safety apparatus in each access opening. These are removable devices that are installed below the cover that can support enough load to prevent accidental entry into the tank in the event of a missing or damaged cover. There are several types of secondary safety apparatuses on the market.

Tips on routine maintenance

Review routine maintenance requirements and follow them.

Secure access covers with bolts where applicable.

Keep an extra gasket on site for your GGI's access covers to prevent leaks and odors in the event of a gasket failure.

Develop and keep a GGI cleaning procedure and maintenance log sheet posted near the system and require employees to follow procedures and to promote proper documentation after each cleaning.

Keep cleaning documentation on file to show consistent cleaning in the event of an inspection or overflow incident.

Summary

Precast concrete gravity grease interceptors offer a simple, efficient solution to a critical problem. Their performance and the degree of protection they provide for the sewer components located downstream are determined by the way in which they are used. As such, it is vitally important that grease interceptors be properly operated and maintained at all times.

Contact your local jurisdictional authority with questions regarding permits, record-keeping requirements or any other maintenance issues that they may require to avoid costly sewer maintenance charges from improper grease discharges. The manufacturer of your interceptor should also be able to provide you with answers regarding the construction and operation of your grease interceptor and may be able to help you locate a licensed, qualified cleaning contractor who can offer a contract cost to maintain your interceptor and documentation required to assure compliance.

Manufacturer Information:

Jurisdiction Information:

Appendix A – Maintenance Log

FACILITY		
NAME		
ADDRESS		
PHONE		
CONTACT PERSON		
SERVICE PROVIDER		
NAME		
ADDRESS		
PHONE		
CONTACT PERSON		
LICENSE #		
MAINTENANCE RECORD		
DATE	ACTION	SIGNATURE
Copy and sent to: _____		

NOTE: Attach a drawing of the precast grease interceptor (GGI) installed (provided by the manufacturer), so the maintenance provider can properly inspect and service components.

Appendix B – No Grease Signs



NO GREASE



NO GRASA



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