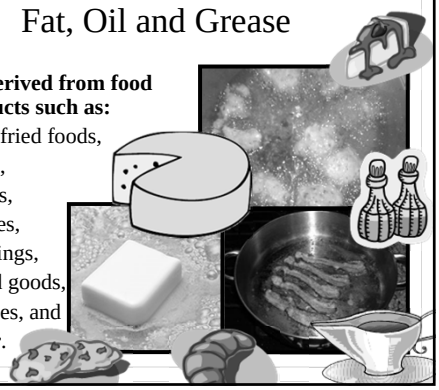
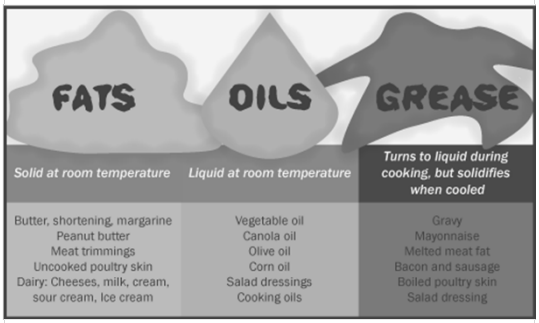
Regulations for Grease Traps in New Hampshire

Fat, Oil and Grease

FOG Derived from food products such as:

- Deep-fried foods,
- Meats,
- Sauces,
- Gravies,
- Dressings,
- Baked goods,
- Cheeses, and
- Butter.



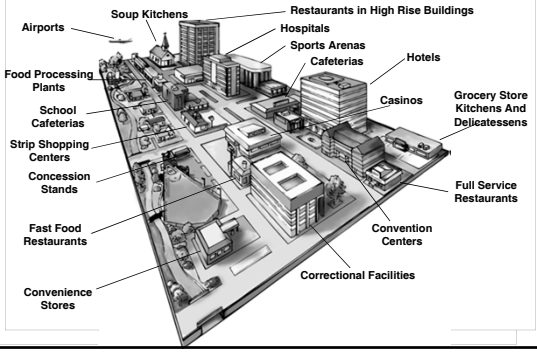


Basic Types of Waste Grease

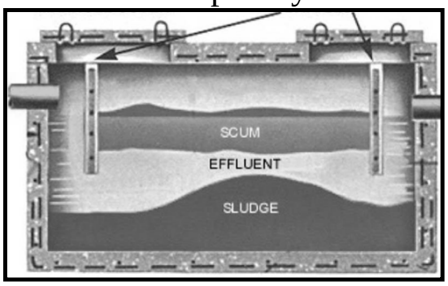
- Brown grease – mixed with wastewater, caught in interceptors or skimmed from the WWTF processes
- Regulated as Septage

- Yellow grease – food grade (French fry) grease, no wastewater or waste contact, good for fuel
- Regulated as Solid Waste

Fat, Oil and Grease



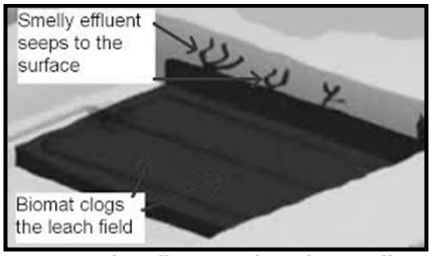
FOG in Septic Systems



Fats can form a mass at the top of the septic tank and interfere with the biological activities taking place.

Neglected septic tank, never pumped. The contents of sre hard enough to walk on. The tank had to be abandoned and an entirely new tank and septic field had to be installed.

The Problem?

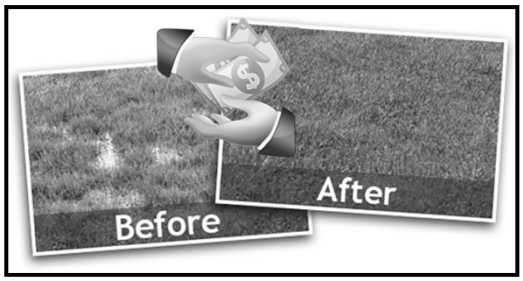


Solids, grease, and smaller particulates that are allowed to leave the septic tank can buildup a bio-mat of viscous slime over the years. This can clog soil pores and render the leach field inoperable for percolation.

The Problem?

Grease clogged drain fields make it impossible for soil to absorb and treat liquids. May require a new drain field.

Replacement is an Expensive Solution



The Solution

Required by Law is a

Grease Interceptor

OR

Grease Trap

Regulations

- International Plumbing Code (NH)

- Env-Wq 1000 Rules (NH) - If on Septic System

- Local Sewer Use Ordinance

NH State Law

155-A:1

IV. "New Hampshire building code" or "state building code" means the adoption by reference of …the International Plumbing Code 2009, … as published by the International Code Council….

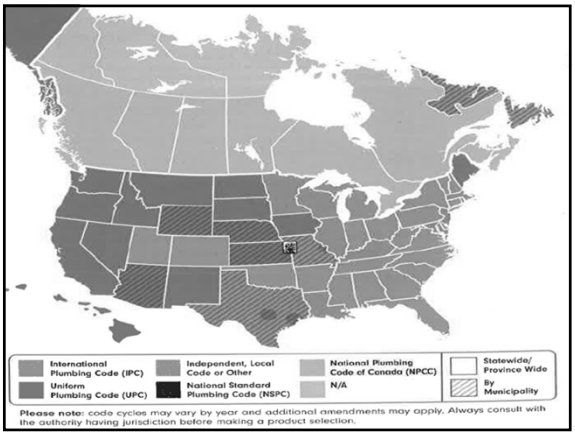
State of New Hampshire

MECHANICAL BOARD

(Formerly PLUMBERS' LICENSING BOARD)

2009 International Plumbing Code

Chapter 10



2009 IPC - Definitions

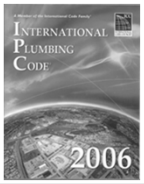
Section 202.

- **GREASE LADEN WASTE.** Effluent discharge that is produced from food processing, food preparation or other sources where grease, fats and oils enter automatic dishwasher pre-rinse stations, sinks or other appurtenances.

2006 IPC Definition Change

Section 202

- **GREASE INTERCEPTOR.** A plumbing appurtenance that is installed in a sanitary drainage system to intercept oily and greasy wastes from a wastewater discharge. Such device has the ability to intercept free-floating fats and oils.
- **GREASE TRAP.** *Definition removed from code.*



2009 IPC

Two types of Grease Interceptors

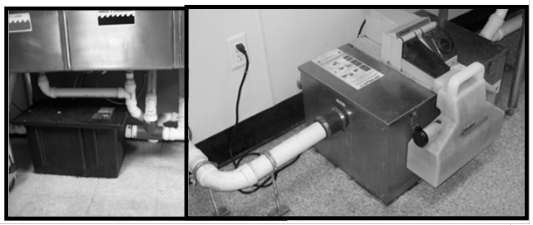
- Passive
- Automatic Grease Removal Devices

“GREASE INTERCEPTOR”

2009 IPC

Two types of Grease Interceptors

- Passive
- Automatic Grease Removal Devices



2009 IPC

Section 1003.3.1

- A GREASE INTERCEPTOR… shall be required to receive the drainage from fixtures and equipment with grease laden waste located in food preparation areas, such as in restaurants, hotel kitchens, hospitals, school kitchens, bars, factory cafeterias and clubs.
- Grease Interceptors … shall receive waste only from fixtures and equipment that allow for FOG to be discharged.

2009 IPC

Section 1003.3.1

- Only from fixtures and equipment that allow for FOG to be discharged.

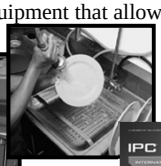
Fixtures and equipment shall include (*but are not limited to*):

- •Floor drains or sinks which kettles are drained
- •Automatic hood washers
- •Dishwashers without pre-rinse sinks
- •Pot sinks
- •Pre-rinse sinks
- •Soup kettles, or similar
- •Wok stations

2009 IPC

Section 1003.3.1

- Only from fixtures and equipment that allow for FOG to be discharged.




PDI G101 recommends that a dishwasher discharge into a dedicated grease interceptor. Tested to150°F.

2009 IPC

Section 1003.3.2

- Food Waste Grinder – Must have a solids interceptor before the Grease interceptor


2009 IPC

Section 1003.3.2

- Solids Interceptor and grease interceptor must be sized and rated for the discharge of the Food Waste grinder.
- Shall not be discharge into the grinders:
  - Emulsifiers,
  - Chemicals,
  - Enzymes, and;
  - Bacteria

2009 IPC

Section 1003.3.3

- Grease Interceptor not required on Individual dwelling unit or private living quarters.

2009 IPC

Section 1003.3.4

- Sized according to:
  - PDI G101
  - ASME A112.14.3 Appendix A
  - ASME A112.14.4
- Tested According to:
  - PDI G101
  - ASME A112.14.3
  - ASME A112.14.4
- Installed according to manufacturer's instruction

EXCEPTION
Outside interceptors 500 gallons or more

2009 IPC

Section 1003.9

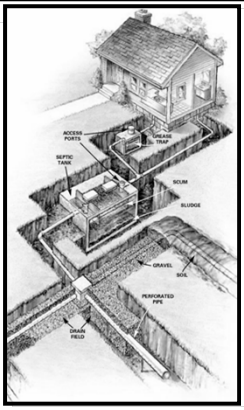
- **Venting of interceptors and separators.** Interceptors and separators shall be designed so as not to become air bound where tight covers are utilized. Each interceptor or separator shall be vented where subject to a loss of trap seal.

"A Grease Interceptor is NOT considered to be a fixture trap."

2009 IPC

Section 1003.10

- **Access and maintenance of interceptors and separators.**
  - *Access* shall be provided to each interceptor and separator for service and maintenance.
  - Interceptors and separators shall be maintained by periodic removal of accumulated grease, scum, oil, or other floating substances and solids deposited in the interceptor or separator.



NH DES – Subsurface Rules

- ENV-Wq1000 – Subdivision and Individual Sewage Disposal Systems Design (ISDS)

Applies when not on a public system

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

NH DES – Subsurface Rules

Definitions

- Env-Wq 1002.34 “Grease Trap” means a tank or series of tanks into which wastewater that contains grease is discharged, where grease floats to the water’s surface and is retained while water below is discharged.

Note: Not consistent with State Plumbing Code “Grease Interceptor”

NH DES – Subsurface Rules

Env-Wq 1012 GREASE TRAPS …

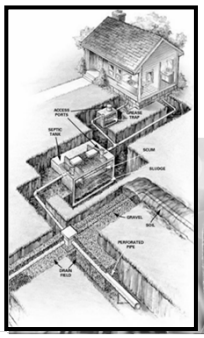
- Env-Wq 1012.01 Grease Traps Required. A grease trap shall be used in the ISDS serving:
- (a) Any commercial facility in which any food handling and preparation occurs; and
- (b) Any dwelling where food handling and preparation is undertaken for any business purpose.

NH DES – Subsurface Rules

Env-Wq 1012.02 Grease Trap Size.

- The grease trap size shall be based on a minimum hydraulic detention time of 36 hours and minimum tank size of 1,000 gallons.
- The outlet shall be protected with a baffle that extends downward and terminates 6 inches from the inside bottom of the grease trap.

NH DES – Subsurface Rules

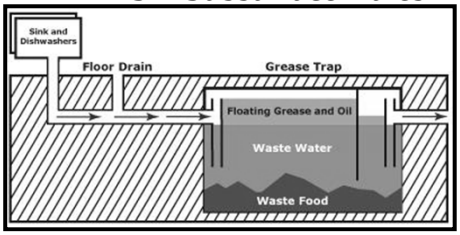


Grease trap is an essential Component of Septic System Design

NH DES – Subsurface Rules

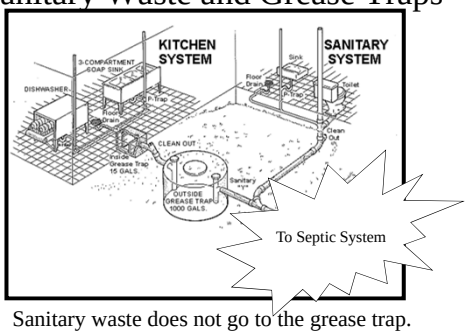
State Performs Review and Inspection

NH DES – Subsurface Rules



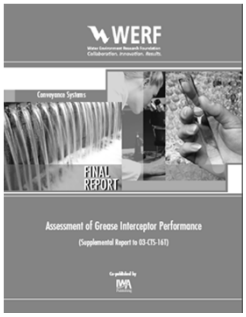
Just like the Septic System they must be pumped Regularly to continue to function as designed

Sanitary Waste and Grease Traps



Sanitary waste does not go to the grease trap.

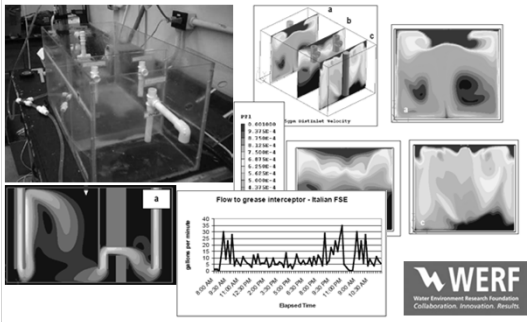
Structural Considerations



Water Environment Research Foundation Assessment of Grease Interceptor Performance (Supplemental Report to 03-CTS-16T)

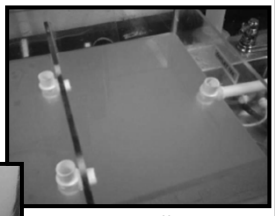
WERF
Water Environment Research Foundation
Collaboration. Innovation. Results.

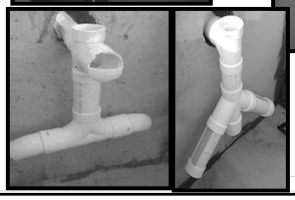
Structural Considerations



Structural Considerations

Better inlet and outlet tees

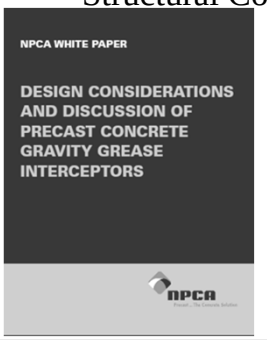




Improve baffle wall to distribute the flow

WERF
Water Environment Research Foundation
Collaboration. Innovation. Results

Structural Considerations



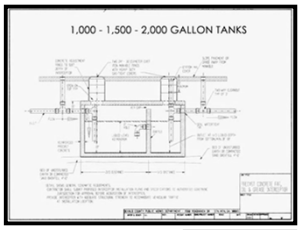
National Precast Concrete Association

NPCA

Structural Considerations

Factors Affecting Size

- Retention Time
- Flow Rates
- Concentration
- Pumping Frequency
- Chemistry
- Temperature
- Location



NPCA

Structural Considerations

Calculating Interceptor Size

- Uniform Plumbing Code
  - Appendix "H " 2003
  - 2006 or 2009
- EPA Formula (1980) – Watch out for correction
- Local Formulas

2003 Uniform Plumbing Code or Appendix H Sizing Method: Table H-1

Grease Interceptor Liquid Capacity =

$$\left(\frac{\#\text{ of meals}}{\text{peak hour}}\right) \times \left(\frac{\text{waste}}{\text{flow rate}}\right) \times \left(\frac{\text{retention}}{\text{time}}\right) \times \left(\frac{\text{storage}}{\text{factor}}\right)$$

Where:

Waste Flow Rate	
With dishwasher	6 gallon (22.7 L) flow
Without dishwasher	5 gallon (18.9 L) flow
Single Service Kitchen	2 gallon (7.6 L) flow
Food Waste disposer	1 gallon (3.8 L) flow
Retention Times	
Commercial Kitchen Waste Dishwasher	2.5 hours
Single Service Kitchen Single Serving	1.5 hours
Storage Factors	
Fully Equipped Commercial Kitchen	
Single Service Kitchen	

U.S. EPA Sizing Method

Grease Interceptor Liquid Capacity = (D) x (GL) x (ST) x $\left(\frac{HR}{2}\right)$ x (LF)

where:

D = Number of seats in dining area

GL = Gallons of wastewater per meal, normally 5 gallons

ST = Storage capacity factor – minimum of 1.0 onsite disposal, 2.5

HR = Number of hours open

LF = Loading factor

a) 1.25 interstate freeways

b) 1.0 other freeways

c) 1.0 recreation areas

d) 0.8 main highways

e) 0.5 other highways

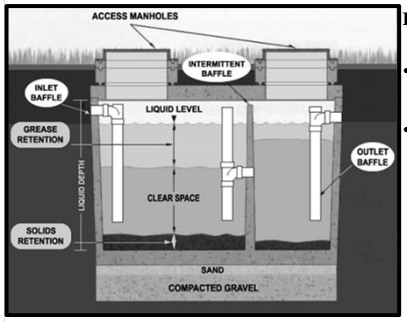
Reprinted from the EPA Design Manual, Onsite Wastewater Treatment and Disposal Systems.

Structural Considerations

Restaurant	Number of Seats	Number of meals per peak hour	Number of Sinks	(D)ouble Sinks or (S)ingle sink	Number of Dishwashers	Dishwasher Capacity (EPA) (gal)	Number Of Floor Drains	Influent Discharge Rate (EPA)	Influent Discharge Rate (UPC)	Total Fixture Units (UPC)
A	20	20	2	S	1	30	1	45	50	12
B	100	100	3	D	2	40	3	140	123	39
C	200	200	6	D	5	75	5	400	275	91

Restaurant	2003 UPC Appendix H	2006 & 2009 UPC Formulas	EPA Formula
A	600	750	680
B	3000	1250	3400
C	6000	2000	6800

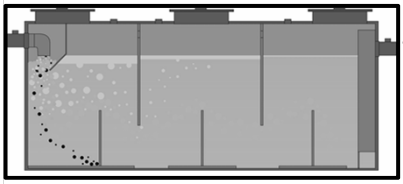
Structural Considerations



Effective interceptors:

- Must have inlet baffle
- Must have an outlet baffle

Structural Considerations



Effective interceptors:

- Must have at least one partition wall

Note: Must be able to access each chamber for maintenance and pump outs

Structural Considerations

Filter on the outlet can enhance performance

PL-625 Effluent Filter
The PL-625 filter is ideal for grease trap applications. The 1/32" filtration has been shown to reduce fats, oils, and grease (FOG) by as much as 60% to 98%! The filter may be used in onsite wastewater systems that require a finer level of TSS removal. Whatever the application, Polylok has the filter for you!

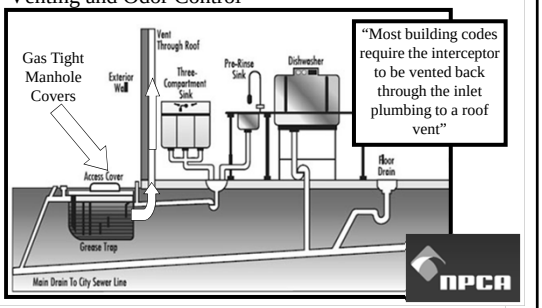
Structural Considerations

Corrosive Environment –

"made of durable materials"

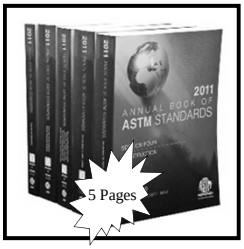
Structural Considerations

Venting and Odor Control–



"Most building codes require the interceptor to be vented back through the inlet plumbing to a roof vent"

Structural Considerations



NPCA

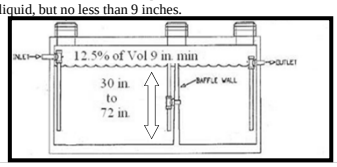
Referenced **ASTM C1613-10**
Standard Specification for Precast Concrete Grease Interceptor Tanks

ASTM INTERNATIONAL

ASTM C1613-10 Standard Specification for Precast Concrete Grease Interceptor Tanks

7. Physical Design Requirements

- **Shape**
  - Local regulations
  - Otherwise
    - Length greater than width
    - Liquid depth should be between 30 inches and 72 inches
    - Air scum volume above liquid shall be at least 12.5% the volume of the liquid, but no less than 9 inches.



ASTM INTERNATIONAL

ASTM C1613-10 Standard Specification for Precast Concrete Grease Interceptor Tanks

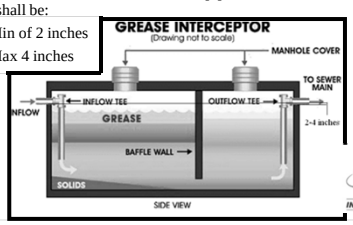
7. Physical Design Requirements

- **Compartments**
  - Multiple units in series is acceptable
  - Transfer port between compartments must maintain low velocity. Minimum of 50in.^{2}
  - Transfer port shall be in the middle 25% of the distance from the bottom of the tank to the waterline.
  - No Tee, outlet filter or tank dividing wall shall extend to the interior roof without providing for venting. Vent must be at least equivalent to a 4 in. diameter pipe.

ASTM C1613-10 Standard Specification for Precast Concrete Grease Interceptor Tanks

7. Physical Design Requirements

- **Inlet and Outlet Pipes**
  - Inlet no less than 4 inches diameter
  - Difference between invert of the inlet pipe and the invert of the outlet pipe shall be:
    - Min of 2 inches
    - Max 4 inches



ASTM C1613-10 Standard Specification for Precast Concrete Grease Interceptor Tanks

7. Physical Design Requirements

- Baffles and Outlet Devices
  - Must be made of noncorrosive materials
  - Permanently connected with noncorrosive fasteners
  - Inlet baffle or tee shall submerged to a depth located in the middle 25% of the distance from the bottom of the tank to the water line
  - Outlet baffle, tee or filter submerged to a depth of 6 in to 12 inches above the tank floor.
  - Both shall extend a minimum of 5 inches above the liquid.
  - Outlet Filters
    - Must be suitable for grease
    - Sizing info for filter
    - Also follow manufacture instructions and/or local code

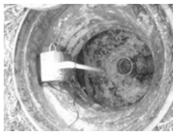
Note: While not a requirement of the regulations provide secure covers. This 3 year old fell into this grease trap.

Advance Technology Solutions

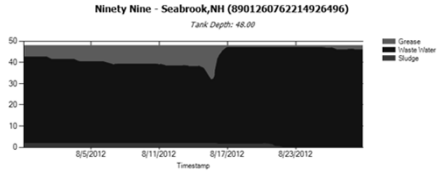
Installed

GREASEwatch® 3 Monitors





Assembled Unit



Timestamp	Grease Total	Sludge Total	Total Solids %
08/14/2012	9.60	1.90	24.00 %
08/14/2012	9.60	1.90	24.00 %
08/14/2012	9.60	1.90	24.00 %
08/14/2012	9.60	1.90	24.00 %
08/14/2012	9.60	1.90	24.00 %

G3 Monitor installed July 18, 2012

Q&A

Contact Info

Ray Gordon
NHDES Septage Coordinator
Wastewater Engineering Bureau
(603) 271-3571