



GUIDELINES
FOR THE
APPLICATION AND DESIGN
OF
GREASE TRAPS,
GREASE INTERCEPTORS,
AND
OIL/WATER SEPARATORS

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Figure 1, Grease Interceptor Detail

Appendix A

Appendix B

I. CODIFIED ORDINANCE OF LOUDOUN COUNTY (excerpts)

Chapter 1064 - Use of Sewers; Building Sewers and Connections

1064.21 PROHIBITED DISCHARGES.

(b) Any water or waste which may contain more than 100 parts per million, by weight, of fat, oil or grease;

1064.22 USE OF GREASE, OIL AND SAND INTERCEPTORS.

(a) Grease, oil and sand interceptors shall be provided when, in the opinion of the Loudoun County Sanitation Authority, they are necessary for the proper handling of liquid wastes containing grease in excessive amounts, or of flammable wastes, sand or other harmful ingredients, except that such interceptors shall not be required for private living quarters or dwelling units. All interceptors shall be of a type and capacity approved by the Authority and shall be so located as to be readily and easily accessible for cleaning and inspection.

(b) Grease and oil interceptors shall be constructed of impervious materials capable of withstanding abrupt and extreme changes in temperature. They shall be of substantial construction, watertight and equipped with easily removable covers which, when bolted in place, shall be gastight and watertight.

1064.23 MAINTENANCE OF INTERCEPTORS.

Where installed, all grease, oil and sand interceptors shall be maintained by the owner, at his expense, in continuously efficient operation at all times.

Chapter 1068 - Pretreatment of Wastewater

1068 GENERAL DISCHARGE PROHIBITIONS

(1) No user shall contribute or cause to be contributed, directly or indirectly, any pollutant or wastewater which will pass through or interfere with the operation or performance of a publicly owned treatment works (POTW). These general prohibitions apply to all such users of a POTW, whether or not the user is subject to national categorical pretreatment standards of any other national, State or local pretreatment standards or requirements. A user shall not contribute the following substances to any POTW.

(2) Solid or viscous substances which may cause obstruction to the flow in a sewer or other interference with the operation of a POTW, such as, but not limited to, grease, garbage with particles greater than one-half inch in any dimension, animal guts or tissues, paunch manure, bones, hair, hides or fleshings, entrails, whole blood, feathers, ashes, cinders, sand, spent lime, stone or marble dust metal, glass, straw, shavings, grass clippings, rags, spent grains, spent hops, waste paper, wood, plastics, gas, tar, asphalt residues,

residues from refining or processing of fuel or lubrication oil, mud or glass
grinding or polishing wastes;

II. DEFINITIONS

- a. **Grease** – melted animal fat; any substance identified as grease per EPA method 14003.
- b. **Grease Interceptor** – typically a concrete structure with a 1,000 to 3,000 gallon capacity that is installed outside of the building, and collects waste only from the kitchen area (no sanitary waste).
- c. **Grease Trap** – any device installed inside a facility to separate grease from the wastewater. Generally grease traps are installed in kitchens under the floor or next to a sink, and are much smaller than grease interceptors.
- d. **Industrial Pretreatment Program** – the program administered by the Engineering Programs Department which utilizes Chapter 1068 of the Loudoun County Codified Ordinance to pretreat or remove materials which have been determined by the EPA and/or the LCSA to have harmful effects on the collection system, the wastewater treatment facility (WWTP) operations, the receiving stream of the WWTP, or the WWTP residuals program. Typical substances controlled by this program include toxic organic compounds, metals, extreme pH, and cyanide. This program does not address sewer pipe blockages caused by grease buildup. Industries having processes that have been specifically identified by EPA are Significant Industrial Users (SIUs) and are issued a wastewater discharge permit, which contain monitoring requirements.
- e. **Oil** – any of various greasy, combustible substances obtained from animal, vegetable, and mineral sources: oils are liquid at ordinary temperatures and soluble in certain organic solvents, but not in water. In the LCSA system, oil is more specifically considered as a petroleum product.
- f. **Oil Water Separator** – typically an engineered steel tank designed to separate petroleum oil from water through the use of baffled compartments and corrugated plates.
- g. **Pretreatment** – a general term used to describe any process which removes a substance from the wastewater stream before it enters the LCSA sanitary sewer system.
- h. **Sand Interceptor** (aka Grit Interceptor) – typically a concrete structure installed outside the building designed to collect sand, grit, or other inorganic particles prior to admission to the public sanitary sewer.

III. ISSUES

- a. **Grease** – The hydraulic capacity of the LCSA sanitary sewer collection system can be reduced by grease buildup inside the pipes. In extreme cases, grease can buildup to a point where the flow is so constricted that sewage backs up into buildings/residences or out of manholes (sanitary sewer overflow). The sewer pipes must be manually cleaned by LCSA personnel or a subcontractor using a flush truck (or equal process).
- b. **Oil** – Petroleum oil is a toxic substance to most microorganisms in WWTP. In addition to possibly harming the operation of the WWTP, petroleum oil that passes through the WWTP can harm the aquatic life in the receiving stream.
- c. **Sand/Grit** – The build up of heavy inorganic particles can reduce the hydraulic capacity of the LCSA sanitary sewer collection system.

IV. APPLICATION GUIDELINES

- a. **Identification** – A facility that needs a grease trap, grease interceptor, an oil/water separator, or that is potentially an SIU should be identified before the facility is constructed. Planning and Development Engineering will take the lead in this effort. Through the Authority's plan review process, businesses that could need pretreatment shall be identified and adequate pretreatment systems specified.

Existing businesses that need new or improved pretreatment systems can best be identified by LCSA's field departments. The backflow prevention coordinator should be aware of possible pretreatment needs when performing backflow inspections. The operations and maintenance department can best identify grease-constricted pipes and toxic odors in the collection system.

- b. **Use of Questionnaire** - The Industrial Pretreatment Program has developed a questionnaire for use in identifying and tracking industries that may be SIUs. Engineering Programs (or Planning and Development Engineering in the case of new industries) sends out this questionnaire, Form 101, to the industry. Engineering Programs reviews the returned Form 101 and determines if the industry is an SIU. Identification of existing businesses/industries that could be SIUs can be made by any department within the LCSA (especially the backflow department, and other field or customer service personnel that are in contact with the LCSA customer base on a regular basis).

V. DESIGN

- a. **Responsibilities of the Developer's Engineer** – The engineering firm submitting plans to the LCSA is responsible for proper design of any pretreatment system. Sizing calculations and construction details shall be shown on the plans for all grease interceptors and oil/water separators in order to allow LCSA inspectors to ensure that approved units are being installed. Design requirements for grease interceptors are attached as Appendix A. A typical design is shown on Figure 1. Design requirements for oil/water separators are attached as Appendix B.
- b. **LCSA Review Procedures** – A reviewer from Planning & Development Engineering (P&DE) will check the sizing calculations and construction details for general compliance with these guidelines. Discrepancies or inadequacies shall be identified in review comments, and must be fully addressed by the developer's engineer prior to LCSA approval of the construction plans.
- c. **Submittal Requirements** - Shop drawings and/or a catalogue cut for the selected unit must be submitted for Authority review prior to the project's construction permit being executed. A reviewer from P&DE will determine whether the selected unit meets the intent of the plans. Discrepancies and inadequacies will be identified by the reviewer and must be addressed prior to installation. Copies of shop drawings and/or catalogue cuts should be forwarded to the LCSA Inspections Department.

A reviewer may allow the construction permit to be executed before a specific unit has been selected. In such cases, the developer will be responsible for providing the submittal and addressing any comments in advance of ordering the device.
- d. **Inspection Procedures** - The LCSA Inspections Department will review delivered devices for compliance with approved shop drawings and/or catalogue cuts and shall oversee test for watertightness.

VI. OPERATION AND MAINTENANCE

- a. **Self-Monitoring** – Businesses shall be responsible for performing adequate testing and monitoring to ensure that the grease traps, grease interceptors, and/or oil water separators are functioning properly. Maintenance and cleaning of devices is required per the Codified Ordinance.
- b. **Record Keeping** - Businesses shall keep records of all maintenance activities and monitoring/testing for a minimum of three (3) years.
- c. **Inspection/Monitoring by LCSA** - The LCSA shall have the right to inspect and monitor all grease traps, grease interceptors, oil-water separators, and sand interceptors.
- d. **Maintenance by LCSA** - The LCSA has elected to notify businesses of regular maintenance needs for these devices as appropriate. A process may later be developed to annually or semi-annually notify businesses of regular maintenance obligations.

All costs incurred by the LCSA for cleaning sewers downstream of a device failing to meet the Codified Ordinance shall be billed to the account of the building/operation causing the obstruction. LCSA Operations and Maintenance Departments may need to establish a set procedure with the LCSA Accounting Department to handle these billings

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Appendix A – STANDARDS FOR GREASE INTERCEPTOR DESIGN

1. Design shall be shown on sewer plans and certified by a Professional Engineer licensed by the Commonwealth of Virginia.
2. The interceptor shall be designed to meet the Loudoun County Sewer Ordinance limit of 100 mg/L maximum oil and grease content at all times of discharge. The following minimum features must be incorporated.
 - a. The design will not require owner maintenance any more frequently than once per month to meet the above discharge limit.
 - b. The detention time must be a minimum of thirty (30) minutes based on peak instantaneous flow (or maximum probable flow using total drainage fixture units) or of eight (8) hours based on average flow, but not too excessive to cause septicity and significant odor problems. Calculations shall be shown on the sewer plans.
 - c. The interceptor shall be partitioned and piped to provide at least two (2) skimming chambers.
3. The interceptor shall be constructed of impervious materials capable of withstanding abrupt and extreme changes in temperature. It shall be of substantial construction and shall meet AASHTO H-20 loading criteria for locations subject to traffic loads. The structure shall be made watertight through bituminous coatings, joint gaskets, and pipe connection gaskets/seals. The number of access hatches/tubes shall be sufficient to permit adequate access for viewing and maintaining/cleaning out the interceptor.
4. The interceptor shall be properly vented to allow for flow through the unit without creating potential odor problems.
5. Cleanouts shall be provided for the influent and effluent lines to the interceptor.
6. An effluent sampling port shall be provided at the exit pipe or each interceptor (*as shown on Figure 1*) where the interceptor effluent can be sampled prior to combining with other untreated flows.

Appendix B – STANDARDS FOR OIL-WATER SEPARATORS

1. Oil-water separator shall be designed and proven to produce 15 parts per million or less free oil in the effluent under normal operating conditions. Normal operating conditions consist of influents containing oils of 0.90 or lighter specific gravity, up to 20% (200,000 ppm) oil content in the water and temperatures of 40° to 140° F.
2. Provide one or more access manway(s) (24” minimum interior diameter) that include extension, cover, gasket and bolts.
3. Provide blueprint drawings for every oil-water separator for LCSA review and approval. Calculations for sizing shall be submitted with the drawings.