CITY OF PORTLAND WASTEWATER CAPACITY APPLICATION

Department of Public Services, 55 Portland Street, Portland, Maine 04101-2991



Mr. Frank J. Brancely, Senior Engineering Technician, Phone #: (207) 874-8832, Fax #: (207) 874-8852, E-mail:fjb@portlandmaine.gov

Date: <u>August 2, 2016</u>

1. Please, Submit Utility, Site, and Locus Plans.

Site Address:	88 Preble Street Street, Portla	nd, Maine	
		Chart Block Lot Number: 33/D/10	
Proposed Use:	Kitchen & Dining Hall		
Previous Use:	Kitchen & Dining Hall	Commercial (see part 4 below)	
Existing Sanitary	Flows: <u>2,342 GPD</u> GPD	Industrial (complete part 5 below)	
Existing Process	Flows:GPD	Governmental	
Description and	location of City sewer that is to	ب Residential	
	oosed building sewer lateral.	ភ៊ី Other <i>(specify)</i>	Х
New 6" sewer	service to Lancaster	Institutional	
Street.		· _	

(Clearly, indicate the proposed connections, on the submitted plans)

2. Please, Submit Contact Information.

City Planner's Name: $\frac{\text{T.B.D}}{\text{T.B.D}}$	Phone:
Owner/Developer Name:	The Salvation Army - Attn: Major Ronald Bernardi
Owner/Developer Address:	30 Warren Ave, Portland, ME 04103
Phone: 207-878-8555	Fax: E-mail: ronald.bernardi@use.salvationarmy.or
Engineering Consultant Name:	Silas Canavan, PE, Walsh Engineering Associates, Inc.
Engineering Consultant Address:	1 Karen Drive, Suite 2A, Westbrook, Maine 04092
Phone: 207-553-9898	Fax: E-mail: silas@walsh-eng.com
(Note: Consultants a	nd Developers should allow +/- 15 days, for capacity status,

prior to Planning Board Review)

3. Please, Submit Domestic Wastewater Design Flow Calculations.

Estimated Domestic Wastewater Flow Generated:	Qave = 3,152, Qmax =	<u>6,935</u> GPD
Peaking Factor/ Peak Times:	PF = 2.2	
Specify the source of design guidelines: (i.e"Handl	book of Subsurface Wastewater Dis	oosal in Maine,"
"Plumhers and Pine Fitters Calculation Manual "	Portland Water District Records	Other (snecify)

_____Portland Water District Records, __ Other (specify) ______Maine Subsurface Wastewater Disposal Rules / TR-16

(Note: Please submit calculations showing the derivation of your design flows, either on the following page, in the space provided, or attached, as a separate sheet)

See attached design flow calculations.

4. Please, Submit External Grease Interceptor Calculations.			
Total Drainage Fixture Unit (DFU) Values:	See attached.		
Size of External Grease Interceptor:	250-gallon, 1076 lbs	5	
Retention Time:			
Peaking Factor/ Peak Times:			
(Note: In determining your restaurant process water flows, and the size of Plumbing Code. Note: In determining the retention time, sixty (60) min detailed calculations showing the derivation of your restaurant process of showing the derivation of the size of your external grease interceptor separate sheet	nutes is the minimum reten water design flows, and pl or, either in the space prov	ntion time. Note: l ease submit detail	Please submit ed calculations
5. Please, Submit Industrial Process Wastewater Flow Calco Estimated Industrial Process Wastewater Flows Generated:	ulations N/A		GPD
Do you currently hold Federal or State discharge permits?		Yes	No
Is the process wastewater termed categorical under CFR 40?		Yes	No
OSHA Standard Industrial Code (SIC): Peaking Factor/Peak Process Times:	http://ww	/w.osha.gov/os	hstats/sicser.html
(Note: On the submitted plans, please show where the building's dom commercial process wastewater sewer laterals exits the facility. Also, s Finally, show the location of the wet wells, control manholes, or other traps)	show where these building	g sewer laterals en	ter the city's sewer.

(Note: Please submit detailed calculations showing the derivation of your design flows, either in the space provided below, or attached, as a separate sheet)

Notes, Comments or Calculation

See attached design flow calculations.



Wastewater Design Flow Calculations

Kitchen & Dining Hall Addition The Salvation Army Adult Rehabilitation Center 88 Preble Street Portland, Maine

The project consists of the construction of an addition to house a new dining hall and kitchen to serve the residents of the Adult Rehabilitation Center. The existing kitchen and dining hall, which has seating capacity for 70 people, will be decommissioned after the addition is constructed. The new dining hall will have seating capacity for 120 people. Analysis of the past year's water and sewer bills indicates that existing water use is approximately 2,342 GPD, which currently discharges to the Preble Street sewer main. It is anticipated that the additional seating capacity in the new dining hall will result in an increase in wastewater flow of approximately 810 GPD. Adding the additional wastewater flow to the current wastewater flow results in a total wastewater demand of 3,152 GPD for the site.

A new sewer service will be installed from the building addition to Lancaster Street. This sewer service will only handle wastewater flows from the new kitchen and dining hall. Therefore, it is anticipated that the flow directed to Lancaster Street will be 1,800 GPD and the flow directed to Preble Street will be reduced to 1,352 GPD.

Wastewater Flow Calculations

Existing Conditions:

- Dining hall seating capacity of 66 people
- Existing wastewater flow = 2,342 GPD (from previous year's water bills)

Proposed conditions:

• Additional dining hall seating capacity = 34 seats

Design flows from Maine Subsurface Wastewater Disposal Rules, Table 4C

• 5 GPD/seat/meal (dining hall)

Increase in Average Daily Flow Qave = (5 GPD)(54 seats)(3 meals)) = 810 GPD

Total Average Daily Flow $Q_{ave} = 2,342 \text{ GPD} + 810 \text{ GPD} = 3,152 \text{ GPD}$

Average Daily Flow directed to Alder Street = (5 GPD)(120 seats)(3 meals)) = 1,800 GPD

Average Daily Flow directed to Preble Street = 3,152 GPD – 1,800 GPD = 1,352 GPD

Peaking Factor = 2.2

Per TR-16 Guides for the Design of Wastewater Treatment Works, Figure 1, pop. = 70,000 Maximum Daily Flow $Q_{max} = 3,152$ GPD (2.2) = **6,935** GPD Please note that WEA investigated the possibility of connecting the sewer service to the 12-inch sewer main in Alder Street. However, the existing 12-inch storm drain along the east side of Alder Street is set at nearly the same elevation as the sewer main. Therefore, there is not viable connection point to the Alder Street sewer main from the site without conflicting with the existing storm drain in Alder Street. Raising the new sewer service above the storm drain does not provide enough cover over the proposed sewer service. A marked up copy of the Alder Street Reconstruction Plan As-Built dated 9/9/1999 is provided to graphically show the horizontal and vertical locations of the existing sewer and storm drains.

Grease Interceptor Sizing

Due to the food preparation use onsite, a grease interceptor will be installed. Two sewer services will be installed from the building. All of the drains and appliances that will discharge grease to the sewer system will be directed to the grease interceptor (i.e. sink drains, dishwasher, food grinder, etc.). A separate service from the building will handle the remaining domestic wastewater flows from the addition. The two services will tie together downgradient of the grease interceptor. The grease interceptor will be installed under the driveway on the west side of the building addition.

WEA has coordinated with Shier Products, and is proposing the installation of a Shier GB-250 grease interceptor. The GB-250 has the capacity to handle 3 meals/day for 88 people (264 meals/day), assuming a 90-day pump-out schedule. The ARC currently has 70 residents. If the number of residents increases above 88 people in the future, then the pump-out schedule will be reduced to 65 days. Calculations are provided below.

Grease Interceptor Calculations

Capacity with 90-day pump-out

Grease capacity of GB-250 @ 100 GPM = 1,076 lbs

Capacity per day @ 90-day pump-out schedule = 1,076 lbs/90 days = 11.96 lbs/day

Grease production of facility = 0.0455 lbs/meal (cafeteria with flatware washing)

Meal capacity per day = 11.96 lbs/day / 0.0455 lbs/meal = 263 meals/day

Person capacity per day = 263 meals/day / 3 meals/person = 88 people

**If the number of meals per day served increases above 263, then the pump-out schedule shall be reduced to 65 days.

Capacity with 65-day pump-out

Grease capacity of GB-250 @ 100 GPM = 1,076 lbs

Capacity per day @ 75-day pump-out schedule = 1,076 lbs/60 days = 16.6 lbs/day

Grease production of facility = 0.0455 lbs/meal (cafeteria with flatware washing)

Meal capacity per day = 16.6 lbs/day / 0.0455 lbs/meal = 365 meals/day

Person capacity per day = 365 meals/day / 3 meals/person = 122 people

Step 1: size by flow rate

Hydromechanical Grease Interceptor Sizing Using Gravity Flow Rates (Per Ch. 10 of the Uniform Plumbing Code)

Diameter of	Maximum	Size of Grease Interceptor	eInterceptor
Grease Waste Pipe	Full Pipe Flow*	One-minute Drainage Period	Two-minute Drainage Period
2" (51 mm)	20 GPM (1.3 L/s)	20 GPM (1.3 L/s)	10 GPM (0.6 L/s)
3" (76 mm)	60 GPM (3.8 L/s)	75 GPM (4.7 L/s)	35 GPM (2.2 L/s)
4" (102 mm)	125 GPM (7.9 L/s)	150 GPM (9.5 L/s)	75 GPM (4.7 L/s)
5* (127 mm)	230 GPM (14.5 L/s)	250 GPM (15.8 L/s)	125 GPM (7.9 L/s)
6" (152 mm)	375 GPM (23.6 L/s)	500 GPM (31.5 L/s)	250 GPM (15.8 L/s)

*1/4 inch slope per foot (20.8 mm/m) based on Manning's formula with friction factor N = 0.012

Recommended

Step 2: calculate grease capacity



×

(see A B G D B F below) Grease Production Values





Grease Capacity

Needed

×

36

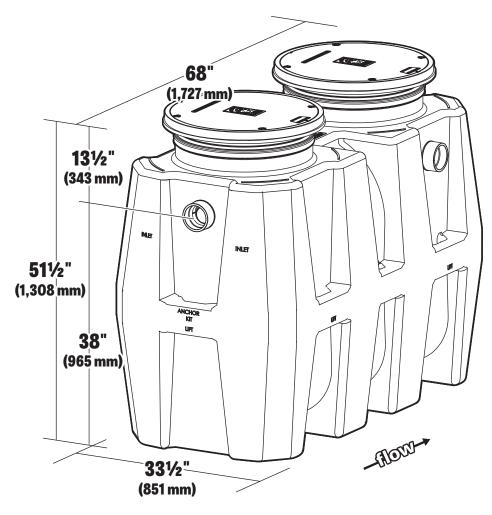


Restaurant Type	Grease Production Values	Examples
Low Grease	Q.005 lbs (2.268 g) / meal (no flatware)	Sandwich Shop, Convenience Store, Bar, Sushi Bar, Delicatessen,
Production	0.0065 lbs (2.948 g)/ meal (with flatware)	Snack Bar, Frozen Yogurt, Hotel Breakfast Bar, Residential
Medium Grease	O.025 lbs (11.340 g) / meal (no flatware)	Coffee House, Pizza, Grocery Store (no fryer), Ice Cream Parlor,
Production	D 0.0325 lbs (14.742 g) / meal(with flatware)	Fast Food, Greek, Indian, Low Grease Output FSE (w/fryer)
High Grease	0.035 lbs (15.876 g) / meal (no flatware)	Cafeteria, Family Restaurant, Italian, Steak House, Bakery, Chinese,
Production	0.0455 lbs (20.638 g) / meal (with flatware)	Buffet, Mexican, Seafood, Fried Chicken, Grocery Store (w/fryer)

GB-250

Great Basin GREASE INTERCEPTOR TECHNICAL DATA

Submittal | Specifications | Installation | Application Specific Details



SUBMITTAL

STANDARD: 4" plain end inlet/outlet | Capacities - Liquid: 275 gal.; Grease: 1,076 lbs. (147.4 gal.); Solids: 105 gal. Highway traffic load rated, bolted, gas/water tight composite covers. (16,000 lbs.)

TeleGlide Risers

OPTIONS:

- 4" Male Thread Inlet/Outlet
- 6" Plain End Inlet/Outlet
- 6" Male Thread Inlet/Outlet
- (stainless steel)
- Pedestrian Rated Covers 2, 000 lbs. H20 Load Rated Pickable
- Cast Iron Covers
- 🗌 Integral Membrane
- Clamping Collar Kit Pumpout Port (Large)

□ SR24 (x2) >6" - 24"
 □ LR24 (x2) >24" - 39"
 □ SR24 (x4) >39" - 43"

AK1 High Water Anchor Kit

SR24 (x2) + **LR24** (x2) >43" - 58" **LR24** (x4) >58" - 72"

APPROVAL:

Signature: Date: Company: Specifying Engineer: Engineering Firm:



9500 Woodend Road | Edwardsville, KS 66111 | Tel: 913-951-3300 | Fax: 913-951-3399 | www.schierproducts.com

SPECIFICATIONS

NOTES

- 1. 4" plain end inlet/outlet
- 2. Unit weight w/composite covers: 230 lbs.; w/cast iron covers: 340 lbs.
- 3. Maximum operating temperature: 190° F continuous
- 4. Capacities Liquid: 275 gal.; Grease: 1,076 lbs. (147.4 gal.); Solids: 105 gal.
- 5. Built-in Flow control.
- 6. For gravity drainage applications only.
- Do not use for pressure applications.
 Cover placement allows full access to tank for
- proper maintenance. 9. Vent not required unless per local code.
- **10.**Engineered inlet and outlet diffusers are removable to inspect/clean piping.
- **11.** Integral air relief / Anti-siphon / Sampling access.

DIFFUSION FLOW TECHNOLOGY

The inlet diffuser splits influent into three paths, creating laminar flow and utilizing the entire liquid volume of the tank for efficient grease separation. The calibrated openings greatly reduce effluent turbulence. The effluent enters the main chamber without disturbing the existing grease or sediment layers.

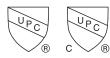
The integral air relief / anti-siphon in the top of the outlet diffuser allows pressure stabilization within the unit during operation. The bottom of the outlet diffuser allows only effluent which is free of grease to exit the tank. It can easily be attached to any of the three outlets provided to ease job site piping layouts.

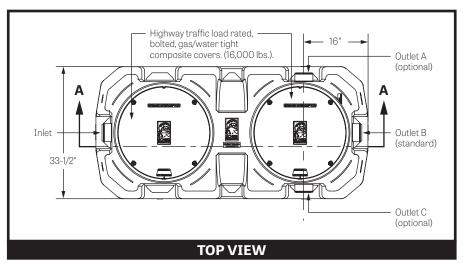
ENGINEER SPECIFICATION GUIDE

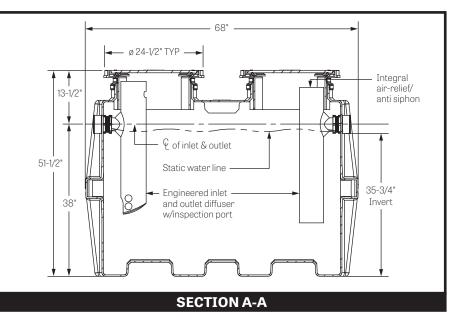
Schier Great Basin[™] grease interceptor model # GB-250 shall be lifetime guaranteed and made in USA of seamless, rotationally-molded polyethylene. Interceptor shall be furnished for above or below grade installation. Interceptor shall be certified to ASME A112.14.3 (type C) and CSA B481.1, with field adjustable riser system, built-in flow control, built-in test caps and three outlet options. Interceptor flow rate shall be 100 GPM. Interceptor grease capacity shall be 1,076 lbs. Cover shall provide water/gas-tight seal and have minimum 16,000 lbs. load capacity.

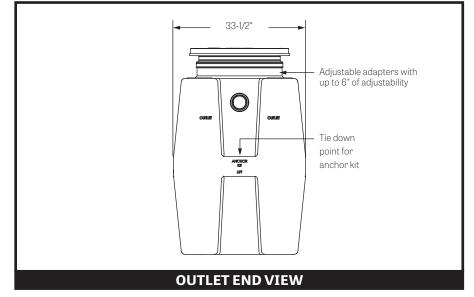
CERTIFIED PERFORMANCE

Great Basin hydromechanical grease interceptors are third party performance-tested and listed by IAPMO to ASME #A112.14.3 and CSA B481.1 grease interceptor standards and greatly exceed requirements for grease separation and storage. They are compliant to the Uniform Plumbing Code and the International Plumbing Code.











INSTALLATION (1 of 3)

WARNING! DO NOT AIR TEST UNIT OR TELEGLIDE RISER SYSTEM! Doing so may result in property damage,

personal injury or death.

LEAK/SEAL TESTING

Cap/plug all base unit plumbing connections and remove covers. For base unit testing, fill with water to just above the highest connection. For riser system testing (if required) fill with water to finished grade level. CAUTION: Risers must be supported before filling with water to prevent tipping. Inspect unit, connections and all gaskets and clamps (if applicable) for leaks. Check water level at specific time intervals per local code.

GENERAL INSTALLATION INSTRUCTIONS

Schier grease interceptors are manufactured with an internal flow control system. They do not require an external flow control system or air intake vent. Schier grease interceptors are not to be installed in any other manner except as shown. Consult local codes for separate trapping requirements, cleanout locations and additional installation instructions.

- 1. The **flow control plate is not installed** on this unit. When the unit is installed 13 feet or more below the fixtures that flow into the unit, or a high flow/increased head pressure condition exists (causing a flow rate above 100 GPM), install the inlet diffuser flow control plate to maintain proper flow rate.
- 2. Set unit on level solid surface as close as possible to fixtures.
- **3.** Connect outlet diffuser to the desired outlet (A,B,C). Unit is shipped with the outlet diffuser in location B and sealing caps on locations A and C.
- Connect inlet and outlet drainage lines to unit. Mechanically couple pipes to unit. Do not solvent weld.
- 5. For units with cast iron covers, remove retainer clips prior to burial.

NOTE: Do not install below a hydrostatic slab.

BELOW GRADE INSTALLATION INSTRUCTIONS EXCAVATION

- 1. Surrounding soil must be undisturbed soil or well compacted engineering fill.
- 2. Width and length of excavation shall be a minimum of 12" greater than the tank on all sides and depth shall be 6" deeper than tank bottom.
- **3.** Set the tank level on a 6" deep layer of well-packed crushed aggregate material and connect waste piping per General Installation Instructions.

BACKFILL

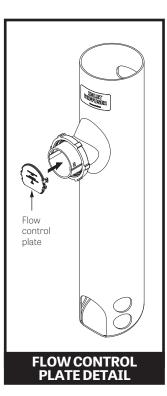
- 1. Preparation of sub grade per geotech recommendations.
- 2. Stabilize and compact sub grade to 95% proctor.
- **3.** Fill unit with water before backfilling to stabilize unit and prevent float-out during backfilling. Secure covers and risers (if necessary) to the unit.
- Backfill evenly around tank using crushed aggregate (approximately 3/4" size rock or sand, with no fines), or flowable fill. Do not compact backfill around unit.

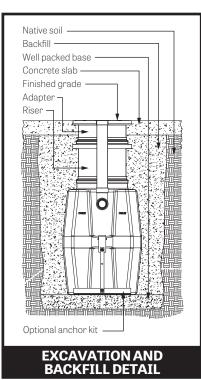
FINISHED CONCRETE SLAB

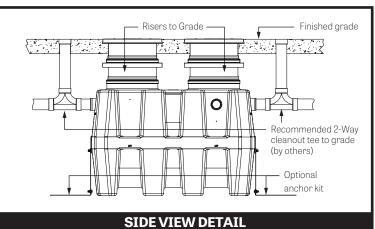
Slab must extend 18" minimum outside the unit footprint.

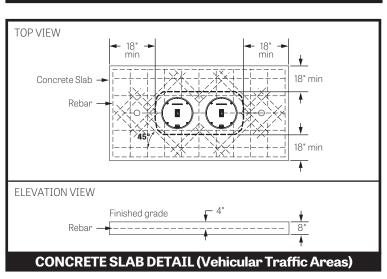
Pedestrian traffic or greenspace areas: 4" Thick reinforced concrete slab required.

Vehicular traffic areas: Minimum 8" Thick concrete slab with rebar required; final thickness of concrete around cover to be determined by specifying engineer. If traffic loading is required the concrete slab dimensions shown are for guideline purposes only. Concrete to be 28 day compressive strength to 4,000 PSI. Use NO. 4 rebar (Ø 1/2") grade 60 steel per ASTM A615: connected with tie wire. Rebar to be 2-1/2" from edge of concrete and spaced in a 12" grid with 4" spacing around access openings.











INSTALLATION (2 of 3)

TELEGLIDE RISER (24 SERIES) INSTALLATION GUIDELINES

Tools needed: 7/16" Nut driver tool/bit (included), marker (included). tape measure and drill with 1/2" chuck. Jigsaw, circular saw or reciprocating saw will be needed if risers need to be cut.

NOTE: To remove a component or adjust its position, the Upper Band Clamp needs to be loosened or removed using nut driver bit. Loosened clamps should be re-tightened to 5 - 8 ft lbs. of torque (same as a rubber no-hub coupling). The Lower Band Clamp is factory set and should not be adjusted or removed.

Riser Assembly Instructions/Steps

- 1. Set unit so the pipe connections line up with job site piping and measure riser height needed from top of cover to finished grade. See Table 1 to select risers needed.
- 2. Remove covers from adapters. Remove adapters from main unit. On a level surface, per-assemble the risers and adapters, adjusting the components upwards or downwards to achieve the riser height needed. Make sure to maintain minimum and maximum insertion depths as shown in Figure 2. If components are too long, make a circular line around the sidewall with marker and cut with a power saw. The lowest cut line on the riser assembly will be 6" beyond the riser height needed to allow for ideal insertion depth (See Figure 1). An alignment mark should be drawn 2" beyond the riser height needed which will align with the top of the base unit gasket. **DO NOT** cut the alignment mark. The Adapters and risers should sit level with each other. Tighten upper clamps to keep riser/adapter assembly from shifting. Make alignment marks on the sidewalls at the top of all riser gaskets to aid final assembly.
- 3. **IMPORTANT:** Before the next step, make sure both diffusers are installed inside the main unit at the appropriate locations. Check if there needs to be any flow control adjustment at the inlet diffuser (see general installation instructions).
- 4. Take apart riser assembly and clean all sidewalls and insides of gaskets to remove dust/debris. Install components into the main unit starting from the lowest riser and work your way up to finished grade. Maintain minimum and maximum insertion depths for all components (see Figure 2). Tighten Upper Clamps to specified torque after correctly positioning components. Riser assembly may need to be supported during backfill.
- **5.** If tilting of the adapter is required to be flush with grade, do so AFTER all clamps have been tightened with riser(s)/adapter in a vertical and level position. Tilting is done using gasket flexibility. Tilting before tightening clamps may ruin a perfect gasket seal. Schier recommends tilting only the adapter versus the entire riser assembly to make sure your riser height and proper tank access is maintained.
- 6. If riser height conditions change after completing above steps, there may be room for adjustment. As long as minimum and maximum insertion depths are maintained (see Figure 2), the adapters/risers can be adjusted/cut as many times as necessary. When riser system installation is complete, see Leak/Seal Testing procedure if required (pg 3 of 6).

ANCHOR KIT INSTALLATION

Stainless steel anchor kit is recommended for installation in high water table conditions to prevent float out. Necessity to be determined by specifying engineer. Hold down force achieved by backfill weight acting on Anchor Plate.

Slide Anchor Hook over tie down point on end wall and bolt to Anchor Strap. Bolt Anchor Strap to Anchor Plate using provided stainless steel hardware. If required, Anchor Plate may be bolted to concrete slab using provided holes.



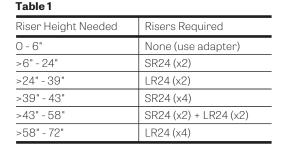
Adapter

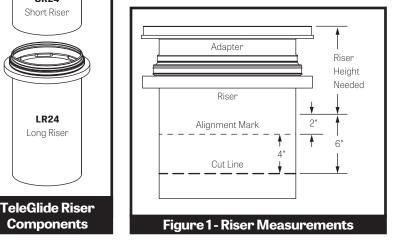


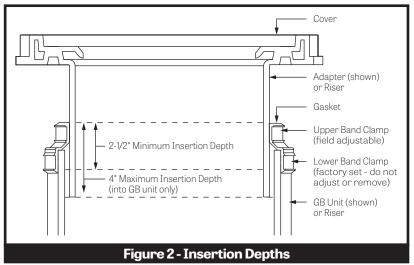
Short Riser

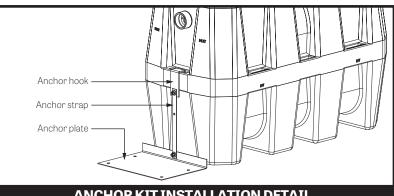
LR24

Long Riser









ANCHOR KIT INSTALLATION DETAIL



INSTALLATION (3 of 3)

EXPANDING GREASE CAPACITY

Multiple grease interceptor configurations must be piped as shown to ensure the system works properly as designed. For below grade installations, all units must be level in the excavation pit. Hybrid systems combining parallel and series installations are available per written approval from Schier.

All inlet manifolds, outlet manifolds, piping between units and two-way cleanout tees by others.

Series Installation of Multiple Grease Interceptors

For lower flow rates and higher grease storage requirements.

For below grade installations it is recommended to install a two-way cleanout tee extended to finished grade before the inlet of the first unit, after the outlet of the last unit and in between units (if there is a long run of pipe between units) for line cleaning purposes.

NOTE: When the flow control plate is required, it should only be installed on the first unit in the series.

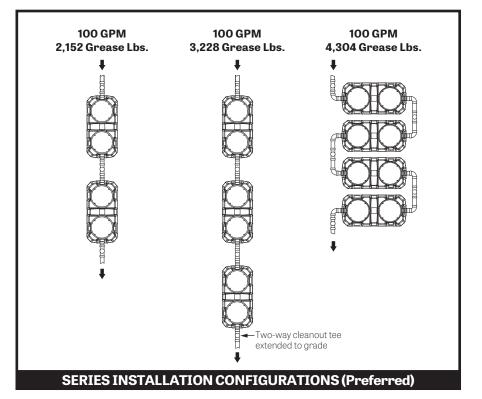
Parallel Installation of Multiple Grease Interceptors

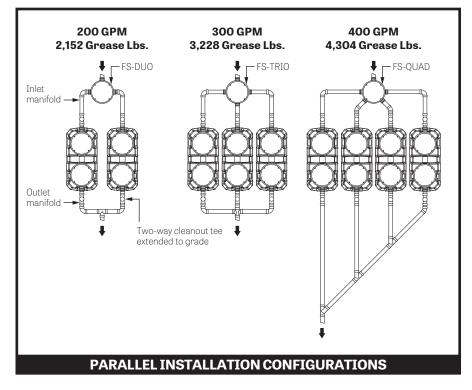
For flow rates above 100 GPM and higher grease storage requirements.

Units must be equally spaced to ensure equal effluent flow distribution.

For below grade installations it is recommended to install a two-way cleanout tee extended to finished grade before and after each unit for line cleaning purposes.

Flow Splitter™ (FS-DUO, FS-TRIO, FS-QUAD) sold separately.







APPLICATION SPECIFIC DETAILS

