

Considering a Pressure Sewer?

Orengo Effluent Sewers vs. Grinder Systems

PUMPS

High head turbine effluent pumps...

- don't corrode — stainless steel and/or thermoplastic
- are lightweight — 25 to 30 pounds
- have a longer life — 20 to 30 years
- have a higher head capacity (½ hp — ≈ 250 ft)
- use smaller motors (½ hp most common)
- are available in 115 or 230 V power
- are easy to service and rebuild
- cost \$400 to replace
- have typically low energy costs (moving liquids only)

Grinder pumps...

- corrode over time, even with protective coatings
- are heavy — most weigh over 100 pounds
- have a much shorter life — 5 to 10 years
- have a lower head capacity (1½ hp — ≈150 ft)
- use larger motors (1½ to 2 hp most common)
- require 230 V power
- are more difficult to remove, service, and rebuild
- typically cost more than \$1200 to replace
- have higher energy costs (moving solids)

COLLECTION LINES

Effluent sewer lines...

- use smaller pipe sizes — typical service line is 1 in.
- handle only the liquid portion of sewage
- do not require periodic pigging (cleaning)
- do not require minimum velocities and can be oversized for future growth
- use a Hazen-Williams coefficient (C) of 150 (lower friction)
- use low-cost air release valves as used in water delivery systems

Grinder pump lines...

- use larger pipe sizes — typical service line is 1¼ in.
- handle all liquids and solids in macerated slurry
- require periodic pigging
- require minimum scouring velocities — pipe sizing is critical
~ pipe sizes that are too small cause excessive headloss
~ pipe sizes that are too large clog and require frequent cleaning
- use a Hazen-Williams coefficient (C) of 120 (higher friction)
- use expensive sewage air release valves

ON-SITE FACILITIES

Processing tanks...

- perform 45% to 55% of sewage treatment (95% grease and oil removal and 85% solids removal)
- have minimum 24 hours emergency storage and approximately 5 days hydraulic retention time
- generally require septage pumping no more frequently than every 10-15 years depending on occupancy loading

Grinder chambers...

- provide no treatment nor removal of grease or oil
- have little or no emergency storage/hydraulic retention time, requiring service personnel to respond to alarms immediately

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EFFLUENT AND THE TREATMENT FACILITY

Processing tank effluent...

- has primary treatment and superior quality:
BOD₅ = 130 mg/L, TSS = 30 mg/L (w/effluent filter), G&O = 15 mg/L
- has better solids management: produces 3 pounds per person/year*
- will require sulfide control when used in conjunction with conventional gravity sewers (sulfide generation proportional to BOD₅ of waste stream)
- allows smaller, low-cost low-maintenance treatment facilities, such as media filters and subsurface dispersal

Grinder pump effluent...

- is a poor quality, macerated slurry of solids:
BOD₅ = 450 mg/L, TSS = 500 mg/L, G&O = 160 mg/L
- has no solids management: produces 50 pounds per person/year*
- will require sulfide control when used in conjunction with conventional gravity sewers (sulfide generation proportional to BOD₅ of waste stream)
- requires larger, more costly treatment facilities

OPERATION AND MAINTENANCE

Effluent sewer systems...

- do not require line pigging
- use non-corrodible, lightweight, long-lasting pumps
- have large emergency storage capacity (underground tank) allowing a long window of time for emergency response
- have fewer service calls
- minimize electrical demands (small motors)

Grinder pump systems...

- require line pigging
- use corrodible, heavy, shorter-lived pumps
- have little or no emergency storage capacity (basin) requiring immediate response to emergencies
- have longer and more frequent service calls
- have greater electrical demands

* "Wastewater Alternatives for Your Community" video