Low-pressure versus gravity sewers

Why a low-pressure system makes sense for the RM of Stanley

The RM of Stanley has undertaken a thorough review of available options to provide sewer servicing within the RM.

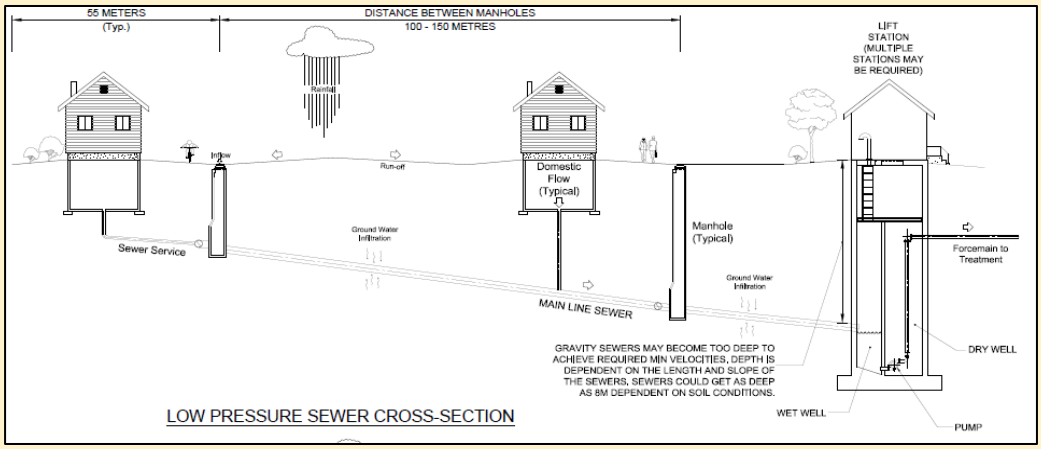
For a rural community like ours, the best combination of economy, flexibility and reliability is offered by a low-pressure STEP system (Septic Tank Effluent Pump).

This fact sheet explains how low-pressure systems differ from conventional gravity systems, and the pros and cons of each.

GRAVITY SEWER
Typically installed in urban communities (higher density)

Gravity systems need slope to keep effluent moving at the required speed. The depth required could be as much as 24 feet, depending on soil conditions. This can be challenging and expensive because:

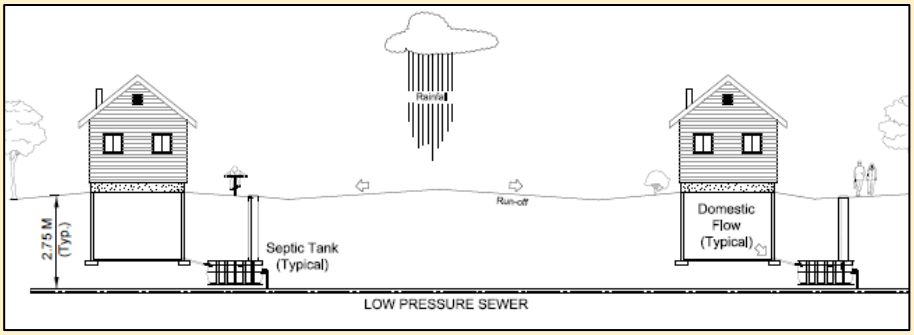
- Existing basement elevations vary – gravity sewer is based on the deepest basement
- Manholes are required throughout – manholes release air allowing the system to flow
- Greater risk of water infiltrating the system, putting strain on capacity
- Requires open trench construction, which can be very damaging to existing roads and yards



LOW-PRESSURE SEWER
Typically installed in rural communities (lower density)

This type of system functions with a septic tank. Solids settle in the tank, and liquid wastewater is moved through the pipes by low-pressure pumps. Installation is less expensive and disruptive because:

- Slope isn't required so sewer lines can be placed at a depth of 8-10 feet throughout
- Pipes are smaller in diameter and can run in any direction
- Lines are installed by horizontal drilling, which reduces costs by minimizing the impact on roads and yards
- A pressure system means less infiltration of the system by groundwater
- Existing septic tanks and pumps can often be used



Impact on the community

Low-pressure systems are typically installed in rural settings where density is low and there are large lot frontages. The lines can be installed with minimal disruption to existing roads, sidewalks and yards, and fewer lift stations are required.

	GRAVITY SEWER	LOW-PRESSURE SEWER
Installation	Open trenching, deep excavation, challenging.	Horizontal drilling, open digging at connection points only.
Manholes	Required every 100-150 metres.	Not required.
Lift stations	In low-density settings, many lift stations are required to convey wastewater over long distances.	One pumping station per community.
Onsite equipment	Service line required for each property; no tank or pump required.	Septic tank, septic pump and service line required on each property.
Cost	High due to requirements for depth of pipes, restoration of surface infrastructure, manholes and multiple lift stations.	Low due to ability to directionally drill lines, no manholes, fewer lift stations and less surface restoration to roads, sidewalks and yards.

Maintenance requirements

Routine maintenance is minimal for both sewer types. Low-pressure systems require annual pump-out of solids from septic tanks – a service that the RM will provide annually, at no additional cost, to households connected to the system. Pump-out costs will be included in quarterly sewer charges.

	GRAVITY SEWER	LOW-PRESSURE SEWER
Homeowner maintenance	Low. Over time, tree roots and other issues can require new service lines to be installed.	Moderate. Septic tank and pump must be kept operational, and service line must remain unobstructed.
Municipal maintenance	Higher long-term costs for lift stations and sewer relining, which are recovered through increased sewer charges.	Pumping station maintenance required.

Reliability

Risk of sewer backup is low with both gravity and low-pressure systems. Each sewer type has advantages and limitations.

	GRAVITY SEWER	LOW-PRESSURE SEWER
Risk of sewer backup	Low. Can be caused by lift station failure, system blockages and stormwater infiltration. No additional sewer capacity on site because there is no tank.	Low. Can be caused by pump or line check valve failure. Less risk of blockages due to higher velocities. Additional sewage capacity also onsite in septic tanks.
Options to avoid backup	Main sewer backflow valve installed in home.	Check values installed in service line, high water alarm in septic tank, main sewer backflow valve installed in home.
Power outage	No direct impact to homeowner. Generators in lift stations can keep main conveyance systems functional.	Homeowners can install generators on-site to keep septic pumps working during outages. Generators in lift stations can keep main conveyance systems functional. Individual tanks can be pumped out by trucks as needed.
Risk of water infiltration into system and wastewater seepage into groundwater	High potential for stormwater or groundwater to infiltrate the system through manholes and old sewer lines.	No risk of groundwater contamination because system is pressurized.

If you have questions

The latest information about the Stanley wastewater project is available on the webpage www.rmofstanley.ca/p/wastewater-project or from the RM office:

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