# **a** System Flow Overview

## Building sewage → Holding Tank → Pump Station → ATU

# Benefits of Using a Holding Tank First

- 1. Flow equalization Reduces shock loading to the pumps and downstream ATU.
- Buffer capacity Allows for intermittent flows and gives you a safety buffer during high-use periods.
- Maintenance access Easier to service than direct pump wells if designed properly.

# Design Considerations

# 1. Tank Sizing:

- Should be sized for peak daily flow + emergency storage (often 24–48 hours of capacity).
- o Consider **alarm levels** (high level for overflow alert, low level to protect pumps).

# 2. Access & Location:

- Must be accessible for pumping (vacuum truck) and routine inspection.
- Account for vehicle loads if it's under or near the parking garage.

## 3. Ventilation & Odor Control:

 Holding tanks can generate odors—especially in a confined site. You may need carbon filters or active ventilation.

# 4. Pump Design:

Use duplex pumps for redundancy, controlled by float switches or level sensors.

 Pumps must be sized for both flow rate and head pressure required to reach the ATU.

## 5. Controls & Alarms:

- o Include an audible/visual alarm system, ideally connected to a remote monitoring panel.
- Backup power or a generator might be required depending on local code.

# Reasons Accessibility is Required

### 1. Maintenance:

o Pumps, floats, filters, and tank baffles will eventually require cleaning, repairs, or replacement.

# 2. Inspection:

o Local health departments or regulatory agencies often require periodic inspections.

# 3. Emergency Access:

o If a pump fails or a tank overflows, immediate access is needed to avoid system backup or environmental hazard.

# National Accessibility Requirements

- Manhole or riser lids must be:
  - At **finished grade** or just below with minimal cover.
  - Minimum 24–36 inches in diameter for ease of entry.
  - Lockable or secured to prevent unauthorized access (especially in public or traffic areas).

- **Pumps and controls** should be reachable **without confined space entry** if possible, or designed to meet confined space safety standards.
- Vent pipes and alarms should also be accessible and visible.

# **M** Special Cases (e.g., under garage slab)

- If the tank or pump is located **under a structure**, you'll need:
  - Removable access hatch or utility vault with code-compliant access.
  - Traffic-rated lids if in drive areas.
  - Clear pathways to bring in service equipment (e.g., pump truck hose reach).

# **Typical Maximum Burial Depths**

Component	Typical Max Burial Depth	Notes
Plastic/Poly Holding Tanks	2 to 4 feet	Some reinforced models allow up to 6 feet. Deeper requires engineering.
Concrete Tanks	4 to 6 feet (or more)	Can be buried deeper if designed for the load and hydrostatic pressure.
ATUs	2 to 4 feet typically	May vary—some are rated for deeper burial with risers.
Pump Chambers	4 to 6 feet	Must maintain serviceable access. Float switches must remain reachable.
Risers and Lids	Extend to grade	Must be watertight, secured, and rated if in traffic area.

# Important Considerations

### 1. Structural Load:

 If under a driveway or garage, you'll need traffic-rated tanks and lids (HS-20) rated).

# 2. Buoyancy/Floatation:

Tanks deeper in wet soils are at high risk of **floating** when empty or partially full—anti-floatation anchors or concrete backfill may be required.

## 3. Access Requirements:

• Even if buried deep, you must have risers to surface grade for pump, inspection, and cleaning access.

## 4. Pump Limits:

 Very deep tanks increase TDH (Total Dynamic Head) on pumps—ensure your pump is rated for the lift.

# Recommendation

Don't bury deeper than manufacturer-approved depths—and if you must go deeper, you'll likely need an engineered solution and local health department approval.

Would you like help determining max burial depth for a specific product or code jurisdiction?

### You said:

in the case that the pre tank and pumps are going to be deeper then 6 ft what would you recommend

### ChatGPT said:

If your holding tank and pump chamber need to be deeper than 6 feet, you're entering territory where standard systems aren't sufficient and extra precautions are required. Here's what I strongly recommend:

# Recommended Design Approach for >6 ft Burial Depth

## 1. Use a Traffic- or Deep-Bury-Rated Concrete Tank

- Concrete tanks are best for deep burial due to:
  - Higher structural strength
  - Better resistance to hydrostatic pressure (floating)
- Specify a tank rated for deep burial and vehicular loading if under a garage or driveway (typically HS-20 rated).

# 2. Install Traffic-Rated, Watertight Risers to Grade

- Risers should be:
  - Concrete or reinforced plastic (e.g., Tuf-Tite or Polylok)
  - Sealed with gaskets or mastic for watertightness
  - Rated for **surface loads** (including garage vehicle weight if applicable)

# 3. Engineer a Secure Anti-Floatation System

- When the tank is **deeper than 6 ft**, especially in areas with **high groundwater**, floatation is a major risk.
  - Use **concrete backfill**, **ballast slabs**, or **tie-downs** with anchor systems
  - Have a professional engineer calculate the buoyancy uplift force and design appropriate countermeasures

# 4. Upgrade to a Heavy-Duty Pump System

- You'll need a pump with:
  - Sufficient head rating (based on vertical lift and pipe friction losses)

- Duplex pumps (for redundancy)
- Control panel with high-level alarms
- Possibly guide rail systems for safe pump removal from grade level

# 5. Include Confined Space Safety Features

- A >6 ft deep chamber qualifies as a confined space under OSHA
  - Add **safety grates** or platforms under lids
  - Use **removable guide rails** or brackets for pump access
  - o Ensure future maintenance can be done without entering the tank if possible

# ✓ Recommendation

- VJ Rice Concrete: Ready-mix Concrete and Concrete Products Bridgetown, Kentville,
  Digby, Mount Uniacke | Halifax NS
- Southwest Fiberglass Products Ltd. Coming Soon
- Alberta's Precast Concrete Manufacturer | Westcon Precast
- https://caseyconcrete.ca/