The City of South Burlington
Pump Station Design Criteria

The city recognizes "Guides for the Design of Wastewater Treatment Works" TR-16 prepared by the New England Interstate Water Pollution Control Commission as its guide for its pump station design. All sewage pumping stations shall be designed in accordance with the TR-16 manual except as noted below.

Submersible Pump Stations: All sewage pumping stations shall utilize submersible pumps unless otherwise approved by the Waste Quality Superintendent. Grinder stations shall not be permitted. It shall be possible to remove and replace the submersible pumps without dewatering the wetwell or disconnecting the piping. Pumps shall be of the pull-up design, using a lifting cable and guides for pump removal. The pump shall be connected to the fixed discharge piping with a self-locking coupling. Shaft seal failure or potential seal failure detection alarms shall be provided. Submersible pumps may also be used in a wetwell/drywell configuration.

Minimum requirements for wastewater pump stations

A. **Pump Requirements:** 2 non-clog submersible sewage pumps, each designed to handle the peak design flow rate expected from the service area. The designer shall submit an analysis of capacity needs for the service area. Pumps shall be 3 phase with no 1 to 3 phase converters with a 4" discharge capable of passing a 3" solid.

B. **Pump Station Electrical Service:** The contractor shall be responsible for providing all materials and labor as required to comply with local and state electrical codes. All electrical connections for pumps will be made outside of the wetwell within a junction box. All electrical panels shall be UL listed.

C. **Emergency Storage:** Provide a minimum of 4.15 hours of storage above the alarm level without surcharging of the sewage collection system. Storage volumes shall be calculated in accordance with the State of Vermont DEC Written Guidance for Preparation of Emergency Action – Electrical Power Failure Plans and shall be based on the maximum daily flow volume being delivered over a 16 hour period.

D. **Wetwell Level Sensor:** The City has adopted a uniform standard for level control systems for all of its wastewater pumping stations. Level control systems shall be consistent with other pumping stations throughout the City which utilize the Muliti-trode control system manufactured by Flygt Corporation. The level control system shall be multi-trode, a multi-sensored probe in conjunction with a multi- triode controller or multi triode relays. All pumping stations shall also include a redundant high water alarm trigger that is a separate float-type or mercury type switch, independent of the Multi-trode unit.

E. **Submersible Duplex Pump Station Requirements:**
   - Pumps (2)
   - Stainless steel rail system for pump removal
   - All hardware including chain shall be stainless steel
   - Aluminum Access cover (Bilco or equivalent)
   - Multitrode pump control
   - HOA Switch for each pump
   - Run lights for each pump
   - Alarm light and audible alarm with battery back-up

- Main disconnect switch
- Double throw switch with plug for city's portable generator
- 110V outlets in panel
- Elapsed time meters
- Lighting protection
- Alternating selector switch
- Telemetry system with battery back-up tied into the South Burlington System
- Spare parts depending on eq

F. Valve Pit Requirements: Shut–off valves and check valves for submersible pumps shall be placed in a separate chamber for ease of maintenance

- Check valves 4"(2)
- Gate valves 4" (3)
- Emergency bypass connection 4" with cam lock and shutoff valve

G. Force Main Requirements: All force mains shall be a minimum of 4" in diameter and shall be designed for a minimum velocity of 3.0 feet per second. Maximum velocities shall be no greater than 7.0 feet per second unless otherwise approved by the Superintendent.

H. Submittal Requirements: The design engineer shall submit plans on 24"x36" drawings showing appropriate plan and elevation views of the proposed pumping station. Elevations shall be based on USGS datum. The submittal shall identify the extent of the service area and an analysis shall be provided that identifies the full build-out requirements of the service area. An analysis shall be provided to access the capacity and condition of downstream interceptors and pumping stations, in order to determine if adequate capacity is available downstream to handle the proposed flows. Upgrades to downstream facilities may be required prior to approval of any new proposed pumping stations.

I. Record Drawings: Prior to the acceptance by the City a complete set of as-built drawings shall be submitted to the City. The as-built drawings shall be provided in both hard copy and electronic format. The drawings shall be electronically drafted using AutoCadd drafting software and shall be stamped by a Professional Engineer who shall certify that the drawings provided represent the actual constructed conditions.