Instructions for Application for Construction/Operation Permit for Sewer System Lift Station/Force Main
Schedule F

This schedule must be submitted with all lift station and/or force main permit application.

1. The name of the project must be the same as that used on WPC-PS-1.

2. The completion and occupancy dates for the project are requested so Agency field engineering visits can be planned.

3. The design population item refers to the area to be served by the lift station in the design year.

   The area to be served is the maximum acres to be served by this project.

   The population to be served should indicate the estimated number of population to be served and the estimated organic industrial population equivalents in the design year.

   The design flow pertains to the hydraulic loading for the population to be served as well as the industrial waste hydraulic load to be attached to the lift station in the design year.

   The maximum flow shall be determined from Appendix D of the Illinois Recommended Standards for Sewage Works.

   Rule 602(a) of Chapter 3, Pollution Control Board Regulations indicates that the installation of new combined sewers is prohibited except where sufficient retention or treatment capacity is provided to ensure that no violation of the effluent standards in Part IV of Chapter 3 occurs. Therefore, new lift stations serving new combined sewers must be equipped with some means of providing treatment to meet the effluent standards if overflows at the lift station are included in the design.

5. A scouring velocity of at least two (2) feet per second shall be maintained in the force main. An automatic air relief must be placed at high points in the force main to prevent air locking. It is recommended that a clean-out or blowoff be provided at low points, but it is not mandatory.

6. The piping friction losses must be computed at C = 100 for unlined iron or steel pipe. For other smooth pipe materials higher c value not to exceed 120 may be used.

7. a. All pumps shall be capable of passing spheres of at least 3 inches in diameter.

   c. The capacity of the lift station must be sufficient to pump peak flows with the largest pump out of service.

8. Suitable shut-off valves shall be placed on suction and discharge lines of each pump. A check valve shall be placed on each discharge line, between the shut-off valve and the pump.

10. The maximum retention time in the wet well shall not exceed 30 minutes. The effective capacity of the wet well shall be based on design average flow and a filling time shall not exceed 30 minutes.

11. Complete buoyancy calculations shall be submitted.

13. Paragraph 32.7 of the Illinois Recommended Standards for Sewage Works gives the requirements for ventilation. Ventilation may either be continuous or intermittent depending on the method and period of operation.

17. Emergency Operation

    17.1 An alternate source of emergency power must be provided. This may be accomplished by the connection of the station to at least two independent public utility sources (sub-stations), or by the provision of portable or in-place internal combustion engine equipment which would generate electrical or mechanical energy by the provision of a portable pump for each lift station although documentation must be provided to show that by using storage in the wet well and sewers, an overflow of sewage into waters of the State or basements served by the sewers will not occur during the power outages anticipated.

    17.2 The statement from the proper authority may be in the form of a letter from the power company or companies.

    17.3 Emergency pumps, generators, portable ventilation equipment, ladders, etc., are in the category which may be listed.

    17.5 This will depend on: the type of alarm system; and concern of employees involved; the times before basement flooding or overflows to streams occurs.

    17.6 The storage volume in the wet wells, sewers and manholes should be computed along with expected flows to give the time interval.

    17.7 Personnel are expected to be available at all times.

    17.8 An alarm system is highly recommended and considered mandatory where there are no personnel on duty on a 24-hour basis.

18. Flow measurement is considered mandatory at every lift station. Paragraph 32.8 of the Illinois Recommended Standards for Sewage Works gives the requirements for flow measurements.

19. Unless the "Standard Specifications for Water and Sewer Main Construction in Illinois, September, 1978" or other approved municipal or sanitary district specifications are indicated as being applicable on the plan drawings, separate specifications must be submitted.

20. All pumping stations and related equipment shall be protected against vandalism (by fencing or other suitable provisions).

Instructions for Application for Construction/Operation Permit for Sewer System Lift Station/Force Main
Schedule F

22. Emergency, high-level wet well overflows will be permitted only if the lift station design meets all applicable requirements of the Illinois Recommended Standards for Sewage Works, including provision of emergency power or emergency pumping capability and alarm system.

SCHEDF.INS

Illinois Environmental Protection Agency
Division of Water Pollution Control, Permit Section
Post Office Box 19276
Springfield, Illinois 62794-9276

Schedule F - Sewer System Lift Station / Force Main

1. **Name of Project:** _____

2. **Design Population:**
   Area to be served _____ acres. Population to be served _____P.E..

3. **Design Flows:**
   Design Average Flow _____ gpm. Design Maximum Flow _____ gpm.

4. **Lift Station will serve:**
   ☐ Only separate sewers ☐ Only combined sewers ☐ Separate and combined sewers
   ☐ Domestic waste sewers ☐ Industrial waste sewers ☐ Domestic and industrial waste sewers

5. **Lift Station is designed to serve:**
   ☐ Only the population indicated above ☐ An anticipated additional waste contribution of _____ P.E.

6. **Force Main:**
   Size of Force Main (inches) _____ Total Length (feet) _____

   Pipe material specifications _____ Joint specifications _____

   Are air relief valves provided at high points? ☐ Yes ☐ No
   Are clean-outs (blow-offs) provided at low points? ☐ Yes ☐ No

7. **Design Head (Total Dynamic Head):**
   A) **Static Head**: Discharge Elevation: _____

   Low Water Elevation: _____

   Static Head _____ Feet

   B) **Pipe friction loss**: _____ Feet at "C" = _____

   C) **Minor Losses** (Valves, etc.) _____ Feet at "C" = 100

   Total Dynamic Head (A + B + C) _____ Feet

   Maximum Suction Lift (if applicable) _____ Feet

8. **Pumps**

Number of Pumps	Type of Pump	GPM per Pump	at TDH (Feet)	H.P. of Each Pump	Pass 3" Spheres
					☐ Yes ☐ No
					☐ Yes ☐ No
					☐ Yes ☐ No

a. Rated Capacity of Lift Station _____ gpm at _____ feet of TDH.

b. Pumping Capacity with Largest Unit Out of Service _____ gpm at _____ feet of TDH.

c. Are all pumps with positive suction head and/or self priming? ☐ Yes ☐ No

d. Have provisions been made to detect shaft seal failure or potential shaft seal failure? ☐ Yes ☐ No

9. Valves

a. Discharge Pipe ☐ Gate ☐ Check ☐ Other _____
b. Suction Line (if applicable) ☐ Gate ☐ Check ☐ Other _____

10. Wet Well

a. Effective capacity (volume between pumps off and pumps on switches) = _____ gallons
b. Detention time at design flow = _____ minutes
c. Are there provisions for pump removal? ☐Yes ☐No

11. Buoyancy Calculations

a. Have buoyancy calculations been submitted? ☐Yes ☐No ☐N/A
b. Depth of groundwater table: _____ feet below the ground surface.

12. Accessability

a. Is the pump station accessible by an all weather road? ☐ Yes ☐ No

13. Ventilation

a. Wet Well:
Continuous with at least 12 complete air changes per hour? ☐Yes ☐No
Intermittent with at least 30 complete air changes per hour? ☐Yes ☐No
b. Dry Well (if applicable):
Continuous with at least 6 complete air changes per hour? ☐Yes ☐No ☐N/A
Intermittent with at least 30 complete air changes per hour? ☐Yes ☐No ☐N/A
c. Is portable ventilation equipment available for use at all times? ☐Yes ☐No

14. Emergency Operations

a. In case of power failure, is an alternate power supply available? ☐Yes ☐No
If yes, please describe the source: _____
b. Is a portable pump, with adequate pumping capacity, available for use at all times? ☐Yes ☐No
c. Has a riser from the force main been provided to hook-up portable pumps? ☐Yes ☐No
d. Length of time between a power failure and commencement of pumping by emergency equipment _____
e. Estimated time interval before damage or sewer backup will occur _____ .

f. Type of alarm system proposed: ☐Telemetering System ☐ Audio-Visual with self contained power

g. Are personnel available at all times to operate emergency equipment? ☐Yes ☐No

15. Flow Measurement

a. Type of flow measurement provided: ☐Flow meter ☐Elapsed time meters ☐ITR

16. Compliance with Illinois Recommended Standards for Sewage Works

a. Can the pump station remain operational during the 25 year flood? ☐Yes ☐No
b. Is the pump station protected from physical damage during the 100 year flood? ☐Yes ☐No
c. When applicable, will electrical systems and components comply with NEC requirements for Class I, Group D, Division I locations? ☐Yes ☐No
d. Have provisions been made to automatically alternate the pumps? ☐Yes ☐No
e. Is the motor control center located outside and protected by a conduit seal? ☐Yes ☐No
f. Can the motor be electronically disconnected without disturbing the seal? ☐Yes ☐No

This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 1112, Section 1039. Disclosure of this information is required under that Section. Failure to do so may prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center