306.00 PRESSURE SEWER SYSTEMS

306.01 Application: The pressure sewer system shall be considered as a supplemental tool for wastewater collection system and not as a replacement for the conventional gravity collection system. It is expected that pressure sewer systems would generally be used in small sub-systems or areas. This system may be approved for use under conditions such as the following:

A. Where the topography makes it difficult for the potential users to be served by a gravity collection system.

B. Where ground-water conditions make it difficult to construct and maintain a gravity collection system.

C. Where excessive rock excavation makes the gravity collection system impractical.

306.02 Design Criteria: The following considerations shall be used for the design of a pressure sewer system including the grinder pump units:

A. Collection System

1. No pressure sewer less than 1 1/4 inches inside diameter shall be provided. The required size shall be determined to maintain low frictional losses in the system and a minimum scouring velocity of 2 feet per second at all points in the system.

2. Special care shall be exercised in the hydraulic design of a pressure sewer system which is proposed to serve ultimately more units than those expected to be served initially.

3. The determination of flow in the pressure sewer system shall be made on the basis of the maximum probable number of grinder pump units that would be expected to run simultaneously.

4. The pressure sewer system shall be laid out in a branched or tree configuration to avoid flow-splitting at branches which cannot be accurately predicted.

5. The pressure sewer piping shall be installed in a depth sufficient to protect against freezing and damage from vehicular traffic.

6. Pipe shall be polyvinyl chloride pipe as per ASTM D2241 SDR-26 or approved equal. A value of C-130 to 150 is recommended for use in the Hazel-Williams formula.

7. Clean-out connections shall be provided at distances not to exceed capability of available cleaning equipment (approx. 400-600 ft.). Flushing clean-outs should be provided at the upstream end of every major branch.

8. Pressure and vacuum release valves shall be employed at appropriate locations. Pressure sewers should be constructed on a gradually ascending slope to minimize air binding.

9. All applicable provisions of sections 303.00 and 304.00 shall be utilized in the development of a pressure sewer system.

10. Pressure sewer system operating pressures in general shall not exceed a range of 40 to 50 psi for any appreciable period of time.

11. Thorough pressure testing of all lines, fittings, valves, etc. shall be made prior to start-up.

B. Grinder Pumps

1. The minimum net storage capacity of the grinder pump unit shall be approximately 50 gallons. The grinder pump tank should be able to accommodate normal peak flows and emergency storage for periods of 8 to 12 hours during a short power failure.

2. When a holding tank is provided for emergency purpose, during an extensive power failure or mechanical breakdown, the tank should be sized for at least 3 days' storage.

3. Adequate provisions should be made to empty the holding tank as and when necessary. The grinder shall have the characteristics which will continue to produce flows of at least 8 gpm even when conditions in the pressure system cause heads to rise temporarily to values as high as 50 psig.

4. Check and shut-off valves shall be employed to isolate the grinder pump unit from the unit service line and the pressure laterals.

5. Appropriate high water and overflow detection devices such as visual and/or audio alarm shall be provided.

6. Provisions shall be made to insure that grinder pump operates even under temporary loads above normal and contains integral protection against back siphonage and over pressure.

7. The grinder pump unit shall be capable of reducing any materials in the wastewater which enters the grinder unit to such size that the material will pass through the pump unit and pressure sewer without plugging or clogging. No screens or other devices requiring regular maintenance shall be used to prevent trashy material from entering the grinder pump.

8. At least one stand-by grinder pump unit for each 50 units or fraction thereof shall be provided for emergency replacement.

9. The grinder pump unit must be capable of being removed without dewatering the collection tank.

10. The pump chamber may be constructed of fiberglass except in areas subject to traffic flow. In the latter case the chamber will be constructed of concrete.